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doc. Ing. David Tuček, Ph.D.

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Preface

Dear Conference Participants!
We are very pleased to introduce the Proceedings of the eighth "Finance and Performance of Firms in Science, Education and Practice" conference. As with previous conferences, the theme was the link between the information provided by researchers and academics, representatives of companies, banks, and other financial institutions, public administration as well as PhD students.

As a conference organized every two years, the Faculty of Management and Economics of the Tomas Bata University in Zlín is pleased to host the eighth conference to recreate a platform for professional discussions and dialogues of participants from different countries. We see this as a wonderful opportunity for those actively engaged in this area to share their knowledge and experience.

The conference programme, as well as the proceedings you have received, confirms that all these subjects and relevant problems are covered and that there is an opportunity for exchange of ideas and opinions. On the basis of double blind reviews, only papers that met the requirements of reviewers regarding the content, structure, and the completeness of the references cited were included in the Conference Proceedings.

The plenary lectures and discussion in special sections bridged the gap between the different fields of: finance, economy, accounting and business and administration, making it possible for non-experts in a given area to gain insight into new areas. Among the speakers were several young scientists, namely, postdocs and students, who brought new perspectives to their fields.

The conference aims to contribute to the enrichment of understanding connected to the given set of current problems and to support further growth of cooperation.

On behalf of all the members of organizational committee, I hope that the conference will provide boundless opportunities for the exchange of knowledge and experience among participants and a chance to make personal contacts.

assoc. prof. David Tuček, Ph.D.
Dean of the Faculty of Management and Economics of TBU in Zlín

Zlín, April 2017

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VALUATION OF PRIVATIZED COMPANIES IN THE TRANSITION ECONOMIES: THE CASE OF PRISHTINA INTERNATIONAL AIRPORT

Aliu Florin, Knápková Adriana, Kryeziu Liridon, Bagis Mehmet

Abstract

The paper aims to capture the valuation problems associated with the privatization of state-owned companies in Kosovo. The methods used in the research detain, if the Prishtina International Airport was undervalued, overvalued, or properly valued in the leasing process. Privatization has been considered as the turning argument in the inclusive economic liberalization process that the Kosovo economy conducted during the transition period. The study comprises research on the factual data in the period 2010-2014 while the estimates on cash flow projections has been made on twenty-year period linked with the concession agreement of the Prishtina International Airport. The results of the study with the standard geometric progression and Monte Carlo simulation, show that the Prishtina International Airport (PIA) was undervalued in the leasing process.

Keywords: Prishtina International Airport, Discount rate, Qualitative Beta, Discounted cash flow, Five Forces, Privatization in Kosovo

JEL classification: G32, G 33

1 INTRODUCTION

Privatization does not contain only local debate; but it is a worldwide subject, since it affects people's economic life. Privatization has been always a controversial topic, within left and right wing economists. Privatization and diversification of the airport services raise the airport efficiency (Truitt & Esler, 1996). In addition, studies conducted by Vasigh and Hamzaee (1998) for Latin America, Western Europe and Asia argue that the government of these countries should pursue policies that transform the ownership structure of airports, from publicly held enterprises into the private businesses. Opponents of the airport privatization argue that charges will increase when the company converts into a private business. London's Heathrow and Toronto airport are typical cases of outputs delivered from privatization, where charges increased and services decreased (Nauss, 1993). Prishtina International Airport (PIA) has not been fully privatized; it has been given with a concession for 20-year period. Airports were normally preserved as the monopolist economic unit's with fewer prospects to cultivate market potentials (Graham, 2013). The appearance of the competitive environment within airports (Economics, 2012; Forsyth, 2010) linked with a privatization as a primary process, fashioned the attitude how airports nowadays are functioning. Low-costs in airline industry and large discounts in newly commercialized and privatized airports are factors that attract passengers (Barrett, 2000). Competition among air transport, such as: cars, long distance buses and other forms affects airport's performance as well (Tretheway & Kincaid, 2010), which fashions enormous pressure on airport management to compete in a complex environment.
Our research imprisons model five forces of Porter (Porter, 1980) in order to capture not only threats and opportunities within industries where the PIA is operating but also is used as a general risk indicator in the *Discounted cash flow* (DCF model). Globalization associated with the concepts of free markets and free movements, has set burden for the airport management

to compete not only on the national borders but also regionally and on a global scale. In 1980s, there were huge waves of airport privatizations, followed by the stream of deregulation, free markets and free movements. While airports converted private, the issue of assessment became increasingly important (Parker, 2011; Vogel & Graham, 2010). Meanwhile, the study conducted in numerous countries by Assaf et al., (2012) argued that economic regulation is the most significant form that effect airport's efficiency in comparison to governance structure installed in airports. Our work has used five competitive forces and valuation techniques to capture the intrinsic value of PIA. The added value of the paper, strikes the contested topics of privatizations and concessions that occurred in Kosovo economy with focus on Prishtina International Airport. The novelty of the paper stands on capturing the complex structure of competitiveness, price signals and products that PIA delivers while it strikes the initial process of concession. We argue that Prishtina International Airport was under-valued, based on the analysis of five forces model of Porter. Therefore, based on the observed phenomena, research questions are as follows: Did the Kosovo government properly assessed PIA before leasing it? PIA was overvalued, properly valued or undervalued in the leasing process? The remaining parts of the study are constructed as follows: first part comprises historical perspective on airports privatization. Second part is divided in two sections: model specification and five competitive forces of the Prishtina International Airport, while the third part is followed by the results obtained from the valuation process. Concluding remarks, limitations and future research stand on the fourth part.

2 HISTORICAL PERSPECTIVE ON AIRPORTS PRIVATIZATION

Prishtina international airport has been established in 1965, restored in 1995 and given with a concession by the Kosovo government in 2010 (Ejupi et al., 2014). The government of Kosovo at that time announced as the winner the Turkish consortium “Limak” and French company “Aeroport de Lyon”. Turkish conglomerate owns around 90% of the shares, while the rest occupied by the French company (Ejupi et al., 2014). Airport privatization was firstly initiated in the United Kingdom, where the British government in 1987 privatized seven of its major airports. The same path experienced Frankfurt airport in 2001 (Vasigh et al., 2003). The Vienna International Airport has been listed on the Vienna Stock Exchange in 1992, while the two Danish airports were privatized in the moment when they got listed on the Copenhagen Stock Exchange (Betancor & Rendeiro, 1999). Sydney Kingsford Smith International Airport has been leased for 99 years (News, 2002). In addition, Australia privatized three major airports: Melbourne, Brisbane and Perth (Forsyth, 1997). Privatizing or leasing airports followed also Asian economies and some of the Latin American countries, where the government intended to give up from controlling and managing them. Even though the USA considered as the backbone of the capitalist system, the majority of airports are not privatized (beside restaurants, parking places etc.) since there was enormous anxiety that the charges will go up after privatization (Vasigh et al., 2003).

3 MODEL SPECIFICATION

There is not an appropriate form and methods to evaluate companies. Most of the inputs within the valuation models stand on the future prospects assumptions, such as: cash flow, earnings, inflation, economic growth, company growth, etc. Scarrett (2008) argues that airports and especially airfields should be valued on the costly methods. On the contrary, the literature which focuses on the real estate considers airports as non-standard specialized property (Wyatt, 2013). Value driver method proclaimed by (Malighetti et al., 2011; Vogel & Graham, 2010) consider that the entity should be treated as an owner occupied asset based on the replacement

costs. The paper intents capturing the intrinsic value of the company not the market price. Valuing private companies tends to be more inaccurate than valuating public companies, where public companies have market prices updated daily. The historical performance of the company is unrelated with her future prospects. There are two methods used in valuation: direct method (known as DCF model) and relative valuation techniques.

DCF creates its base model standing on historical outcomes of profit, cash flow, etc. in order to generate future results. DCF is discounted with the risk level of the company and the country where the company is operating (known as discount rate). Moving forward on DCF terminal values, the geometric progression delivers less added cash flow on the present value. Investors appreciate less their expected returns, when terminal values move far away in the future. Vasigh et al. (2003) considers that DCF is an appropriate method for the valuation of airports and is used for valuation of three Korean airports.

$$DCF = \sum_{i=1}^{\infty} \frac{FCFF_t}{(1+WACC)^t} \quad (1)$$

DCF stands for discounted cash flow or the intrinsic value of the firm. WACC stands for the risk level of the company while it incarcerates cost of equity (CAPM-Capital Asset Pricing Model) and cost of debt (Cd). FCFF reflects free cash flow to the firm, generated from financial statements.

Some of the work done on the company valuation use WACC as a proxy variable based on other countries or similar companies operating in the same industry. Using WACC on this basis delivers unrealistic results since different companies have different risk level, diverse capital structure (debt vs. equity) and they pay dissimilar interest rates. The problem gets even more exacerbated when the WACC is used from other countries (the companies that operate in the same industry in other countries), since different countries have different economic settings (risk free rate, economic growth, rules and regulations etc.) and different risk level. Minor variations in the WACC deliver completely dissimilar results on the company value and it is the initial step toward speculative prices. Valuation that uses different accounting measures such as: equity cash flow, free cash flow, economic profit, etc. should deliver identical results of the company value (Fernandez, 2002).

$$CAPM = R_{FR} + \beta(R_M - R_{FR}) \quad (2)$$

Where CAPM stands for Capital Asset Pricing Model, R_{FR} represents risk free government bonds, $(R_m - R_{FR})$ shows the differences within risk free government bonds and market returns. Standard textbooks on valuation promote that Beta coefficient (β) must be obtained from the regression of the company returns with market returns. CAPM is difficult to become a testable theory, since we don't know how the portfolios are constructed (Roll, 1977). Beta coefficient is a component risk within CAPM that shows how much the return of the company is sensitive toward market returns. Beta reflects systematic risk (market risk) of the company, while companies are capable to eliminate only unsystematic risk (Elton et al., 2009). The problem becomes even more complex regarding beta coefficient, in the case when the stock market of the particular country is weak efficient form, and does not cover whole information's of the economy. The risk free rate is fundamental indicator, since improper risk free rate might deliver misleading results (Fernandez & Bilan, 2013). Kosovo does not have stock market, which would enable obtaining accounting beta. Standing on these limitations beta coefficients (β) has been gained from the Five Forces Model of Porter. **The five competitive forces mutually**

determine the dynamics of competition, profitability and is a crucial element of formulating the company strategy (Porter, 1980). Five forces model is an important tool in investigating attractiveness of the industry, standing upon assumption that the competitive structure is derived through five competitive forces (Lee et al., 2012). The common outcomes of five forces rely on the differences among industry relations in the profit volume (Renko et al., 2011).

3.1 Five Competition Forces Model at Pristine International Airport

The five competitive forces mutually determine the dynamics of competition, profitability, and have an important effect on formulating strategy (Porter, 1980, p. 6). Five forces model is important tool to analyse the attractiveness of the industry (Lee et al., 2012), linking the company with its environment throughout formulating strategy and taking into account factors and forces inside and outside the industry (Porter, 1980, p. 3)**.** Airport strategies have two important insights which are interdependent in attracting airlines and passengers (Graham, 2004). Therefore, airports seek to increase the number of passengers, airline contracts, transferring traffic, cargo transportation (Dmitry, 2012), reduce over-crowding, easier access in terminals, less charges for car parks (Barrett, 2000), in order to gain competitive advantage. **Airport infrastructure, low-cost terminals, government licenses (Njoya & Niemeier, 2011)**, modern infrastructure, appropriate location, complex planning and conservative regulatory process are issues that diminish airport establishment (Graham, 2004). It is proven that competition among entrepreneurs drives innovation, productivity and lower prices. Burdens that firms are opposed to the competitive environment and the opportunity to change position generates competition among them. Elements that intensify competition within existing players are influenced from equally balanced competitors, anaemic industry growth, enormous fixed costs, lack of product differentiation, diverse competitors, strategic risks, high exit barriers (Porter, 1980, pp. 18-20)**.**

3.2 Barriers to entry

Industry entry barriers stand on economies of scale, product differentiation, capital requirements, switching costs, distribution channels, government policy while such barriers vary from industry features **(Porter, 1980, pp. 7-10). Airport infrastructure, low-cost terminals, government licenses (Njoya & Niemeier, 2011)**, modern infrastructure, appropriate location, complex planning and conservative regulatory process are issues that diminish airport establishment (Graham, 2004). Gjakova airport was established based on Article 11 of the Law No. 03/L-087 on Public Enterprises, Supplemented Law No. O4\L-11, and the regulation No 07\2011 in 2014. The Airport is used for military purposes, not for civilian and commercial purposes. Moreover, the lack of Government's investments and high costs accompanied with functionalization of Gjakova Airport are not expected to be realized in the near future.

3.3 Rivalry among existing competitors

It is proven that competition among entrepreneurs drives innovation, productivity and lower prices. Burdens that firms are opposed to the competitive environment and the opportunity to change position generates competition among them. The joint strategies that are used in the competitive environment stand on: prices, advertisement, product promotion and better customer services (Porter, 1980, p. 17)**.** Elements that intensify competition within existing players are influenced from equally composed competitors, industry growth, enormous fixed

costs, lack of product differentiation, diverse competitors, strategic risks, high exit barriers (Porter, 1980, pp. 18-20). The competition among airports is stronger when geographical distance is insignificant (Graham, 2004). The PIA is surrounded by Skopje (85 km), Tirana (330 km), Belgrade (355 km) and Podgorica Airport (331 km) where the Skopje Airport is leading competitor standing on geographical distance. According to the microeconomic principles (game theory), competition can be accomplished even with two players in the market if they do not have cooperative agreements on prices.

3.4 Substitutes

Products that complete equivalent functions are considered as substitutes (Porter, 1980, p. 23). Airports and airlines are not threatened to be replaced from a long distance travelling's such as: ships, trains, buses, and cars (Fleisher & Bensoussan, 2015, p. 167), while the key substitutes for airports are considered to be high speed trains (Graham, 2004; Njoya & Niemeier, 2011). Cars and busses are considered as the main competitive opponents for PIA. Buses are traditional substitutes for PIA, since they offer diverse destinations and lower prices compared to airline companies.

3.5 Bargaining power of buyers

Buyers have substantial pressure on companies to lower prices, offer better services, lower profitability and increasing industry costs (Porter, 1980, p. 24). Government price controls and industry regulations are forms that affect pricing power of airline companies, especially in a situations when a small number of airline companies control airline destinations (Graham, 2004). Passengers have strong purchasing power since internet compromises diverse chances to book tickets with lower prices (Fleisher & Bensoussan, 2015, p. 167).

3.6 Power of suppliers

Suppliers have a straight influence on industry profitability through raising industry expenses and prices that they provide for costumers (Porter, 1980, pp. 27-28). The airport compromise diverse services for airline companies, starting from air traffic control, security, ground handling and commercial facilities. Security services are mainly provided via governmental authorities who are free of charge. The main concern of airline companies is that suppliers offer high prices for Kerosene, which then reflects on ticket prices offered by airline companies.

4 METHODOLOGY

Valuation of PIA takes place from 2010 till 2014. Data have been obtained from the audited financial statements of the company. Terminal values in the DCF model have been adjusted according to the concession life time and concession agreement with Kosovo government. The ratios such as: FCFF, WACC, beta coefficient, cost of equity, cost of debt, market risk premium etc. have been adjusted on a yearly basis. Vasigh et al. (2003) use WACC as a proxy variable standing on the England's Civil Aviation Authority (CAA). In contrast, our work adjusted WACC based on the risk profile of the company and industry where the company is operating. Five Forces Model with elements, such as: threat of new entrants, threat of substitutes, bargaining power of buyers, bargaining power of suppliers and rivalry among existing competitors, have been constructed based on different sources. Second hand data were collected from various sources such as: newspapers, articles, website of a company, websites of government institutions, market and industry reports, official reports from Civil Aviation

Authority's and Airline network news and analysis. Weights and quantified risk of beta under five forces has been captured within and outside the PIA, standing on: PIA annual reports, newspapers, government rules and regulations, the institute reports, etc. Standard DCF model has been used to derive future terminal values with assumptions on growth, upcoming WACC and the beta coefficient. Monte Carlo simulation has been employed to deliver future possible outcomes, through using free cash flow to the firm (FCFF).

4 RESULTS

Model Five Forces of Porter is used to capture internal and external risk of the company, named as beta under five forces. Each force within five forces represents the risks and opportunities in the company. We have quantified the five forces into the beta coefficient (see: Appendix 1). FCFF (Free Cash Flow to the Firm) has been used within the 20 years' terminal values and discounted with WACC (Weighted Average Cost of Capital). All the adjustments needed to build WACC has been arranged for the company and country basis. The average growth rate (g) in 10 years' terminal values stands on regional industry potentials while the remaining part declines in the average economic growth of Kosovo. This decline in growth assumptions is reasonable, since new entries are evident not only on national scope but also in the regional scale. Competition can be achieved even with two players in the market (price war among airports), if they don't have cooperative agreements within them. According to the basic microeconomic principles, profits will drop down where P=MC (Price equals Marginal Costs). The competition not only among PIA and regional airports, but extra competition is expected to be driven from alternative forms of travelling, such as cars and buses.

Table 1. Beta Coefficient under Five Forces Model

Weight (%)	Year 2010	Low	Average	Substantial	High	Very High	Weighted Risk
		1	2	3	4	5	
0.1	Buyers power	1					0.1
0.1	Threat of Entry	1					0.1
0.3	Rivalry Among Existing Competitors				4		1.2
0.4	Substitute of products			3.5			1.4
0.1	Bargaining power of suppliers	1					0.1
100%							2.9

Source: Authors own elaboration. Where: 1- represents low level of risk, and 5 very high level of risk.

Qualitative beta has been reconstructed from the Mascoflapex model into the five forces model of Porter. Each force has been scaled from one (low risk level) to five (very high risk level). Beta coefficient was fluctuating on a yearly basis since five forces is a dynamic model of risk capturing. Each force within the model is not changing weight (because the weights are perpetual in each year) which is the limitation of the model but the competitive risk is altering. The higher weights are set up on internal rivalry (competition among local and regional

airports) with 30% weight while substitutes (cars, buses, not travelling) with 40% weight. Beta coefficient in 2011 and 2012 was 1.5 while ended up to 1.7 in 2014 that evidently demonstrates that risk level was altered based on changing the competitive structure of five forces.

Table 2. Discount rate (WACC, CAPM, Cost of Debt)

	2010	**2011**	**2012**	**2013**	**2014**
WACC (cost of capital)=Cost of Equity%(weight of equity)+Cd(%weight of debt)	0.1636802	0.050068	0.103325	0.173992	0.18835
Cost of Equity*(weight of equity)	0.161279	0.005394	0.063073	0.130094	0.18089
Cost of debt*(weight of debt)	0.0024012	0.044674	0.040253	0.043898	0.00746
After tax cost of debt= pretax cost of debt (1-tax rate)	0.058518	0.058518	0.058518	0.058518	0.058518

Source: Authors own elaboration

WACC is varying variable from 2010 till 2014, since the cost of equity and cost of debt has been changing. Capital structure (debt vs. equity), the average interest rate imposed on the Kosovo economy from commercial banks, S&P returns (used as a benchmark for new investors in PIA) and beta coefficient are the major source of WACC movements. While coefficients such as RFR (Risk Free Rate), corporate tax rate are unchanged coefficients, with constant effect on WACC.

Table 3. Capital Asset Pricing Model (CAPM) adjusted for Kosovo economy.

	2010	**2011**	**2012**	**2013**	**2014**
Cost of Equity = Risk-Free Rate + Beta * (Market Rate of Return - Risk-Free Rate)	0.16818	0.0228	0.20207	0.520725	0.20732
Risk Premium (RM-RFR) (http://people.stern.nyu.edu/adamodar/)	0.1332	0.006	0.1439	0.3065	0.1202
Risk Free Rate (RFR) (Kosovo Government Bonds)	0.015	0.015	0.015	0.015	0.015
Beta*(Market Rate of Return - Risk-Free Rate)	0.15318	0.0078	0.18707	0.505725	0.19232
Standard and Poor's (S&P 500)	0.1482	0.021	0.1589	0.3215	0.1352
Qualitative Beta (5F Model of Porter)	1.15	1.3	1.3	1.65	1.6

Source: Authors own elaboration

Cost of equity that stands for CAPM, is also dynamic metric affected from beta coefficient and S&P returns, as non-constant variables. S&P is affected from 500 company's performance listed on it and American economic prospect, while the beta coefficient is changing based on the risk level within and outside the PIA. FCFF has been growing at 10% (g=10%) on the first five years of the geometric progression. While FCFF growth assumptions declined to 5% linked closely with the average economic growth of the Kosovo economy (2010-2014). DCF is a mathematical formulation that is influenced mainly from two variables: FCFF growth rate

assumptions and on historical risk-reward trade-offs. Standing on all these inputs obtained from the valuation procedures, PIA on the concession period has been undervalued. Free Cash Flow for the owners on the 20 years' period with adjustments for inflation, on the worst scenario will obtain 378 million. According to the concession agreement with Kosovo government, the company has promised investing 100 million euro in the PIA during concession period. Building of new terminal costed the company 130 million euro, even though experts considered that costs has been inflated (Riinvest Institute, 2015). According to the leasing contract of PIA with the Kosovo government, 39,42% of the total turnovers will be delivered to the government budget. This means that FCFF will be reduced by the amount of cash that the company will send to the government of Kosovo. Turnover does not mean certainly cash, since sales might stand in account receivables. Airport industry operates with less account receivables as the payments are made in time. The following calculations reflect intrinsic value of PIA during the concession period.

$$PIA - value\ under\ concession\ without\ 39.42\% - to\ be\ sent\ to\ the\ governement$$
$$= \sum_{t-1}^{16} \frac{FCFF_t}{(1+WACC)^t} = \frac{CF_1}{(1+r)^1} + \frac{CF_1 x(1+g)^2}{(1+r)^2} + \cdots + \frac{CF_1 x(1+g)^{16}}{(1+r)^{16}}$$
$$= \frac{5733190}{1.227} + \frac{6306510}{1.261} + \frac{6937161}{1.41} + \frac{7630877}{1.589} + \cdots + \frac{11918892}{2.078}$$
$$= 5596357$$

The following calculation show intrinsic value of the company shaped from the leased contract within the new company and government of Kosovo.

$$PIA - Value = \sum_{t=1}^{16} \frac{FCFF_t}{(1+WACC)^T} = \frac{CF_1}{(1+r)^1} + \frac{CF_1 x(1+g)^2}{(1+r)^2} + \cdots + \frac{CF_1 x(1+g)^{16}}{(1+r)^{16}}$$
$$= \frac{34733166}{1.227} + \frac{3646825}{1.261} + \frac{3829167}{1.41} + \frac{4020625}{1.589} + \cdots + \frac{14508280}{4.321}$$
$$= 48151592.48$$

The following calculation considers the intrinsic value of the company, under the requirement that the company will distribute to the Kosovo government 39.42% of the total yearly turnover. The intrinsic value of the company with the adjustments (for the turnover of 39.42%) stands in the range of 48,151592.48 Euro (approximately 48 million).

Table 4. Represents the value of the company under Monte Carlo Simulation with 1000 samples. Initial FCFF on the geometric progression stands for 35 million euro, WACC is in the range of 12.3%, while growth rate is 5% for whole terminal future values.

Table 4. Monte Carlo Simulation results.

Data Concerning Prishtina International Airport:		Net Present Value Results:	
Initial Investment	130 (Million Euro)	NPV	104.52 Euro
Cash Flow Year 1	35 (Million Euro)	NPV	104.52 Euro
Growth rate 'g'	5%	IRR (Internal Rate of Return)	28.36%
Discount rate 'r'	12%	PI	1.78
Number of Samples:	1,000	Pay Back	5.040 (years)
NPV Mean	104.39 (Million Euro)	Minimum	95.11 (Million Euro)
NPV - Standard Deviation	3.49	Maximum	116.00 (Million Euro)

Source: Authors own calculations

In difference from standard geometric progression, Monte Carlo simulation enables all possible outcomes that can be delivered in the future. Stimulation with 1000 samples produce DCF mean in the range of 104 million Euro. The minimum value of the company stands in the range of 95 million Euro, while the maximum value in the range of 116 million Euro. The growth rate has been set up at the level of 5%, since the terminal values treat whole lifespan of the airport. A growth rate of 5% has been used, since: new airports might be built in the Kosovo and in the region, regulation might change concerning airport regulation, cars might be more attractive for travelling when Kosovo obtains visas liberalization from EU etc. Payback period is 5 years with 130 million euro investments in the new airport terminal. Internal rate of return (IRR) which measures the profitability of potential investments, is in the level of 28%. The inclusive value of the company is 104 million with all probability distribution of Free Cash Flow to the Firm.

5 CONCLUSION

Privatization process in Kosovo has been attended with tension debates within the economists, politicians and overall society in terms of fairness, economic prosperity, and proper assessment of the privatized companies. Standing in our research, government in Kosovo and regional countries had less transparency when the national assets were sold. Lack of transparency creates an ambiguous environment in the privatization process. Our research sheds light on the new scholars to capture the intrinsic value of the privatized companies in Kosovo, and reveal if SOE-s have been assessed properly during the privatization process. Kosovo went from the centrally managed economy into the market oriented economy where national economic assets were underutilized during the socialist era, which creates additional obstacles in the valuation procedures. Valuation of privatized (leased) companies contains a lot of unclear input elements and also output results, since the restructuring of SEO-s does not contain only change in ownership control but also a strategic destination of the company. Valuing State Owned Companies with strategic positions in the market is a significant element in terms of fairness, accountability for citizens but also it is an orientation signal for possible investors. Since Prishtina International Airport is a national air transport monopoly, the results of the paper strike the principal concepts of the privatization process in Kosovo (the value of Kosovo national assets). Standing on our method, with the limitation that general procedures for the valuation recognize, Prishtina International Airport has been undervalued in the leasing process. Standard geometric progression within 20 years' terminal value shows that the company has been undervalued in the range of 48 million Euro. Valuation of the company, according to the Monte Carlo simulation with 1000 samples demonstrate that Prishtina

International Airport has been undervalued by 104 million Euro on average. The paper creates an original indication for new scholars to explore on the controversial issue of the privatization process in Kosovo and worldwide.

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Appendix:

Weight (%)	Five Forces	2011						2012						2013						2014					
		L	A	S	H	VH	VR	L	A	S	H	VH	VR	L	A	S	H	VH	VR	L	A	S	H	VH	VR
		1	2	3	4	5		1	2	3	4	5		1	2	3	4	5		1	2	3	4	5	
0.1	**Buyers power**		2				0.2		2				0.2				4		0.4			3			0.3
0.1	**Threat of Entry**	1					0.1	1					0.1	1					0.1	1					0.1
0.3	**Rivalry Among Existing Competitors**				4		01.				4		01.				4		01.				4		01.
0.4	**Substitute of products**			03.			01.			03.			01.				4		01.				04.		01.
0.1	**Bargaining power of suppliers**	1					0.1	1					0.1		2				0.2		2				0.2
100%	**Beta of Equity**	3x0.5=1.5					3	3x0.5=1.5					3	3.5x0.5=1.75					03.	3.6x0.5=1.8					03.

Source: Authors own elaboration.

L: Low
A: Average
S: Substantial
H: High
VH: Very High
VR: Veighted Risk

INTEGRATED PERFORMANCE MANAGEMENT SYSTEM IN A GLOBALIZED ORGANIZATION

Androniceanu Armenia, Krajčík Vladimír

Abstract

In the globalized world, the effective management requires an efficient and flexible approach. The expectations of all stakeholders and shareholders should be taken into consideration along the entire management process.Many organizations concerned with their economic growth are open and receptive to the new management models and approaches. The paper proposes an integrated performance management system that meets a variety of needs and circumstances. The main purpose of the research was to design a new integrated performance management system based on performance models used in the last decades by various organizations. For designing the system, a number of factors and variables that provide flexibility in the implementation process were taken into account. This work is based on a research carried out on a representative sample of 32 multinational companies from Romania. The methods of investigation used were the online questionnaire, correlative and comparative analyzes. The main result of this research process is an integrated performance management model that can be adapted and implemented in any organization. Other results reveal the most suitable management tools that can be considered in implementing the proposed system. The research proved the fact that the multinational organizations involved in this survey agreed to implement the integrated performance management system proposed in order to become more efficient and effective. The managers involved assesed the performance management system proposed as a viable and sustainable alternative for their organizations and for any modern organizations in a globalized world.

Keywords: performance, performance management, integrated system, assessment.

JEL Classification: M1; M12; O15; P17.

1.INTRODUCTION

In the past years a new attempt to redefine the registration and measuring of performance as well as a redefining the implementation of performance measuring systems can be observed. This aspect is due to the fact that many of the current systems didn't lead to the desired results (Akrofi, 2016). On the other hand, the organizations expectations have increased according to the high level of performance. For a long period of time, the organization's managers have considered that a certain system of measuring the performance based on a certain model of performance could lead automatically to the increase of the performance level (Muriana, Piazza & Vizzini, 2016). The reality proved that the implementation of a management performance system will not immediately lead to obtaining performance. Performance is one of the most frequently used concepts in an organization (Rajnoha, Lesníková, 2016). The employers are searching every time to attract and train performance obtaining employees, whereas employees expect that the place they work at to stimulate them but also motivate them to get better results. In the last decades, an increased number of companies are interested in implementing modern systems of performance management which are based on different models of performance measurement. As a result, the traditional performance management models were updated in order to meet the new requirements of the global business environment (Felipe, Oto, 2015). A performance management system is effective if it leads to individual and organizational performances. Human resources who are under the level of accepted performance should be

guided, positively supported or reassigned in order to achieve performances. The performance management systems are often associated with the need of controlling. Such a statement is only partially true. In the global development context, a new integrated, systematic and flexible approach of performance management is needed, because all organizations are dealing with major challenges in the internal and international business environment. Based on a consistent research conducted in the last years in Romania, we propose an integrated performance management system that could be an alternative for several organizations nowadays.

2.LITERATURE REVIEW

The organization's performance is built around the individual performance of each employee. Employee performance is measured in compliance with the company's standards and is being supported on the level of personal development. Formulating objectives, the individual style of approaching tasks and relationships inside the company and establishing the individual standards are only roughly viewed abilities for growing organization performances. One of the most representative opinion in this area belongs to Armstrong, which highlights the *cyclical process of performance management* (fig 1).

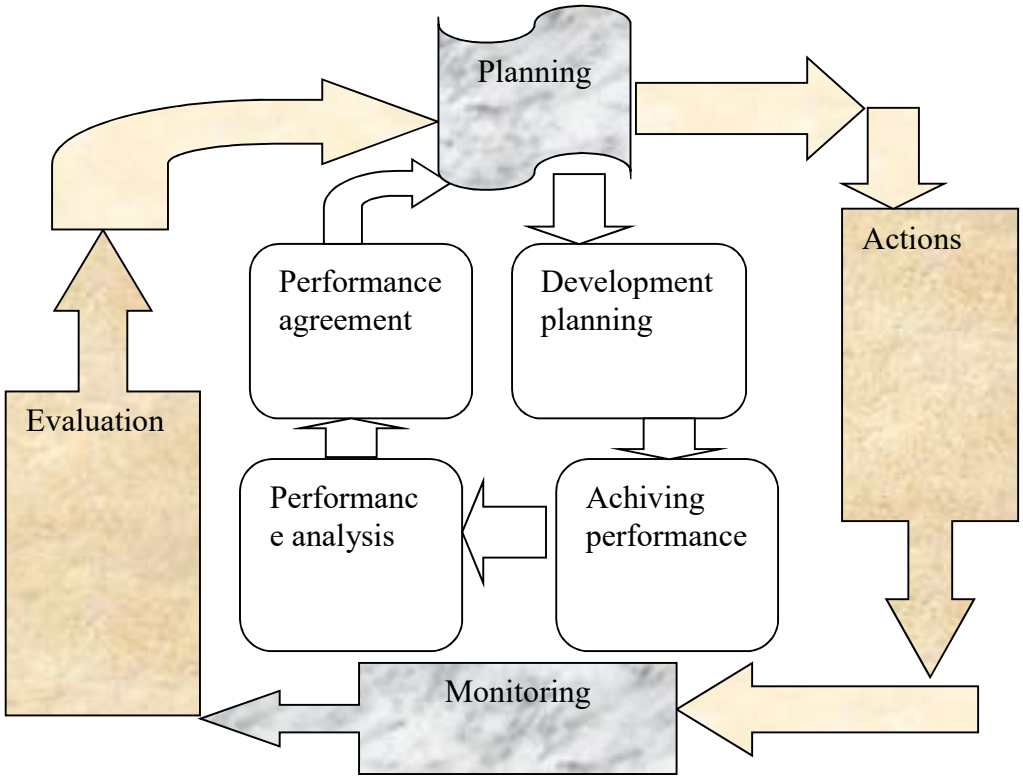


Fig.1 - The cyclic process of performance management. Source: Adaptation of the author based on Armstrong, 2005, p. 430

In 1986, White Baird said that the performance is a result of a certain action. Also, Corvellec (1995) explained that the performance terms can simultaneously refer to an action, to a result of an action and to the prominence's success or an action in comparison to other actions. In 1996, Ghalayini and Noble explained that performance measurement have a regular character and is based on using a certain multidimensional set of performance indicators. In another approach (Niculescu, Lavalette, 1999), the performance represents *the realization of the organizational objectives regardless the nature of their variety.* Their opinion is that the economic performance of an industrial company represents the unstable equilibrium as a result of a relationship's evolution: effectiveness – productivity. In the literature there are other

authors that have approached performance and performance management from different perspectives (Androniceanu, 2014; Popescu, G.H., Ciurlau, 2016). In 2001, Neely and Adams underlined that the performance measurement is a process of quantification of efficiency and of an action's effectiveness. In 2006, H.P. Hatry defines the performance measurement as a amendable process that is oriented on the periodic insurance of valid information about the performance indicators of the results and outputs (Jakubowska, 2016). There are other authors that define the performance from the economic perspective mainly (Ciobanu, Androniceanu, 2015, Lazaroiu, 2016). From another perspective, Nica and Molnar (2016) consider that the performance measurement is a desired instrument to evaluate and quantify the satisfaction level of the organization's clients. Under the financial-accountant aspect, the performance measurement is viewed as an instrument of a financial management, that highlights the organization's financial results (Becerra-Alonso, Androniceanu & Georgescu, 2016). They consider that the performance is the sum of all the processes that help managers in making necessary decisions in order to lead to better results further. Their theory about the performance of an organization is not based on a simple input/output relationship of the employees or of a simple productivity's quantification, but consider this term as being a complex of relationships between different criteria.

The performance concept is a notion often used for the contained metaphorical allusions. The organizational performance shows the individual's ability to progress, on the strength of constant efforts. A performance itself is not good or bad (Shen, 2016). The same result can be considered as a good performance, if the objective is modest or of a weak performance if the objective is ambitious. (Popescu, G.H., Comanescu, Dinca, 2016).

Team's performances are based on the synergy created by the team. The synergy effect takes place when a team's results are better than the individual's results. Performance teams are balanced, and it's members are naturally working together in order to reach the targets. The way in which the balance of a team is created depends on its components as well as on the realistic performance standards and the performance indicators being adequately dimensioned (Łakomy-Zinowik, Horváthová, 2016). The performance management is a process to achieve and measure results comparing them to what had to be achieved, respectively to the proposed goals (Chovancova, Arendas, 2015). The management of performance is a continuum cyclic process, that is self-renewing, in a integrated system setting which we call *an integrated system of performance management.* An integrated system is a formal system, based on information and procedures used by managers to maintain or to modify structures of an organization's activities. (Neely, 2005; Androniceanu, Dragulanescu, 2016; Lazaroiu, 2015a; Lazaroiu 2015b;). An increased number of organizations implement performance management systems in order to obtain better results in the activities that they are conducting and for synchronizing those with the state's monetary policies (Andrei, Galupa, Androniceanu & Georgescu, 2016). For example, the measurement system and the performance management based on the Balanced Scorecard is used by different types of organizations: government, non-profit organizations or business enterprises. In our opinion (Androniceanu, Dragulanescu, 2012; Androniceanu, Ohanyan, 2016; Androniceanu, 2015a; Androniceanu, 2015b; Nica, Manole & Briscariu, 2016; Nica, 2016), *the integrated system of performance management can be defined as a set of interconnected processes using the same resources – human, materials, infrastructure, financial, information – to fulfill a set of related targets which satisfy all the interested parties*. The integrated system combines the business components into a coherent setting that will allow the fulfillment of an organization's mission.

Lately, at an international level, the performance management have increasingly been outlined and clearly approached at all the organizational levels. An integrated performance management system helps the leading staff to find out the right instruments they can use, the way in which these instruments interact, which is the system's dynamic and the key role they have in the entire organizational mechanism.

3. RESEARCH METHODOLOGY

The research methodology includes three distinct sections. The first section contains a brief presentation of the main models of performance management selected from the literature. The second section contains the integrated performance management system proposed. The third section contains the main results of an applied research centered on the integrated performance management system proposed through this paper.

3.1 The main models of performance management

There are several models of performance management in the literature (Diaz-Chao, Sainz-Gonzalez & Torrent-Sellens, 2016; Chadwick, Guthrie & Xing, 2016). According to the Chadwick's group opinion, a model of performance management should offer a clear and balanced view of the organization on its internal processes and the interaction with the external environment (Belas, Demjan, Habanik, Hudakova, Sipko, 2015). Also, the model should highlight as simple as possible the performance of the organization, leading to an easy implementation (Virglerova, Dobes & Vojtovic, 2016). Regarding the models underlying performance management systems construction, Kit Fai Pun and Anthony Sydney White (2005) provided a classification of the ten most frequent models for measuring performance. From these, were selected the following models: Fitzgerald Model, Keegan Model, Lynch and Cross Model, Kanji Model, Neely and Adams Model, Norton and Kaplan Model. These models were considered in designing the new integrated performance management system.

Fitzgerald Model (2015) reflects the fact that the information of the management system should provide a direct line of control and a feedback control by investigating variation along the six dimensions of performance. It is important to note that the generic six dimensions of performance are divided into two main conceptual categories. The first category reflects the success or result of choosing a strategy, while the second category includes relevant factors.

Keegan's Model D.P, also known as the model of performance measurement, reflects the fact that performance measurement should provide the connection between the activities of the organization and its strategic plans. According to this model, performance measurement includes the entire organizational structure, each level having certain levels of performance assigned. (D. P. Keegan, G. R. Eiler, Charles R., 1991).

Lynch, Cross & Nair Model (1990) represents a structural model that considered performance as a SMART system of control. The model takes the form of a pyramid, the SMART pyramid, and is based on a combination of quality management processes and the organizations operations. As indicated by the two specialists, the model is based on two concepts: the concept of objective and the measurement concept. The central idea of this model was to convert strategic objectives, through top-down detailing (based on the priorities of the clients) while measurements start from the bottom-up along the four level pyramid (McNair, Lynch, Cross, 1990). According to the authors model, the objectives should be derived from the organization's vision. These objectives should be transposed to the structural units (Kaplanova, 2016). Therefore, the pyramid offers a structure of a two-way communication system needed to establish a strategic vision of the organization, as a model. (Popescu, C.R., Popescu, V.A., Popescu N.G., 2015).

The Business Excellence Model of Gopal Kanji (1998, p.638) starts from the fact that for many organizations the successful solution to stay "leader" in a competitive, dynamic and highly unpredictable environment, is linked to the need for the organization to reach a certain level of excellence in four core business areas: maximizing shareholder value; excellence in the development process; continuous organizational learning and maximizing the satisfaction of stakeholders. According to the model proposed by Kanji (1998, p.637), measuring the success

of the organization is based on eight concepts called by the author "*key concepts*", detailing the results of the four principles derived from the TQM's principles.

The Performance Prism Model of Neely and Adams (2001) assumes that it is impossible to create value for shareholders without creating value for other interested groups – stakeholders. The *prism of performance model* views the performance measurement as a result of meeting the demands and needs of interest groups - stakeholders. In the authors' view, the performance should be correlated with: the requirements and interests of shareholders; needs and requirements of customers / consumers; needs and requirements of employees and suppliers. All these interest groups are part of the organization's "stakeholders". In addition to the categories listed above, the performance should be reflected in community's satisfaction.

Kaplan and Norton's Model (2001a, 2001b) started from the premise that economic and financial indicators were not sufficiently reflected in analyses of results. Essentially, the model contains a set of financial and non-financial indicators measuring the performance of organizations. An important element in the construction of the model is the idea of "learning and development". (Kaplan, Norton, 1992; Kaplan, Norton, 1996). The model is based on a balance scorecard and consists of tracking the performance indicators through four perspectives: financial perspective - showing whether the creation, implementation and execution of the strategy leads to increased profits; customers perspective – the managers identify customers and market segments in which the company will compete; internal processes perspective - implies pursuing internal processes that have the greatest impact on customer satisfaction and shareholders; learning and development perspective - identifies the infrastructure on which the organization will be based on in its development. In the opinion of the authors, competition and environmental characteristics are forcing organizations to continually improve their capacity to provide added value to customers and shareholders. Learning and development come from three sources: *people, systems and organizational procedures* (Sink, Tuttle, 1989, p. 32).

3.2. Integrated performance management system

In the last three decades, different models of performance management that integrate various indicators of financial and non-financial performance, have designed and developed. (Popescu, C.R., 2016; Popescu C.R., Dumitrescu, 2016).

Some of them were presented in the previous section. The main objective of these models was to help the managers from different organizations to focus their attention on performance and to motivate them to discover a new and better way of dealing with their businesses in an increasingly complex and uncertain global environment (Valter, Androniceanu, Dragulanescu & Duca, 2016). The integrated performance management system we propose in this paper addresses the performance on two basic coordinates: one is the field of activity and the other is the level of representation within an organization. According to the first basic coordinate, the following five areas can be taken into consideration: financial, operational, marketing, human resources and innovation-development. The levels of representation of the proposed performance management system are: individual, organizational and procedural. According to the proposed system individual performances are integrated in procedural performances that combine and generate organizational performances. The graphical representation of the concept model is shown in figure 2.

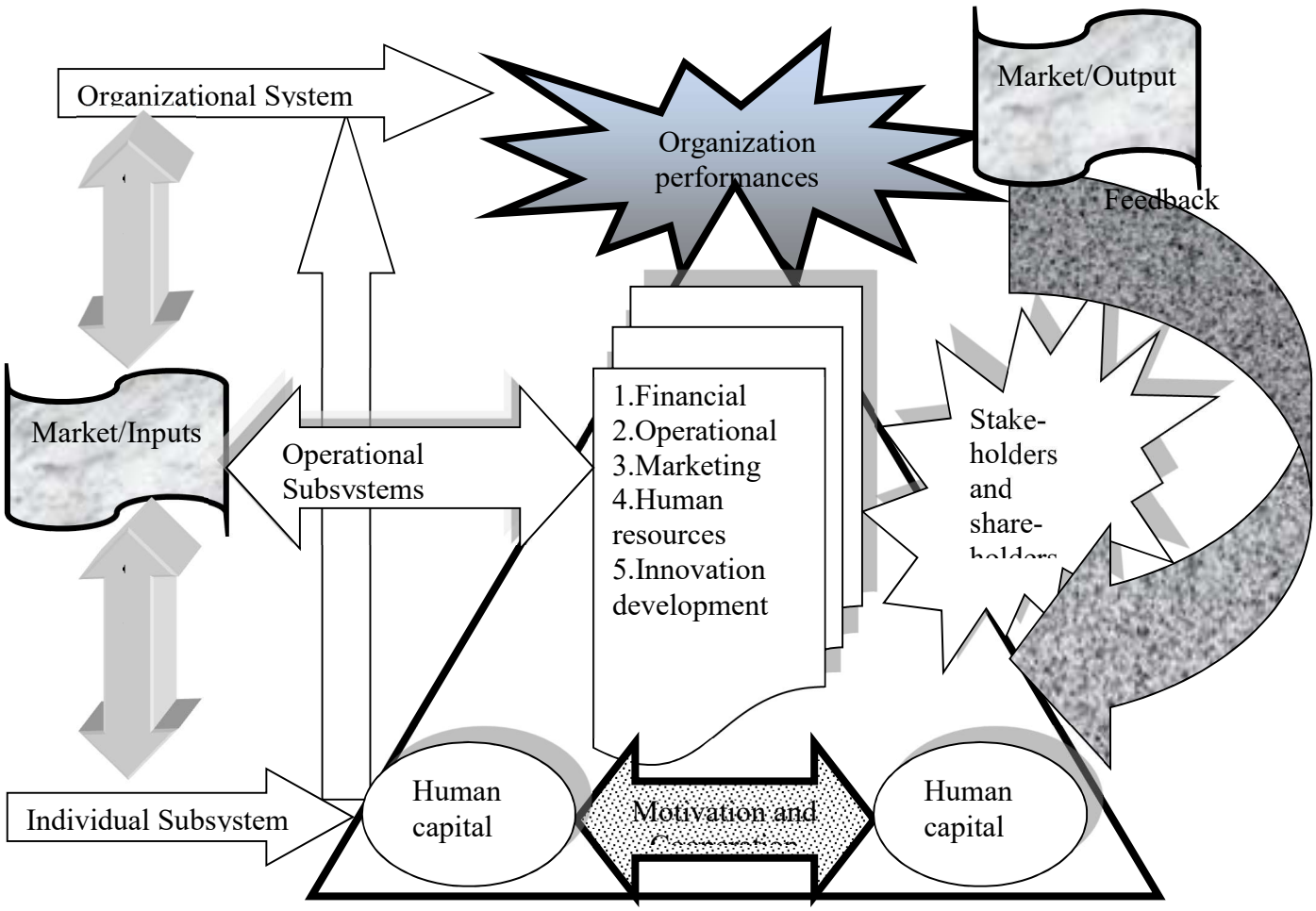


Fig.2. Integrated performance management system. Source: the author

The integrated performance management system we propose in this paper is based on the following assumptions:
- The organizational standards and human resources ground its elaboration;
- Adapting/permanent adjustment of the system components according to internal needs, interests and expectations of stakeholders and shareholders' interests;
- The existence of five basic organizational areas for which a performance management subsystem was designed;
- Establishing three levels of customized subsystems of performance management system;
- The underlying concept that sets the grounds of the system is dynamic and flexible;

The integrated performance management system proposed is based on the following coordinates:

- Designing and implementing of a systemic program and progressively motivating the human resources to achieve individual performance;
- Determining and achieving performance in each of five areas: financial, operational, marketing, human resources and innovation development;
- The allocation and efficient use of resources (human, material, financial and informational) on processes and activities in relation to the market requirements and stakeholders and shareholders' interests and expectations;
- Collecting and processing information online, updating the products and services according to the market requirements;

- Designing and implementing an integrated information system based on an open discussions and consultations along the decision-making processes;
- Establishment of a successive iterations of performance indicators at each level of organizational representation: individual, procedural and organizational;
- Provide an online feedback to the managers which should be able to improve the integrated performance management system accordingly.

The main advantages of the new system are the following:

- it helps clarify the vision and the overall objectives of the organization;
- it transposes the company objectives at an individual level;
- applying the model generates a continuous and evolutionary process in which performance improves over time;
- it relies on cooperation and collaboration, not control and shares of coercion;
- encourages self-management of individual performance;
- the adoption of an open management style and encourages communication between superiors and subordinates;
- requires a continuous online feedback;
- ongoing processes of feedback allow the experiences and knowledge acquired by the managers and their employees on the job to modify business goals;
- it measures and evaluates all performances compared with agreed objectives;
- it applies to all human resources whose results are compared with the performances set.

4. EMPIRICAL DATA AND RESULTS ANALYSIS

In the last months of 2016 we have conducted an empirical research process which included 34 multinational organizations headquartered in Bucharest, Romania. The main purposes of this survey were: (1) to know what their current performance management system is composed by; (2) what kind of management instruments they are using currently; and (3) which are their opinions referring to the new performance management system proposed. Some of the most relevant ideas and results obtained are selected and presented in this section of our paper. In the implementation of an organizational performance management system they always start from understanding the organization's positioning on the market segments and from the objectives arising from the organizations strategy. They continue to set the configuration of systems, subsystems and processes needed for getting performances. Related to this issue, our research revealed the fact that there are still important problems concerning the degree in which the performance obtained by the employee in different organizational projects are taken into account in final evaluation. According to their practices, the employees are evaluated by the head of department. The difficulty arises when some employees are involved in several organizational projects and work under the direction of different heads of departments (Kaufman, 2016); Popescu, G.H. 2016). During the survey, managers were asked to indicate to what extent they take into account both *the results of activities included in the job description* and *the performances obtained by the human resources in other organizational projects,* when they are doing the final evaluation of their employees. The results are presented in Table 1.

Tab.1.- The degree to which the performances obtained in projects are considered in evaluation. Source: the author

Variable	Minim (Very low level)	Maxim (highest level)	Average level
The manager works with employees in setting performance goals	1	5	3,74
The assessment is based on the previous performance goals	1	5	4,30
The project activities are taken into account when the performance are evaluated	1	5	3,60
The success of the project is clearly defined	1	5	2,75
The success of the project is taken into account when the performance is evaluated	1	5	4
Employees are rewarded for their work in projects	1	5	3,43

Our research findings have highlighted a number of problems that arise in the organizations analyzed with regard to the performance evaluation of human resources involved in various organizational activities and projects (Popescu, G. H., Bitoiu, 2016). These results indicate the fact that the multinational organizations involved in this survey have a real need to revise their current performance evaluation system, by taking into account all the performances obtained by the employees. The new performance management system proposed could be a viable alternative for these multinational organizations.

In our survey, a special attention was paid to the *management tools* used by the multinational companies in the evaluation of their human resources performances.
Through the survey, we found out that most organizations have a performance indicators system already established, but the management tools for supporting its implementation at procedural and operational levels are quite poor. Taking into account this real situation, we brought to the attention of the managers the following management tools included by the new performance management proposed: *matrix with indicators; sheets of process; job description; monitoring system; performance evaluation system*. A very short description of them were included within the online questionnaire and a selection of it is made here.

The matrix with indicators has the role to establish a clear direction by translating financial indicators at the operational and organizational level determination process indicators and individual level (Sedláková, 2016). It creates a dashboard that signals performance gaps and their impact on short, medium and long term and will enable rapid intervention to correct the situation (Jeong, Choi, 2016). The sheets of processes are used to establish clear activities, responsibilities and performance standards expected in order to achieve objectives and

increasing the effectiveness of the individual and organizational level (Ittner, Larcker, 2003; Otrusinova, 2016). The process data sheets enable clearer communication of expectations of the management regarding the desired results. The job descriptions are based on clear targets, with measurable results as arisen from the processes that they are part of. The employee know exactly what to do, what standard results they should deliver and can compare their target with the facts. The monitoring system facilitates control so that they are fair and easier to achieve because the focus moves from person to assessing and evaluating measurement results. Expected results by highlighting process-level and individual, sets a clear direction, people are results-oriented, efforts are focused and resources are directed towards achieving the goal. The performance evaluation system consists of aggregated indicators correlated with financial and operational specific indicators that define the direction of the organization. The system allows increasing responsibility through individual assessment correlated with organizational goals (Alpopi, Silvestru(Bere), 2016) . Every employee understands its contribution to achieving organizational goals. In addition, due to the implementation of an objective evaluation system, increase employee motivation that disappears accusation of bias against superiors, especially when after the evaluation bonuses are awarded or promotions are operated. These tools have been brought to the attention of managers. Then, we asked managers to select the management tools which they think are appropriate for improving the performance management system currently in place in their multinational organizations. Thereby, we discovered the main instruments preferred and considered appropriate by the managers involved in our survey. As can be seen in figure 3, there are some differences that revealed that although some multinational organizations do not use enough a tool or another, the managers agreed with them and want to integrate them in the current performance management system of their organizations. In addition, the results showed that all management instruments proposed are considered by most managers as necessary (Ahmed, Arshad & Akhtar, 2016).

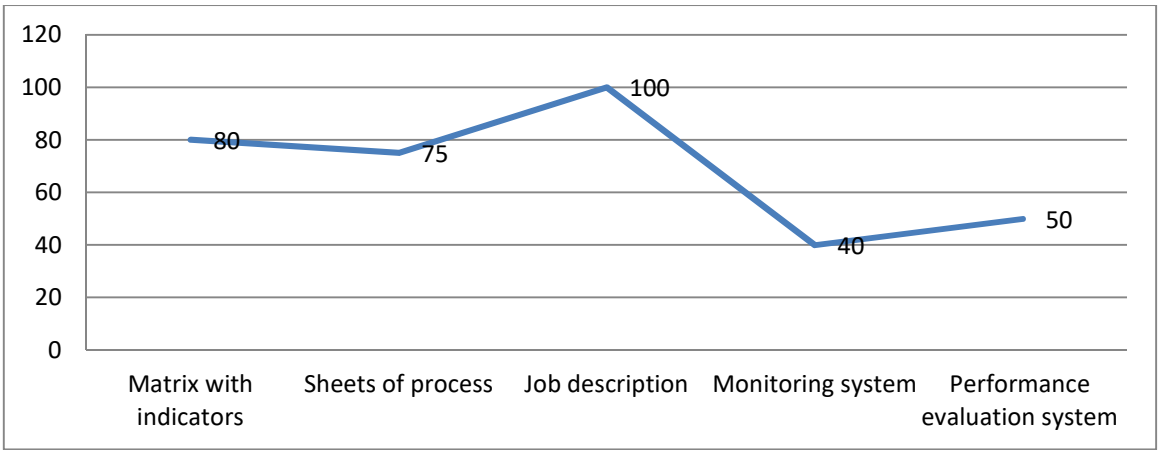


Fig.3. The manager's opinion related to the main instruments proposed by the new system. Source: the author

Another important result achieved in this research is that managers from multinational organizations have positively assessed the new integrated performance management system. The main attributes of the new performance management system considered in this research were the following: profitable; applicable; useful; objective; balanced. These attributes were addressed to the managers involved in this survey in order to get their opinions. The main results are presented in figure 4.

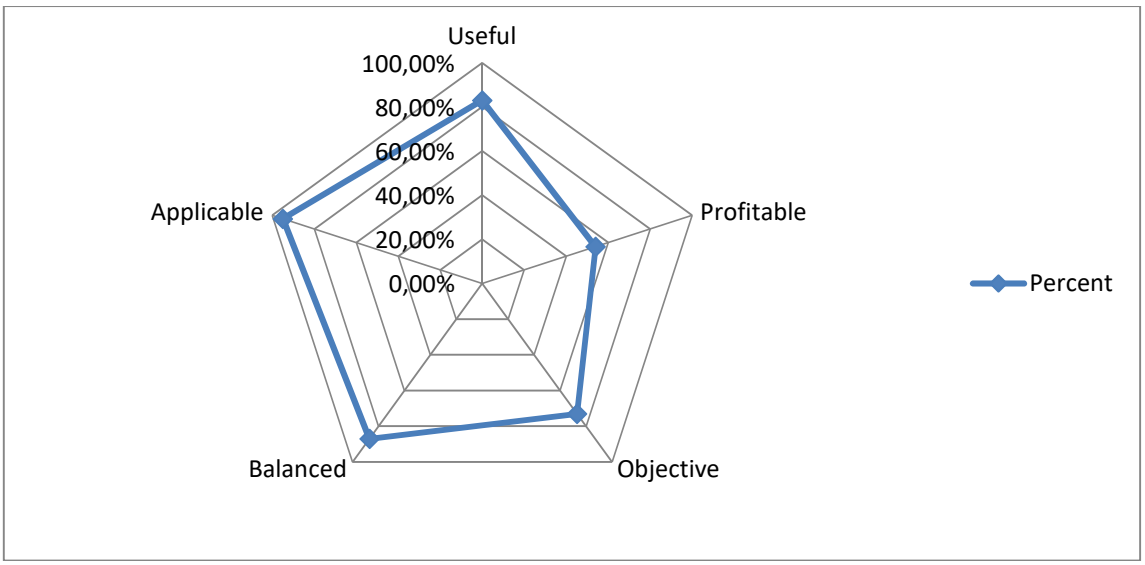


Fig.4. The main attributes of the new performance management system according to the managers opinions. Sourse: the author

As we learned through this research, most managers of multinational companies established in Bucharest appreciated the performance management system proposed and believes that their businesses would be more prosperous if they succeed to implement it (Bayar, 2016).

5. CONCLUSIONS

Performance is always the result of a comparison. Having performances means to achieve more then the targets set. It shows that performance depends on a reference or a target or a goal or a standard. Performance is multidimensional when goals are multiple. Performance is both objective and subjective. It is *objective* because the performance level is set by the manager from the beginning and known by the other employees. It is *subjective* because it consists of approaching a desired reality. Performance measurement involves both what is to be achieved and how employees will know that they have accomplished. Implementation of the integrated performance management system proposed is a viable and sustainable solution. An integrated system can lead to efficient use of human, financial and material resources. In the context of global development, the system proposed for measuring organization and individual performances can significantly contribute to improving human capital assessment and motivation for achieving performance.

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TURN OF THE MONTH EFFECT ON THE PRAGUE STOCK EXCHANGE

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Abstract

The turn of the month effect is a calendar anomaly based on the premise that the asset returns are higher during the first and last days of a month (the turn of the month period) than during the rest of the month. The turn of the month effect has been identified on various stock markets around the World, the developed stock markets included. This paper investigates the presence of the turn of the month effect on the Czech stock market, represented by the PX stock index, over the 1997 – 2016 period. The results show that the PX returns are statistically significantly higher during the first and the last trading day of a month than during the rest of the month. Also the returns over the first three and the last three trading days of a month are statistically significantly higher compared to returns recorded over the rest of the month. The returns recorded over the first five and the last five trading days of a month are higher compared to returns recorded over the rest of the month, however, in this case, the difference is not statistically significant. The turn of the month effect on the Czech stock market is strong enough, to beat a simple buy & hold investment strategy notably.

Keywords: turn of the month effect, Czech stock market, calendar anomaly, PX

JEL Classification: G01, G14, G15

1. INTRODUCTION

The turn of the month effect is one of many calendar anomalies that have been identified on the financial markets. The main symptom of the turn of the month effect are stock returns that are regularly higher during the last trading days of an old month and during the first trading days of a new month (the turn of the month period) than during the rest of the days. This phenomenon was investigated by various authors who approached the topic from several directions.
Back in the 1980's, Ariel (1987) discovered that during the 1963 – 1981 period, the stock markets recorded positive average returns only during the last and first days of a month. The average returns were close to zero, during the rest of the days. Also Lakonishok and Smidt (1988) came to a similar conclusion. Cadsby (1992) concluded that a significant turn of the month effect is present also in Canada, Great Britain, Australia, Switzerland and Germany. Kunkel et al. (2003) found out that in Austria, Belgium, Denmark, France, Germany, Netherlands, Switzerland, Great Britain, Australia, Japan, New Zealand, Singapore, Canada, USA, Mexico and South Africa, a 4-day turn of the month period accounts for 87% of monthly returns, on average, over the 1988 – 2000 period. Kayacetin and Lekpek (2016) concluded that on the Turkish stock market, during the 1988 – 2014 period, the average daily return was 0.46% in the three-day period covering the last trading day and the first two trading days of each month and it was only 0.09% for the rest of the days. McConnell and Xu (2008) investigated the returns of the Dow Jones Industrial Average over a time period longer than 100 years (1897 – 2005). They came to conclusion, that on average, all of the positive returns occurred during a time interval of the last 4 trading days of an old month and first 3 trading days of a new month. Recent study of Liu (2013) found out that over the 2001 – 2011 period, the S&P 500 stock index experienced the turn of the month effect as well. It was the strongest during the last 4 trading days and first 2 trading days of a month. Liu also concluded that the stock values tend to be the highest on the first or second trading day of a month and the lowest on the sixth or

fifth trading day before the end of a month. Sharma and Narayan (2014) focused on stocks of 560 NYSE listed companies and found out that the impacts of the turn of the month effect are dependent on the size of the company and its industry. Kunkel and Compton (1998) showed that the turn of the month effect can be exploited by investors to generate some abnormal returns. They developed a turn of the month effect based investment strategy of switching between stock market and money market assets. Their strategy was able to generate an average annual return by 2.1 percentage points higher than a simple buy & hold investment strategy.

There are several theories regarding the origins of the turn of the month effect. Ogden (1990) presented a hypothesis that the turn of the month effect is caused by the standardisation of payments that induce a surge in liquidity and stock returns at the end of each calendar month. This assumption was recently supported by Burnett (2017), who expanded Ogden's hypothesis by behavioural aspects. According to Burnett, when the confidence of investors is high, the turn of the month effect is more regular. Nikkinen et al. (2009) came to conclusion that the turn of the month effect is caused mainly by the U.S. macroeconomic news announcements, as they usually tend to take place around the turn of the month time period. On the other hand Maher and Parikh (2013) investigated the turn of the month effect in the Indian stock market, concluding that there is only little support for the payday and the U.S. macroeconomic news hypotheses. But they discovered that the institutional traders increase their trading volumes significantly at the end of the month, which could explain the turn of the month effect on the Indian stock market.

The Czech stock market started to develop in early 1990's, after the capitalistic economic system had been established. Over time, the Czech economy and the Czech stock market itself got into the centre of attention of several researchers who investigated various aspects of its functioning. For example Hsing (2011) focused on the impacts of the macroeconomic variables on the Czech stock market, while Korhonen and Peresetsky (2015) focused on some of the other factors. Krepelova and Jablonsky (2013) studied the connection between the Czech bond market and the Czech stock market. Horvath R. and Petrovski D. (2013) investigated the comovements of the Central, South-Eastern and Western European stock markets. Baumohl (2014) focused on the correlations between the V4 stock markets and developed stock markets. Hanousek and Novotny (2014) analysed the volatility of the Czech stock market during the most critical period of the 2008 global financial crisis. Svoboda (2016) and Bubak (2010) focused on modelling of returns and volatility of the Czech stock market.

Some attention has been paid also to calendar anomalies on the Czech stock market. For example Deev and Linnertova (2012) investigated the weak-form efficiency of the Czech stock market, through the analysis of the intraweek and intraday price anomalies. Stavarek and Heryan (2012) investigated the day of the week effect on the Czech, Hungarian and Polish stock markets. Arendas and Chovancova (2016) investigated the presence of the Halloween effect on the stock markets of 12 CEE countries. On the Czech stock market, during the 1994 – 2015 period, the Halloween effect occurred in 14 out of 21 years, with the average winter period returns by 8.25 percentage points higher compared to the average summer period returns.

Heininen and Puttonen (2008) investigated the presence of various calendar anomalies on stock markets of the CEE countries, over the 1997 – 2008 period. Over the 2005 – 2008 sub-period, they identified the turn of the month effect on the Czech stock market that was statistically significant at the 0.1 significance level.

The aim of this paper is to contribute to the research of the market anomalies on the Czech stock market, by investigating the presence of the turn of the month effect. The presence of the turn of the month effect, as well as any other calendar anomaly, is in a contradiction to the efficient markets theory. It also generates an opportunity for investors, to reach some abnormal returns. If the turn of the month effect on the Czech stock market is strong enough, a turn of the month effect based investment strategy should be able to beat the simple buy & hold investment strategy.

2. DATA AND METHODOLOGY

The aim of this paper is to investigate the presence of the turn of the month effect on the Czech stock market, represented by the benchmark PX stock index. The PX stock index was established in 1994, as PX 50 and it included stocks of 50 companies. In 2006, it was transformed into PX. Today, it includes stocks of 13 companies (Tab. 1) (as of January 11, 2017). The biggest weight is attributed to Erste Group Bank, Komerční Banka and ČEZ. These three companies represent more than 60% of the PX stock index. It is also able to see that the financials (Erste Group Bank, Komerční Banka, Moneta Money Bank and VIG) create slightly more than 59% of the index.

Tab. 1 – PX stock index composition. Source: own processing, using data of the Prague Stock Exchange

company	**weight**
Erste Group Bank	20.83%
Komerční Banka	19.81%
ČEZ	19.65%
Moneta Money Bank	9.86%
VIG (Vienna Insurance Group)	9.06%
O2 C.R.	6.59%
Philip Morris ČR	2.94%
Pegas Nonwovens	2.80%
Stock	2.67%
Unipetrol	2.59%
CETV	1.82%
Fortuna	0.72%
Kofola ČS	0.66%

After a stagnation in the late 1990's and early 2000's, the Czech stock market experienced an impressive bull market during the 2003 – 2008 time period. But the growth of the PX values was abruptly ended by the global financial crisis of 2008. After a short period of recovery, the PX started to move in a sideways trend that is still intact.



Fig. 1 – PX development. Source: own processing, using data of www.stooq.com

The daily PX returns over a 20-year time period (January 1, 1997 – December 31, 2016) are used to determine the presence of the turn of the month effect. The 20-year period involves 240 months and 5,020 trading days which means 20.92 trading days per month on average (Tab. 2). The average daily return equals to 0.0204% and the variance equals to 0.000194. The highest daily return of 13.16% was recorded on October 29, 2008, while the lowest daily return of -14.94% was recorded on October 10, 2008.

Tab. 2 – Descriptive statistics. Source: own calculations

number of trading days	5020
number of months	240
average number of trading days per month	20.92
average daily return	0.0204%
highest daily return	13.1609%
lowest daily return	-14.9435%
variance	0.000194

The evaluation of the presence of the turn of the month effect is based on the comparison of daily stock market returns recorded over the turn of the month period and the daily stock market returns recorded over the rest of the month. Trading days of every calendar month included in the investigated time period (January 1997 – December 2016) were divided into the turn of the month and rest of the month subgroups.

As different sources provide slightly different definitions of the turn of the month period, three alternatives of the turn of the month period are evaluated. The first one includes only the first and the last trading day of each month. The second one includes the first three and the last three trading days of each month and the third one includes the first five and the last five trading days of each month. If the turn of the month effect is present on the Czech stock market, the returns recorded over the first and the last trading days of the month (the turn of the month period) should be higher compared to the returns recorded over the rest of the month.

Standard statistical methods are used to evaluate whether the difference between the turn of the month period returns and the rest of the month returns is statistically significant: the parametric two-sample t-test and non-parametric Wilcoxon rank-sum test. The Shapiro-Wilk test is used to determine whether the data sets are normally distributed, i.e. whether the results of the parametric or non-parametric test are more robust. The F-test is used to determine whether the two-sample t-test for equal or unequal variances should be used for a particular pair of datasets.

We set up three hypotheses:

1. The average turn of the month period returns are higher compared to the average rest of the month returns.

2. The difference between the turn of the month period returns and the rest of the month returns is statistically significant.

3. A turn of the month effect investment strategy based on investing in PX always at the beginning of the turn of the month period and closing the position at the end of the turn of the month period is able to beat the buy & hold investment strategy of investing in PX on January 1, 1997 and holding the position until December 31, 2016.

3. RESULTS AND DISCUSSION

The results of the data analysis are captured by Tab. 3. The table shows average PX returns for all of the three alternatives of the turn of the month effect analysed. Alternative 1 analyses the turn of the month effect over the first and the last trading day of each month. Under alternative 2, the turn of the month period involves the first three and the last three trading days of each month and under alternative 3, the turn of the month period involves the first five and the last five trading days of each month. Columns marked as T-O-M show results recorded over the turn of the month period and columns marked as R-O-M show results recorded over the rest of the month.

Tab. 3 – Turn off the month effect (1997 – 2016). Source: own calculations

	alternative 1		alternative 2		alternative 3	
	T-O-M	R-O-M	T-O-M	R-O-M	T-O-M	R-O-M
average return	0.184%	0.003%	0.083%	-0.005%	0.038%	0.004%
Shapiro-Wilk test (p-value)	1.00E-06	3.95E-45	1.03E-24	2.70E-41	3.88E-31	1.69E-37
two-sample t-test (two-tailed p-value)	0.003486		0.038479		0.381979	
Wilcoxon rank sum test (two-tailed p-value)	**0.005276**		**0.028847**		**0.405943**	

Table 3 contains also the results of the statistical significance tests, the parametric two-sample t-test and the non-parametric Wilcoxon rank sum test. The results of the more appropriate test (based on the results of the Shapiro-Wilk normality test) are written in bold. In all of the cases, the data come from a non-normally distributed population which means that the results of the non-parametric Wilcoxon rank sum test are more appropriate. The cases when the difference between the T-O-M returns and the R-O-M returns are statistically significant, are highlighted.

The results show that during the 1997 – 2016 time period, the average daily return of the first and the last trading day of each month was 0.184%. It is far more than the average return recorded over the rest of the trading days (0.003%). Both of the statistical tests show that the difference between the turn of the month period returns and the rest of the month returns is statistically significant, even at the 0.01 significance level.
Similar results are valid also for alternative 2. The average daily return for the first three and last three trading days of each month is 0.083%. For the rest of the month, the average return is negative, -0.005%. The difference between the turn of the month period returns and the rest of the month returns is statistically significant, at a 0.05 significance level.
Also taking into account the first five and the last five trading days of each month reveals the presence of the turn of the month effect. In this case, the average daily return over the turn of the month period is 0.038%, while the average daily return over the rest of the month is only 0.004%. Although the turn of the month period average daily return is still higher, the difference is notably smaller compared to alternatives 1 and 2. Also both of the statistical tests show that the difference between the turn of the month period returns and the rest of the month returns is not statistically significant.

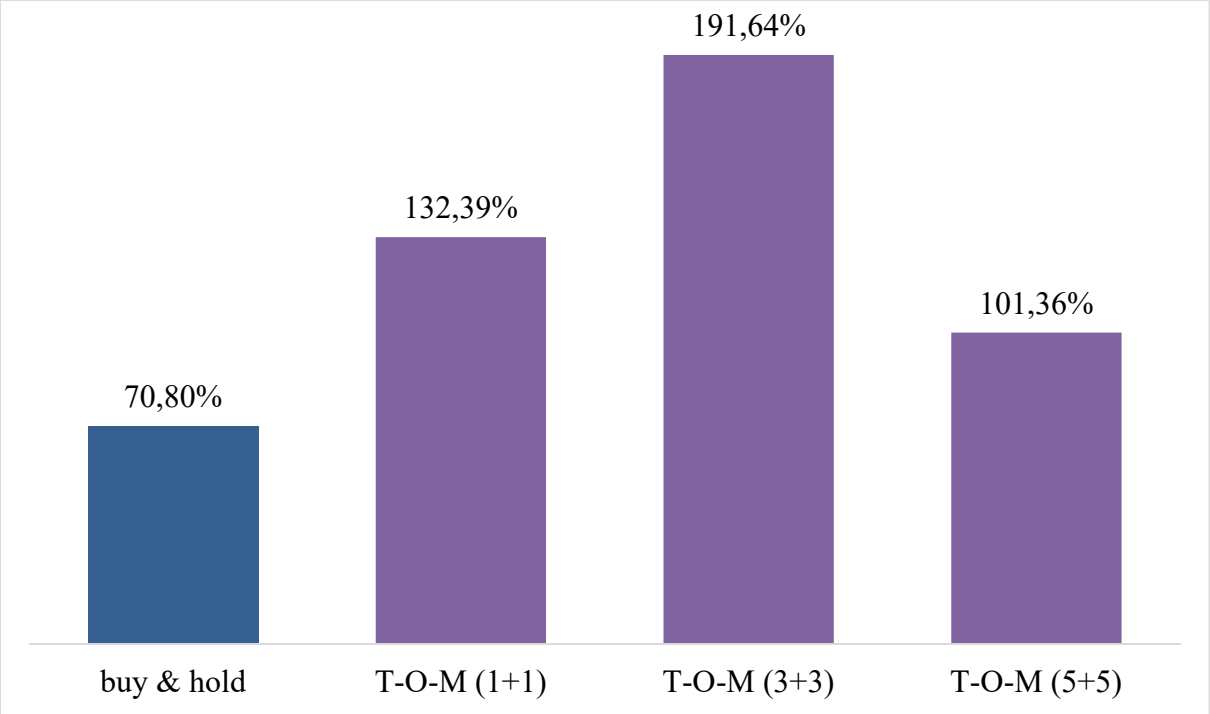


Fig. 2 – Results of the investment strategies. Source: own calculations

The strength of the turn of the month effect on the Czech stock market is presented also by Fig. 2 that captures results of a turn of the month based investment strategy in comparison to a simple buy & hold investment strategy. The buy & hold strategy that assumes investing in PX at the beginning of 1997 and holding the position up to the end of 2016, would generate return of 70.8%. The relatively low return that was recorded over the 20-year time period is caused mainly by the poor performance after the global finance crisis of 2008 (Fig. 1). On the other hand, investing in the PX stock index only during the turn of the month periods generated much higher returns in all of the three cases. Investing in PX only during the last and the first trading day of each month (T-O-M (1+1)) generated returns of 132.39%, while investing during the first three and the last three trading days (T-O-M (3+3)) and the first five and the last five trading days (T-O-M (5+5)) generated returns of 191.64% and 101.36% respectively. Although we didn't take the transaction costs into account, the superiority of the turn of the month based investment strategy is so big (at least in the case of T-O-M (1+1) and T-O-M (3+3)) that the

institutional investors as well as some big retail investor that can optimise their transaction costs should be able to successfully exploit the ability of the turn of the month strategy to generate abnormal returns.

Based on the abovementioned analyses, it is able to accept the **hypothesis no. 1**. The average turn of the month period returns are higher compared to the average rest of the month returns. This finding is valid for all the three alternatives of the turn of the month effect that were investigated.

The **hypothesis no. 2** can be accepted for alternative 1 (the turn of the month period consists of the first and the last trading day of a month) and for alternative 2 (the turn of the month period consists of the first three and the last three trading days of a month). In both of the cases, the difference between returns recorded over the turn of the month period and the returns recorded over the rest of the month is statistically significant. Although the turn of the month period returns are higher compared to the rest of the month returns also in the case of alternative 3 (the turn of the month period consists of the first five and the last five trading days of a month), the statistical significance tests didn't confirm statistical significance of the differences.

Hypothesis no. 3 can be accepted as well. A turn of the month effect based investment strategy is able to beat the buy & hold strategy. This ability was proven in the case of all of the three alternatives of the turn of the month effect, with best results achieved by alternative 2 (the turn of the month period consists of the first three and the last three trading days of a month) that was able to beat the buy & hold strategy by 120.84 percentage points.

The results show that the turn of the month effect is strong and statistically significant. It is in a partial contradiction to conclusions of some of the older studies. For example Tonchev and Kim (2004) who investigated the presence of the day of the week effect, the January effect, the half-month effect the holiday effect and the turn of the month effect on the stock markets of the Czech Republic, Slovakia and Slovenia, came to a conclusion that only a very weak evidence for the calendar effects has been found. Also Heininen and Puttonen (2008) who investigated the 1997 – 2008 time period, discovered the turn of the month effect only during the 2005 – 2008 sub-period. However, these studies investigated only much shorter time periods and they haven't reflected the newest data from the past 10 years.

As shown by Fig. 3, it was the last decade that brought the turn of the month effect to the Czech stock market. Over the 1997 – 2006 period, the average daily returns over the T-O-M (3+3) period (a.k.a. alternative 2) were only 0.04%, while the R-O-M average daily returns were 0.054%. But during the 2007 – 2016 period, the T-O-M (3+3) average daily returns climbed to 0.114%, while the R-O-M average daily returns dived to -0.06%. It is able to conclude that these findings confirm the conclusions of some of the previous studies, e.g. Zhang and Jacobsen (2013) or Arendas (2017), who show that the strength of the calendar anomalies changes over time. This is also the case of the turn of the month effect on the Czech stock market.

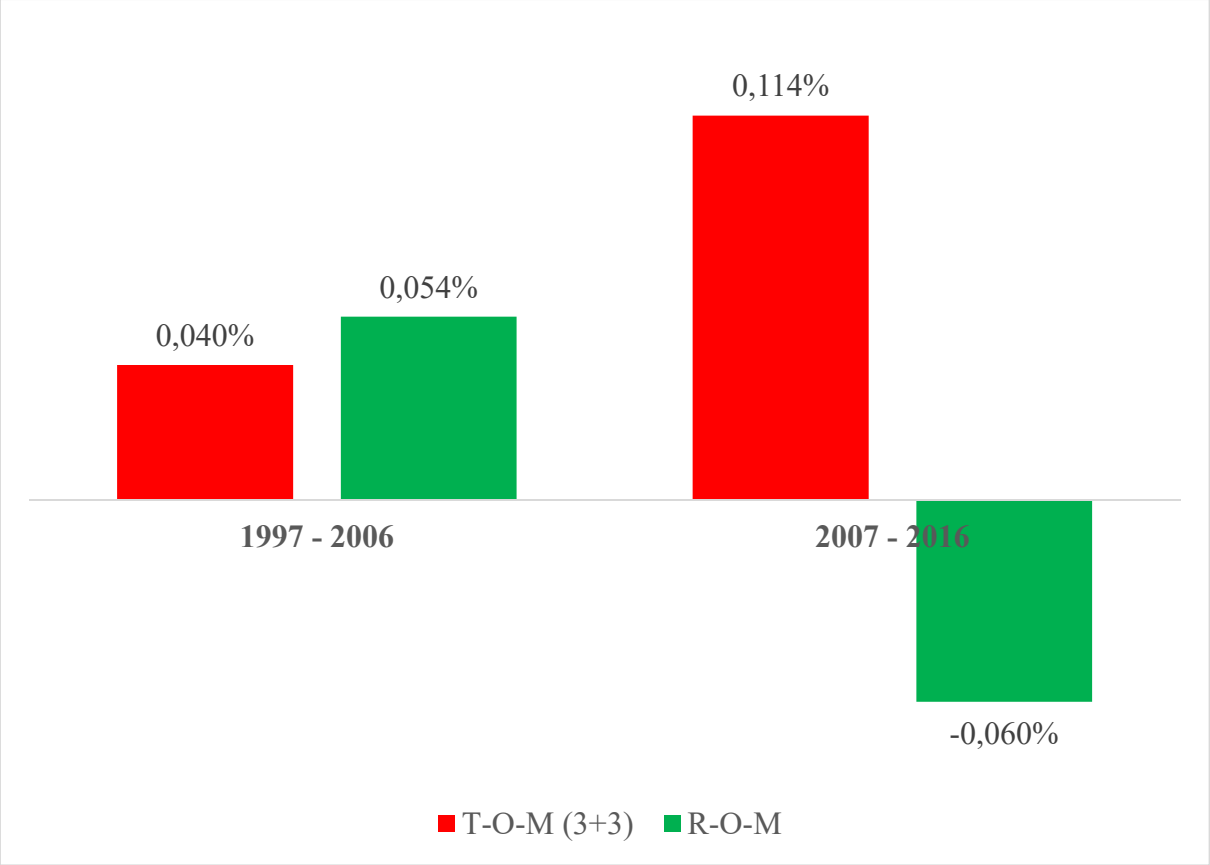


Fig. 3 – Average daily returns over the 6-day T-O-M period and over the R-O-M – comparison of the 1997 – 2006 and 2007 – 2016 time periods. Source: own calculations.

4. CONCLUSION

The data analysis shows that the Czech stock market is impacted by the turn of the month effect. During the 20-year time period from 1997 to 2016, the average daily return recorded during the first and the last trading day of each month was 0.184%, while it was only 0.003% for the rest of the trading days. The difference is statistically significant. The same conclusion is valid for comparison of average daily returns reached during the first three and the last three trading days of each month (0.083%) and during the rest of the month (-0.005%). Also the average daily returns recorded during the first five and the last five trading days of each month are higher compared to the average daily returns recorded over the rest of the month (0.038% vs. 0.004%). However in this case the difference isn't statistically significant.
The differences in returns achieved during the turn of the month period and during the rest of the month are so big, that it is possible to exploit them to reach abnormal returns. While a simple buy & hold investment strategy would generate returns of only 70.80%, the three investigated alternatives of the turn of the month effect based investment strategy would generate returns of 132.39%, 191.64% and 101.36% respectively, over the 1997 – 2016 time period.

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THE EVALUATION OF FINANCIAL PERFORMANCE OF MANUFACTURING FIRMS IN THE CZECH REPUBLIC AND IN 28 COUNTRIES OF THE EUROPEAN UNION AND THE EFFECT OF THE ECONOMIC CRISIS

Bartoš Vojtěch, Jelčová Denisa

Abstract

The aim of this article is to determine impact the economic crisis on the financial performance of Czech manufacturing firms and its subsequent comparison with manufacturing firms from 28 EU countries over the past ten years (2006-2015) and find evidence of relations between selected financial indicators in the selected divisions. The article is based on secondary quantitative research conducted among SMEs in the Czech Republic and 28 countries from EU. Relevant data are acquired from the database Amadeus. The sample contains 1,412 firms operating in the domestic manufacturing industries and of 14,881 firms in the same category operating in 28 EU countries. The analysis of development of sales in selected period and three financial indicators were selected to obtain proper results. The findings are processed using statistical indicator, Winsorized mean and Spearman correlation. Firstly, development of the sales together with added value is applied and shows a positive result represented by the increase in the studied period. More significant increase has been recognized withnin sample of Czech manufacturing firms. Secondly, a Return on Assets demonstrates evident impact of the financial crisis in the year of its onset. The last indicator used for purposes of this paper, Total Debt shows decreases tendency. As was shown by the literature, the impact of the financial crisis on firm performance is of great importance. Over the past ten years, the financial health of industrial enterprises in the country has increased the financial health. The growth of financial efficiency of industrial enterprises in the Czech Republic was higher than in the 28 EU countries. There is clear evidence of strong relation betweenr Total Debt ratio of Czech companies and Added Value on Sales where the higher Debt Ratio is accompanied by lower Added Value on Sales.

Keywords: manufacturing firms, financial crisis, financial performance, added value, debt ratio, return on assets

JEL Classification: G03, L60.

1.INTRODUCTION

The impact of the economic crisis on business performance has been a topic of much discussion in recent years. Before the reader delves deeper into these issues, they should better understand the terms "economic crisis" and "business performance", addressed at the beginning of this paper.

Some authors are of the opinion that a crisis is any sequence of events that requires a quick response. Rongier et al. (2012), however, give a more comprehensive definition and see a crisis as a serious human-made threat which affects the basic structures, values and norms of a social system.

Skodakova (2009) brings, through her research, a different perspective to the notion of a crisis. Eight out of the twelve firms approached in a questionnaire survey identify the economic crisis as an opportunity. The basic areas for growth prompted by the crisis include: increasing market share, elimination of competition and taking over orders of "fallen companies".

Another important term regarding this issue is the aforementioned "business performance". As Wu (2009) noted, despite the fact that a significant number of studies have focused on the issue of measuring business performance, a clear definition is still a matter of debate. Probably the most frequently recurring idea, which deals with measuring performance, comes from Kennerly et al. (2002), in which they argue that a performance measurement system allows for the adoption of decisions and actions based on obtained information, which should result overall in quantifying efficiency and increasing effectiveness. Response to the rapidly evolving global trends and the changing role of society also requires the development of methods to measure business performance. Traditional approaches to identifying performance were established mainly on financial grounds, but at the end of the 1980s, studies showed that financial indicators alone provided insufficient means for understanding and managing a business in the new economy due to the organisation and structure of the markets in which the individual businesses compete. However research by Stříteská (2012) confirms that 66.7% of the surveyed Czech manufacturing firms still use traditional financial indicators.

Chan et al.(2014) suggested that the financial health of a company can be determined by five indicators: Return on Assets, Return on Equity, Fixed Asset ratio, Debt-to-Equity ratio and Working Capital turnover.Ong et al. (2011) demonstrated that five financial ratios, namely, Activity ratios, Cash flow ratios, Solvency ratios, Liquidity ratios and Profitability, had been found to be significant and useful for the prediction of corporate failures.

For delivering a quick, unambiguous view of the financial performance of a company, financial metrics such as Return on Assets, Total Debt ratio, Value Added to sales or development or sales are used.

Manufacturing has traditionally been an important contributor to economic growth and employment in the Czech Republic (PwC, 2017). The share of manufacturing industry on the total industry revenues was 89,3 % in the year 2008. Due to economic recession, total share of manufacturing industry on total industry revenues dropped to the 87,8 %. In the year 2013, there is increase of revenue share of manufacturing industry up to 90,9 % and employed 1 044 732 persons (MPO, 2014). There clear evidence of manufacturing industry importance in EU 28 countries. The manufacturing sector employed 29.7 million persons in 2013 and generated EUR 1 630 billion of Value Added. By these two measures, manufacturing was the second largest of the NACE sections within the EU-28's non-financial business economy in terms of its contribution to employment (22.3 %) and the largest contributor to non-financial business economy Value Added (EUROSTAT,2016).

2.LITERATURE REVIEW

The chapter is divided into two parts where the first part focuses on the Czech Republic and the second part on the international environment.

Impact of the financial crisis on the performance of firms in the Czech Republic

The question of how the economic crisis affects business performance has already been discussed by the authors. Bartoš et al. (2013), who focused on businesses in the South Moravian Region in the Czech Republic and concluded that the companies are able not only to react to turbulence, but even increase their added value. Karas et al. (2013), discuss the impact of the economic crisis on ROE indicators for companies in the manufacturing industry. The development of the ROE indicator shows a very positive development until the period of the global recession. While there was economic growth in the years 2004-2007, there was a significant decrease in 2008 (-6.02%). However, in the second half of 2009, the impact of the German economy caused a positive change for the Czech Republic where an increase in ROE (5.18%) is reported. A drop occurred again in the period 2010/2011, which is caused by a drop in domestic demand, but nevertheless the development in recent years can be evaluated

positively because of the growing share of exports in total sales. On the other hand, the results of industrial businesses are increasingly dependent on the development of foreign economies. It clearly arose from the results of the authors' analyses that external factors such as trends in interest rates or tax burdens were reflected in a decrease in business performance. The more difficult access to capital during the crisis due to the interest burden together with the risk premium corresponds to the results of other authors mentioned below in this paper.

Despite the aforementioned positive approach adopted by Skodakova (2009) in her research, 66.7% of surveyed companies expect a decline in turnover, reduced profit margins on products or insolvency. All surveyed businesses stated that the economic crisis mentioned several times in this paper means a change in company management. The most common changes are: extension of maturities with suppliers, reduction of the number of employees including senior personnel, reduction of wages and suspension of all planned investments of companies, which is to some extent associated with the suspension of bank loans. The efforts to maintain positive cash flow also benefited from the suspension of payment of overtime or limitation of employee education. All the surveyed companies mentioned increased their attention paid to inventory and working capital turnover. The questionnaire survey results were also confirmed by a report from the Czech Statistical Office dated March 2009, which provides the exact numbers for the development of industrial production. The value of new contracts in selected sectors fell by 16.5% year-on-year, of which contracts from abroad amount to 15.2%. New contracts dropped the most in the following sectors: manufacture of basic metals, metallurgical processing of metals (foundry industry) (48.5%), manufacture of machinery and equipment (27.9%) and manufacture of metal structures and metalworking products (23.5%). The number of employees registered in industrial enterprises with 50 or more employees fell by 9.9%, while the year-on-year increase in their nominal monthly wages was 2.5%, i.e. CZK 23,370 over the same period (March 2009). However, the author Kislingerová (2010) emphasises further in her publication that it is ill-advisable to predict development in a crisis development only based on a short-term series and it is always necessary to monitor the overall development – even when new numbers may indicate an improvement of the situation. Therefore ten years time period for this research has been picked up.

Impact of the economic crisis in Europe

In their publications, the aforementioned authors addressed the issue under the conditions of the Czech economy; however, the financial crisis was global in scope. Claessens et al., (2011) provide overview of the performance of manufacturing firms in 42 countries and find that the crisis had a bigger negative impact on firms with greater sensitivity to aggregate demand and international trade. Lacina and Vavrina (2014), pointed out the impact of the financial crisis in Ireland and Greece. Based on company financial statements, they provide evidence that European corporations experienced an economic decline in the area of corporate finance. Both sides of the economy, supply and demand, were significantly affected. Irish companies reported a decline in the added value by more than one-fifth where the authors indicate the reduction of wages and government cuts as the main cause. Meanwhile in Greece, small and medium-sized enterprises suffered disproportionately more than the large ones. The crisis affected mainly two sectors – manufacturing and construction sectors. A significantly lower number of employees are typical for small and medium-sized enterprises as well as a decrease in added value in the period 2008-2012. The largest decline among financial indicators of Greek businesses was in ROCE, specifically in sectors such as scientific and technical activities, advertising agencies and engineering. Subsequently, the largest number of companies with declining profitability is from wholesale and retail trade and repairs of motor vehicles and motorcycles. Two years before research of Lacina and Vavrina (2014), Bricongne Et al. (2012) used sample of French

firms. Their finding showed that the effect of the crisis on large firms has been mainly at the intensive margin and has affected less the products being offered to export destinations.
Financial ratio Total Debt has already been the object of studies of previous researchers. From the latest period, Laevena and Valencia (2011) observe that the growth of firms more dependent on external financing was more positively affected by bank recapitalization and fiscal policies stimuls.
The relationship between financial leverage and firm performance is highlighted by Opler and Titman (1994). The relationship between firm performance and financial distress is negative and significant, while later Asgharian (2002) tests the performance - distress relationship on the sample of Swedish firm where was observed that highly leveraged firms in distressed industries face relatively lower stock returns.

3.METHODS

This article aims to evaluate the impact of the economic crisis on the financial performance of companies in the manufacturing industry in the Czech Republic during the period 2006-2015 and the subsequent comparison with the impact of crisis in selected EU enterprises and find evidence of relations between selected financial indicators in selected divisions.

The paper uses the method of secondary quantitative research, on data received from the Amadeus database. Annual turnover and the value of assets of individual businesses were selected as the categories. Due to the large sample available for this research, 1,412 businesses located in the Czech Republic and operating in the manufacturing industry in field shown below, the size of which falls within the classification of the European Commission provided further in this paper, were used. 20,532 enterprises from 28 countries of the EU suited to demanded requirements in the Amadeus database.

For a complete calculation 1,412 Czech industrial firms have been used and the compared with 14,881 firms in the same category from 28 EU countries during the reporting period 2006 - 2015. The selected sample includes the same number of enterprises during the whole monitored period.

The reason for accomplishing selection from this category is due to the dominant position of manufacturing industry withnin the country. The automotive industry accounts for around 23,1% of the Czech industrial output and is thus the country's largest single industry (MPO, 2014). Automotive sector (Division-29) has been excluded for the current research as the paper compares industry with the EU 28 and there is just significant importance recognized for Czech Republic.

The largest EU-28 subsectors in 2013 in terms of Value Added and Employment were the manufacture of machinery and equipment (Division 28) food manufacturing (Division 10) and the manufacture of fabricated metal products (Division 25) (EUROSTAT, 2016). The great importance in the Czech Republic is placed on the divisions below|:

- 25 Manufacture of basic metals, metallurgical and metalworking products
- 28 Manufacture of machinery and equipment
- 26 Manufacture of electrical and optical equipment and devices
- 22 Manufacture of rubber and plastic products

The second place in Czech manufacturing industry belongs to the division 25 Manufacture of basic metals, metallurgical and metalworking products with total share on total industry revenues 8.7% followed by division 28 Manufacture of machinery and equipment with total share on total revenues 8.1%.The biggest importance of year-on-year change show division 25 + 5.6 % increase in 2013 and division 22 Manufacture of rubber and plastic products +2.8 %. The opposite trend is shown by division 26 Manufacture of electrical and optical equipment and devices with decrease of -2.6 % (MPO,2014).
Significant influence of selected divisions on total manufacturing industry is recognized in terms of employment too. The most significant year-on- year growth was in division 25 +1.7% of employees and division 28 + 0.6% of employees (MPO,2014). Based on evidenence above, authors of this paper picked up four described subsectors.
These businesses operating in the Czech Republic are classified based on the recommendation of the European Commission 2003/361EC as: small, medium-sized, and large enterprises. Micro-enterprises are not included in this research.

Table 1: Distribution of enterprises according to the EU Commission (Source: EU Commision, 2003)

Company category	Number of employees	Annual turnover	Value of assets
a) Micro-enterprise	< 10 employees	< EUR 2 million	< EUR 2 million
b) Small enterprise	< 50 employees	< EUR 10 million	< EUR 10 million
c) Medium-sized enterprise	< 250 employees	< EUR 50 million	< EUR 43 million
d) Large enterprise	Above the aforementioned limits		

As there is wide range of ratios of financial analysis and at the same time limitations of content contribution, just limited numbers of ratios has been used for purpose of this research. The measurement of all basic areas of firm's financial situation is an important goal of financial analysis and in this case it is eligible to use only a limited number of indicators Thanks to their almost universal applicability, they allow for comparison of firms of different sizes, so they can be used as a tool for benchmark (Dluhosova, 2010). Applying financial ratios encounter also some disadvantages already highlighted by Bartos et al. (2013).
Financial ratios rely on historical data and they describe the "past" – in this contribution the goal is the evaluation of the past period, therefore this aspect is not relevant.
Financial ratios have limited ability to give information about some evolution in certain field of firm finances if they are examined only for a short period – in this contribution a ten years period is investigated in order to grasp the evolution of the indicators values in longer time.

Firstly, the Development of Sales (expressed in thousands of euros) during the monitored period is shown and the indicator is supplemented by time indices. Time indices are expresed from two different points of view. Firstly change between each year expressed in % is shown, secondly the change between each year compared to the first year (2006) is proceed. These changes are higly connected and compared with changes in the cost, therefore ratio indicator Value Added on Sales has been picked up.

- The Development of Dependence of Added Value on Sales (Added value/ Sales expressed in %)

Subsequently, significant ratios of financial analysis to provide the outline of financial performance in selected period are applied for this contribution.

- The Development of Return on Assets (EBIT /Total Assets, expressed in %) Earn before interest and taxes has been selected for comparison purposes of companies with different taxation and interest expenses.

- The Development of Total Debt (Liabilities/Assets, expressed in %)

The results are processed and determined using statistical indicators, Winsorized mean to be the most appropriate for data analysis, in order to reduce effect of these extreme values from the sample by their nearest values. Winsorized mean is based on replacement of a given percentage of the smallest and highest values from the sample by their nearest values (Meloun at al., 2002). The advantage of Winsorized mean compared to arithmetic mean is its robustness to the outlying values. The Winsorized mean is calculated as:

$$\bar{x}_w(\vartheta) = \frac{1}{n}\left[(M+1)\left(x_{(M+1)} + x_{(n-M)}\right) + \sum_{i=M+2}^{n-M-1} x_{(i)}\right] \quad (1)$$

where

$M = \text{int}(\vartheta n/100)$

and

ϑ – is the percentage of trimmed values in the line,
$x_{(i)}$ – are the order statistics,
n – number of values in the sample.

To measure the strength and direction of association between two ranked variables, the Spearman's correlation is applied. John H. McDonald, 2014 defines the Spearman's rank-order correlation such as the nonparametric version of the Pearson product-moment correlation. In a sample below it is denoted by r_s and is by design contrained as follows

$$-1 \leq r_s \leq 1 \quad (2)$$

The closer r_s is to ±1 the stronger the monotonic relationship. Intuitively, the Spearman correlation between two variables will be high when observations have a similar (or identical for a correlation of 1) rank between the two variables, and low when observations have a dissimilar (or fully opposed for a correlation of -1) rank between the two variables.

$$r_s = \rho_{\mathrm{rg}_X, \mathrm{rg}_Y} = \frac{\mathrm{cov}(\mathrm{rg}_X, \mathrm{rg}_Y)}{\sigma_{\mathrm{rg}_X}\sigma_{\mathrm{rg}_Y}} \quad (3)$$

where

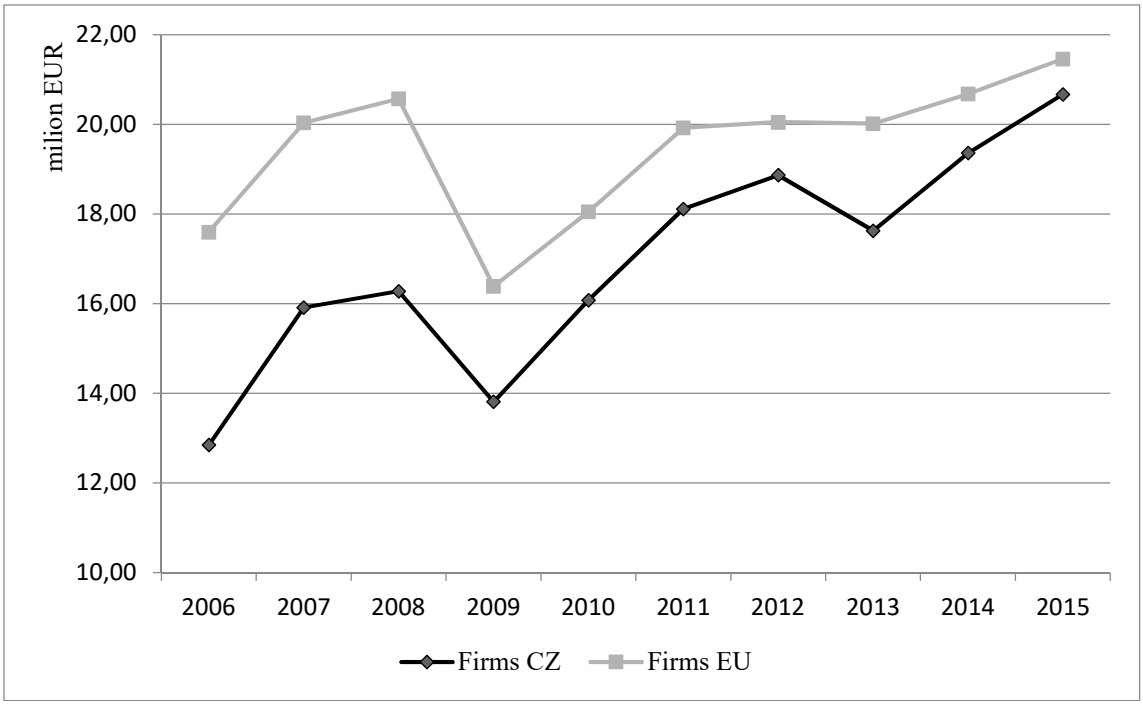
ρ denotes the usual Pearson correlation coefficient, but applied to the rank variables.
Cov (rg_x,rg_y)- is the covariance of the rank variables
σ rg_x and σ rg_y - are the standard deviations of the rank variables.

4.RESULTS AND DISCUSSION

The following tables and graphs show the development of selected financial indicators for the selected period.

The Development of Sales and Added Value on Sales

During the monitored period, from 2006 to 2015, there is higher sales growth of 60.88% in the Czech manufacturing firms in comparison with revenue increase by 21.95% in industrial enterprises in the EU. Czech enterprises are not excluded from the total number of EU enterprises as the portion of Czech firms on total number is just 9 %.



Graph 1: Development of Sales in the monitored period (2006-2015). Source: authors' own data, 2017

Considering year-on-year change in Czech manufacturing firms and in EU firms, there is clear evidence that revenues suffered significant drop. However when comparing year of crisis 2009 with year before crisis 2006, Czech manufacturing show increase of 7 % whereas EU firms are characterized by 7% decrease. Monitored period after crisis (2010) signalizes upturn development in both monitored groups when considering year-on-year change . Until the year 2013, the impact of crisis on revenues is more notable in Czech environment where significat fall of 7% is visible. However taking into consideration changes in comparison with the year 2006, there is substantial growth in Czech companies between the period 2010-2015.

Tab. 2: The development of Sales in motired period using time indices Source: authors' own data, 2017

Time indices	2007	2008	2009	2010	2011	2012	2013	2014	2015
year-on-year Δ in CZ	24%	2%	-15%	16%	13%	4%	-7%	10%	7%
year-on- 2006 Δ in CZ	24%	27%	7%	25%	41%	47%	37%	51%	61%
year-on- 2006 Δ in EU	14%	17%	-7%	3%	13%	14%	14%	18%	22%
year-on-year Δ in EU	14%	3%	-20%	10%	10%	1%	0%	3%	4%

The first selected indicator for the purposes of this article, the development of Added Value on revenues shows overall increase in added value in 2015 by compared to 2006. Higher percentage change between the year 2006 and 2015, 6.78 % is reconginzed for Czech manufacturing firms. Bartoš et al. (2013), whose research confirmed that businesses in the Czech republic were able to increase their added value during the financial crisis, previously addressed the indicator of Added Value in connection with the financial crisis. Our results

clearly indicate that the share of Added Value in revenues increased in 2009 to up to 33.68%, while in 2006 the value was only 31.88%. In 2014 and 2015, the value has stabilised at 34.33% and 34.04%.

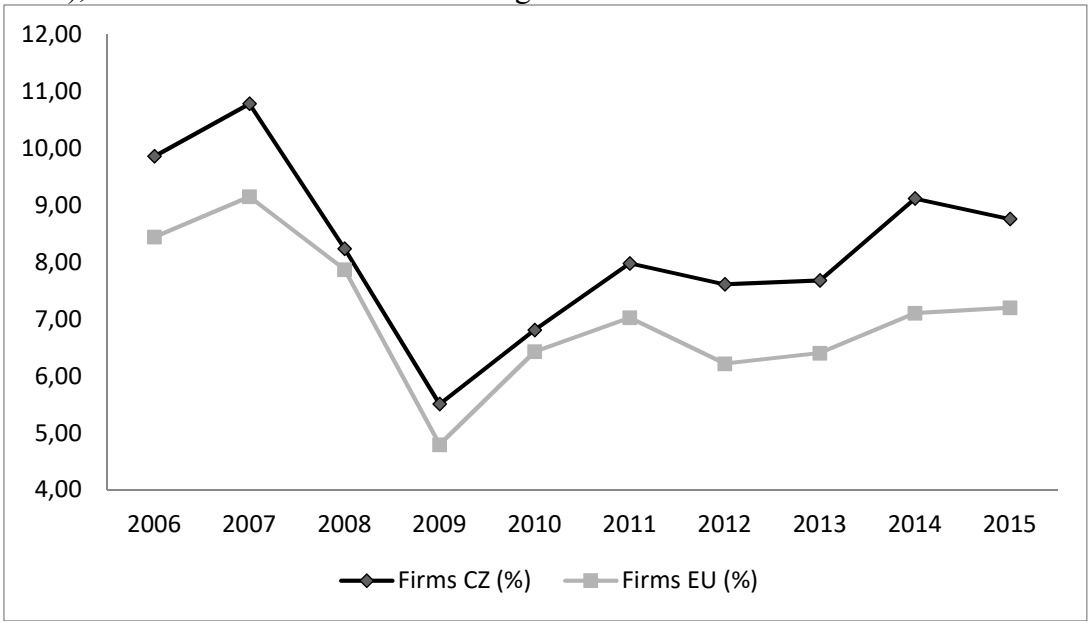
In the recent ten years, industrial enterprises in the EU are able to increase the Value Added to their sales, confirmed by table below with change of 4.46 % . Autors highlight higher and steeper value throughout the period within Czech firms.

Tab. 3: The Development of Dependence of added value on sales Source: authors' own data, 2017

Years	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Firms CZ (%)	31,885	32,395	32,271	33,685	33,9326	33,522	33,677	33,7454	34,3304	34,0477
Firms EU (%)	30,118	29,960	29,851	31,624	31,3725	30,538	30,818	31,061	31,494	31,461

Return on Assets

In the second selected ROA indicator (return on assets), it can be seen on the basis of results obtained in the form of the Winsorized mean that the the impact of the economic crisis is evident in the year of its onset, where the values show decrease of 44.15 % in Czech environment and decrease of 43.19 % in European environment compared to the years which are considered pre-crisis. The overall lower decrease of 11.19% during the whole monitored period is significant for Czech manufacturing industry whereas EU manufacturing industry generated change of 14.69 % in the same period. A slight decrease occurs only in two post-crisis years (2012 and 2013), but in 2014 there is an increase again.



Graph 2: Development of ROA in the monitored period. Source: authors' own data, 2017.
Total debt

It is apparent from the table below that the overall debt decreased, in terms of the Winsorized mean, by 18.25% in Czech Republic and by 13.22 % in EU environment. In the first reference period from 2006 to 2009, the median debt of businesses fell more significantly 11% in the condition of Czech environment and 9% in the condition of international environment than during the crisis. The businesses across the EU have reduced the share of their liabilities during monitored period. Many enterprises have learned from the economic crisis and despite the significant decline in interest rates the latest trend has been followed..

Table 4: Development of Total Debt in the monitored period 2006-2015 Source: authors' own data, 2017.

Years	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Firms CZ (%)	50,151	48,809	47,741	44,543	44,480	44,357	42,897	42,750	42,218	41,000
Firms EU (%)	63,431	62,698	60,284	57,890	58,284	58,009	56,789	56,305	55,835	55,046

The Spearman correlation

As the reader can see in the calculation below, almost perfect negative association (-0.8) between variable Total – Debt ratio and variable Added Value on Sales is confirmed. Higher total Tebt ratio of Czech companies is accompanied by lower Added Value on Sales. The weaker negative association in the same field is proved in EU countries.

Table 5: Spearman correlation Source: authors' own data, 2017.

	Spearman correlation					
Variable	AV/R (CZ)	AV/R EU	TD (CZ))	TD (CZ)	ROA (CZ)	ROA (EU)
AV/R (CZ)	1.000000	0.842424	-0.842424	-0.842424	-0.284848	-0.430303
AV/R EU	0.842424	1.000000	-0.612121	-0.721212	-0.466667	-0.624242
TD (CZ)	-0.842424	-0.612121	1.000000	0.963636	0.200000	0.406061
TD (EU)	-0.842424	-0.721212	0.963636	1.000000	0.260606	0.490909
ROA (CZ)	-0.284848	-0.466667	0.200000	0.260606	1.000000	0.915152
ROA (EU)	-0.430303	-0.624242	0.406061	0.490909	0.915152	1.000000

5.CONCLUSION

The fact that the financial crisis had an impact on various business areas has been already mentioned by multiple authors and demonstrated in their research. The paper tries to assess the effect of the economic crisis on firm performance in selected divisions of manufacturing sector in Czech Republic and subsequent comparison with the companies from EU 28 countries within the same divisions. For the purpose of this contribution, data of 1,412 Czech industrial firms have been used and the compared with 14,881 firms in the same category from 28 EU countries. Based on used literature three financial indicators as mentioned above have been utilized and data have been proceed using Winsorized mean and Spearman correlation.

The higher sales growth in the Czech manufacturing firms has been confirmed when comparing revenues increase in industrial enterprises in the EU. Taking into consideration changes in comparison with the year 2006, there is substantial growth in Czech companies between the period 2010 -2015.

Another important indicator recognized by authors is the growing trend of Added Value. Autors highlight higher and steeper value throughout the period within Czech firms.

Total debt shows a downward trend in the monitored period, which results in the firms, which found themselves in a situation with falling revenues and problems with repayment of debt in the crisis period, choosing the strategy of reducing debt to under 50% is visible for Czech enterprises. The debt ratio between 50% and 60% signifies that the companies had low leverage and were financially healthy (Chan,2014). Slightly reduced Debt ratio of 60 % was obtained after crisis 2009, indicating an decrease in total liability that was greater than the decrease in total assets in these EU countries. During the crisis, businesses with high debts experienced difficulties in repaying loans because their revenues greatly decreased.

In the pre-crisis period, the effectiveness of the company in utilising its assets to generate profits had an downward trend. The impact of the crisis on the Return on Assets was showed during the year of its onset. Although the crisis brought a decline in the profitability of assets, after the crisis period there is a rise again, less impact and better recuperation is visible in the domestic environment.
The literature and previous research have shown that it is not essential to focus on annual increases in sales, rather attention should be paid to increasing added value based on sales. The results of selected firms from the Czech republic showed that despite the turbulent crisis period, Added Value will be increasing based on sales. This results in the detailed monitoring of costs and the associated use of new technologies, materials and often product processing procedures.The future of business will be associated with the automation of production and a change in the ratio of individual costs. PwC (2017) publishes that changes are most significant in terms of demands, increasing production innovations, manufacturing technologies, increasing automatisation and digitalisation. These facts bring up changes in the utilisation of production capacities, the search for cost savings in all operational areas, including HR management, and, at the same time, they increase the need for restructuring and reorganising, including new set-up of the systems and processes.

The number of production workers will continue to decrease and there will be increasingly high demands on them which have an impact on labour productivity (measured using the added value per employee indicator) which is reflected in increasing values.

In addition, the crisis period also had an impact on senior personnel as they were undergoing a test of skills during that period. The financial crisis had many negative consequences and had an impact on various business sectors. Ranging from senior personnel, who were subjected to tests of skills, to production workers whose numbers were reduced.

However, the crisis also brought positive effects that stimulated new methods of business management which resulted in innovation which has great influence of company performance (Zizlavsky et al., 2016) and is today considered one of the main factors for success.

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SELECTED HEALTH CARE SERVICES PROVIDERS IN THE CZECH REPUBLIC IN THE CONTEXT OF MODERN HUMAN RESOURCE MANAGEMENT

Bejtkovský Jiří

Abstract

Human resource management is a field in which, as in other fields, there are various changes taking place. New trends, methods and techniques are emerging; there are of various ways of implementation and various ways of impact not only on employees, but also on the corporation as such. The article focuses on selected health care services providers in the Czech Republic in the context of modern human resource management. The goal of the paper was to define and, subsequently, map and evaluate selected current trends in the field of human resource management of a health care services provider's HR specialist. The paper presents some of the outcomes of primary quantitative and qualitative research. This research was carried out in 2016 from the sample of 47 participants. One research hypothesis and one research question have been formulated. The verification or rejection of null research hypothesis was done through the statistical method of the Pearson's Chi-square test. The results came along with the discovery that there is no statistically significant relation between the owner of a selected health care services provider in the Czech Republic and current utilization of a selected modern trend in the field of human resource management.

Keywords: care of employees, diversity management, employer brand, e-recruitment, global workplace, health service providers, HR outsourcing, new technology, work-life balance

JEL Classification: I10, J24, M12

1.INTRODUCTION

In recent times, there has been a major focus on the meaning and significance of human resource management. From its early roots in welfare and personnel management through periods when employment relations and legal regulation came to the fore, nowadays strategic human resource management appears to have taken centre stage. This has significant implications for human resource management and the role of the human resource function (Marchington, 2015).
Human resource management is one of the most dynamic and rewarding responsibilities in healthcare delivery. Because a healthcare organization cannot exist without the people who provide care, both directly and indirectly, recruitment, loyalty, motivation and satisfaction of workforce are critical (Fried & Fottler, 2008).
According to Olšovská, Mura & Švec (2016), the main task of human resource management is to focus on the multiple dimensions of working with people, which consists of the following personnel activities: (1) conceptual management and human resource planning, (2) seeking, recruitment and selection of workforce, (3) concluding of work contracts, (4) keeping personnel files, (5) employment issues of an individual and his/her work assignment, (6) allocation of employees, (7) education and development, (7) career planning and management (8) and securing working conditions and occupational safety and health at the workplace.
Regarding this, Ślusarczyk & Golnik (2014) claim that factors like: employee ability, skills, experience, education, behaviour, personality traits and stimulation/motivation influencing the company's prosperity and competitiveness.
A corporate performance and competitiveness depend not only on financial indicators but also indicators of value – including human resources. Qualified, stimulated/motivated, loyal human

resources are undoubtedly the wealth of each corporation. An efficient work with human resources represents benefits of functional human resource management for organisational performance. Within the HR work is necessary not only to care for the employee, but also tracking the current modern trends in the Czech Republic but also abroad. Along with the latest development of human resource management, there has been continuous progress and development of the concept of human resource management as a scientific field taking place in the case of both health care services providers and the corporations themselves. This development has demonstrated an impact on individual areas, processes, techniques, methods and mechanisms. The time and everyday practice in corporations and employees themselves will show whether it is a positive or negative impact. And, with the development of a current concept of human resource management (in the Czech Republic and elsewhere), we can speak of implementation of new staff activities which have the ability to make the field of human resource management easier and more effective. But, in the end, they can be successful because they build, strengthen and improve the productivity, performance and competitive edge of each corporation and health care services provider.

2.THEORETICAL BACKGROUND

Over the last three decades, the practice of human resource management has experienced significant change and transformation. This has included human resource management moving from being a lower-level administrative and maintenance-oriented function to operating in many corporations as a core business function and a strategic business partner (Ulrich & Dulebohn, 2015).

In the world of contemporary corporations, regardless of size, structure and other variables, the most valuable asset is people: employees. Employers are generally aware of the role of human capital. Even if they cannot precisely define it, they know that development of their enterprises depends on the qualifications, knowledge, skills, experience and the personality predispositions of workforce (Moczydłowska & Widelska, 2014).

According to Martin & Fellenz (2010), in the 21st century, senior managers have a responsibility for strategic management, human resource management and ensuring the corporation's mission, vision and goals are achieved.

Many viewpoints from the sphere of management theory and corporate practice show that creativity, performance, effectiveness and efficiency of the workforce to great extent is dependent on the proper work environment, but successes of the enterprises are dependent on the personal values of the employees; these are shaped by the environment itself (Robak & Słocińska, 2015).

2.1.Selected current trends in human resource management in health service providers (in hospitals, in healthcare organizations)

According to Stone & Deadrick (2015), the field of human resource management today is experiencing numerous pressures for change. Shifts in the economy, globalization, domestic diversity and technology have created new demands for corporations and propelled the field in some completely new key concepts or directions.

Regarding this, Sparrow (2007) says that corporations operating in a global environment face a number of new challenges including differences in the language and culture of the workforce, and variations in social, political and legal systems. Multinational corporations are large companies operating in several countries that are confronted with new questions, including how to create consistent human resource practices across different locations, how to develop a coherent corporate culture and how to prepare managers to work in a diverse cultural environment.

On the basis of content analysis of scientific literature, eight selected current modern trends characterizing the field of today's human resource management were defined in total. These are: (1) care of employees/healthcare workers, (2) diversity management, (3) employer brand/branding, (4) e-Recruitment, (5) global workplace, (6) HR outsourcing, (7) new technology and information system in human resource management, (8) work-life balance.
These selected current trends characterizing the field of today's human resource management were subsequently worked with via realized researches, namely the primary ones.

I. Care of employees/healthcare workers

A strategic approach to human resource management seeks to provide competitive advantage proactively through its human resources (Richard & Brown Johnson, 2001).
Thus, employees represent irreplaceable treasure, resource and merit. That is why a corporation management department should make efforts to understand needs and wishes of employees, so that a given corporation can maintain its ability to compete. These efforts do not have to be concerned with the sphere of employment only, but also they should be directed towards improving and facilitating employees' work – as well as making it more effective, with health care, family care, leisure time, etc. included. For example, counselling, prevention, and so on.
Regarding this, Ammendolia, Côté, Cancelliere, Cassidy, Hartvigsen, Boyle, Soklaridis, Stern & Amick (2016) impart that the workplace health promotion and wellness programs vary considerably in size and composition. Comprehensive programs provide health education, links to related workforce services, supportive physical and social environments for health improvement, integration of health promotion into the corporate culture, and employee screening with adequate treatment and follow up.
Care for employees (health care, family care, leisure time, counselling, prevention and so on) is essential for the achievement of quality and flawless job performance. A corporate performance and competitiveness can grow through this trend.

II. Diversity management

According to Holck & Muhr (2017), diversity management, as a managerial concept and tool, was adopted around the end of the last millennium as a solution to the diversity problem.
The diverse workforce refers to the co-existence of employees from various cultural, social and ethnic backgrounds within the corporation. Diversity also denotes the differences between individuals on any personal attributes that determine how employees perceive one another and diversity management seeks to harness those differences in the pursuit of more productive environments (Kundu & Mor, 2017).
A diverse workforce has different knowledge, experience, skills, personal know-how and so on. A corporate performance and competitiveness can grow through interaction and cooperation diverse workforce (for example according to sex, age, education, nationality, ethnicity and so on).

III. Employer brand/branding

In creating an employer image, employer branding focuses on the economic, psychological, behavioral and functional benefits of employment and identification with the corporation (Biswas & Suar, 2016).
The employer, as a brand, represents an intangible asset for a corporation (Martin, Beaumont, Doig & Pate 2005).
Regarding this, Maxwell & Knox (2009) claim that attributes that affect the employment experience are: (1) employment, (2) company's success, (3) construed external image and (4) product/service characteristics.
According to Martin, Gollan & Grigg (2011), employer brand/branding is a critical tool for talent acquisition, development and retention.

This trend is important in the context of personal marketing. The corporations (hospitals) operate in the labor market as a popular and these corporations (hospitals) are really attractive to experienced and qualified human resources. These employees (healthcare workers) can increase the corporate performance and competitiveness of the corporation – hospital.

IV. Online recruitment, e-Recruitment

Nowadays, the internet is the most widely and vastly used mode of communication; it has empowered millions of users by networking them socially which allows them to interact with one another beyond the expectations (Almusa & Albalawi, 2016).

According to Sylva & Mol (2009), technological innovations in the World Wide Web have significantly changed employee recruitment and selection practices over the last decade, as recruiting corporations have started to increasingly use this medium.

This e-Recruitment is one of the new and modern tools, adopted by prospective job seekers or employers to initiate the employment process (Almusa & Albalawi, 2016).

Online recruitment (e-Recruitment) improves and accelerates human resource activities and human resource operations.

V. Global workplace

According to Karoly & Panis (2004), in the next years, work will be shaped by demographic trends, technological advances and economic globalization. The formulation of labor policy will require an understanding of how those trends will evolve and how they will affect the size and composition of the labor force, the features of the workplace and the compensation structures provided by employers.

As competition in a number of global industries is becoming more and more technology- and knowledge-intensive, the ability of multinational corporations to leverage their competencies across dispersed subsidiaries is an increasingly significant and relevant source of competitiveness and competitive performance (Hansen & Løvås, 2004).

Regarding this, Ryan & Wessel (2015) illustrate that the importance of diversity is also expanding, as corporations are beginning to recognize the needs of employees increasingly diverse in many different ways, including (but not limited to): sex, age, race, education, religion, nationality, ethnicity, sexual orientation and disability status. Overall, evidence points toward a workforce that is changing in its composition and increasingly includes a diverse set of needs that must be addressed by managers and human resource systems, raising new questions about fair treatment.

Global workplace increases the corporate performance and competitiveness through human resource diversity.

VI. HR outsourcing

According to McIvor (2008) and Yang, Kim, Nam & Min (2007), the concept of outsourcing is considered an outdated business method. Outsourcing became an important business approach and accordingly, a competitive advantage may be gained if products or services are produced more effectively and efficiently by outside suppliers.

Human resource outsourcing, implementation human resource activities, is outside a corporation's boundaries. Its advantage and attractiveness lies in the promise of operating efficiencies, the import of specialist experience and expertise, greater process control and risk reduction, and more specifically to human resources, a key strategic enabler facilitating a shift away from an inward human resource administration focus towards an outward business focus (Glaister, 2014; Martin, Reddington & Alexander, 2008).

Outsourcing is the work of professionals and it can be efficient in selected human resource activities and human resource processes.

VII. New technology and information system in human resource management

In recent years, information and communication technologies have had an extreme effect on human resources procedures, principles, processes, methods and practices. However, most of the existing studies have not assessed the degree to which these new systems enable corporations to reach their human resource goals of attracting, addressing, stimulating, motivating and retaining workforce. One argument for this is that there are a number of limitations associated with current systems, including the fact that they: (1) use one way communication systems, (2) are passive and impersonal, (3) do not always allow for interpersonal interaction and (4) often create an artificial distance between corporations and people (Stone, Deadrick, Lukaszewski & Johnson, 2015).

New technology and information system in human resource management improves and accelerates human resource activities and human resource operations.

VIII. Work-life balance

According to Sucheta & Usha (2015), the work-life balance concept means maintaining balance between the professional and personal spheres of life of an employee.

Balancing the work and life style of an employee is mainly connected with the difficulties with: (1) distribution of time devoted to work and other dimensions of non- professional life and (2) engagement of energy in performing the professional duties and playing other life roles, including parental roles, marital roles, social roles and so on (Robak & Słocińska, 2015).

This trend is important for personal satisfaction and needs of employees. The employees (healthcare workers) can increase the corporate performance and competitiveness of the corporation – hospital through work-life balance concept (half-time job, job sharing, home-office, company kindergartens, holiday program for children, social counseling in crisis situations and so on).

3.OBJECTIVE AND METHODS

The paper deals with the issue of modern human resource management. This field was previously researched as literary research and afterwards as a primary marketing research which was realized with selected health care services providers in the Czech Republic. With the aid of specialized monographic publications and analysis of scientific literature which was accessible via electronic databases (papers presented through Scopus and Web of Science), content analysis of found secondary information resources was subsequently carried out. Thanks to the content analysis, there were, in total, eight current trends defined which are primarily focused on the field of human resource management.

The goal of the presented article was to characterize these selected modern trends and then to map and evaluate HR specialists of selected health care services providers in the territory of the Czech Republic. Selected health care services providers were healthcare organizations in the Czech Republic – for example hospitals and clinics.

Via quantitative and qualitative marketing research, it was managed to obtain basic primary sources of information which served to verify the given research hypothesis and to answer research questions. That is why there are only some results of the realized marketing researches presented in the paper. The quantitative research was carried out via questionnaire. It was realized in 2016. The questionnaires, in both electronic and paper form, were distributed to HR specialists of selected health care services providers in the Czech Republic. Each questionnaire was composed of two basic parts. The first unit was focused on specification, implementation and usefulness of selected modern trends in the field of human resource management from the respondents' point of view. It contained twenty-four questions altogether. The second unit introduced identification questions and other additional information related to the research. There were twelve questions in this unit. The sampling frame was constituted by 188 health care services providers in the Czech Republic – according to a list of health care providers in

the Czech Republic. Because four of the questionnaires received were not filled in properly, they had to be excluded from the evaluation. Nevertheless, the final range of the sampling frame, which served for purposes of mathematical statistics-related evaluation of research hypothesis, comprised 47 filled-in questionnaires from specialists in the field of human resource management from the selected heath care services providers. The rate of return was twenty five percent. The verification of the proposed hypothesis was realized with the aid of Pearson's Chi-square test method.

In the scope of more detailed analysis of the research question and subsequent interpretation of gained information, the qualitative research was realized as well. In total, it was composed of twelve semi-structured interviews with selected HR specialists. The semi-structured interviews were focused on different research topics. This article presents only one part of qualitative research (semi-structured interviews). This part of research was focused on the process of passing on experiences between individual generations of employees (healthcare workers). The facts and information gained from both areas of research served to answer the presented research question.

For processing of both secondary and primary information resources and to phrase the conclusions, selected scientific methods were used, including analysis, synthesis, induction and deduction.

4.RESULTS

On the basis of literary research, analysis and evaluation of the information and facts gained, there was one research hypothesis (H1) and one research question (RQ1) formulated:

H1: There is a statistically significant relation between the owner of a selected health care services provider (a ministry; a region, a city, a municipality; the church; a private legal person – for example, Agel; other entity) and current utilization of a selected modern trend in the field of human resource management.

RQ1: In what way does the selected health care services provider arrange the process of passing on experiences between individual generations of employees?

Primary information sources served to fulfilling the defined research goal and were obtained via questionnaire and semi-structured interviews with HR specialists of the selected health care services provider.

The research involved instruments such as the tools of descriptive statistics (averages and percentages). The hypothesis was tested (verified) individually for each criterion using the statistical method of Pearson's Chi-square test of independence on the research hypotheses. The evaluation was carried out with the help of the SPSS Statistics program. The SPSS Statistics program was an important tool for the data analysis due to its possibilities in data processing using pivot tables, methods of comparison and deduction in the data analysis.

The structure of heath care services providers in the Czech Republic selected on the basis of the ownership (the owner) is presented in the table below (Tab. 1).

Tab. 1 – The structure of heath care services providers in the Czech Republic selected on the basis of the ownership (the owner). Source: Authors, own source

Ownership (the owner)	**The absolute frequency**	**The relative frequency**
A ministry	7	14.89 %
A region, a city, a municipality	14	29.78 %
The church	2	4.26 %
A private legal person – for example, Agel	18	38.29 %
Other entity	6	12.77 %
Total	**47.00**	**100.00 %**

The table (Tab. 1) presents the structure of heath care services providers in the Czech Republic selected on the basis of the ownership (the owner).
The qualitative research included 12 employees of selected health care services providers in the Czech Republic that are active and responsible for the area of human resources.
The research hypothesis 1 (H1): There is a statistically significant relation between the owner of a selected health care services provider (a ministry; a region, a city, a municipality; the church; a private legal person – for example, Agel; other entity) and current utilization of a selected modern trend in the field of human resource management.
H0: There is no correlation between the owner of a selected health care services provider (a ministry; a region, a city, a municipality; the church; a private legal person – for example, Agel; other entity) and current utilization of a selected modern trend in the field of human resource management.
HA: There is correlation between the owner of a selected health care services provider (a ministry; a region, a city, a municipality; the church; a private legal person – for example, Agel; other entity) and current utilization of a selected modern trend in the field of human resource management.
In other words, there is no statistically significant difference between the owner of a selected health care services provider (a ministry; a region, a city, a municipality; the church; a private legal person – for example, Agel; other entity) and current utilization of a selected modern trend in the field of human resource management.
The table (Tab. 2) shows data that characterize the research hypothesis (H1).

Tab. 2 – The verification of the research hypothesis (H1) by means of the Pearson's Chi-square test. Source: Authors, own processing at SPSS Statistics program (2017)

H1: There is a statistically significant relation between the owner of a selected health care services provider (a ministry; a region, a city, a municipality; the church; a private legal person – for example, Agel; other entity) and current utilization of a selected modern trend in the field of human resource management.							
Selected current trends in HRM	**Chi-square**	**df**	**p-value**	**Selected current trends in HRM**	**Chi-square**	**df**	**p-value**
Care of employees	1.297	4	0.842	**Global workplace**	3.021	4	0.348
Diversity management	3.024	4	0.418	**HR outsourcing**	3.240	4	0.417
Employer brand	3.114	4	0.712	**New technology**	2.948	4	0.501
e-Recruitment	2.784	4	0.598	**Work-life balance**	2.891	4	0.478

The proposed research hypothesis (H1) was divided into individual units on the basis of monitored and selected modern trend in the field of human resource management. The results of its validity verification show that the value of p-value of Pearson's Chi-squared test of independence is, for each established modern trend, higher than the given value of 0.05. In the significance level of 5 %, the H0 hypothesis is not rejected.
In this case, we can say that there is no statistically significant relationship between the owner of a selected health care services provider (a ministry; a region, a city, a municipality; the church; a private legal person – for example, Agel; other entity) and current utilization of a selected modern trend in the field of human resource management.

The research question 1 (RQ1): In what way does the selected health care services provider arrange the process of passing on experiences between individual generations of employees?
The structure of interviewed HR specialists of the health care services providers selected on the basis of the ownership (the owner) is presented in the table below (Tab. 3). The research team addressed twelve selected HR specialists.

Tab. 3– The structure of interviewed HR specialists of the health care services providers selected on the basis of the ownership (the owner). Source: Authors, own source

Ownership (the owner)	**The absolute frequency**	**The relative frequency**
A ministry	2	16.67 %
A region, a city, a municipality	4	33.33 %
The church	1	8.33 %
A private legal person – for example, Agel	3	25.00 %
Other entity	2	16.67 %
Total	**12.00**	**100.00 %**

Most of the interviewed HR specialists identically stated that the passing on of experiences between individual generations of employees is realized viva voce, in person and directly in the scope of a daily working process or during work in individual departments of a selected health care services provider. Passing on information and experiences also takes place during team meetings and consultations between colleagues who are currently dealing with a given problem or case. Three of the interviewed HR specialists also presented mentoring and coaching possibilities which they actively and successfully realize.
Experiences of individual employees are also enriched, shared and passed on through the agency of specialized workshops, lectures, seminars, training courses and internships. Training courses and internships are realized either by selected health care services providers or by other providers. Two of the interviewed HR specialists of a selected health care services provider stated that some employees can go abroad for an internship. If there is a new employee in a workplace of a selected provider, in most cases an adaptation plan for a newcomer in written form is established, and they are checked on regularly and a new employee is provided feedback on their working results so far. Both medical and non-medical professions require a life-long education process, which is why the mentioned field is not omitted by the selected health care services providers.

5.DISCUSSION

Many researchers do not directly research the current trends in human resource management in health service providers in the Czech Republic or abroad. A chapter discussion therefore presents the results of other researchers at a general level. These results are analyzed in the context of primary research presented in this research paper.
According to Berber & Slavić (2016), in today's turbulent economic and political environment, modern corporations are searching for possibilities to ensure competiveness as well as sustainable and long term development.
Prosperity and the ability of a corporation to compete are dependent on many variables, factors and resources. Besides material, financial and informational resources, there are human resources included which play an irreplaceable role, and without which there could not exist or function any corporation.
Regarding this, Satwinder, Darwish, Costa & Anderson (2012) claim that over many decades, the area of human resource management has attracted a great deal of attention across various disciplines owing to its benefit and impact on the bottom-line issues within corporations.
Because of ascertained research results presented in the previous chapter, we can conclude that the relation between the owner of a selected provider (a ministry; a region, a city, a municipality; the church; a private legal person – for example, Agel; other entity) and a current utilization of a selected modern trend was not proved to exist. This fact could have been caused by, among other things, the limitations of the research. That limit might lie in the fact that a sufficiently big research sample of health care services providers in the Czech Republic was not managed to be secured, which causes results which cannot be generalized. In any case, this sphere may inspire other possible research in the field.
The researched selected modern trends in the field of human resources management are used by health care services providers. According to Stone & Deadrick (2015), Strohmeier & Kabst (2009) or Strohmeier (2007), over the past thirty years, one of the major drivers of transformation in human resource management has been the increased use of information technology to collect, store and utilize data for decision-making. Regarding this, Salas, DeRouin & Littrell (2005) say that in addition, corporations are using various forms of technology to deliver education and training to the workforce (the Internet, intranet systems, video conferencing, online simulations and so on).

The work-life balance philosophy and the field of employee care viewed in the context of human resource management which not only arises from the legislative framework is evaluated very positively. Also, care can be found in any area and can be directly related to loyalty level, motivation and satisfaction; it can enhance the performance and productivity of employees, profitability and their ability to compete, which is discussed indirectly by Richard & Brown Johnson (2001).

The concept of diversity of management in the global work place is nowadays becoming an essential part of modern human resource management. Iverson (2000) realized research – a qualitative study – with diverse group managers and developed a model of diversity management practices that could help create a corporation where diversity is endorsed. The procedures that leadership should consider adopting include: (1) supporting all employees, (2) communicating effectively with all employees, (3) valuing a diverse work team, (4) recognizing the capabilities of all employees and (5) respecting the cultural beliefs and needs of employees.

An effective communication principle and employee variety is important for the process of passing on knowledge and experiences not only in medical services providers, which is clear from the primary research presented in this paper.

Holck & Muhr (2017) state in this context that to foster equal opportunities within corporations, not only should unequal power relations between the majority and the minority be addressed, but also the relationship between employer and workforce.

Employer brand as a modern trend is not fully and effectively implemented in practice in the Czech Republic. According to Lievens & Highhouse (2003), symbolic benefits (prestige of the corporation) do increase when salary and functional benefits (holidays, vouchers, leave allowance, etcetera) are similar to those offered by competing employers. Regarding this, Biswas & Suar (2016) impart that employees identify with corporations that are positively evaluated by outsiders. This fact pushes management to create a positive perception of the corporation image among employees by means of external and internal communication regarding the employer brand.

Selected health care services providers use LinkedIn or Facebook, as traditional examples of social media sites, for e-Recruitment. This fact was supported by the primary research presented in this article. According to Maurer & Liu (2007), in recent years the practice of using corporate websites to recruit job applicants has increased steadily. Despite this trend, however, studies show that approximately 75 % of job seekers find the sites too complicated to use successfully. Clearly, online recruitment methods represent a growing and high-potential opportunity for corporations and employers to broaden their recruiting reach and reduce recruiting costs.

Braun, Pull, Alewell, Störmer & Thommes (2011) say that about 58 % of the users of HR outsourcing expect higher levels of service quality when sourcing from an external (opposed to an internal) provider. The relationship between HR outsourcing and service quality is considerably stronger if the provided services are complex and if the potential for monitoring an internal provider is low.

Selected health care services providers make use of outsourcing not only in the field of human resource management but also in security services, laundry services and cleaning work services.

6.CONCLUSION

The basic aim of any corporation is to achieve competitiveness, success and prosperity. Overall enterprise policy depends on this objective, its decisions and concrete actions. Such a corporate culture is a combination of strategic business perspective and human resource management, resulting in the adequate behavior of managers and workforce (Šenková, Šambronská, Mitríková, Matušíková & Maťková, 2016).

The paper was focused on selected health care services providers in the Czech Republic in the context of modern human resource management. Its goal was to define and subsequently map and evaluate the selected current trends in the field of human resource management by HR specialists of health care services providers. On the basis of secondary information resources, eight modern trends were established in total, which were worked with in the scope of the primary research. The primary research was carried out via questionnaire and semi-structured interview. In order for the paper's goal to be completed, one research hypothesis and one research question were established. In total, 47 respondents participated in the questionnaire survey (the rate of return was twenty five percent); 12 HR specialists who are active in the field of human resource management were interviewed. It was established in the scope of the verification of the research hypothesis that there is no statistically significant relationship between the owner of a selected health care services provider in the Czech Republic and current utilization of a modern trend in the field of human resource management. The process of sharing and passing on knowledge, information or experiences between individual generations is, according to interviewed HR specialists, realized viva voce, in person and during daily work tasks and duties. The interviewed HR specialists evaluated this fact as effective and beneficial for all employee groups involved. Around 25 % of interviewed HR specialists even stated that there is a process of education, personal development and passing on and sharing of knowledge gathered throughout one's life realized in their workplace – this via modern forms such as mentoring and coaching.
The selected tested current trends in human resource management of health care services providers in the Czech Republic proves to be appropriately defined, which encourages the further research in this area.

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EMPIRICAL ANALYSES OF REQUIRED COMPETENCIES OF GRADUATES OF ACCOUNTING AND FINANCIAL MANAGEMENT SEEN FROM AN ANGLE OF EMPLOYERS AND STUDENTS

Berková Kateřina, Plevková Klára

Abstract

The article examines required competencies of graduates of The University of Economics degree in Accounting and Financial Management from the perspective of the most prestigious employers and students. The article is based on a survey Universum Talent Survey (2016). It is grounded on foreign studies from tertiary and vocational education, which is related to the generally accepted requirements for the professional competence of professional accountants, auditors and controllers. Empirical research was aimed at understanding of the significance of practical training strengthening in education seen from an angle of companies in which these graduates are often heading and from a perspective of current students of the field. In conclusion it can be stated: (a) professional graduate profile of the field is in accordance with the requirements of the labor market; (b) students of the field have very good chances to be employed in occupations financial analyst, controller, assistant auditor by the most desirable employers; (c) despite these findings, however, there are constantly pressures from the labor market and current students to strengthen the practical component in their study.

Keywords: Accounting, auditing, training, labor market, professional competence, university graduate profile.

JEL Classification: J24, M41, M42

1.INTRODUCTION

At the beginning of this article let´s ask a question whose essence becomes actually more important because it affects education of our society and building of a professional profile of graduates: "*Does the professional profile and the university graduates field structure corresponds to labor market requirements?"* Evaluation of practical skills, experience and key competences of graduates are the hot topics. Practice represented by potential employers from the ranks of prestigious companies and also graduates themselves are putting more emphasis on the practical component relative to theoretical skills today. The practice should be increasingly represented in the study program structure in their opinion. Therefore, many experts also occupy the question: *"What competencies did graduates get, if they are needed and vice versa, what skills do they lack and are they needed?"* As these graduates are precisely the ones who will contribute to maintain company prospect and performance.
These two initial questions illustrate the line of thought of our contribution, which presents results of an empirical study concerning evaluation of the graduates of the Faculty of Finance and Accounting of the University of Economics, Prague with an emphasis on practice from the perspective of employers and students.

The aim of this contribution is with the application of empirical analysis to determine the current requirements of the Czech employers for the professional competence of the Faculty of Finance and Accounting graduates in the field of study Accounting and Financial Management at the University of Economics, Prague (UEP). The following aim is to compare the

requirements of employers with the requirements of UEP students for sufficient practical training. The research primarily determines if it is necessary to strengthen the graduate profile in the Accounting and Financial Management field of study in the Faculty of Finance and Accounting at the UEP by practically oriented courses for their professional readiness and easier transition to the labor market, both from the perspective of employers representing the demand for qualifying labor force and from the job seekers perspective. The research was focused to find employers' requirements – of the largest consultancy firms - in field of accounting, audit, taxes, and insurance - and also in the field of IT and public administration - put for new graduates of economic fields. The selective sample consists of companies to which the graduates of the UEP are heading most often. Identified requirements of these employers are monitored according to their preferences concerning prioritization of graduate of the UEP before graduated from another university of economics and are matched with the needs of current students of the University of Economics degree in Accounting and Financial Management. This division of the employers is required to determine the satisfaction of employers who prefer practically trained UEP graduates, mainly because of significant collaboration of the UEP with them.

2.LITERATURE REVIEW

Efforts to strengthen freedom of the relationship between the labor market and universities from the graduates preparation perspective (Little & Archer, 2010) began to strengthen in recent years. The authors consider these trends as necessity for human capital development through closer cooperation between universities and the labor market and for a positive impact on the whole economy development. These trends persist even today. The state interventions are developed with the aim to influence tertiary education towards maximizing the outputs from universities (Brown & Lauder, 2009) for development of professional competencies for graduates. Therefore, it is desirable that professional competences of the students for performing the various economic professions will be developed during the study of, in cooperation with the practice.

These problems are solved at various levels of professional competences abroad (Bahador & Haider, 2012; De Lange, Jackling & Gut, 2006; Damasiotis et al., 2015; Rudman, 2010; Siriwardane, Hoi Kin Hu & Low, 2014). The authors focus on the level of the professional accountants and auditors competences and in the development of information technology in the environment for SMEs. They discover that accounting skills are still lower compared to the standard required by accounting professional organizations, such as IFAC (International Federation of Accountants) and the AICPA (American Institute of Certified Public Accountants). The emphasis is given on the development of human resource management, organizational and interpersonal skills within integration of information technology. All these skills are perceived as requirements for the competence of professional accountants and auditors (Bahador, 2014). According to De Lange, Jackling & Gut (2006), Tudor Gheorghe & Oancea (2013), IT changed the way the data are collected, stored, processed and distributed among the participating companies. As a result, the professional accountants were strongly influenced by this change. It is needed to systematically optimize professional competence, which carries professional theoretical knowledge, practical skills, professional values and ethical aspects (Lin, 2012) in the context of graduates professional competencies development and the demand for quality qualification force. This topic is also dealt within empirical studies of Král & Šoljaková (2015), who analyzed the generally accepted requirements for the professional competencies of managerial accountants and controllers in the Czech Republic (Král & Šoljaková, 2016).

A simulation method that can accurately portray the activities of professions of accountants and auditors (Rudman, 2010; Silva, 2015; Stephenson, 2016) is used for the development of professional competencies required for university students abroad. Simulation contains real

economic problems from practice. Students are exposed to real audit with integration of information technology with regards to the current requirements of IFAC (International Federation of Accountants). Development of real critical competencies required for professional accountants is subject to (a) accountability to the joint enterprise, (b) mutual engagement, (c) shared repertoire of communal resources (Stephenson, 2016). It is therefore desirable that practice experts will be invited to the teaching based on real practice simulations. In Jakarta and the Western Province, Pratama (2015) examined differences in the professional competence of students of accounting, provided that teaching was led by an academic lecturer from university and practice expert. The practice experts were more successful in teaching as they were able to bring current burning questions into it with respect to focusing on the development of professional competencies towards the practice.

Even in the Czech Republic, simulation methods penetrated into the teaching of economics in universities. Efforts are underway to greater coherence between theory and practice. However, according to survey of the University of Economics, Prague (UEP) which was implemented in 2016 and which was attended by 358 graduates from the Faculty of Finance and Accounting, the connection between theory and practice was at an average level (Böhmová & Vrňáková, 2016). The UEP educates young talented people in the context of long-term statistics, 95% of which will find their first job within three months. In this context, graduates from the Faculty of Finance and Accounting are using their acquired knowledge by the best way. The graduates also have a very good general overview, communication, presentation skills and written expression. In terms of professional career and employability of graduates in the labor market, a general conclusion can be done from this study that the best professions are controller, financial analyst, assistant auditor or tax advisor. These professions are closely related to the profile of a graduate degree in Accounting and Financial Management, which is being implemented at the University of Economics, Prague. According to the survey of Universum Talent Survey (2016) which implements the Swedish company Universum in cooperation with the Czech agency Student Media, ranking of ideal TOP employers was investigated. The ranking was compiled based on 14,500 responses of Czech graduates in the Czech Republic. Referring to the aim of this article only a section dedicated profession of accountants, auditors, tax advisors, which are closely related to the field of study Accounting and Financial Management is to be considered. Below are the most desirable employers which belong to that section (Universe, 2016):

- KPMG (16th place among all TOP employers)
- Deloitte (20th place)
- Ernst & Young (21st place)
- PWC (29th place)
- McKinsey & Company (41st place)
- The Boston Consulting Group (59th place)
- TPA Horwath (98th place).

This list is a ranking of the Czech Republic's Most Attractive Employers, which was focused on individual Business areas for the year 2016.

3.METHODOLOGY

3.1.Hypotheses

Research shows that these hypotheses are subject to verification based on descriptive statistics with regard to the smaller sample of companies, which was caused by approached potential employers certain obligations to maintain confidentiality:

- H_1: Graduates of the UEP in Accounting and Financial Management are perceived differently in terms of practice readiness by both experimental groups of employers.
- H_2: Positive requirements for inclusion of practically oriented subjects to the examined study fields are different between both groups of employers.

The null hypothesis H_{0-3} and related alternative hypothesis H_{1-3} were formulated for the purpose of statistical testing of our assumptions:

- H_{0-3}: Satisfaction with practical form of teaching of discipline of Accounting and Financial Management at the bachelor's program students and students of the adjacent master's program is identical.
- H_{1-3}: Satisfaction with practical form of teaching of discipline of Accounting and Financial Management at the bachelor's degree students and students of the adjacent master's program is different.

3.2.Participants

Research was attended by two groups of respondents. In the first sample, there are employers representing the largest consulting companies. (Tab. 1 shows the structure of the research sample.) Overall, 60 consulting companies focused primarily on the area of tax, audit and accounting were approached as well as companies oriented in banking, insurance, legal advice, public administration, IT, energy were engaged to the research. The survey involved 24 companies among others those employers who were categorized to the *Czech Republic's Most Attractive Employers* under the Universum survey (2016). The return was 40%, mainly because of the employees confidentiality required by certain companies surveyed.

Tab. 1 – Structure of the research sample - employers (in %). Source: authors

Activity, specialization		Size (number of employees)		National / transnational scope	
Audit, Tax	58%	1 – 50	8%	Worldwide	58%
Accounting	4%	51 – 100	17%	Within the EU	17%
Public administ.	9%	101 – 500	29%	In the Czech Republic	25%
Banking	4%	501 and more	46%		
Business	8%				
Other	17%				

Respondents included in the "other" category with respect to their professional specialization are companies from the fields of insurance, IT, energy and legal advice. In terms of company size, 75% of respondents with more than 100 employees are represented within the sample the other respondents belong to the category of small and medium-sized companies. 75% of the sample has the international scope. In terms of the objectives of our research study, the sample is made up of employers relevant to verify our hypothesis with respect to the prevailing structure of employers who represent multinational companies focused primarily on auditing and taxation. They are those companies into which the vast majority of graduates from the Faculty of Finance and Accounting are heading. On the other hand, it must also be taken into

account the scope of other respondents and their requirements for new graduates of economic fields, because it is not guaranteed that graduates from the UEP are typical only by ambition of professional growth in multinational companies. (This arises from the statements of students - see the survey results.) Respondents are divided into the group of employers which prefer the UEP graduates as potential employees, and the group that is indifferent to them.
The second sample represents students of the bachelor's program and continuing master's program of Accounting and Financial Management of Faculty of Finance and Accounting at the University of Economics, Prague. (Tab. 2 shows the structure of the research sample.) The total sample represented 139 students, 53 students of bachelor's degree students and 86 master's degree students from the total number of respondents, which numbered 260. (The return was 54 %.)

Tab. 2 – Structure of the research sample - students (in %). Source: authors

Level of education		Employment while studying	
Bachelor's study	38%	Students with employment	88%
Following Master's study	62%	Students without employment	12%

There are a larger proportion of students of following master's degree of Faculty of Finance and Accounting in the selected sample, who focus on the field of Accounting and Financial Management (62%). With regard to the objective of our study, larger representation of these students is relevant because the study is primarily focused on comparing the demands of employers and students when entering the job market after graduation. However, the proportion of students of bachelor's degree (38%) is significant in terms of examining the permeability of the entire study at the University of Economics and determining preferences of students from the beginning to the end of their studies. Most students are also already employed during their studies, not excluding bachelor's studies students 75% of whom are employed. The number of employed students of master's degree is higher, it represents 95%. This implies that students majoring in Accounting and Financial Management have very close contact with the practice which also corresponds with their requirement of the practical experience development during their studies, which is preferred by 88% of all students (the second place is held by the knowledge of foreign languages, 66.3 %.) Although the majority of students at both levels of education are already employed, only 52% of students working in the same field they are studying.

3.3.Data, methodology design

The method of questioning through research tool - questionnaire of own web design was used for data collection. A total of two questionnaires were prepared for each group of respondents. Before the research, preliminary research was realized which was participated with the sample with the main research respondent characteristics which increased the content validity and reliability of the research tools. The questionnaire contained a combination of closed questions with open ones using intervallic and Likert scales.
The questionnaire for each group of respondents included one open question which examined the respondents' views on specialization of practically oriented subjects that should be strengthened in the field of study with a focus on audit, tax and accounting. Only this open question was qualitatively evaluated within each survey other questions were evaluated by quantitative methods.
Analyzed data take the form of qualitative (dichotomous) variables. With regard to the qualitative nature of the variables and small sample of employers, H_1 and H_2 are evaluated by descriptive statistic methods (average in relative terms). For better clarity, the results are shown in the contingency table type *2 x 2*. Hypothesis $H_{0\text{-}3}$ is verified by chi-square goodness of fit test which is ranked among nonparametric statistical method with the support of NCSS

statistical program (version 2007). Test can prove the existence of a significant relationship between two statistical characters. The test is based on a comparison of the observed (X_i) and the expected frequency (Np_i). The observed frequencies are shown in the contingency table, the expected frequencies were calculated as

$$\chi^2 = \sum_{i=1}^{k} \frac{(X_i - Np_i)}{Np_i} \qquad (1)$$

where χ^2 is a random variable with the distribution of chi-square, k is the number of parts; p_i is the probability that a random variable acquires the value of the i-th part (Weiss, 2012; Řezanková, 1997).
The basic premise is to calculate the expected frequency, which should be compared with the observed frequencies. Subsequently differences between these frequencies are found. The null hypothesis is rejected if the P-value will be lower than significance level $\alpha = 0.05$ stated by us. In this case, it is concluded that with a risk of 5%, respectively with 95% of confidence we can declare that there are differences between the examined statistical characteristics (Weiss, 2012; Řezanková, 1997).

4.RESEARCH RESULTS

4.1.H_1 Verification – student training for the practice from the perspective of employers

Table 3 takes the form of contingency table type *2 x 2* which shows the relationship between opinions on the practical readiness of the University of Economics graduates degree in Accounting and Financial Management for companies which prefer these graduates and are indifferent to them. The table also reflects the opinion of the company representatives about sufficient practical training of the graduates.

Tab. 3 - Practical training of graduates of Accounting of the University of Economics, Prague (UEP). Source: authors

		Practice training		
Companies	**Data**	**yes**	**no**	**Total**
Preferring UEP graduates	count %	5 50%	5 50%	10 100%
Indifferent to UEP graduates	count %	1 7%	13 93%	14 100%
Total – count		**6**	**18**	**24**
Total - %		**25%**	**75%**	**100%**

Analysis brought some surprising findings for us. The results clearly show (Tab. 3), that 75% of representatives of companies perceived readiness of graduates from the University of Economics degree in Accounting and Financial Management as insufficient for practice. Opinions of companies were further analyzed according to the fact whether they prefer the University of Economics graduates of the examined discipline or are indifferent to them. Research shows that 50% of representatives of companies which prefer graduates of the University of Economics (it´s a case of the consulting companies in the field of audit, tax and accounting) perceive their preparation for practice as sufficient; the other half is of the opposite opinion. For companies which approach graduates of the University of Economics indifferently, the situation is different. Only 7% believe that practical training of graduates of the UEP as adequate and 93% believe that these graduates lack practical skills. As the contingency table (Tab. 3) shows the graduates of the University of Economics degree in Accounting and Financial Management in terms of readiness for practice are perceived by both groups of

employers differently. The first group of employers perceives the practical training of graduate better than the other. ¾ of all companies into which graduates are often heading consider their preparation for practice as inadequate in terms of the whole sample opinion. This can be considered as the first signal for assessment if the professional profile of the graduate corresponds to the labor market requirements with a focus on companies with which the Faculty of Finance and Accounting closely cooperate and where graduates are often heading and if it is necessary to strengthen the professional profile with a practical component.
Representatives of the companies surveyed also commented on the issue of the overall readiness of students not only from the perspective of practical training and stated competencies in which the graduates entering the labor market are mostly lacking. Most often, graduates lack in practical experience (consider 70.8% of all respondents), foreign languages (41.7%), while the smallest knowledge was identified with the German language, they also reported a greater willingness to work and flexibility (25%). Theoretical quality of graduates of the UEP is very good and this competence was ranked in the last place with respect to the most missing skills by respondents.

4.2.H_2 Verification – the need to include practice-oriented subject from employer's perspective

Table 4 which takes the form of contingency table type *2 x 2* shows the relationship between views of the need to include practice-oriented subject into the study of Accounting and Financial Management for companies that prefer graduates of this field and are indifferent to them. The table also shows the opinion of all companies on the need for inclusion of practical subjects into the examined field of study.

Tab. 4 - Need of inclusion of practically oriented subject in the field of Accounting and Financial Management of the UEP. Source: authors

		Inclusion of practically oriented subject		
Companies	**Data**	**yes**	**no**	**Total**
Preferring UEP graduates	count %	6 60%	4 40%	10 100%
Indifferent to UEP graduates	count %	9 64%	5 36%	14 100%
Total – count		**15**	**9**	**24**
Total - %		**62,5%**	**37,5%**	**100%**

The emphasis on the need to include practice-oriented subject into the study degree in Accounting and Financial Management is laid by 62.5% (15 respondents) of the total sample. This result is not considered as a significant. However, the result correlates with the evaluation of employers regarding graduates´ practical training that is currently not sufficient and that is considered to be a significantly missing professional competence. It should be noted that the lack of readiness of graduates for practice is seen by 75% of which only 62.5% recommend to include practical subjects. The remaining 12.5% of potential employers have their opinion that graduates are lacking in practice but they will get it only when entering the labor market and therefore it is not necessary to introduce practical subjects into the program of study. The contingency table (Tab. 4) shows that both groups of employers perceive the need for the inclusion of practically oriented subjects into the study of Accounting and Financial Management as well. However, the inclusion of these subjects is required from perspective of the response of the entire sample.
The response of respondents to the open question ascertaining the views on **specialization of the practical subjects** which should be strengthened in the field of study **with a focus on audit,**

tax and accounting was assessed qualitatively. Representatives of the companies reported most often the practical subject in the following forms:

- Realistic simulation of projects with potential employers,
- Internships or practice by student preferences,
- Application of accounting and tax laws and their interpretation in practice,
- Fictional company.

4.3.H_3 Verification – the UEP Students' satisfaction in study of Accounting and Financial Management with practical training

Table 5 which takes the form of contingency table type 2 x 2 shows the relationship between bachelor's and master's study of Accounting and Financial Management of the UEP student opinions on satisfaction with the practical orientation in this field. Further, the opinions about satisfaction, respectively dissatisfaction with practical training in the field of all students participating in research are shown.

Tab. 5 - The UEP Students degree in Accounting and Financial Management satisfaction with practical training. Source: authors

		Satisfaction with practical training		
Students	**Data**	**yes**	**no**	**Total**
Bachelor Study	count %	32 60%	21 40%	53 100%
Following Master Study	count %	28 33%	58 67%	86 100%
Total – count		**60**	**79**	**139**
Total - %		**43%**	**57%**	**100%**

Hypothesis $H_{0\text{-}3}$ was statistically tested by chi-square test of goodness of fit. With the support of NCSS statistical program (version 2007) is P = 0.01. P-Value is lower than the significance level $\alpha = 0.05$ and therefore it can be stated that **the significance of 5% disapproves $H_{0\text{-}3}$.** This means that with 95% confidence it can be argued that the satisfaction of students in bachelor and following master study with practical training is different. With regard to the results in Table 5, 57% of students (of which dominate following master's degree students, dissatisfaction was found in 67%) is dissatisfied with the practical training on the field of Accounting and Financial Management. The situation is better at the bachelor studies, respectively, students still do not feel the absence of the practical component – only 40% of students - bachelors were dissatisfied with the practical training.

The UEP Students were also examined regarding opinions on the need to include practice-oriented subject, where 90% of all students recommended inclusion of these subjects into the study plan. (94% of students in bachelor's program and 90% of students in following master's program.) Interestingly, 60% of students of bachelor's program are satisfied with practical training of Accounting and Financial Management, and yet 94% of the same group of respondents required to strengthen the practical component. Their recommendations may be associated with an emphasis on the diversity and interestingness of studies, clear meaning and applicability of adopted theoretical basis.

The responses of respondents to the open question (as with employers), surveying opinions on **specialization of practical subjects with an emphasis on audit, tax and accounting**, were assessed qualitatively. Often they mentioned the establishment of the company since establishment to liquidation, accounting using real economic software (Pohoda, Helios, SAP), auditing project (complex activities related to closing operations, auditor's report), taxes (work

with real data related to the processing of tax returns, control reports, work with case law and other legislation, tax administration), practical accounting with an emphasis on solving difficult and unusual accounting cases, case studies – Due Diligence, Business Modeling, case studies - dealing with cases under IFRS and US GAAP, practice or internship.

5.DISCUSSION

Despite the fact that 95% of graduates of the Faculty of Finance and Accounting of the University of Economics find the first job within three months with the best labor market application in terms of professional competence (Böhmová & Vrňáková, 2016), according to our empirical studies, the connection between theory and practice during education is increasingly desirable. Potential employers and students majoring in Accounting and Financial Management of both levels of education are laying greater demands on practical training and strengthening of the practical component in the graduate profile. The most suitable professions for graduates (students) of given field are controller, financial analyst, assistant auditor, tax advisor. In our research sample, consulting companies which rank among the most desirable in the employer survey by Universum (2016), and which are offering given profession, were represented. Companies which prefer graduates of the University of Economics in front of others from other universities perceive them in terms of competence and readiness for practice better than companies that do not have a strong opinion and are indifferent to them. However, at level of all addressed potential employers there is still a need to strengthen the practical component in the study through the introduction of practice-oriented subjects. The current students of bachelor's and following master's program of this field of study also have the same opinion, and this tendency is weaker in the first stage of education – in the bachelor studies.
Strengthening of the practical component should be under the opinion of both groups of respondents (employers and students) in the form of practically oriented subject. The most commonly reported are real simulation projects in collaboration with potential employers. So it is highly desirable a simulation method will be implemented into education and practice experts will be invited. Those will be solving the acute practical questions, developing the students' perspective from their view, all of these in comparison with the teaching leadership of academician which can create a very good general overview and theoretical basis within the students. These recommendations are consistent with the practice in the foreign environment of tertiary education (Rudman, 2010; Silva, 2015; Stephenson, 2016; Pratama, 2015). Students are encouraged to faithful rendition of professional accountants, auditors, controllers and other professions activities. The basic idea of such teaching is a simulation of a real professional environment and development of skilled competence, as required by IFAC and AICPA.
Based on the opinions of potential employers and students from both levels of education the practically oriented subject should be integrated into study of Accounting and Financial Management with the most frequently mentioned focus on the application of accounting and tax laws and their interpretation in practice, complex activities related to closing operations, auditor's report, tax issues in the context of work with real data, practical accounting with an emphasis on solving of difficult and unusual accounting cases, including adjustments under IFRS and US GAAP, case studies – Due Diligence, Business Modeling. These requirements are consistent with the trends that are generating within the development of professional competencies on the transnational level. Tendencies in the development of professional competencies of the mentioned fields of human resource management, organizational and interpersonal aspects of using IT are growing globally. Attention is also paid to ethical aspects (Bahador & Haider, 2012; De Lange, Jackling & Gut, 2006; Damasiotis et al., 2015; Rudman, 2010; Siriwardane, Hoi Kin Hu & Low, 2014). It is the integration of IT in developing professional skills is desirable because it changes the way of work with information and relevant data of the participating enterprises (De Lange, Jackling & Gut, 2006; Tudor Gheorghe & Oancea, 2013).

6.CONCLUSION

At the beginning of this article, we asked a question if the professional profile and professional structure of university graduates correspond to labor market needs with an emphasis on graduate degree in Accounting and Financial Management of the University of Economics, Prague. Based on empirical research which was focused on the evaluation of competencies required in terms of the practical preparation of the graduates of the field from a perspective of employers and students, it can be stated that the professional profile is in accordance with the requirements of the labor market. However, pressures are constantly generated by the labor market and current students to strengthen the practical component.
Students of Accounting and Financial Management have very good chances to apply for the most desirable employers in professions such as financial analyst, controller, assistant auditor or tax advisor. An analysis of available foreign and domestic literature suggests that students are well-trained in terms of the required theoretical basis, however, more intensive preparation to practice is considered useful. According to the results of our study these competences are exactly the ones that students, hence graduates are missing. A simulation method for development of practical skills often used abroad is also used in the Czech Republic but is not yet applied in the tertiary education environment that far. Its advantage is the possibility of linking theory with practice which is claimed by interviewed potential employers and students. Although no significant deficiencies were found in the analyzed proficiency of graduates in Accounting and Financial Management, it will be certainly useful to bring the professional environment using the simulation method to the teaching.

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INDICATORS PREFERENCE DETERMINATION OF THE LEVEL INSURANCE MARKET ASSESSMENT BY APPLYING THE AHP AND ANP DECOMPOSITION MULTI-ATTRIBUTE METHODS

Borovcová Martina, Špačková Adéla

Abstract

This paper is focused on the description, verification and application of the multi-attribute decomposition methods AHP and ANP on the Saaty pair comparison approach. The AHP and ANP methods are described including the computation procedure. The possibility of the methods application is presented on the preferences determination. The linear AHP and nonlinear ANP methods were applied. These methods are applied for insurance market assessment, particularly, for indicators preference determination of the level insurance market assessment. We consider a task to set the weights (preferences) of evaluation indicators of the development of the insurance market to apply Saaty methods in the framework of decomposition methods AHP and ANP (insurance penetration ratio, claims frequency ratio, concentration ratio, premium indicator, benefit indicator, number of insurance company indicator, average premium ratio and average insurance benefit).

Keywords: Multi-attribute methods, AHP (analytic hierarchy process), ANP (analytic network process), Saaty pair comparison approach, insurance market, qualitative ratios, quantitative indicators

JEL Classification: C02, C4, G2, G11

1.INTRODUCTION

Multicriteria decision-making is one of options, how to choose optimal variant of certain sets of variants. Only very rarely it is possible to find the very optimal variant which meets all specified criteria. The solution of decision-making problem is more often a compromise variant, which meets just the most important criteria, while it does not meet all the specified criteria the best.

It is preferable to take into account more than one decision-making criterion when making the decision. Although may arise a situation, where the choice of options has been used only a single evaluation criteria. Conditions for the quantitative nature of the criteria would then be enough to organize a variant according to the values of the criteria and the variant with the highest or the lowest value would be the best (optimal) option. However, there are relatively a few decision-making problems with monocriterial character. More and more frequently, it is possible to meet with problems, when the solution variants should be assessed using a larger number of evaluation criteria. Such decision-making problems then have the character of multicriteria decision-making. It is necessary to determine the goals of decision-making for the application of methods of function evaluation of variants and criteria of decision-making.

The aim of the article is to describe the multi-attribute methods AHP (analytic hierarchy process) and ANP (analytic network process), and their applications to verify the simplified example of determining weights partial indicators of the evaluation of the development of the insurance market. Qualitative, quantitative and other indicators of the level of the insurance market are considered in the study.

2.DESCRIPTION OF THE MULTICRITERIA DECISION MAKING EVALUATION OF ALTERNATIVES

The aim of the application of the multi-criteria decision making evaluation of variants is primary finding the best (optimal) variant and layout of these variants from the best to the worst. The best option is usually a variant of the compromise. The compromise solution is the least distant one from the ideal variant, or the furthest away from the variants of basal, while the ideal option is the one that has all the criteria with the best possible value. On the contrary, variant with the worst values of the criteria is the basal variant. Ideal and basal variants are usually hypothetical. If the ideal variant really existed, it would be at the same time, a variant of the optimal solution. However, this situation usually does not occur and therefore any selected solution is the solution to the compromise. Compromise variant must be undominated in all tasks, which means that there is no dominating variant among decision-making variants (Ramík, 1999). The role of multi-criteria decision making can be classified according to the type of information that express the preference criteria of variants, see Table 1.
Depending on the combination of the method of determination of preferences of criteria and values of criteria can be used a variety of methods. It is apparent that it is possible to distinguish four groups of combinations. I. group contains tasks regardless of the preferences of the criteria, II. group is represented by roles with quantitatively specified criteria (e.g., financial, economic), III. group includes tasks for which both preferences of criteria and values of criteria are determined using the same method, IV. group includes other combinations.

Tab. 1 – Multi-criteria decision making combination of the ways of determining the values and preferences of the criteria. Source: Zmeškal (2012)

<table>
<tr><td colspan="4" rowspan="3">The combination of the methods of determing the values and preferences of the criteria</td><td colspan="5">Preferences sub-criteria</td></tr>
<tr><td rowspan="2">without</td><td>ordinal</td><td>cardinal</td><td colspan="2">paired</td></tr>
<tr><td>sequence</td><td>point</td><td>Fuller</td><td>Saaty</td></tr>
<tr><td colspan="4">A</td><td>B</td><td>C</td><td>D</td><td>E</td></tr>
<tr><td rowspan="6">The values of the criteria for variants</td><td>cardinal</td><td>quantitative</td><td>a</td><td rowspan="6">I.</td><td colspan="4">II.</td></tr>
<tr><td>ordinal</td><td>sequence</td><td>b</td><td>III.</td><td colspan="3" rowspan="2">IV.</td></tr>
<tr><td>cardinal</td><td>point</td><td>c</td><td rowspan="3">IV.</td><td>III.</td></tr>
<tr><td rowspan="3">paired</td><td>Fuller</td><td>d</td><td>III.</td><td></td></tr>
<tr><td>Saaty</td><td>e</td><td colspan="2">III.</td></tr>
</table>

One of the groups of multi-attribute methods are multi-stage decomposition methods based on Saaty's method of paired comparison. These include AHP method and ANP method. These methods are preferences (weights) set out as gradual decomposition. AHP method is linear and without feedback. ANP method is nonlinear and complicated method with the feedback included. It allows us to capture the relationship between the variants and preferences even in the complexity of variations. AHP method is a special case (a subset) of ANP method.

2.1.Criteria and methods of determining the values of the criteria

Alternatives are specified by using variants and the measurement of satisfaction depends on each variant. Determination of the criteria is difficult process, which requires certain knowledge of the area. The criteria used to selection of the most appropriate variants can be classified according to several aspect. Firstly it's possible to divide criteria as maximizing (income, profit) or minimizing (cost, loss) according to the level of desirable values. According to the type

Secondly it is possible to divide criteria into qualitative and quantitative. These are expressed in the units of measurement.
For calculations and comparison it is usually desirable for specified criteria values y_{ij} to be normalized the unit interval, i.e.

$$x_{ij} \in [0;1]. \quad (1)$$

Generally it is possible to obtain these values of the criteria from the sub-functions of the utility (value) as

$$x_{ij} = u(y_{ij}). \quad (2)$$

Utility of the criteria, which acquire the worst values is equal to 0 or close to 0, and the utility of the criteria with the best value is equal to 1.
Saaty method AHP and ANP will be used in the application part of the study, therefore the following description will be focused on these methods.

Saaty's method of pairwise comparison
The Saaty's method of weights determination of the criteria can be divided into two steps. The first step consists of a pairwise comparison when finding the preferential relations of criteria pairs. It is presented as so-called Saaty's matrix *S*. This matrix is symmetric with elements s_{ij}. It is possible to determine also the size of this preference expressed by a certain number of points from the selected point scale in addition to the direction of the preference of pair of criteria. Scale of relative importance (descriptors) was recommended by Saaty and it is shown in Table 2. Other values can be used to express sub-preferences. The strength of preferences is expressed in the interval $s_{i,j} \in [1;9]$. The result of this step is to obtain the right upper triangular part of the matrix size preferences (Saaty's matrix). The diagonal element have to be $s_{i,i} = 1$ and for the inverse elements (in the lower left triangular part of matrix) is true the following:

$$s_{i,j} = \frac{1}{s_{j,i}}. \quad (3)$$

The elements s_{ij} Saaty matrix are estimated shares of weights of criteria v_i and v_j, so:

$$s_{i,j} \cong \frac{v_i}{v_j}. \quad (4)$$

The scales can be obtained in the following manner:

$$\min F = \sum_i^n \sum_j^n \left(s_{i,j} - \frac{v_i}{v_j} \right)^2, \quad (5)$$

with the condition $\sum_i^n v_i = 1.$

Because of difficulty it is possible to obtain the weights using an algorithm based on the geometric average.

$$\min F = \sum_{i=1}^n \sum_{j>i}^n \left[\ln s_{i,j} - (\ln v_i - \ln v_j) \right]^2, \quad (6)$$

with the condition $\sum_i^n v_i = 1.$

The final solution is based on the geometric mean of rows (Saaty, 2010):

$$w_i = \frac{v_i}{\sum_i^N v_i} = \frac{\left[\prod_j^N s_{i,j}\right]^{\frac{1}{N}}}{\sum_i^N \left[\prod_j^N s_{i,j}\right]^{\frac{1}{N}}}, \tag{7}$$

Tab. 2 – Recommended point of scale with the descriptors by Saaty. Source: Saaty (2006), own processing

The number of points	**Deskriptor**
1	Element A and B are equally important
3	Element A is moderately more important than element B
5	Element A is strongly more important than element B
7	Element A is very strongly more important than element B
9	Element A is extremely more important than element B

The sign of relevant evaluation is the consistency of Saaty's matrix, in other words when the elements satisfy the condition of transitivity the most. It should be emphasized that in many methods this aspect is not accounted. Consistency can be measured using the coefficient of consistency *CR* (Consistency Ratio). The coefficient for consistent evaluation should be $CR \leq 0{,}1$. Consistency ratio is calculated as following $CR = \frac{CI}{RI}$, where $CI = \frac{\lambda_{\max} - N}{N-1}$, (Saaty, 2010). The characteristic number of the matrix $\lambda_{\max}$ can be determined by various procedures. One option is $\lambda_{\max} = \frac{1}{N}\sum_i^N (S \cdot w)_i / w_i$, while w is a vector and $(S \cdot w)_i$ is the *i*-th element of the vector. Furtherly *RI* (Random Index) is derived from an empirical examination and reaches the following values depending on the number of criteria, show in Table 3.

Tab. 3 – The value RI according to the number of criteria. Source: Saaty (2009), own processing

N	1	2	3	4	5	6	7	8	9	10
RI	0,00	0,00	0,52	0,89	1,11	1,25	1,35	1,40	1,45	1,49

Multi-attribute methods AHP and ANP

Weights or values of criteria are in the case of decomposition tasks set by gradual decomposition from the goal, global groups of criteria, sub-groups, to the the initial sub-criteria and variants. For AHP method these linkages may be linear and for ANP method in the shape of a pyramid or nonlinear with feedbacks.. Evaluation of preferences (weights) of the criteria is carried out using the Saaty's method of pairwise comparison.

Local weights (preferences) of the subgroups or indicators with regard to the specified purpose are determined by using Saaty's method of pairwise comparison. The next step is calculation of the global weights including the initial sub-weights. The sum of all sub-weights is equal to one. In AHP method can be used *analytical procedure* and also *method of supermatrix.* In the ANP, it is possible to calculate global weights by using only the *method of supermatrix* (Saaty, 2010).

For analytical method AHP the indicator subgroup weights are obtained as follows, $w_{i,j} = v_i \cdot v_{i,j}$, where $w_{i,j}$ is global weight of *j*-th indicator and *i*-th group, v_i is local weight of *i*-th group and $v_{i,j}$ is local weight of *j*-th indicator and *i*-th group. By this way we can gradually get all the global weights of primary indicators.

The procedure for the calculation of sought weights in case of AHP and ANP ***supermatrix method*** can be divided into three steps:

a) First step is determination of *default supermatrix* W. In Fig. 1 is shown supermatrix. The local weights $v_{i,j}$ .are typed to the columns inside this *supermatrix* W. The weights of criteria are highlighted from $e_{2,1}$ to $e_{2,n2}$ according to the purpose (criteria) $e_{1,2}$ in Fig. 1.

b) Subsequently the default supermatrix is transformed into the *weighted supermatrix* $\overline{W}$ so, that sums of columns are equal 1.

c) The last step is the calculation of limit (final) supermatrix. $\overline{W}^{\infty}$. This supermatrix can be calculated like acyclical weighted matrix as following $\overline{W}^{\infty} = \lim_{k\to\infty} \overline{W}^{k}$, where $\overline{W}^{\infty}$ is limit (final) supermatrix, $\overline{W}^{k}$ is weighted supermatrix without existence cycle, and this supermatrix is k times amplified. Global weights are found in the first column considering the goal.

supermatrix W		goal C_0	group C_1				group C_2				……..				group C_N			
		e_0	$e_{1,1}$	$e_{1,2}$	… .	$e_{2,n2}$	$e_{2,1}$	$e_{2,2}$	… .	$e_{2,n2}$					$e_{N,1}$	$e_{N,2}$	… .	$e_{N,nN}$
goal C_0	e_0																	
group C_1	$e_{1,2}$																	
	$e_{1,2}$				**$W_{1,1}$**				**$W_{1,2}$**							**$W_{1,N}$**		
	….																	
	$e_{2,n2}$																	
group C_2	$e_{2,1}$																	
	$e_{2,2}$																	
	….				**$W_{2,1}$**				**$W_{1,2}$**							**$W_{2,N}$**		
	$e_{2,n2}$																	
…….																		
group C_N	$e_{N,1}$																	
	$e_{N,2}$				**$W_{N,1}$**				**$W_{N,2}$**							**$W_{N,N}$**		
	….																	
	$e_{N,nN}$																	

Fig. 1 – Default supermatrix. Source: Zmeškal (2012)

3.DETERMINING THE PREFERENCES OF THE INDICATORS ASSESSMENT OF THE LEVEL INSURANCE MARKET ACCORDING TO THE AHP AND ANP

We consider a task to set the weights (preferences) of evaluation indicators of the development of the insurance market to apply Saaty's method in the framework of decomposition methods AHP and ANP.

3.1.Decomposition for AHP and ANP

Decomposition is designed in two ways from the goal, categories of indicators and each indicator of the assessment of the level of the insurance market is. The first way is linear system of AHP, see Fig 2, and subsequently the second is nonlinear system ANP with typical feedbacks. The intention is to determine the weights of individual indicators of the assessment of the level of the insurance market by using AHP method and ANP method. Analytical procedure and supermatrix method can be used in the case of AHP method.
Qualitative, quantitative and other indicators of the assessment of the level of the insurance market are taken into account for the purposes of the article. Following indicators are included among quantitative indicators according to the subjective opinion of an expert: insurance penetration ratio (IPER), claims frequency ratio (CFR), concentration ratio (CONR). Following indicators are included among quantitative indicators: premium indicator (PREI), benefit indicator (BENI) and number of insurance company indicator (NICI). Average premium ratio (APRER) and the average insurance benefit (ABENR) can be regarded as indicators of others. Demonstration of the application of AHP and ANP is shown in Fig 2.

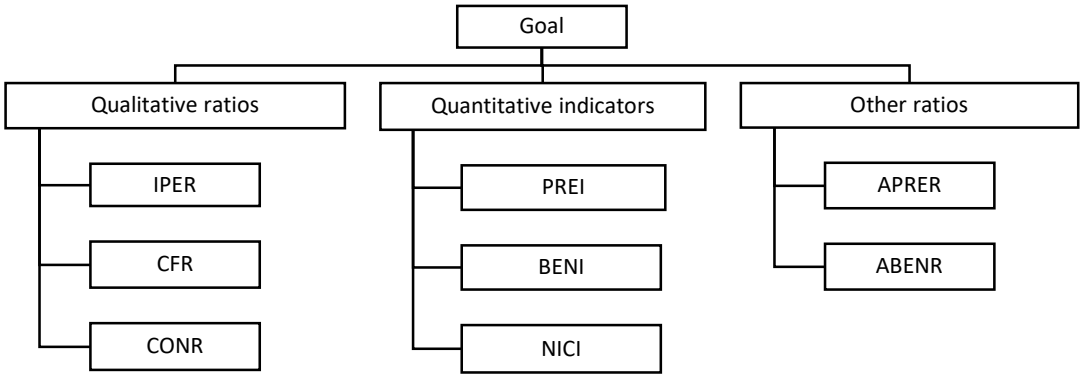


Fig. 2 – Decomposition of weights for AHP. Source: own processing

3.2.Input data and calculations

Local and global weights based on Saaty's method of paired comparison are calculated in this subchapter. At first the local weights are established and then the global weights. Global weights are calculated by both AHP and ANP method. Analytical procedure and supermatrix method were used in case of AHP. In the second case ANP, was used the only possible way and it was supermatrix method.

Tab. 4 – Weights groups the indicators according to the AHP and ANP. Source: own processing

Goal	**Qualit.**	**Quanti t.**	**Others**
Qualit.	1	2	3

geomean	weights w	S . w	(S . w)/w_i
1,8171	0,5396	1,6238	3,0092

Quantit.	1/2	1	2
Others	1/3	1/2	1

1	0,297	0,8936	3,0092
0,5503	0,1634	0,4918	3,0092
3,3674	1,0000	λ_{max} =	3,0092
RI =	0,5800	CI =	0,0046
N =	3,0000	CR (CI/RI) =	0,0079

Tab. 5 – Comparison of qualitative ratios (AHP , ANP). Source: own processing

Qualit.	**IPER**	**CFR**	**NICR**
IPER	1	2	3
CFR	1/2	1	2
CONR	1/3	1/2	1

geomean	weights w	S . w	(S . w)/w_i
1,8171	0,5396	1,6238	3,0092
1	0,297	0,8936	3,0092
0,5503	0,1634	0,4918	3,0092
3,3674	1,0000	λ_{max} =	3,0092
RI=	0,5800	CI =	0,0046
N=	3,0000	CR (CI/RI) =	0,0079

Tab. 6 – Comparison of quantitative indicators (AHP, ANP). Source: own processing

Quantit.	**PREI**	**BENI**	**NICI**
PREI	1	2	3
BENI	1/2	1	2
NICI	1/3	1/2	1

geomean	weights w	S . w	(S . w)/w_i
1,8171	0,5396	1,6238	3,0092
1	0,297	0,8936	3,0092
0,5503	0,1634	0,4918	3,0092
3,3674	1,0000	λ_{max} =	3,0092
RI=	0,5800	CI =	0,0046
N=	3,0000	CR (CI/RI) =	0,0079

Tab. 7 – Comparison of others indicators (AHP, ANP). Source: own processing

Others	**APRER**	**ABENR**
APRER	1	2
ABENR	1/2	1

geomean	weights w
1,4142	0,6667
0,7071	0,3333
2,1213	1,0000
RI=	0,0000
N=	2,0000

Tab. 8 – Comparison of indicators with regard to the groups of indicators (ANP). Source: own processing

Qualit.	Quantit.	Others
Quantit.	1	3
Others	1/3	1

geomean	weights w
1,7321	0,75
0,5774	0,25
2,3095	1,0000

Quantit.	Qualit.	Others
Qualit.	1	1/2
Others	2	1

geomean	weights w
0,7071	0,3333
1,4142	0,6667
2,1213	1,0000

Others	Qualit.	Quantit.

geomean	weights w

Qualit.	1	1/3	0,5774	0,25
Quantit.	3	1	1,7321	0,75
			2,3095	1,0000

All of the assembled Saaty's matrix are consistent.

3.3.Solution and the result for analytical method AHP

Local weights are calculated according to formulas in subchapter 3.2. Subsequently, the local weights are converted according to the $w_{i,j} = v_i \cdot v_{i,j}$.

Tab. 9 – Weights according to the analytical method AHP. Source: own processing

Item	Local	Category	Global
Goal	0		
Qualit.	53,96 %		
Quantit.	29,70 %		
Others	16,34 %		
IPER	53,96 %	53,96 %	**29,12 %**
CFR	29,70 %		**16,03 %**
CONR	16,34 %		**8,82 %**
PREI	53,96 %	29,70 %	**16,03 %**
BENI	29,70 %		**8,82 %**
NICI	16,34 %		**4,85 %**
APRER	66,67 %	16,34 %	**10,89 %**
ABENR	33,33 %		**5,44 %**
∑		100,00 %	100,00 %

3.4.Solution and the result for the method of supermatrix AHP and ANP

Limit supermatrix with resulting global weights is based on the compilation of the default and the weighted supermatrix according to the procedure of the calculation referred in chapter 2.

Tab. 10 – Default supermatrix (AHP) = weighted supermatrix (AHP). Source: own processing

	Goal	Qualit.	Quantit.	Others	IPER	CFR	NICR	PREI	BENI	NICI	APRER	ABENR
Goal	0	0	0	0	0	0	0	0	0	0	0	0
Qualit.	**0.5396**	0	0	0	0	0	0	0	0	0	0	0
Quantit.	**0.2970**	0	0	0	0	0	0	0	0	0	0	0
Others	**0,1634**	0	0	0	0	0	0	0	0	0	0	0
IPER	0	**0,5396**	0	0	1	0	0	0	0	0	0	0
CFR	0	**0,2970**	0	0	0	1	0	0	0	0	0	0
CONR	0	**0,1634**	0	0	0	0	1	0	0	0	0	0
PREI	0	0	**0,5396**	0	0	0	0	1	0	0	0	0
BENI	0	0	**0,2970**	0	0	0	0	0	1	0	0	0
NICI	0	0	**0,1634**	0	0	0	0	0	0	0	0	0
APRER	0	0	0	**0,6667**	0	0	0	0	0	0	1	0
ABENR	0	0	0	**0,3333**	0	0	0	0	0	0	0	1
∑	1	1	1	1	1	1	1	1	1	1	1	1

Tab. 11 – Limit supermatrix(AHP). Source: own processing

	Goal	Qualit.	Quantit.	Others	IPER	CFR	NICR	PREI	BENI	NICI	APRER	ABENR
Goal	0	0	0	0	0	0	0	0	0	0	0	0
Qualit.	0	0	0	0	0	0	0	0	0	0	0	0
Quantit.	0	0	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0
IPER	**0,2912**	**0,5396**	0	0	1	0	0	0	0	0	0	0
CFR	**0,1603**	**0,2970**	0	0	0	1	0	0	0	0	0	0
CONR	**0,0882**	**0,1634**	0	0	0	0	1	0	0	0	0	0
PREI	**0,1603**	0	**0,5396**	0	0	0	0	1	0	0	0	0
BENI	**0,0882**	0	**0,2970**	0	0	0	0	0	1	0	0	0
NICI	**0,0485**	0	**0,1634**	0	0	0	0	0	0	0	0	0
APRER	**0,1089**	0	0	0,6667	0	0	0	0	0	0	1	0
ABENR	**0,0544**	0	0	0,3333	0	0	0	0	0	0	0	1
∑	1	1	1	1	1	1	1	1	1	1	1	1

Tab. 12 – Default supermatrix (ANP). Source: own processing

	Goal	Qualit.	Quantit.	Others	IPER	CFR	NICR	PREI	BENI	NICI	APRER	ABENR
Goal	0	0	0	0	0	0	0	0	0	0	0	0
Qualit.	**0,5396**	**0**	**0,3333**	**0,25**	0	0	0	0	0	0	0	0
Quantit.	**0,2970**	**0,75**	**0**	**0,75**	0	0	0	0	0	0	0	0
Others	**0,1634**	**0,25**	**0,6667**	**0**	0	0	0	0	0	0	0	0
IPER	0	**0,5396**	0	0	1	0	0	0	0	0	0	0
CFR	0	**0,2970**	0	0	0	1	0	0	0	0	0	0
CONR	0	**0,1634**	0	0	0	0	1	0	0	0	0	0
PREI	0	0	**0,5396**	0	0	0	0	1	0	0	0	0
BENI	0	0	**0,2970**	0	0	0	0	0	1	0	0	0
NICI	0	0	**0,1634**	0	0	0	0	0	0	0	0	0
APRER	0	0	0	**0,6667**	0	0	0	0	0	0	1	0
ABENR	0	0	0	**0,3333**	0	0	0	0	0	0	0	1
∑	1	2	2	2	1	1	1	1	1	1	1	1

Tab. 13 – Weighted weighted supermatrix (ANP). Source: own processing

	Goal	Qualit.	Quantit.	Others	IPER	CFR	NICR	PREI	BENI	NICI	APRER	ABENR
Goal	0	0	0	0	0	0	0	0	0	0	0	0
Qualit.	**0,5396**	**0**	**0,1667**	**0,125**	0	0	0	0	0	0	0	0
Quantit.	**0,2970**	**0,375**	**0**	**0,375**	0	0	0	0	0	0	0	0
Others	**0,1634**	**0,125**	**0,3334**	**0**	0	0	0	0	0	0	0	0
IPER	0	**0,2698**	0	0	1	0	0	0	0	0	0	0
CFR	0	**0,1485**	0	0	0	1	0	0	0	0	0	0
CONR	0	**0,0817**	0	0	0	0	1	0	0	0	0	0
PREI	0	0	**0,2698**	0	0	0	0	1	0	0	0	0
BENI	0	0	**0,1485**	0	0	0	0	0	1	0	0	0
NICI	0	0	**0,0817**	0	0	0	0	0	0	0	0	0
APRER	0	0	0	**0,3334**	0	0	0	0	0	0	1	0
ABENR	0	0	0	**0,1667**	0	0	0	0	0	0	0	1
∑	1	1	1	1	1	1	1	1	1	1	1	1

Tab. 14 – Limit supermatrix (ANP). Source: own processing

	Goal	Qualit.	Quantit.	Others	IPER	CFR	NICR	PREI	BENI	NICI	APRER	ABENR
Goal	0	0	0	0	0	0	0	0	0	0	0	0
Qualit.	0.0000	0	0	0	0	0	0	0	0	0	0	0

Quantit.	0.0000	0	0	0	0	0	0	0	0	0	0	0
Others	0,0000	0	0	0	0	0	0	0	0	0	0	0
IPER	0,1970	**0,3052**	0,0727	0,0654	1	0	0	0	0	0	0	0
CFR	0,1084	**0,1680**	0,0400	0,0360	0	1	0	0	0	0	0	0
CONR	0,0597	**0,0924**	0,0220	0,0198	0	0	1	0	0	0	0	0
PREI	0,2054	0,1472	**0,3434**	0,1472	0	0	0	1	0	0	0	0
BENI	0,1130	0,0810	**0,1890**	0,0810	0	0	0	0	1	0	0	0
NICI	0,0622	0,0446	**0,1040**	0,0446	0	0	0	0	0	0	0	0
APRER	0,1695	0,1077	0,1526	**0,4040**	0	0	0	0	0	0	1	0
ABENR	0,0847	0,0539	0,0763	**0,2020**	0	0	0	0	0	0	0	1
∑	1	1	1	1	1	1	1	1	1	1	1	1

3.5.Comparison of the results applied methods AHP and ANP

The results of analytical method and supermatix method led to identical weights (preferences). However, using the methods AHP and ANP led to significantly different results, which is explained by differences in approaches to estabilish preferences and to the influence of feedbacks between sub-groups of indicators. Detected values of the preferences are captured in Fig. 3 with graphics included.

Item	**AHP**	**ANP**
Goal		
Qualit.		
Quantit.		
Others		
IPER	29,12 %	19,70 %
CFR	16,03 %	10,84 %
CONR	8,82 %	5,97 %
PRER	16,03 %	20,54 %
BENR	8,82 %	11,30 %
NICR	4,85 %	6,22 %
APRER	1,89 %	16,95 %
ABENR	5,44 %	8,47 %
∑	100 %	100 %

Fig. 3 – Detected values of the preferences. Source: own processing

4.CONCLUSION

The aim of this paper was to determine the preferences of indicators of evaluation of the level of insurance market using multi-attribute methods AHP and ANP on the basis of Saaty's method of paired comparison. Methods including multi-attribute decomposition AHP and ANP on the basis of Saaty's method of paired comparison were described. Subsequently analytical method and supermatrix method AHP were applied on the example of determination of preferences of indicators assessment of the level of insurance market. It was found that both approaches AHP and ANP lead to the same results and at the same time, that the results obtained on the basis of linear methods of AHP and non-linear method ANP differ significantly.

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ENFORCING BSC AND QMS TOOLS DURING THEQUALITATIVE CORPORATION MANAGEMENT

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Abstract

This article is about the issues of developed management system quality, interconnected with the Balanced Scorecard and it is monitoring its influence on corporations competitiveness and changes in their management. The corporate environment changed lately since the managing of corporations did so as well. The original approach cannot recognize new aspects of corporations efficiency. The original approach is not able to detect new aspects of corporation efficiency. Actual systems are mainly concentrated on financial factors of corporation competitiveness and often the non-financial factors are neglected. But they with a proper management can bring the strong positive influence into corporation competitiveness. The proposed methodology is describing which tools to use in corporation procedures, how to integrate this methodology to reach the significant market success. Developed method of implementing the SMK and BSC integration can contribute to a solution of specific corporation problems.

Keywords: Quality management system, Balanced Scorecard, testing, BSC/QMS tools perspective, competitiveness

JEL Classification: M12

1.INTRODUCTION

Competitiveness is the essential part of ongoing economic, political and social transformation in developing countries and those with developed infrastructure as well. 21st-century economics has the knowledge, information and innovative economy characteristics, it is based on skills and experience, on creativity and expertise. Developed and implemented the system of qualitative management is thus becoming the decisive factor in commercial success mainly of industrial production (Mintzberg, Ahlstrand and Lampel, 1998). Simultaneously it is possible to observe that since 90´s up to today search is on for the appropriate concept of measuring and managing the corporation efficiency and competitiveness. Such process is described by Young a O'Byrne (2001) as the „war of indicators" where each approach is presenting its correctness, simplicity, and suitability in real life. The corporation competitiveness is according to the responding European managers, mostly influenced by financial indicators, among them outstanding long-term profit, profit margin, investment efficiency, and sales growth. The results are presenting still great orientation toward traditional financial indicators such as accounting balance. Modern measures are not concentrating just on efficiency output, but it must be oriented toward corporations competitiveness (Zámečník, R. & Výstupová, L., 2012). Since the efficiency is measured mainly during longer periods, (year, quarter) the operative level of management is necessary, with the unique chance of efficiently use the international systemic standards of all observed indicators of industrial practice (Eccles 1998), (Frigo and Krumwiede, 1999). Only this way devised measures can contribute to the increase of corporation competitiveness (Nenadál, Noskievičová, Petříková, Plura, Tošenovský and Vykydal, 2005). Article aim of the research is oriented toward the influence of modern management tools on corporation increase of competitiveness.

2.THEORETICAL BACKROUND

Niven (2006) is stating that the *Harvard Business Review magazine* recently **labeled Balanced Scorecard** as one of the 75 most influencing ideas of the entrepreneurial sector of the 20th century.

BSC can be defined as a strategic system of corporate efficiency, interconnecting the financial and non-financial performance measures. BSC is not just the collection of such measures but it is used to transfer the strategy to the interconnected set of measures, thus defining long-term strategic goals and tools to achieve the target.

Enforcing new concepts, mostly criticizing traditional approach is the continuation of such tasks. Niven (2006), (2005) is stressing the BSC importance for following reasons:

- *financial measures and their introduction* – he is claiming that the financial measures are not in compliance with the actual business environment. Financial measures are excellent if using the past view and are inclined toward functional orientation. Financial measures are missing the long-term view but they are concentrating on short-term view. Financial measures are not forming the relationship within all corporation levels (Zámečník, R. & Rajnoha, R. 2015).
- *growing importance of intangible assets* – their share is growing and forming about 75 % of value resources, but they are not commonly showing in accounting. They can be for example high quality products and services, motivated and experienced employees, flexible and predictable internal processing, satisfied and loyal customers (Nenadál, Noskievičová, Petříková, Plura, Tošenovský and Vykydal, 2005), (Vlček, 2002).

Horváth (2002) is extending such list by:

- *enforcing the strategy* – in reality, it is a big problem to enforce the strategy, mainly with its sharing and communication.
- *the necessity of clear reporting* – most of the information is from the operation reporting only, lacking the information about strategy and long-term overview.

BSC is measuring the corporation efficiency using four balanced perspectives (Kaplan and Norton, 1992, 2002).

The basic problem of corporation management is today it's multidimensional expressed today as the combination of different approaches, concepts, philosophy, technology, systems, techniques and tools, implemented by the corporation to reach the important strategic goals, with the vision of efficient level of productivity in all stages of managing (Keehley, P., Abercrombie, N. 2008). Having the BSC in corporation fully functioning one, the project of ideas must be developed, formed with the following documents (Remeš, 2005):

- BSC goals inside the corporation and their contribution for managing
- Corporation mission and vision for next 1 to 5 years
- Basic map of strategy
- Aims, measures, and values for next 5 years
- Control system of goals performance
- List of responsible range and action plans

During the use of BSC system, it will become the key managerial system, serving as a basic controlling frame of important managerial processes.

A variety of different activities in business or non-profit organizations environment required during the certain period of time a series of miscellaneous alternatives of quality management. Today worldwide crystallized three basic concepts of systems in developing quality management:

- concept of industry standards
- concept ISO

- concept TQM

Hereby we are presenting the concept as a strategic approach, developing in a different environment and with different intensity the quality management principles. But this concept is different since there exist various requirements of resources and human knowledge and direction followed.

3.RESEARCH AND METHODOLOGY

The reason for solving the mentioned problem is continuing need to increase the competitiveness. To increase it and the corporation efficiency it is necessary to use the right management concepts, allowing such progress. Interconnection of both concepts can offer more effortless managing of key efficiency indicators, thus allowing the improvement of corporate competitiveness. Combining both systems allows the elimination of excessive orientation toward short-term corporation competitiveness.

Need for a solution is based on several trends. As the basic goal, it enforced the increase of corporation competitiveness. To manage this, not only the financial indicators are used. A stronger position is of those non-financial efficiency indicators. The important part of efficiency management is the strategy and its execution.

In managing non-financial factors it is appropriate for example the use of Balanced Scorecard. Exactly the interconnection of both concepts allows the formation of complex management system, supporting the basic goal as of increasing the corporation competitiveness at the market and simultaneously supporting a strong orientation toward strategy, allowing the management of non-financial efficiency factors flow.

Expert literature is presenting the view that the interconnection of both principles is possible and can be even beneficial. Unfortunately, the authors are not presenting the concrete ways of principles interconnection and means of developing the complex system of managing the corporation competitiveness. It follows the need for problem solution. It is necessary to form the methods of interconnection of both attitudes and particularly to offer own ways of implementation.

As it was mentioned earlier, mutual interconnection will allow a consistent application of corporation competitiveness management. Next is the discussion about chances of both system interconnection and quest for advantages.

The relationship between both attitudes can be described this way:
„The concept of BSC and SMK can be labeled as the complementary approach. As of their common use, it can significantly improve the efficiency of strategic management.“

Methodological explanation of both systems interconnection is easy. SMK can become a part of corporation strategy and then it will be the unique top indicator of BSC financial perspective. But the interconnection is not over by this, it is necessary to interlock it with other SMK perspectives, using non-financial indicators, allowing targeted and balanced corporation management. This is just the first phase of interconnection. Next, it is necessary to involve k the reward system for managers as well. Closer methodology solving the means of successful interconnection of both systems is missing in actual theory.

According to Horváth (2002) the approach of *„corporation efficiency indicators“ is* helpful if seeking the strategy and its quantitative evaluation. BSC can help to implement the strategy. As a result, there is a very strong link between both attitudes.

Interconnection of BSC and SMK toward „integrated Management Quality Scorecard" has 3 advantages. Improving and implementing SMK will become the top corporation goal since SMK is placed at the top of the pyramid. Strategy and operational excellence are subordinate of managing quality improvement goal. Another advantage is the time point of view, included in BSC. Managers are responsible for SMK improvement during short or long-term periods. Planning during BSC includes short-term horizon of one year and a longer period of 3 to 5 years as well. This allows managers to determine activities leading to long-term SMK improvements. The third element securing the integration are the strategic actions, indicators, and goals leading to strategy improvements and are directly connected with 8 D reports.

Wide summary of advantages resulting from the integration of BSC and value management is presented by Michel (1997). To improve the corporation competitiveness it is necessary to select a suitable concept, allowing the accomplishment of all elements of value management. In this case it means the concepts of Balanced Scorecard and Economy added value (EVA). Since the EVA is the value indicator, Balanced Scorecard allows the strategic planning using non-financial indicators a well. Reciprocal use of both attitudes allows consistent application of the corporation value management and is making the contribution to the owner's value growth and stakeholder satisfaction, which means of those producers and the market as well.

This article goal is to devise the suitable methods for implementation of SMK system using Balance Scorecard. Just the integration of both methods should lead to the long-term positive financial output of the corporation, which is dominant for keeping the adequate level of such corporation competitiveness. To implement the goals many methods were used. First, it is the analysis of both systems as of the increase of the corporation performance and next, the causal analysis.
Research package was formed with 45 respondents. The final number of questionnaires was 45, thus return a level of quantitative research was 100%.

Questionnaire delivery used was by e-mail or personally served directly in the corporation.

Corporations can be divided into 4 basic groups, according to their main activity:

- industrial, service-oriented
- inancial sector oriented and others

As of their turnover, there are 3 categories. Biggest share (78 %) was formed by corporations with the turnover higher than 10 million €. 11 % of businesses is working with the turnover from 3 to 10 million €. Another category with the turnover up to 3 million € is of the same size 11%.

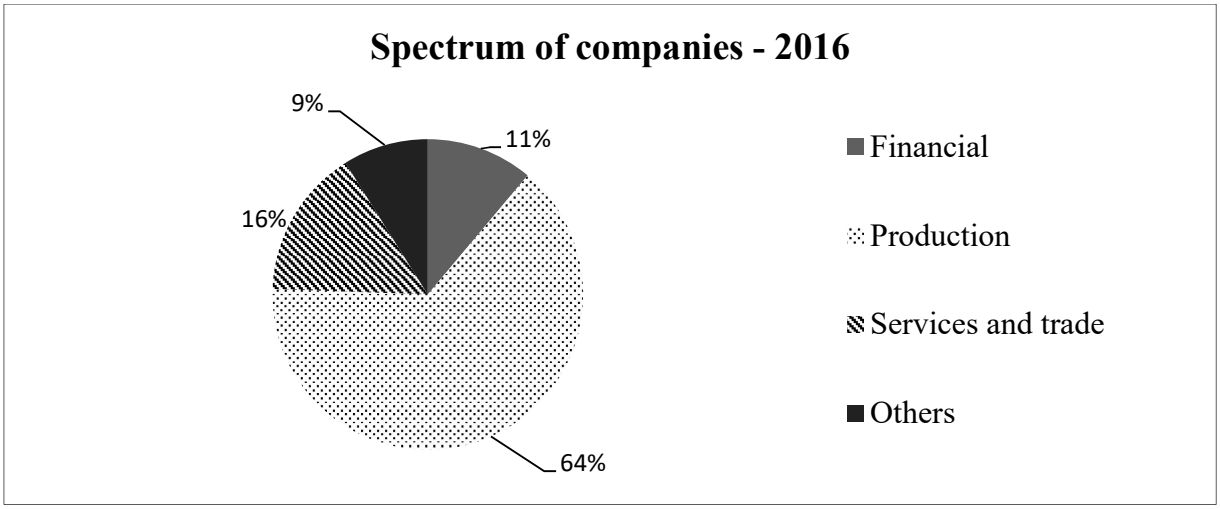


Fig. 1 – Spectrum of companies. Source: own

Based on mentioned theoretical solutions the following hypothesis was formulated, being the subject of mathematical-statistical testing.
H1- Reporting – it has a very important role in corporation management and decision-making and it is providing the management with the resources for the right decisions.
H2 – Competitiveness- it is related to the targeted application and development of quality management systems (SMK) and Balanced Scorecard (BSC) inside of given corporation

4 RESULT AND DISCUSSION

The questionnaire was concerned with the following questions:

1. Do you have a long-term goal of your corporation?
2. Which indicators are you using to measure this goal?
3. Which system of measuring the efficiency is used by your corporation?
4. Is your corporation using the tools of financial analysis?
5. Line up the factors influencing the financial structure (share of own and others equity) in your corporation according to their importance (from most important-1 to a minimum-7)

Questionnaire results:
Question No.1 Do you have a long-term goal of your corporation? When the answer is Yes, say what is your goal.
Answer - The goal of the corporation are:

1. Results of economic activities -33 %
2. Turnover and other fiscal indicators – 15.56 %
3. Market share and competitive position – 15.56 %
4. Corporation value – 13.33 %
5. Customers – 8.89 %
6. Other – 13.33%

Question No.2 Which indicators you are using to measure this goal?
Answer - The corporation is using those indicators to measure the efficiency:

1. Absolute level of profit – 100 %

2. Return on investment – 51.11 %
3. Size of turnover – 73.33 %
4. Market share – 37.78 %
5. Profit margin – 35.56 %
6. Added value for stakeholders – 31.11 %
7. Size of export – 26.67 %
8. Size of dividends – 4.44 %

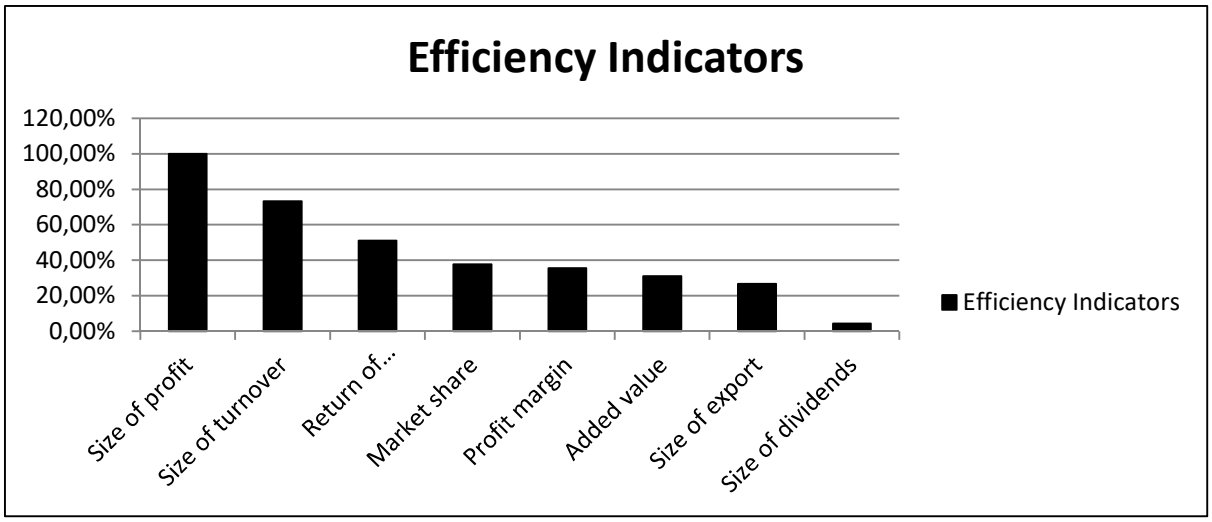


Fig.2. Efficiency indicators. Source: own

Question No.4: Is your corporation using the tools of financial analysis?
Answer - All corporation stated that they are using financial analysis.

Question No.5: Line up the factors influencing the financial structure (share of own and others equity) in your corporation according to their importance (from most important-1 to a minimum-7)
Answer- Factors influencing the financial structure are:

1. Profit margin
2. Cost of corporation equities
3. Growth of turnover
4. Return on investment
5. Long-term profit
6. Efficiency of managing receivables, inventories, short-term obligations
7. Tax rates

Chart No.1. Level of importance of each factor influencing the financial structure formation (1 the most important to 7 -the least important). Source: own

	Questionnaire points	Arithmetic mean	Variation width	Standard deviation	Scattering	Modus
1.	Profit margin	2,933	5	1,063	1,129	3
2.	Cost of corporation equities	5,244	6	1,369	1,874	6
3.	Turnover growth	3,622	6	1,434	2,057	4

4.	Return on investment	3,356	6	1,509	2,274	3
5.	Long-term profit	2,022	5	1,267	1,606	1
6.	Efficiency of managing receivables, inventories, short-term obligations	4,711	6	1,160	1,345	5
7.	Tax rates	5,922	6	1,451	2,107	7

Arithmetic mean is the most important figure from all others. Since the scale is set as 1 to 7, we can determine from the above chart that the level of importance influencing the formation of financial structure is from 2.022, important to 5.922, less important. The most simple, but the rudest level of variation is the variation width. The occurrence of one extreme value can cause a significant size of variation width. Standard deviation is practically the scattering from a mean. It is intercepting the answers, how much the corporations deviate from given questions. The greatest deviations as of level of importance are the return on investment, tax level, and turnover growth.
To confirm the H1 hypothesis, more tests were performed. The level of importance selected by 5 %, then the Kolmogorov–Smirnov test was made.

Tab. No. 2 – Normality tests for level of importance of each factor, influencing the financial structure development Source: own

	Questionnaire points	Kolmogorov-Smirnov test	Result
1.	Profit margin	0,121	important
2.	Cost of corporation equities	0,025	insignificant
3.	Turnover growth	0,162	important
4.	Return on investment	0,027	insignificant
5.	Long-term profit	0,350	important
6.	Efficiency of managing receivables, inventories, short-term obligations	0,105	important
7.	Tax rates	0,024	insignificant

Normality tests shows that as of level of importance of each factor influencing the financial structure development there are insignificant: tax rates, return on investment and cost of corporation equities. As of the important factors, they are: long-term profit, turnover growth, profit margin and efficiency of managing receivables, inventories, short-term obligations To demonstrate the validity of H1 hypothesis the results of questioning were used. Those results indicated that reporting performs very important role in management decisions-making, as it can be seen in Tab.2.

To prove the H2 hypothesis Competitiveness- which depends on the targeted and developed application of SMK and BSC methods incorporation, more questioning was used.
In corporations where he system of efficiency measuring is used, this measuring is based on financial indicators out of 85 %. Efficiently, and in accord with the chosen plan it is measured by over 75 % of respondents. Attributes of efficiency measuring systems are penetrating each other, thus the corporations variability of answers. The important observation of a number of different systems is that the majority of questioned corporations (40 of them) is using two or more efficiency measuring systems.

Question No 3: Which system of efficiency measuring is used by your corporation?

Answer: Corporations are using those systems of efficiency measuring:

1. Financial indicators – 82.22 %
2. In accord with the chosen plan - 75.56 %
3. Total Quality Management – 60.00%
4. Balance Scorecard – 42.22%
5. Based on standards - 22.22%

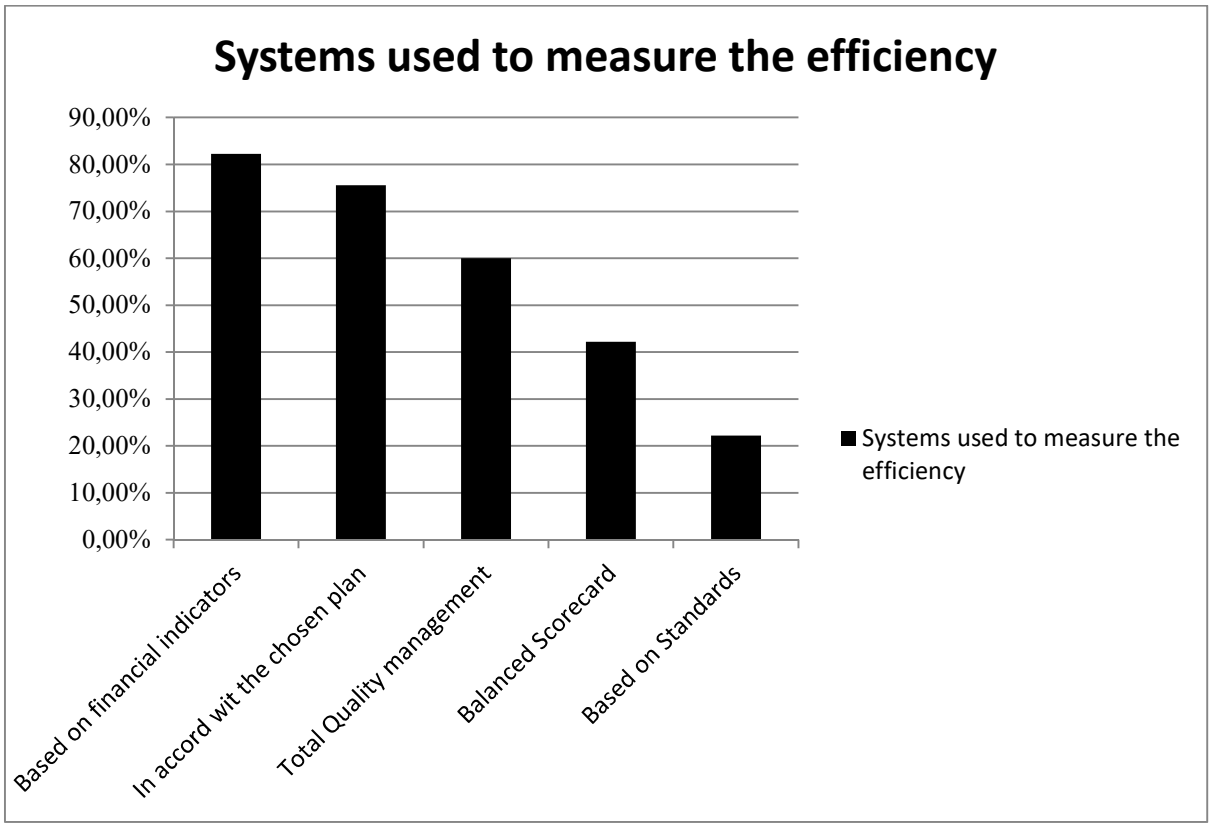


Fig. 3. Systems used to measure efficiency. Source: own

Next, the use of quality management system and Balanced Scorecard indicators were analyzed within the actual managing practice in researched corporations. Balanced Scorecard concept is used rather substantially, by 42 % of them.

Question No. 6: Is Balanced Scorecard method used to manage your corporation?
Answer - Corporations are using those systems to manage the business:

1. Yes – 42.22 %
2. No, but we are just introducing BSC system– 33.33%
3. No, but we are considering it – 33.33%
4. We are not considering it – 8.89%

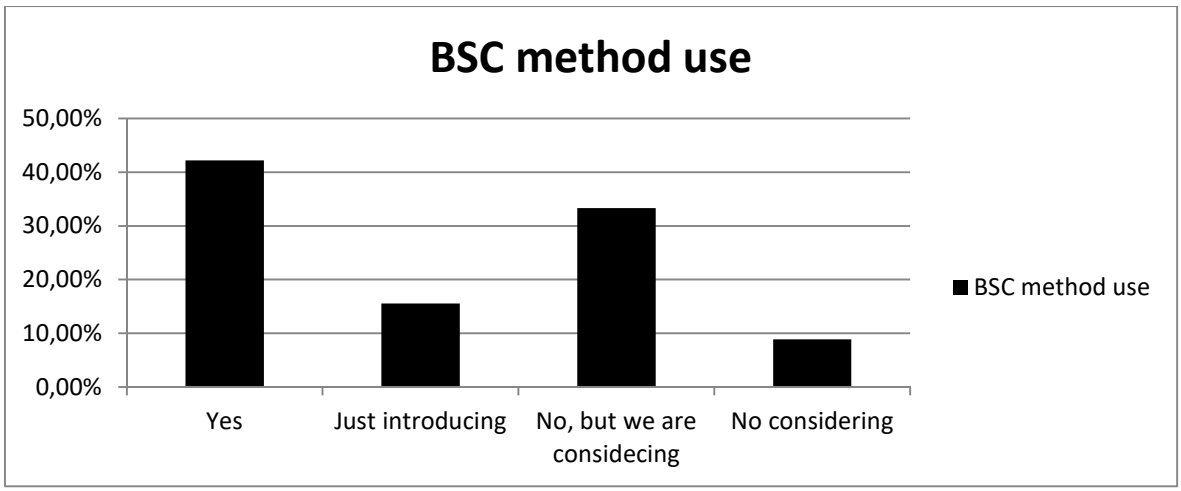


Fig. No 4., BSC method use. Source: own

It is important for the future, that 15 %of corporations are just introducing the system into reality. 1/3 of respondents is familiar with the system and is considered for introduction later. Financial indicators used in each BSC perspective is solved by the question No.7. Corporations using BSC system already are using (in average) 10 to 16 indicators, as it can be seen in Tab.3.

Tab. 3. Number of indicators represented in BSC financial perspective. Source: own

Perspective	Number of indicators
Financial perspective	10
Customers perspective	12
Internal corporate processes	16
Perspective of learning and growth	11
Total number of corporations using BSC system	19

The most indicators are gathered in perspective of internal corporate processes (16). but their listing is not considered as the determinant, since the great number and diversity and the fact that each corporation is unique and is itself deciding what is a priority to fulfill this perspective. The fewest indicators are in the financial perspective. It is interesting to see that the proportion exists between the size of turnover and number of indicators in the financial perspective. In such case they are significantly represented by the economy added value (EVA), EBIDTA and free-cash-flow (FCF), together with the total cash-flow (see Fig. No.5).

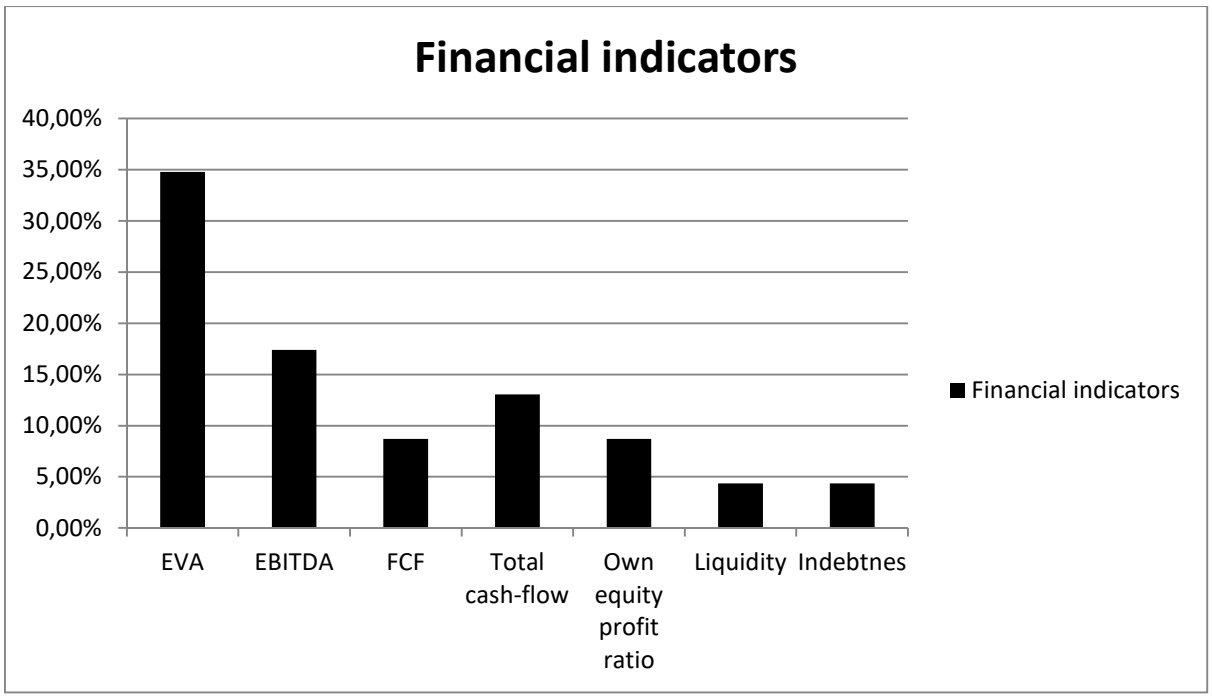


Fig. No.5.- Financial indicators represented in BSC financial perspective. Source: own

As of statistical point of view, the dependency of a number of used indicators and size of turnover is interesting, as it can be observed on Fig. 6.

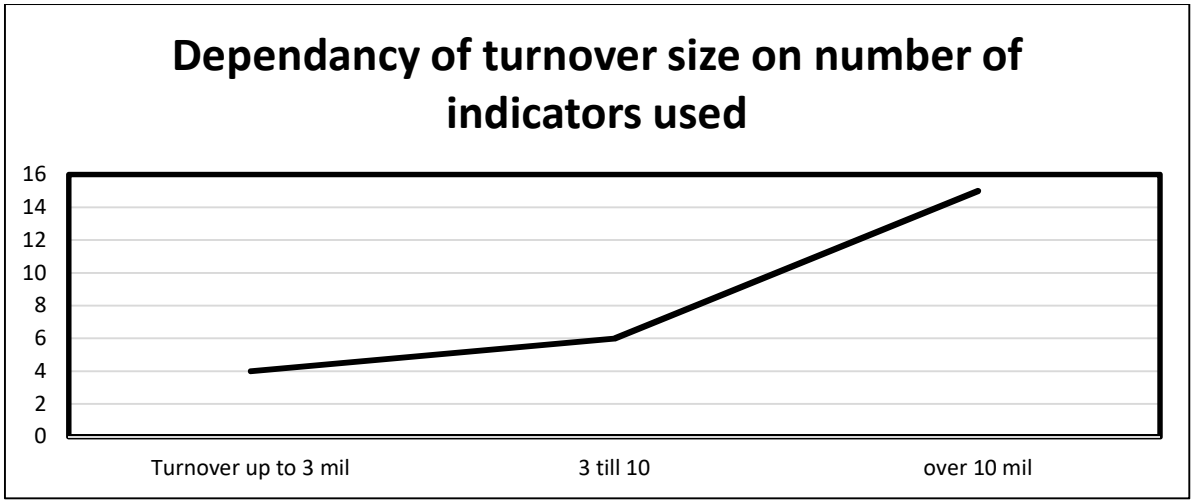


Fig. No.6 – Dependancy of turnover size (in mil Eur) on number of indicators used Source: own

Another part of research was oriented toward quality management system, where 60 % of involved corporations implemented such system and in the managing are using ISO 9001 standards. Another fact is that the others, even not owning the appropriate certificate for their internal processing their dominant products are in line with the quality and are commonly tested according to the strict standards of certifying institutions. It was explored according to which standards the corporations are certified. 27 of them implementing SMK are using the essential part of system of environmental standards of ISO 14001 (51 % of businesses) and labor safety standards OHSAS 18000 (48% of businesses).

Choosing which SMK tool is favorable for use and for a closer implementation, the tool which is simple for everyday use, with the clear and immediate information value and is bringing its effect can be seen in this data: out of 45 observed enterprises, 78 % is in their activities using G-8D. Corporations are using this system to apply the corrective measures and monthly assessing, 78 % of them stating that the improvement in quality occurred.
Corporations, according to the survey are using the G-8D not only to apply corrective measures to eliminate the loss and production additional cost when not consistent product is made, or procedure/phenomenon, but even as a prevention which could occur in the future for example in the customer perspective when the product may be delivered to the market, not in time.
Another question aimed toward SMK was if the corporations are familiar with the EFQM model and the answer was in 78 %, yes.
Based on the above findings it is possible to confirm the H2 hypothesis, it means the corporations able to implement the SMK and BSC standards are in present days exceptionally competitive, they (in the business sectors) control the market and belong to the high turnover business category.

Tab. No.4 – General model of SMK-BSC introduction Source own

	Strategic goal	Indicator	Responsible	Frequency
	Financial perspective			
	Increase the corporate value	Corporate value according to EVA	Economy department	quarterly
	RONA increase	Value of RONA, NOPAT, NOA	Economy department	monthly
	Lower cost of equity	WACC, equity structure VK/C	Economy department	quarterly
	Customer perspective			
	Gaining the multinational customers (NZ)	Number of NZ, turnover with NZ	Trade department	monthly
	Gaining new markets	Number of them and turnover	Trade department	monthly
	Introducing the unique solution to the customers	Share of new products turnover on total turnover	Trade department	monthly
	|Offering the complex solution to customers	Survey of customers satisfaction, recognized customers claims, cost of claims,	Trade department	yearly, monthly
	Perspective of internal processes			
	Strengthen the process of innovations	Number of applied innovative projects, number of accepted innovative projects	Technical department	monthly
	Increase production efficiency	Efficiency of machine time, personal efficiency	Production, workshop	monthly
	Improved planning	Supply turnover, slow sellers, rejected products and material	Controlling, Production, workshop	monthly monthly
	Increase of assets utilization	Operational assets turnover, order turnover time	Economy department	monthly

	Perspective of training and growth			
	Increase of employees initiative	Number of proposed innovative projects	Technical department	monthly
	Developing the educational system	Share of educational cost on turnover, effectiveness of individual educational plans	Personal department	quarterly
	Increase of information system utilization	Number of classes, use of ERP system	IT department	quarterly
	Increase of team spirit	Survey about the team spirit evaluation	Personal department	quarterly

5.CONCLUSIONS

The corporations are working with the long-term goal, mainly for certain level of profit gains, but the efficiency measures not always responding to such demands.

In Europe, the modern approach to the managing and efficiency measuring are commonly used, such as SMK and BSC. It is a positive finding that the knowledge of mentioned principles exists within the half of corporations. BSC is having a great potential to be implemented in Eastern Europe. A number of used indicators is between 16 and 25. As of financial perspective, they are represented by traditional indicators such as rate of return, total and own assets, debt liquidity, cash flow.
The system of managing and efficiency management is with the part of enterprises connected with the reward system. Corporation competitiveness is, according to the European managers mostly influenced by financial indicators. Among them, it is outstanding long-term profit forming, profit margin, assets efficiency and turnover growth. The results are explained still great orientation toward traditional financial indicators such as fiscal gain. The cost of quality is grossly influenced by the cost of qualified labor and its financial stability. As of research of SMK tools in Europe and overseas, it is dominated by the use of G-8D reporting. The important moment is, that the corporations using G-8D reporting in all cases are assessing the corrective measures in the monthly horizon and always they stated that in an identification of inconsistency using G-8D reporting the percentage inconsistency measures is falling. 90 % of success is presented by enterprises using corrective measures and tasks defined in each strategic goal of appropriate BSC perspective. Indisputably it is clear that in case of corporations non-financial indicators it is the majority of efficient management of customer relationship being the decisive factor. And it is necessary to note that their certification is absolutely regular.

Hereby are assessed the advantages and disadvantages of proposed SMK+BSC model.

- It is remarkable in strong orientation toward increasing the corporate assets
- It is defining the influence of each component to fulfill the basic goal
- It is a dynamic model, since the regular G-8D report update
- It has the assumption of great efficiency since it is containing the anchor of the basic corporate goal, growth of assets. To gain this goal the BSC is used allowing to manage the activities leading to the corporation better competitiveness
- It concentrates on long-term corporation efficiency growth. It means, that the short-term decisions are not in favor of long-term decisions

- It contains the communication of increasing efficiency processes and is motivating employees toward the efficiency increase
- It contains the detailed measuring of efficiency, in accord with the basic corporation goal
- It is improving the communication with the capital providers
- It allows the use of other tools
- Implementation is more demanding than with separately with SMK or BSC concept
- Corporation value, assets, is based on future EVA indicators, with the indefinite results, but this is related to often subjective expectations with their gross distortion. Furthermore, there is a risk that the corporation management will perceive the future expectations differently than the shareholders

There exist for proposed SMK+BSC model the methodology of implementation. The model was verified using the case-study at the selected corporation. Such study authenticated the model itself and implementing the methodology as well. The results of case study indicated that the application of SMK+BSC model is leading in given enterprise to the significant growth of assets.

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INFLUENCE OF SELECTED FACTORS OF HRM ON LABOUR PRODUCTIVITY IN SMES IN SOUTH BOHEMIA

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Abstract

Labour productivity is one of the most important conditions for successful existence of enterprises in the market. The productivity of the company is made up of the productivity of individual employees (labour productivity), and that is influenced by a number of factors. The paper deals with the influence of selected factors of human resource management on the labour productivity in small and medium-sized enterprises in South Bohemia. The factors chose for this article are the following: the importance of education of employees for the management of enterprise, the number of improvement´s proposal and the average monthly cost per an employee. Our database uses both kind of data quantitative and qualitative. The data from the documentation of an enterprise were used, such as the value (financial) indicators of production and non-production activities, including financial analysis, and the data on human resources. Economic data were also obtained by tracing in annual reports and reports of financial results of the enterprise by its identification number. A questionnaire survey was a part of the research. The research sample includes 300 SMEs from South Bohemia, which were chosen by random selection. Aim of our research is find the factors of HRM which influent to labour productivity. We explore tree thesis in this article: If the education of employees is important for management of the company the labour productivity is higher, then in company when management don´t care about education of employees; Number of improvement´s proposal and average monthly cost per an employee have a positive influence to labour productivity.

Keywords:HR management, SMEs, labour productivity,

JEL Classification: M 00, M10, M 50,

1.INTRODUCTION AND BACKGROUND

The development of small and medium enterprises helps reducing unemployment. This group of enterprises is faster and more responsive to changes in demand. The disadvantage compared to large enterprises are situations where non-usage of capacity options will increase production costs, which can be considered a barrier for further development, or may even cause the enterprise´s closure under extreme circumstances. Another disadvantage is the focus of SMEs mainly on local markets; therefore it is difficult for them to enter beyond, such as the foreign markets. A common problem is the lack of funding for research, development, education and training of employees.

As reported by Holátová& Doležalová (2015), management of small and medium enterprise has many specifics. In small enterprises, the low number of employees and managers cumulates many functions as the responsibility of only a few workers. Small businesses are also characterized by predominance of oral communication over written communication.

The aim of SMEs is an effective procedure that leads to the achievement of competitive advantage (Chadswick, 2015). In order to allow the company to successfully meet its objectives, it is desirable to achieve harmony between business objectives and human resource management. In hierarchically controlled society, people do according to what they are evaluated, first of all. Therefore it is very important that the enterprise established performance indicators, measurable variables that are in accordance with its strategic objectives.

Prerequisite for achieving the enterprise's strategic goals is the ability of managers to invest in human resources in the desired direction and to assess the return on such investments based on an analysis of costs, revenues and anticipated risks, and in other areas of corporate governance. Currently, more and more small and medium enterprises see their human capital and its productivity as one of the key success factors of the quality. Previously, it was possible to evaluate the productivity of human labour methods precisely by specifying individual procedures and operations such as work standardization. Nowadays, the demands on labour and its quality are much greater and the quality of human capital is also seen in a much broader context.

With the growing share of services in the economy, work based on mental abilities and skills, which cannot be assessed and measured by such variables as the standard quantity and quality, has increased. It is therefore necessary to use a scale which corresponds to today's requirements for evaluation and human resource management (Bissola & Imperatori, 2013).

Labour productivity expresses the volume of produced values per a unit of consumed work for a certain period (year, month, day, hour) depending on the period of monitoring.

By Fiala et al. (2013), it is the ratio of outputs to inputs (total output divided by labour inputs). Labour productivity increases when the same amount of inputs produces multiple outputs. Furthermore, according to Jose (2013), labour productivity increases due to improved technology, higher labour skills and capital deepening. Specifically, productivity is influenced by skilled labour, but also by the productivity of other factors of production, engaged in production. It is influenced by management and technological methods of an enterprise – it means how the enterprise is able to utilize the knowledge capital and other factors of production (Ngwenya, 2017).

The simplest calculation of labour productivity indicates how many CZK was created by one employee per a shift, a month, a quarter, or a year: Labour productivity = output (output, turnover, added value) / Number of employees (hours worked). This calculation of productivity is used in our paper (Vaníčková, 2015).

Labour productivity is also classified by different units of work. If this unit is a human activity (work done by a person measured the price of labour - wages), we call it the productivity of living labour. If a unit of work is considered work contained in all the inputs into a certain transformation process (resulting into production of values), we call it the social labour productivity (measured by the cost of all inputs into the production process - the price of living and materialized labour).

At the level of different organizations (enterprises, associations and companies) that produce specific values, it is possible to express the volume and values produced in details - not only as the monetary volume, but also in natural units (pieces, kilograms, meters, etc.). Consumption of work at this level is often referred to as the cost of living and materialized labour (Vaněk & Vaníčková, 2015).

Aim of our research is find the factors of HRM which influent to labour productivity. We explore tree thesis in this article: If the education of employees is important for management of the company the labour productivity is higher, then in company when management don´t care about education of employees; Number of improvement´s proposal and average monthly cost per an employee have a positive influence to labour productivity.

2. METHODOLOGY

Classification of the sample enterprises was done by Act 47/2002 Coll., on Support for Small and Medium-sized Enterprises, as amended, which refers to the definition of small and medium-sized enterprises (SMEs) pursuant to Commission Regulation (EC) no. 70/2001 Coll., the amendment to Act no. 364/2004 Coll., Appendix 1 (European Commission, 2008).
The categorization was carried out based on three basic criteria: number of employees, turnover and assets and an annual balance sheet total.

Tab. 1 - Classification of SMEs. Source: author

Size of enterprise	Number of employees (AWU)	Annual turnover	Annual balance
Medium-sized enterprise	50 – 249	< 2500 mil. CZK	< 1075 mil. CZK
small enterprise	10 – 49	< 250 mil. CZK	< 250 mil. CZK
Micro-enterprise	0 – 9	< 50 mil. CZK	< 50 mil. CZK

In the region of South Bohemia, there were 66,514 (population) economic entities registered within the selected category in 2015. The sample included 96% of micro-enterprises (61 560); 3% of small enterprises (2349) and at least 1% of medium-sized enterprises (608).
The research sample included 1,075 enterprises with available economic data. All enterprises in the sample (1,075) received our questionnaire. We got 325 of the questionnaires back, 25 out of which were excluded because of the inadequacy of the response.
Characteristics of the sample (300 companies) are as follows: micro enterprises with up to 9 employees represent 19%; small enterprises are represented by the largest number (49%), despite representing only 3% of all SMEs in the region. Medium-sized enterprises are the most common in the district of České Budejovice, which is associated with better conditions for business (infrastructure, easier connections with institutions supporting the development of SMEs, etc.). In the region, there were 608 registered, representing the lowest share of the total number of and so they represent only 1% (Český statistický úřad, 2014). As a part of the sample, these companies represented 32%

Tab. 2 – Structure of the sample of small and medium-sized enterprises by number of employees. Source: author.

Number of employees	Enterprises per cent	
0 – 9	57	19 %
10 – 49	147	49 %
50 – 249	96	32 %

The average age of the enterprises in the sample is 16 years, the oldest enterprise within the research sample is 50 years old, the youngest are one year old. Most enterprises (58%) are older than 15 years and 25% of them are younger than 10 years.
The sample was divided by type of business as follows: there were 82% of limited liability companies (s.r.o.); 13% of the trade certificates; other forms were underrepresented, the number of enterprises ranging from one to four in the total number of 300.
The research sample (1075) was selected by non-probabilistic method of random selection from the population (66,514 enterprises), because of the difficult conditions of data collection The

research sample generated sample examined, which consists of 300 small and medium-sized enterprises with its activities in South Bohemia.
For this paper we chose calculation of labour productivity which indicates how many CZK was created by one employee per year: Labour productivity = output (added value) / Number of employees (hours worked).
Aim of our research is find the factors of HRM which influent to labour productivity. We explore tree thesis in this article: If the education of employees is important for management of the company the labour productivity is higher, then in company when management don´t care about education of employees; Number of improvement´s proposal and average monthly cost per an employee have a positive influence to labour productivity.

3. RESULT

As reported above, the paper deals with the evaluation of some factors in the field of Human Resources Development in connection with the performance of employees. The factors discussed in this paper are reviewed below

Importance of education

Education is one of the factors that affect employee satisfaction and satisfaction can influent to labour productivity. The aim of this chapter is to determine whether the importance of education of employees for the management of enterprise has an impact on employee productivity, based on the assumption that the enterprises, where employees education is important, implement it. Managers evaluated the importance of education of employees by a scale of 1 to 9, where 1 means the greatest importance, 9 smallest.

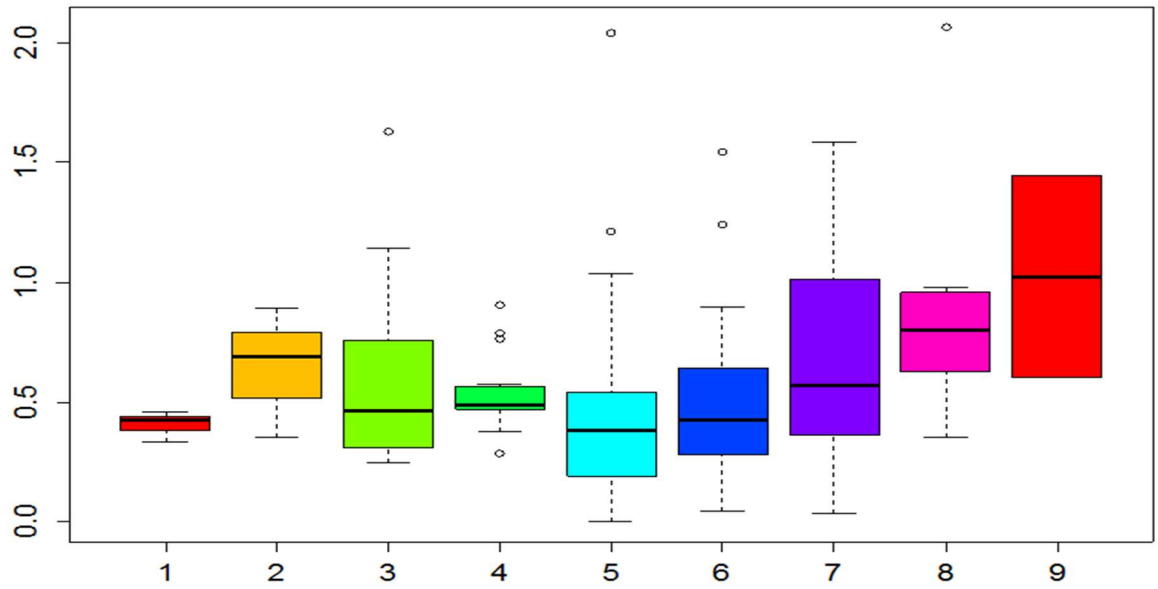


Fig. 1 – Relation between the importance of employee education for a management of enterprise (1-9) and labour productivity (0.0-2.0). Score: 1= the most important indicator; 9 = the least important; Importance of employee education for the management of an enterprise. Source: Own research

We used a box-whiskers plot to describe and visualize the relation between employee education and labour productivity, see figure 1.
We tested a null hypothesis of conformity of mean values of nine groups (here importance of employee education for a management of enterprise). Given the evidence of heteroskedasticity (verified by Bartlett´s test = 19.4618; sv = 8, p-value = 0.01258), and a significant

"abnormality" for the variable of „labour productivity" (Shapiro-Wilk´s test, p-value = 8,659.10- 9) a nonparametric Kruskal-Wallis´s one-way analysis of variance was used. The result of the test rejected the null hypothesis (= 17,375; sv = 8; p-value = 0.02643) In other words, it managed to prove that in terms of median level of labour productivity, characterized by medians of each group, at least one of the nine groups reports a significant difference. When using a post-hoc test, according to Conover and Holm´s adjustment (Bissola, R., 2013), the following significance values are reached for paired comparisons:

Tab. 3 – Paired comparisons. Source: Own research

Group	Group of importance								
	1	2	3	4	5	6	7	8	9
1	-								
2	1,00	-							
3	1,00	1,00	-						
4	1,00	1,00	1,00	-					
5	1,00	1,00	1,00	1,00	-		Sym.		
6	1,00	1,00	1,00	1,00	1,00	-			
7	1,00	1,00	1,00	1,00	0,413	1,00	-		
8	1,00	1,00	1,00	1,00	0,043	0,317	1,00	-	
9	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	-

The table shows that we were able to reject the null hypothesis of conformity of medians at the significance level only between groups 8 and 5.

Number of improvement proposals

The relation of the number of improvement proposals (which means how many improvement proposals the employee put forward to the management of company in any fields of companies process in fact it is means how are the employees interesting in company´s proceses) and labour productivity is reported in figure 2.

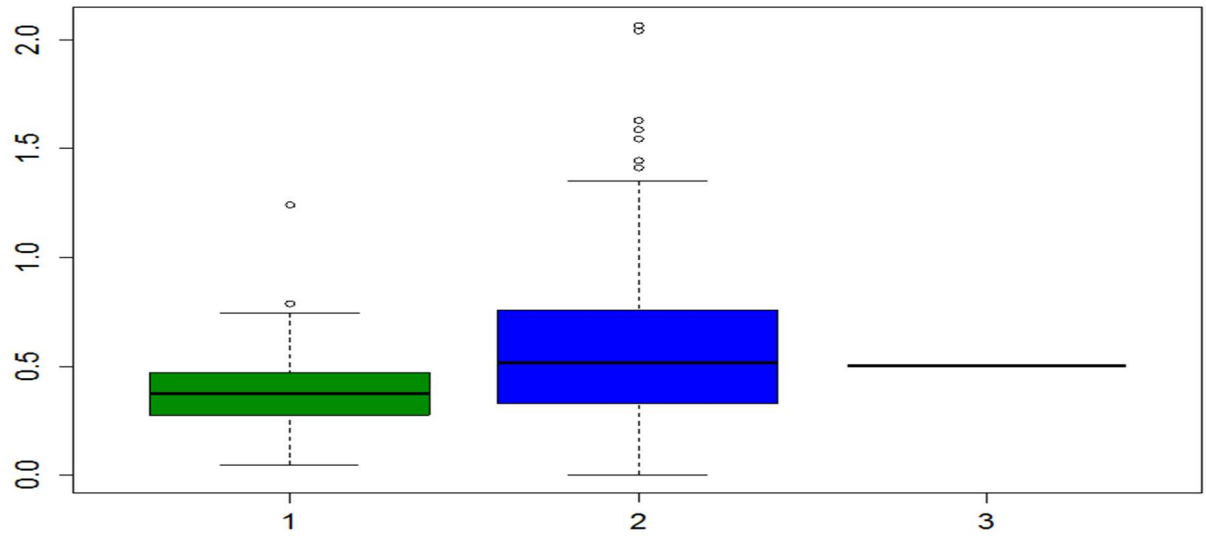


Fig. 2 – Relation of the number of improvement proposals and labour productivity (1, 2 ,3:

Number of improvement proposals for an enterprise a year),(0.0-2.0: productivity in mil. Kč.) . Source: Own research

We used a box-whiskers plot again to describe and visualize the relation of the number of improvement proposals and labour productivity, see figure 2. Prior to testing it should be said that the three improvement proposals appeared in only one case. For this reason a comparison of labour productivity is performed in only two groups, namely "an improvement proposal" vs. "two improvement proposals." The absolute frequency of these two groups was 24, respectively 105. Given the significant "abnormality" of the variable of "labour productivity" (Shapiro-Wilk´s test, p-value = 8,659.10-9), we used a nonparametric Mann-Whitney´s test to test the conformity of mean values.
Specifically, the following hypothesis was verified: $H_0 : \tilde{\mu}_{501} = \tilde{\mu}_{502}$ vs. $H_0 : \tilde{\mu}_{501} < \tilde{\mu}_{502}$
The test result led to the rejection of the null hypothesis (W = 871; p-value = 0.009354) In other words, the second group achieved statistically significantly higher labour productivity compared with the first group. So we can say, that more of improvement proposals lead to the higher labour productivity.
As a complement, notice the relation between labour productivity and average monthly costs per an employee.

Average monthly costs per an employee

The following scatter plot reveals a correlation of average monthly costs per an employee and labour productivity. If we characterized the strength of linear dependence using the Pearson correlation coefficient, its value would be at 0.4938 The confidence interval would be (0.3515; 0.6138) This value could be increased by cropping its "convex hull", as the graph show the presence of influential points.

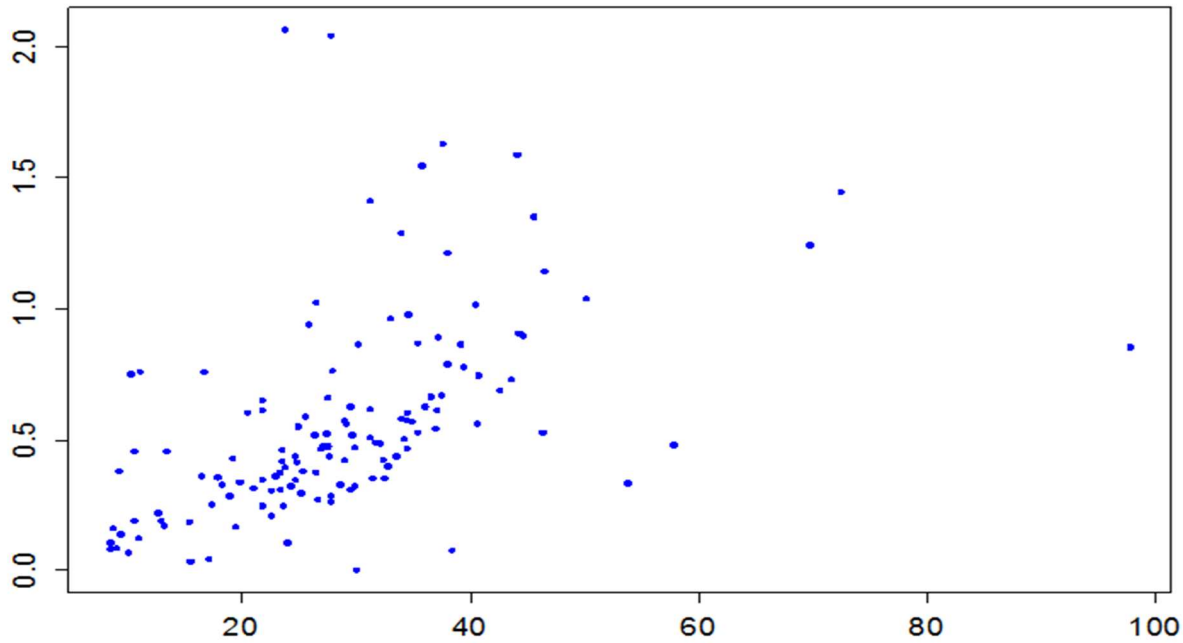


Fig. 3 – Average monthly costs per an employee (20 – 100). Production in mil. Kč. (0.0.-2.0) Source: Own research

The following figure 4 shows the convex hull of the data and the area filled by the data.

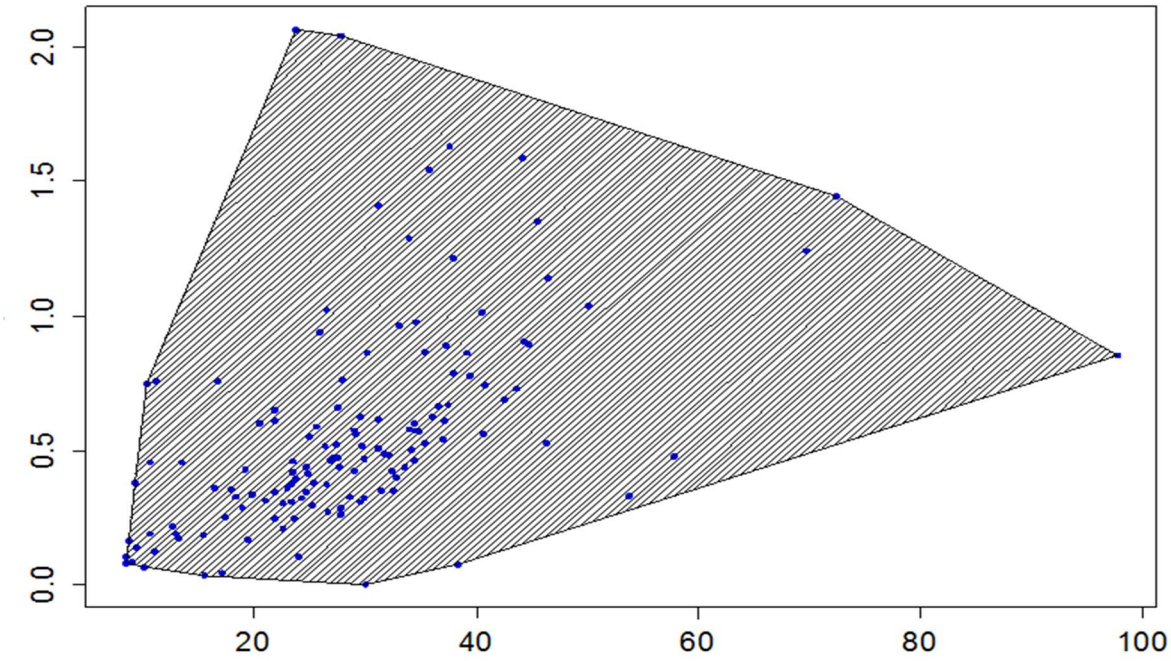


Fig. 4 – Average monthly costs per an employee (20 – 100). Production in mil. Kč. (0.0.-2.0).
Source: Own research

After cropping the convex hull, we got a simple linear model without an absolute member (general shape of the model) With regard to the obvious heteroskedasticity of the data weighted least squares, were used to estimate the regression coefficients. The weights were chosen through individual prescription for $w_i = x_i^{-1}$, pro $i = 1,2,...,n$. Therefore, this is not a mere estimate that would have been obtained using classical least squares ($w_i = 1$, pro $i = 1,2,...,n$).
The resulting model is described as $\hat{y}_i = 0{,}019208x_i$ where the dependent variable is the estimation of labour productivity in mil. CZK and independent variable is the average monthly labour costs per employee in thousands CZK. Determination index amounted to 0.824. The model as a whole was statistically significant (F = 558.2 at 1 and 118 S.V., p-value <2,2.10-16) (Conover, 1979).
The figure below shows the convex hull of the data and the area filled by the data. The graph also shows the estimated regression model (red line).

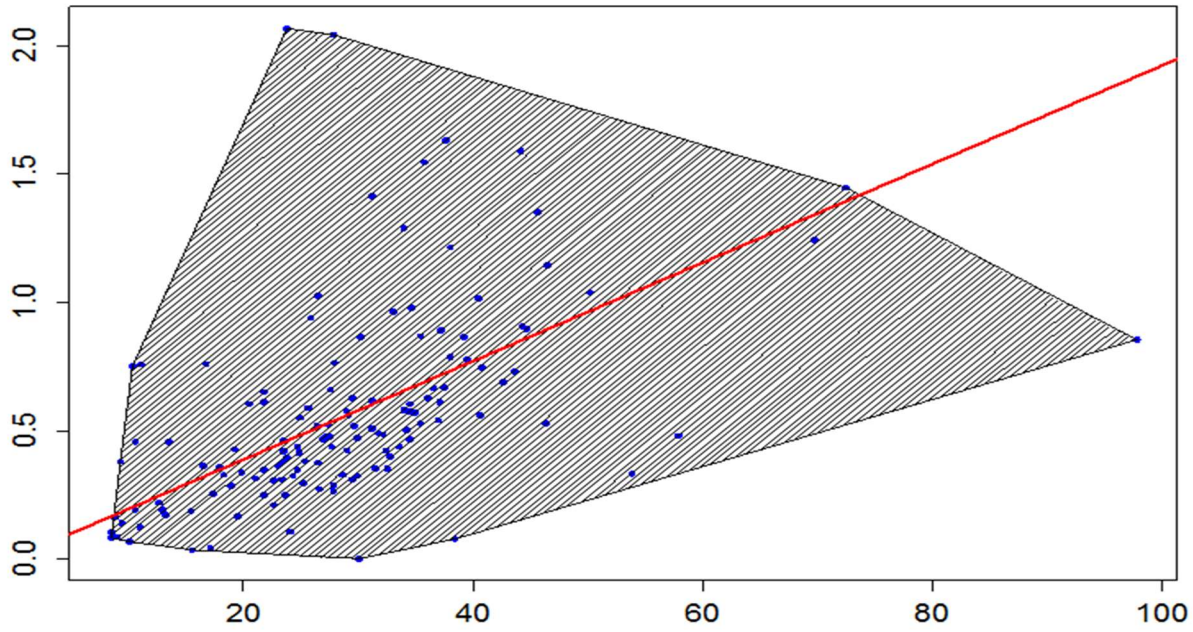


Fig. 5 – Average monthly costs per an employee (20 – 100). Production in mil. Kč. (0.0.-2.0). Source: Own research

It is possible to conclude, that if average monthly costs per an employee increase, labour productivity increases too and vice versa.

4. CONCLUSION

Outside the factors generally considered like the factors which has an impact on labor productivity such as technology, employee qualifications and their job satisfaction. There are many factors that do not affect their unequivocal. Our research is trying to find another factors and demonstrate their impact on labor productivity, such as the existence of trade unions and company management approach to educating of employees.
The paper analysed some factors of human resource management and their impact on employee productivity The selected factors (average monthly cost per an employee, employees improvement proposals and the importance of employees education for a management of company) were all mentioned and assessed as factors affecting employee productivity The average monthly cost per employee reported even a linear relationship, the more these rising costs, the greater the labour productivity.
Šimůnková (2012) also confirmed the average monthly costs per an employee and employee satisfaction as a factors affecting labor productivity. Hájková (2009), examines the influence of educational level on labor productivity, she does not endorse this factor as a factor affecting labour productivity. Furthermore Kmoníčková (2009), confirms the influence of the working environment on labour productivity. According to Kmoníčková the labor productivity is influenced not only by technological factors, but also of the psychological factors like workplace relationships and others. Next part of our research is focused to monitoring of the objectives of the company, determine company´s strategy, the existence of trade unions in the company, drawing up the plans of the number of employees.

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THE IMPACT OF CASH HOLDING ON MARKET PERFORMANCE OF LISTED FIRMS IN THE VIETNAMESE STOCK MARKET

Do Thi Thanh Nhan, Pham Ha, Ngo Kim Thanh, Pavelkova Drahomira

Abstract

Using a sample of 650 listed firms on the Vietnamese stock exchange over the period 2007 to 2016, we examine the factors effect on the cash holding with employing the mixed model. The results find out leverage, state ownership, profit and firm age has a positive impact on cash holding level while leverage and size influence negatively on cash reserve. Furthermore, the dividend and the foreigners in board is insignificant with cash holding level. The findings have implications of cash management in the firms. Reference to the relationship between market performance and cash reserve level, this study investigates that the cash holding influences on market performance of listed firms. The findings will contribute to understand the factors impacting on the cash holding level as well as the important of cash management in improving the market performance of listed firms.

Keywords: Cash holding, market performance, listed firms

JEL Classification: G31, G32, G34.

1.INTRODUCTION

In recent years, there has been a growing interest in corporate cash holdings level. The cash holding decision is a very important task of the managers that considers as a difficult job. Besides that, the differences in cash reserve in companies can affect the firm performance (Harford et al., 2012). In particular, if the corporations do not have enough cash to cope with all the situations, these firms may suffer from losing affordability leading to decrease firm value (Martina-Sola et al., 2013). However, stockpiling too much cash can cause some contrary consequences. Derek et al. (2014) indicate that the excess cash will affect the future stock returns and profit of corporations or holding too much cash will lead to the questions that the firms or the managers have not employed investment opportunities. Thus, the primary task of the administrator is to find the right level of cash holding which can trade-off between profit and cost in order to improve the value for the company (Martina-Sola et al., 2013).

Moreover, most previous studies focused on some determinants that impact on cash holding such as firm size, net working capital, leverage, inventories, growth opportunities, financial distress, cash flow, and dividend payment (Ali and Cemil, 2014; Ogundipe et al., 2012; Megginson et al., 2014). There is one of another important factor can be the predominant drivers of cash reserve which is board structure (Ozkan and Ozkan, 2004; Harford et al., 2012). Recent papers have focused to examine the determinants of cash holding which influence on cash holding level in the developed countries. There are different situations for cash reserve in developed countries and developing countries or transition economies (Boubakri at al., 2005). Therefore, the determinants impact on cash holding level in transition economy is becoming the concern topic. Besides, the cash reserve is also an important factor which can influence the market performance of firms (Fresard, 2010). Thus, this relation is also interesting for studying in order to confirm the cash holding level is one of factor need to be considered when the listed firms want to increase their market performance.

The paper sought to achieve the following objectives: To discover the determinants influence on the level of cash holding and test the interaction between cash holding level and market performance. The contribution of the paper is that the paper is also the first study in Vietnam to examine the foreigner members in board can effect on the level of cash holding, this can give

the suggestions to improve the management in cash policy as well as provide the appropriate policies for the equalization process. In addition, the paper detects the interaction between cash reserve level and market performance of listed firms in the Vietnamese stock exchange which is known as one of developing countries or transition economy.

The results find out that there is no relationship between cash holding and foreigner board members. This argues that the board structure has no impact on the level cash holding and the board members can not consider as a factor in managing the cash reserve of firms. Lastly, the cash holding of companies has an influence on market performance that can be explained that the higher cash holding level lead to improve the performance of firms. Nevertheless, the firms keep too much cash can affect the profitability (Harford et al., 2012 and Derek et al., 2014).

The rest of the paper is arranged by defining the model specifications to address the relevant empirical researches, generating the results based on the model using Stata, analyzing the empirical results and deriving a conclusion based on the findings and analysis in comparison with literature.

2.REVIEW OF RELEVANT EMPIRICAL STUDIES

There are many studies has been grown to explain the determinants influence on the cash holding level. Furthermore, the cash reserve is known as a vital factor which can impact on the firm value (Martina-Sola et al., 2013). There are some basic theories as agency theory (Jensen, 1986), pecking off theory (Myers and Majluf, 1984), tradeoff theory (Myers, 1977). Firstly, the agency theory argues the conflict of interest between principals and agents due to the difference of ownership and control (Jensen, 1986). The agency theory reveals that the managers will maximize the benefits of their individual rather than the profit for shareholders. The managers may evade their risks and avoid investing in risky projects, so they ignore the opportunities with higher risk even though they can get higher returns while the shareholders want to get more profit for the firms. As a result, there is a conflict between managers and shareholders or board, namely agency problems and the cash holding level can be influenced by the board structure and the managers of firms. Secondly, pecking off theory (Myers and Majluf, 1984) describes a hierarchical system that the companies prefer using the internal funds than external sources to minimize financing cost. In addition, the capital structure of the business consists of structures from profitability, investment opportunities and dividend payment policy. According to this theory, the cash is available for businesses when profits exceed investment needs. Furthermore, enterprises will finance their investments primarily with internal funds than having outside investors. According to the theory, companies tend to hoard more cash. Thirdly, tradeoff theory (Myers, 1977) states that the optimal cash holding is the tradeoff between the costs and benefits of cash holding. Moreover, the operation and growth opportunities require the firms to maintain a reasonable amount of cash to avoid seeking money from external parties. However, corporate cash holdings should consider benefits and costs of cash reserves. Based on these basic theories, there are some main factors which influence on firm operations such as ownership structure, board structure, dividend policy, size, age, leverage and profitability of firms.

Ownership structure (State Ownership-State)

Many studies point out the influence of state ownership on the effective for the business operations. Yu (2013) shows that positive connection between the state ownership and firm performance is due to assistances from political connections and government support in order to take advantages in operating the businesses. The positive relationship between state ownership and firm performance is confirmed by many studies (Najid and Abdul Rahman, 2011; and Sun et al., 2002; Le and Buck, 2011; Le and Chizema, 2011). Nevertheless, some earlier studies show that the higher proportion of state ownership has more pressure by politicians such as lower sales price, more unnecessary employee and lack of flexibility in decision in operating the firms which cause the drawbacks of state ownership (Shleifer and

Vishny, 1998). Besides, state ownership is connected with poor corporate governance mechanisms, weak performance, and severe moral hazard problems (Megginson and Netter, 2001). Borisova et al. (2012) state the negative association between state-owned and cash holding. Consequently, being state-owned may cause the poor corporate governance mechanisms and agency problems. Since the listed firms should hold more cash in order to avoid of risks, this predicts the positive relation with cash holding.

Profitability (Prof)

The companies have different returns not keep the same amount of cash due to pecking order theory (Ferreira and Vilela, 2004). Particularly, when the company gets more profit from operating activities which create large cash flow the firms can reduce the cash reserve (Kim et al, 1998). And the company decreases to mobilize capital when they have higher profit (Opler et al, 1999; Ferreira and Vilela, 2004). Nevertheless, some companies intend to keep more cash as they can get more profit in growing periods. (Megginson and Wei, 2010; Ogundipe et al., 2012).

Leverage (Lev)

Whenever the cash deficit, the companies may borrow funds by issuing debts or the banks. Pecking order theory and free cash flow theory suggest a negative correlation between cash and leverage (Ferreira and Vilela, 2004; Hardin et al., 2009; Rizwan and Javed, 2011; Ali and Cemil, 2014). In addition, Martinez-Sola et al. (2008) indicated that the cash holding level is higher to avoid the financial problems.

Size

Asymmetric information often occurs for small companies; thus the cost of raising capital is costly in comparison with larger firms. However, the bigger corporations have more advantages in getting the information as well as more flexibility in fiscal policy. Therefore, the smaller firms have higher cash level which is in the line with the trade-off theory (Ferreira and Vilela, 2004; Saddour, 2006; Megginson and Wei, 2010; Ali and Cemil, 2014). Likewise, the younger and smaller firms will hold more cash in order to decrease the cost of raising external capital.

Dividend(Div)

Meggison et al. (2014) point out a negative association between cash and dividend payment in Chinese firms. Similarly, Kim et al. (2011) suggest that the restaurant firms pay more dividend with holding less cash. However, the corporations pay more dividend which have an intention to delay payment in case of cash deficit occur. Thus, the companies pay a dividend will hold larger cash level (Saddour, 2006; Drobetz and Grüninger, 2007) .

Age

Bates et al. (2009) says that the listed firms hold more cash than non-listed firms in the United States, so we predict the positive relation between cash reserve and age. Besides that, the firm age has a connection with the growth of firms (Huynh and Petrunia, 2010). Moreover, Loderer and Waelchli (2010) conclude that there is a negative relation between firm age and profitability. As the profit of firm impact on the liquidity of firms as well as the cash management.

Board structure(BS)

Many characteristics of board are investigated in the view of corporate governance mechanism such as CEO duality (Baliga et al., 1996; Goyal and Park, 2002). Besides, Lee and Lee (2009) suggests that the board structure in the firms have an influence on the firm performance. Similar to the agency theory, there exist the conflict between managers and board in the decision

making for operating the firms (Jensen, 1986). This lead to the connection between the management strategy and firm performance (Conyon and Peck, 1998)

There are three levels of determinants of cash holding level (Babatunde and Olaniran, 2009). Firstly, the external element as the economy condition which beyond the control of the companies. Secondly, the internal factors including governance structure, ownership structure affect the ability to deal with the external issues. Thirdly, there are some other factors which impact the cash holding such as firm ages, size, dividend, leverage, profit and board structure (Meggison et al, 2014; Ferrei and Vilela, 2004).

Furthermore, cash holding level is also important in improving the market performance of firms (Fresard, 2010). In addition, firm profitability as ROA, ROE and EPS is influenced by cash reserve level the profitability (Sami and Jamalludin, 2014). In particular, the authors indicate the positive relation between cash holding level and profitability in developing market namely Jordanian stock exchange. This result iss in line with Martina-Sola et al. (2013), Bates et al. (2013) which suggest that higher cash reserve increase the competition of firms in the market. However, the firm hold too much cash which exceed the optimal level can decrease the firm value (Martina-Sola et al., 2013). In detail, the tradeoff theory also confirms that the firm hold the right level cash reserve can improve the firm value (Myers, 1977). Besides that, Pinkowitz et al. (2006) argue that the cash holding level just have weak connection with the market performance of firms in US listed firms from 1950 to 1999 and the cash holding level is higher in the firms with more growth opportunities. This finding can be applied in emerging economy where the investment opportunities for firms is higher. Al-Najjar (2012) confirms that cash holding level has significant role in the developing countries.

3. METHODOLOGY AND MODEL:

The first model will evaluate the determinants impact on the cash holding. Ferreira & Vilela (2004), Jigao & Zhengfei (2009), Ozkan & Ozkan (2004), Martinez-Solano et al. (2013), Megginson and Wei (2014) among others indicate the determinants which are in equation 1 has been substantiated by previous works in determining cash holding level. In this model, some variables are used to determine cash and evaluated to ascertain whether these determinants have a negative or positive effect on cash in relation to the firm. Moreover, cash holding is affected by the capacity of the company as well as the investment opportunities which are individual effects. Besides that, time effects of listed firms which includes the interest rate and inflation rate or other monetary policies impact on the firm's operation.

$$\boldsymbol{Cash_{it}} = \boldsymbol{\gamma_1}(\boldsymbol{State_{it}}) + \boldsymbol{\gamma_2}(\boldsymbol{Prof_{it}}) + \boldsymbol{\gamma_3}(\boldsymbol{Lev_{it}}) + \boldsymbol{\gamma_4}(\boldsymbol{Size_{it}}) + \boldsymbol{\gamma_5}(\boldsymbol{Div_{it}}) + \boldsymbol{\gamma_6}(\boldsymbol{Age_{it}}) + \boldsymbol{\gamma_7}(\boldsymbol{BS_{it}}) + \boldsymbol{\alpha_i} + \boldsymbol{\lambda_t} + \boldsymbol{\varepsilon_{it}} \quad (1)$$

where i is the accumulation of firms; t is time; $Cash_{it}$ is cash holding; $Prof_{it}$ is net profit after tax of the firm; Lev_{it} is the Leverage; $Size_{it}$ is ; Div_{it} is dummy variable which equal 1 if the firm pays dividend in a fiscal year and zero otherwise; Age_{it} is defined as the number of years since the companies are listed; Age_{it} is defined as the number of years since the companies are listed; BS_{it} is defined as the dummy variable which is equal 1 if the board has the foreigners and zero otherwise; $\alpha_i$is the unobservable heterogeneity. It measures both firms' particular characteristics and the characteristics of the sector in which they operate; λ_t are dummy variables that change in time but are equal for all firms in each of the periods considered; $\mathcal{E}_{it}$ is the error term.

The second part will test the correlation between cash holding and market performance using three assumptions. Using the assertion of Fresard (2010) and Abushammala1 and Sulaiman (2014), the equations were formulated based on cash in a time period of t-n which will have an impact on *ROA, ROE* and *Price to book value.* The Panel vector regression is applied to figure out the connection which ROA, ROE and Price to Book value can be influenced by the cash holding level.

The first assumption tests the correlation between the Return-on-equity (ROE) and cash holding. The total net income return divide by shareholders' equity is the ROE. The ROE determines the profitability of a firm based on the amount invested by shareholders. The third assumption indicated in equation 4 therefore compares the profitability of the firms used in the study as a measure of market value. All variables and coefficients areas explained earlier.

$$\boldsymbol{ROE_{tn} = \beta_0 + \beta_1 Cash_{t-n} + \varepsilon_{tn}} \quad (2)$$

The second assumption is to determine the relation between cash holding and ROA. Return-on assets (ROA) approximates the economic profit by the quotient of earnings before tax to assets. The positive correlation of this assumption signifies a positive correlation of cash holding and market performance Fresard, 2010; Abushammala1 and Sulaiman, 2014). The assumption equation is detailed in equation 2 below

$$\boldsymbol{ROA_{tn} = \beta_0 + \beta_1 Cash_{t-n} + \varepsilon_{tn}} \quad (3)$$

where $Cash_{t-n}$ is the cash holding in time *t-n* and the other variables and coefficients as defined earlier.

The third assumption examines the correlation of the cash holding on PriceToBook value. PriceToBook value approximates the value of the firm and it's generated by finding the proportion of share price to earnings per share. The positive impact of cash holding in time *t-n* will uniquely affect the value of a company measured by PriceToBook in time *t* (Cho & Pucik, 2005). The assumption is indicated in equation 4 below. All variables and coefficients areas explained earlier.

$$\boldsymbol{PB_{tn} = \beta_0 + \beta_1 Cash_{t-n} + \varepsilon_{tn}} \quad (4)$$

4. DATA

This paper extracted data from financial statements from the databases of the two largest stock exchange companies in Vietnam, Ho Chi Minh City Stock Exchange (HOSE) and Hanoi City Stock Exchange (HASTC). The paper used the industrial firms listed on Vietnam stock exchange for the period 2007 to 2016. Between 2006 and 2007, many corporations were listed on the stock exchange with a lot of preferential exemptions which boost the market and Vietnamese economy developed very fast. And the interest rate was going up due to the demand money for the investment increase. Therefore, they had an incentive to keep more cash in order to obtain all the opportunities as well as avoid the high cost of borrowing. That is the reason for us to research Vietnam stock exchange for the period 2007 to 2016. The data has 120 listed firms from the Vietnam Stock Exchange which excludes the banking firms. The data was preprocessed by removing missing values, correcting accounting errors, and removing repetitions. Companies were selected based on the possessing of all data for the time period used. The observations were financially calculated into user variables in testing the models to respond to the main objectives for this paper. The paper used the Stata data analysis tool to analyze the data extracted from the data bases. The correlation analysis and the linear regression modeling techniques were employed in producing the coefficients of the explanatory variables to analyze the model in response to the objectives of the study.

All summary statistics for all variables used in the paper are presented in table 1. From the table, the average cash holding is 10.2% out of total asset which is higher than other markets. In addition, this result is similar to Turkish firms which hold 9.1% of their total assets as cash and cash equivalents from 1997 to 2011 by Ali et al. (2014). However, this rate is higher in comparison with others such as Garcia Teruel and Martinez Solano (2008) indicate that the average cash holding is 6.57% in Spain; Martina-Sola et al. (2013) in United State, 7.9%; Gill. A and Shah (2012) in Canada, 3.87%; Ogundipe et al. (2012) in Nigeria, 7.18%. The reason is

that the cost of borrowing capital rose quickly during the period due to the financial crisis, hence the firms intend to hoard more cash to increase the liquidity and flexible finance.

Table 1 - Descriptive Statistic

Variable	Obs	Mean	Std. Dev.	Min	Max
cash	3832	.1020	.1102	0	.6083
state	3832	24.67	23.68	0	80
prof	3832	9.817	1.803	4.385	14.91
lev	3832	.4813	.2182	0	.9096
size	3832	5.082	.5677	3.698	6.866
div	3832	.7713	.4199	0	1
age	3832	.5955	.2952	0	1.204
bs	3832	.0895	.2855	0	1

Note: Cash= (cash + marketability)/total assets; State is the fraction of shares owned by the state. Size is the logarithm of total assets; Div is 1 if the firm pays dividend, zero otherwise; Age is the number of years since a firm is listed; Prof is the net profit after tax of the firms; Lev is leverage which is ratio between debt and equity; BS is the dummy variable which is equal 1 if the board has the foreigners and zero otherwise.

Table 2 shows the correlation matrix. As a result, there are no high correlations between independent variables, significant at 1% level.

Correlation Analysis

Table 2 - Correlation Matrix

Variables	cash	state	prof	lev	size	div	age	bs
cash	1.0000							
state	0.1088	1.0000						
prof	0.1841	0.0532	1.0000					
lev	-0.2988	0.1317	-0.0745	1.0000				
size	-0.0555	-0.0691	0.6563	-0.0097	1.0000			
div	0.1496	0.2098	0.2012	0.0230	-0.0353	1.0000		
age	0.0293	0.0969	0.0244	-0.0155	0.1351	0.1053	1.0000	
bs	0.0540	-0.1919	0.1629	-0.1199	0.2046	-0.0252	0.0681	1.0000

Note: Cash= (cash + marketability)/total assets; State is the fraction of shares owned by the state. Size is the logarithm of total assets; Div is 1 if the firm pays dividend, zero otherwise; Age is the number of years since a firm is listed; Prof is the net profit after tax of the firms; Lev is leverage which is ratio between debt and equity; BS is the dummy variable which is equal 1 if the board has the foreigners and zero otherwise.

5. Empirical results

Table 3 represents the results of the determinants which influence on cash holding level after managing for unobserved heterogeneity. To solve the time and individual effects from the model 1, we employ the technique of mixed model and apply the Stata for estimating the results.

Table 3: The determinants of cash holding level

Dependent variable: CASH	Model 1
State	.0002429**

	(.0000994)
Prof	.0150856*
	(.0012704)
Size	-.0449098*
	(.0055779)
Div	.0034995
	(.0035826)
Age	.0175717**
	(.0072121)
BS	.0138646
	(.011147)
Lev	-.1263303*
	(.0102712)
LR test vs. linear regression: chi2(2) = 1333.50	
Prob > chi2 = .0000	

** p < 0.1, ** p < 0.05, *** p < 0.01*

Note: Cash= (cash + marketability)/total assets; State is the fraction of shares owned by the state. Size is the logarithm of total assets; Div is 1 if the firm pays dividend, zero otherwise; Age is the number of years since a firm is listed; Prof is the net profit after tax of the firms; Lev is leverage which is ratio between debt and equity; BS is the dummy variable which is equal 1 if the board has the foreigners and zero otherwise; v1 is the code of listed firms.

The table shows the results of mixed model for dependent variable CASH with other independent variables. From the table 3, the state-owned have a positive sign with the cash holding. The clear inference is that the higher level of state ownership leads to hoard larger cash reserve in the listed firms. This is consistent with previous studies (Najid and Abdul Rahman, 2011; Sun et al., 2002; Le and Buck; 2011; Le and Chizema, 2011). This conforms with the current situations in Vietnam. The government is still weak in managing the listed firms lead to the poor corporate governance as well as several agency problems (Hoang, 2015). To conclude, the listed companies have a higher level of state ownership hold more cash reserve to prevent the risk or extra cost in the future. Turning to the age variable, as firm age increases the cash holding also rise due to the fact that they have experienced the interest racing period in Vietnam. Because of that, they tend to keep more cash to alert the difficulties in getting cash for their operations (Bates et al., 2009). Besides, the demand for cash will rise if the companies get profitable investment chances (Ozkan and Ozkan, 2004). Some previous papers suggest that the listed corporations in Vietnam intend to keep more cash during the profitable period to match with the finding (Hardin et al., 2009; Megginson et al., 2010; Ali and Cemil, 2014). However, there are no relations between dividend payment and cash holding level which is a different conclusion with Saddour (2006); Drobetz and Grüninger (2007). According to this finding, the dividend of firms has no impact on the cash management policies due to the fact that the companies have the plans before payout dividend. Moreover, the board members are insignificant with cash holding level. This is

Many characteristics of board are investigated in the view of corporate governance mechanism such as CEO duality (Baliga et al., 1996; Goyal and Park, 2002). Besides, Lee and Lee (2009) suggests that the board structure in the firms have an influence on the firm performance. Similar to the agency theory, there exist the conflict between managers and board in the decision making for operating the firms (Jensen, 1986). This lead to the connection between the management strategy and firm performance (Conyon and Peck, 1998)

There is a negative correlation between cash holding and firm size owing to the larger corporations can get external capital with cheaper cost (Ferreiara and Vilela, 2004; Ali and Cemil, 2014; Martina-Sola et al., 2013). Similarly, the leverage impact negatively on cash holding level because the firms have higher level of leverage which is difficult to raise capital or the cost of borrowing is more expensive. This result is in the line with Pecking order theory and free cash flow theory (Hardin et al., 2009; Rizwan and Javed, 2011).

The table 4 shows the results of the correlation between cash holding level and market performance which includes ROA, ROE and price to book value using the panel vector regression. The study decides to use lag.3 in explaining the relationship between cash holding level and market performance indicators. However, ROA, ROE and PB has a significant relationship at lag.1, this can be explained that the cash holding level last year impact on the market performance of listed firms after one year (Fresard, 2010 and Abushammala1 and Sulaiman, 2014). This means that the market performance of firms is affected by the cash management strategies in the firms. Furthermore, Vietnamese listed firms can consider the amount of cash reserve in order to increase the profitability or market performance of firm.

Table 4: The relationship between cash holding level and ROE, ROA and price to book value

	Model 2	Model 3	Model 4
Depedent variable			
L1.ROE	.5863903*** (.054995)		
L2. ROE	-.0739005** (.0327532)		
L3.ROE	.071755** (.0293573)		
L1.ROA		.6159741*** (.0793878)	
L2.ROA		-.0575567 (.0494621)	
L3.ROA		.0337756 (.041417)	
L1. PB			3.722477** (1.644156)
L2. PB			.4504929 (.3556054)
L3. PB			.1832696 (.1506667)
Independent variable			
L1. CASH	.0477117 (.0791717)	-.0009058 (.0552326)	14.74918 (10.00881)
L2. CASH	-.066646* (.0331379)	-.0424633** (.0197982)	3.972289 (2.934543)
L3. CASH	-.0109052 (.0322442)	-.0424633 (.0197982	3.521947 (2.616589)

*Note: ***p<0.01; ** p<0.05; *p<0.1.*
Note: Cash= (cash + marketability)/total assets. ROE is return on equity= net profit after tax divide the owner's equity. ROA is return on equity= net profit after tax divides total assets. PB is price to book value= market price of listed firms divides the book value.

6. CONCLUSION:

The paper finds out the determinants impact on cash holding level of Vietnamese listed firms from 2007 to 2016. These factors include firm size and leverage which have a contradictory influence on the cash holding level but leverage, state ownership, profit and firm age impact positively on the cash reserve. The study detects the dividend policies of firms are not correlated with the cash holding level in the firms. In addition, the cash reserve is the same whether the board has foreigners or not. Basically, these results provide the references for the listed companies in Vietnam can adjust the cash level in the corporation in order to prevent the shortage of finance.

The results indicate the positive connection between cash holding level and market performance which is presented as ROA, ROE and price to book value. In other words, the firms make more

profit when they hold higher level of cash in Vietnam. This is due to the fact that the listed firms in Vietnam can take the advance of holding cash in order to get more money. Thus, they may keep more cash to get all the opportunities as well as preventing the risk of shortage funds. These finding for the listed corporations in Vietnam should consider as a vital reference to keep suitable the amount of cash which improves the firm performance or market performance.

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CROWDFUNDING – A NEW MODERN WAY OF FINANCING STARTUPS: EMPIRICAL STUDY FROM THE CZECH REPUBLIC

Doležal Jiří

Abstract

The realisation of many ventures requires funding from external parties, which is very difficult to gain at the beginning stage of bussines, where very often only prototype is created. Crowdfunding offers a new potential source of financing, which is frequently expected to favor socially and art-oriented ventures. However, little is known about actual state reward based crowdfunding in the Czech Republic, what campaings are more likely to be successful and how it could be effectively used for businesses. This article empirically examines two biggest reward based crowdfunding platforms in the Czech Republic to analyze current situation of crowdfunding in the Czech Republic and likelihood of successful funding reward based campaings in general.

Keywords: Crowdfunding, reward based, alternative financing, startup, online platform

JEL Classification: L13, D62, G24

1 INTRODUCTION

Today's digital world of interdependence of people and business got into a position where entrepreneurs and consumers must seek mutual cooperation more than ever before. According to Dehling (2013), it is due to the joint creation of products and businesses, they have become addicted to each other in terms of innovation, development and new product development and the like. The digital phenomenon allows people to actively participate in solving problems on the other side of the globe. Occupation known as "digital nomad or freelancer" are becoming quite common. These changes create new tools that seek to implement new forms of business, they need to seek appropriate sources for its financing (Rifkin, 2010; Chui et al., 2012; Serres, 2013 Girouard, 2013).

Due to these facts, some entrepreneurs have begun to use the Internet to use it to directly seek financial assistance from the general public (hereinafter the "crowd") instead of the traditional financial investors such as business angels, banks or venture capital funds (Kleemann et al., 2008; Lambert and Schwienbacher, 2010). And because the financial crisis has caused a significant decline in the availability of bank loans for startups, a new modern service called crowdfunding – based on rasing money from crowd - could fill this gap.

2 THEORETICAL PART

Sources of funding for startups at the very beginning of the business activities are very popular topic in the scientific community. Classically financial resources are divided into own and foreign (debt) capital. Unfortunately most startups do not have access to either the source, because they lack stable cash flow to hedge interest payments or bonds and at the very beginning of their business they are surrounded by asymmetric information (Cosh et al., 2009).

Although there are various investors with large amounts of capital, such as venture capital funds and banks, for startups it is often a difficult and intractable situation. That is because the global

financial crisis exacerbates this situation and nowadays traditional venture capital firms are less tolerant of risk of new starting business (McCahery and Vermeulen, 2010). Indeed startups often require much less money they are typical of these sources of funding are not able to, respectively, are willing to provide. Therefore, these startup businesses often have to rely on friends and family, or their own savings (Schwienbacher and Larralde, 2010).

Although crowdfunding it has been known for a while (especially in music industry), it is a relatively new source of funding for startup projects. It is a young phenomenon, which is particularly widespread in Western countries. In essence it is the involvement of a large number of people (hence the word crowd) who are mobilized through an online platform and is typical communication via online channels. The most widely used models are in the form of donation (Social projects and startups), or investment models in order to contribute in a given limited period of time provide a relatively small part of the funds to promote the idea, product, project or business venture. Donors mentioned models are usually created to facilitate philanthropic giving, providing or immaterial rewards donors. Investment models will operate on the basis of entitlement to debt or equity ratio (or a portion of profits or revenue), in exchange for a contribution by the investor (referred to as a starter - "Backer) (Turan, 2015).

Another popular type of crowdfunding is the reward based model. This model rewards investors by chance to pre-order material goods, products or services (eg. sites Kickstarter and Indiegogo; in the Czech Republic HitHit and Startovač), while others encourage investment purely for philanthropic or social reasons (eg. Razo). Other reward investors with a delay of a financial return. And either in the form of unsecured interest loans (LendingClub; Zonky (CR), or by allowing companies to sell equity (Crowdcube; Fundlift).

Crowdfunding is therefore associated with the collective efforts of various individuals who meet to chose and got funding to support new potential projects, organizations and businesses. From history crowdfunding offers a new potential source of funding, which is often very beneficial for socially or environmentally oriented businesses, which often suffer significant disregard for conventional investors. And because startups generally have a problem with getting to classical forms of financing, some have begun to use crowdfunding to finance their own activities. (Haas et al., 2014; Beaulieu et al., 2015.) But this potential for financing of startups has been more seen in the western countries. In the Czech Republic it is still very rare example, where most common source of financing are banks or own funds (family, friends, own savings, etc.)

Simply put, crowdfunding is the funding of a project or enterprise by group of individuals rather than professional parties (such as in the case of use of the above mentioned banks, venture capitalists or business angels). Theoretically, it is the individuals who finance the investments indirectly through their savings, because the bank acts as an intermediary between those who have money and those who need the money. But crowdfunding is targeted for the end-investor, without any intermediary. Entrepreneurs communicate directly to individuals, ie a specific project or potential users of the product. And this benefit could be used not just for the financing, but also as verification for the idea behind the project.
Increasing public attention concentrated on crowdfunding could not instigate an academic response. Many authors started to empirically analyze the general characteristics of the behavior of starters and suggest that starters often have the same characteristics as professional investors. These starters often perceive and act rational decisions about the probability of project success. However, a significant difference from conventional financing is that conventional finance is often associated with a small number of investors contributing of large sums for the project. In the crowdfunding these investors are replaced by a large number of individuals who all

contribute relatively small amounts of capital, but together they are able to finance even larger projects (Lehner, 2013).

Due to the lack of a centralized and independent data collection it is currently difficult to estimate overall market size of crowdfunding. In terms of total funding, crowdfunding it should still be considered as a limited phenomenon across the globe, not just in the Czech Republic. But it is supposed to change very rapidly. According to the study InfoDev (2013), crowdfunding could grow in the next 25 years so that it could reach a range between $ 90 million - 96 millions USD. Which is almost 1.8 times greater than the current size of the venture capital industry worldwide. In the Europe, The United Kingdom has a leading position in sector of funding via crowdfunding platforms financing. And according to Turan (2014), due to less stringent regulations and tax breaks granted to new entrepreneurs, the British market, will growth in average by 410% from 2012 to 2014 and will be the world leader in raising funds through crowdfunding platforms.

However from this rapid growth could benefit many countries, especially those with limited acces to foregin capital. Lack of regulation, easy implementation and expected growth of digital technology in the developing contries could lead to chance to finance new and innovative projects, which will be “chosen” by actual potential users of this idea.

2.1 Crowdfunding in the Czech Republic

Crowdfunding in the Czech Republic officially started in July 2011, when Fondomat was established. It was the first crowdfunding platform, which established two British living in Prague and it was supposed to serve as Kickstarter. Even that Fondomat does not exist anymore because founders wanted to concentrate on their another businesses, it was the first step towards the new source of financing projects and business in the Czech Republic. The second platform, which originated in the Czech Republic shortly after the first, is called Nakopni.me and has been established in Novemeber 2011 and it is still active till today.

But beginning of crowdfunding in the Czech Republic was not easy. For example In March 2012, internet online journal Lupa.cz published an article where they expressed the Czech crowdfunding position very negatively. Based on interviewing one of the founder of Fondomat, they stated biggest problems crowdfunding situation. Firstly, they had problems with unmet collections. The most common system of crowdfunding is principle of "all or nothing" when the funds collected are given to the owner of the project only when it is achieved target value of the project. If not, the funds are returned to the donors. However Fondomat decided to get any money, which are raised on their site. The problem was that they used for financing PayPal, and all the costs had to pay owner of the campaign. Therefore the costs were really high with 4 % as a campaing fee for Fondomat and 13 % fee for Paypal. Another problem was that people could not see, how much many was already raised. Problem of portal Nakopni.me was payment option only via banking transfer, which was very slow and therefore it lost on its attractivity.

But the biggest failure from their point of view was in misunderstanding of the project owner, who at the Czech environment requires quite exorbitant. Also they stated that a large part of projects is thematically rather uninteresting and very often with poor quality of rewards. (Černý, 2012) Even the situation got better in last 5 years, we still can see this problem in recent crowdfunding projects.

The year 2012 was significant for the Czech crowdfunding. During this time there was a boom in crowdfunding in other states, as well as in the Czech Republic (Staszkiewicz 2014). According to conducted analysis, crowdfunding has helped over 2012 worldwide choose $ 2.7

billion of capital and just over US portal Kickstarter has supported nearly 20,000 projects (Lauschmann 2013). In the Czech Republic arose in 2012 three new platforms: Kreativcisobe.cz, Music Cluster and Hithit. In April 2013, Startovač followed them. Another four platforms followed a year later, as the first was launched in April, Everfund, then Vision Partners at the end of the year and started catalyst. The latest innovation in reward platforms is Sportstarter project and recently, in cooperation in between students and universities CZU and VSE, a new crowdfunding platform is about to launch which would focus exclusively on projects of students from the Czech Republic and Slovakia. It is seen as an enormous interest in supporting entrepreneurial activities of students and this platform could serve as an important catalyst.

Also another forms of crowdfunding have started to be more popular. Equity crowdfunding in the Czeh Republic is expected to become more used after Fundlift was launched, a pure equity crowdfunding platform. Since June 2016, when Fundlift was established, 7 projects were successfully financed. Total raised amount was €1,2 million (Fundlift, September 2016).

Very popular form of crowdfunding in the Czech Republic (that is actually not publically perceived as a form of crowdfunding), is P2P consumer lending. It started to accelerate during 2015 when Zonky.cz was launched. This platform has built its public recognition on the emphasis that people who do not match the criteria of banks should nevertheless have a chance to get a loan. Since 2014, when Zonky was launche, till april 2016 people borrowed via its platform almost € 2,60 million. And thanks to a dramatic increase in the use of services of Zonky in last months, we assume that Zonky in 2016 will arrange loans in amount of € 14 million.

Based on the data, we can say that the use of crowdfunding for various projects off the ground has grown increasingly popular in the Czech Republic. In the reward based type of crowdfunding, the most thriving projects are cultural and creative, as it is in Western countries and the Czech Republic is no exception. The reason for the smaller amounts of money to these projects require, in comparison with the IT sector. Additionally, the authors of cultural and creative projects attract more public attention, and usually do have a larger fan base than the actual business projects. It then helps them to accelerate the spread of their campaigns, thus have a greater reach to better find support for these projects.

The most successful Czech crowdfunding campaign was a computer game Kingdom Come: Deliverance by Czech company Warhorse Studios. The campaign collected € 1.3 million and it belongs between the most successful computer game financed by crowdfunding campaign in the world. The sought amount was overshot almost three times, when more than 35,000 backers supported it. And because it was so successful, company continued to raise money on its websites after the campaing on Kickstarter was finished and they recently announced number of 70,000 backers.

Although the success of this size is unique and cannot be compared with projects consisted only in the Czech Republic and Slovakia, it still shows potential of online platforms for raising the money. And recent data shows that reward based crowdfunding in the Czech Republic is able to finance big projects too. The first place in the Czech Republic still holds the project Trabantem napříč Tichomořím from 2015, which collected over €100,000 in 30 days. More projects have started to overcome the threshold of €50,000, as Kick Slaughterhouse! with €90,000, €80,000 DVTV and more.

3 DATA AND METHODOLOGY

This paper builds on empirical work by exploring the relationship between the fundamental parameters of reward based crowdfunding projects in the Czech Republic and their likelihood of success. As crowdfunding can be still consider as young phenomena in the evolving field of sustainable entrepreneurship in the Czech Republic, such an exploratory approach seems most promising in order to develop initial empirical insights on reward based crowdfunding projects in the Czech Republic, and to identify and structure potential for further research.

The statistical analysis builds on a dataset of crowdfunding projects taken from HitHit and Startovač, two biggest reward based crowdfunding sites in the Czech Republic. Data from a total of 1,844 projects that have not yet been analyzed in any current research, in addition to this extent. For the purpose of this research was used programming methods in statistical program R Project for Statistical Computing, while logical methods in the form of analysis-synthesis and induction-deduction.

Because both platforms use a different way of working with the parameters of the project, for the purpose of this research, 8 categories were created and combined for both platforms and projects to secure comparability of outputs. To analyze impact of targeted amount on the project, category or platform, four sizes of campaigns were imported.

CATEGORIES		SIZE OF CAMPAIGN	
1	MOVIE	0	< 50 000 CZK
2	BOOKS AND WRITTING	1	51 000 – 149000 CZK
3	GAMES AND APPS	2	150 000 – 249 000 CZK
4	MUSIC	3	>250 000 CZK
5	ART, THEATHRE, DANCE		
6	OTHERS		
7	BUSINESS		
8	SCIENCE, EDUCATION, TECHNOLOGY		

4 RESULTS

Two biggest crowdfunding platforms, HitHit and Startovač, since their beginning helped together to finance more than 900 projetcs in a total of €3,5 million. Hithit, The biggest reward-based crowdfunding platform in the Czech Republic, has successfully helped finance over 530 projects and raised more than € 2.3 million Startovač, the second largest reward based crowdfunding platform in the Czech Republic, which started its work two months later, managed since its beginning to raised € 1.2 million with a total of 401 successful projects.

Tab. 1 - Total projects and their success rates [Own results]

size	state	total	totalClass	success
0	SUCCESSFUL	163	369	0.4417344
0	UNSUCCESSFUL	206		0.5582656
1	SUCCESSFUL	327	674	0.4851632
1	UNSUCCESSFUL	347		0.5148368
2	SUCCESSFUL	27	89	0.3033708
2	UNSUCCESSFUL	62		0.6966292
3	SUCCESSFUL	18	66	0.2727273
3	UNSUCCESSFUL	48		0.7272727

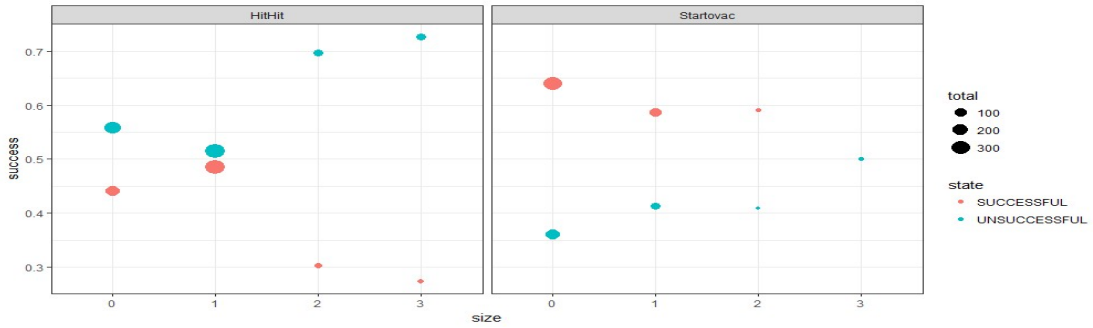


Fig. 1 The size of projects and their influence on success rate [Own results]

Tab. 2 Projects on platforms and their differences [Own results]

size	site	state	total	totalClass	success
0	HitHit	SUCCESSFUL	163	369	0.4417344
0	HitHit	UNSUCCESSFUL	206	369	0.5582656
0	Startovac	SUCCESSFUL	288	450	0.6400000
0	Startovac	UNSUCCESSFUL	162	450	0.3600000
1	HitHit	SUCCESSFUL	327	674	0.4851632
1	HitHit	UNSUCCESSFUL	347	674	0.5148368
1	Startovac	SUCCESSFUL	88	150	0.5866667
1	Startovac	UNSUCCESSFUL	62	150	0.4133333
2	HitHit	SUCCESSFUL	27	89	0.3033708
2	HitHit	UNSUCCESSFUL	62	89	0.6966292
2	Startovac	SUCCESSFUL	13	22	0.5909091

2	Startovac	UNSUCCESSFUL	9	22	0.4090909
3	HitHit	SUCCESSFUL	18	66	0.2727273
3	HitHit	UNSUCCESSFUL	48	66	0.7272727
3	Startovac	SUCCESSFUL	12	24	0.5000000
3	Startovac	UNSUCCESSFUL	12	24	0.5000000

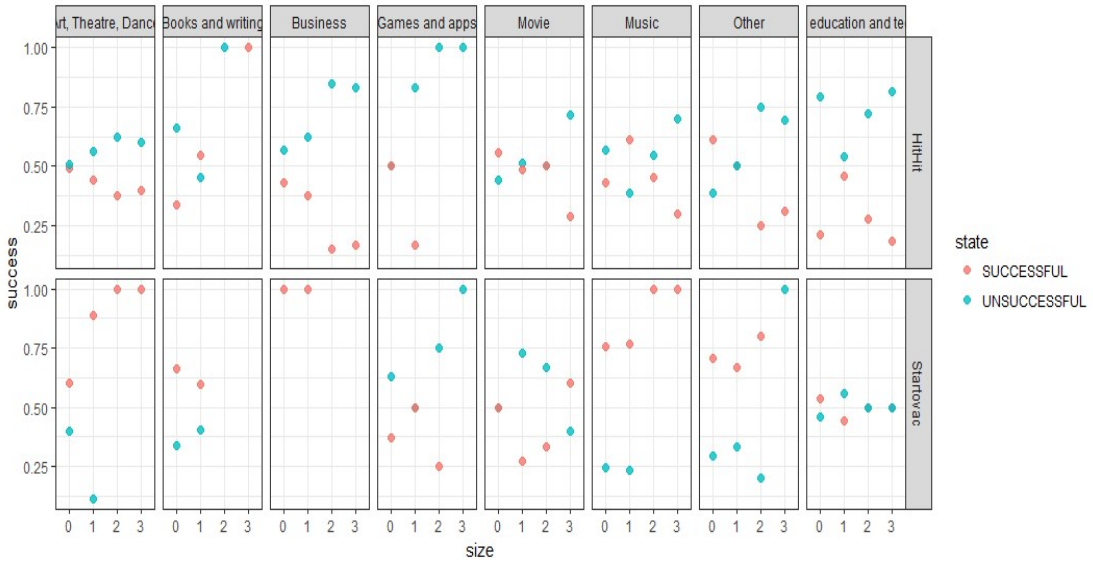


Fig. 2 Categories within platforms and projects success rate comparation [Own results]

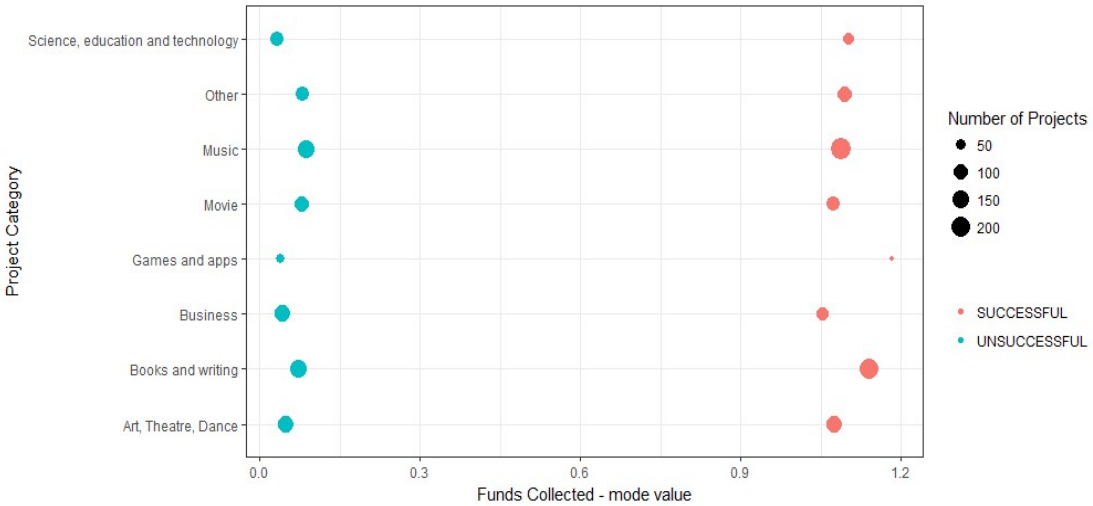


Fig. 3 Categories and their funds collected value

Tab. 3 Categoires of project and their ability in raising targeted amount [Own results]

	category	state	ProjectsTotal	collectedPerc
1	Art, Theatre, Dance	SUCCESSFUL	140	1.07600000
2	Art, Theatre, Dance	UNSUCCESSFUL	139	0.04996000
3	Books and writing	SUCCESSFUL	202	1.13920000
4	Books and writing	UNSUCCESSFUL	154	0.07158929

5	Business	SUCCESSFUL	76	1.05364579
6	Business	UNSUCCESSFUL	135	0.04400000
7	Games and apps	SUCCESSFUL	19	1.18333333
8	Games and apps	UNSUCCESSFUL	37	0.03937000
9	Movie	SUCCESSFUL	97	1.07416667
10	Movie	UNSUCCESSFUL	111	0.07937500
11	Music	SUCCESSFUL	233	1.08872000
12	Music	UNSUCCESSFUL	152	0.08713833
13	Other	SUCCESSFUL	115	1.09345000
14	Other	UNSUCCESSFUL	92	0.08133333
15	Science, education and technology	SUCCESSFUL	54	1.10170750
16	Science, education and technology	UNSUCCESSFUL	88	0.03188462

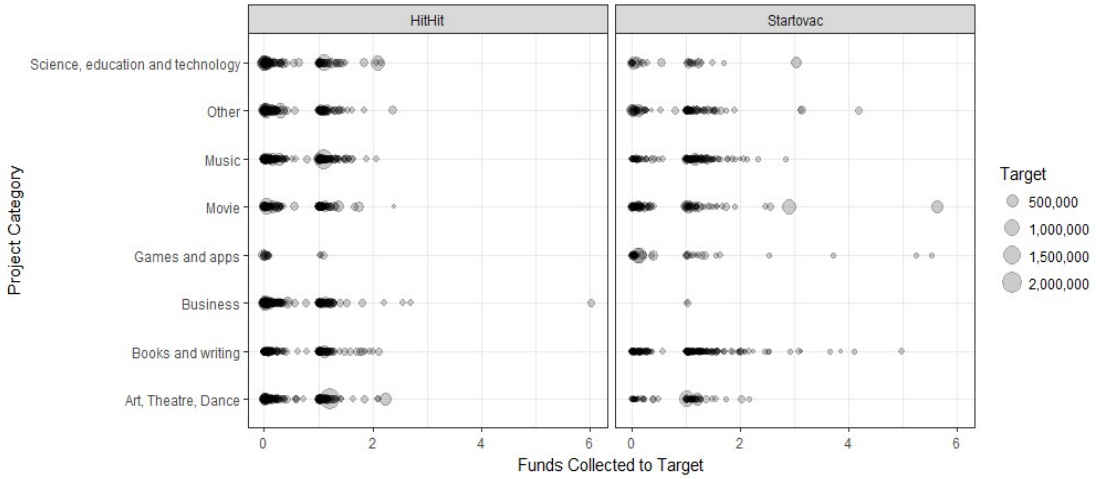


Fig. 4 Platforms, projects and their fundings to targeted amount [Own results]

5 CONCLUSION

Comparison of the different categories of crowdfunding projects on HitHit and Startovač suggests that in the Czech Republic are still most successful campaings regarding music industry. The most successful categories combined are music, books and writing and projects, which are related to art, theatre or dance. On the other hand, projects, which are related to the business, did not perform well. However analysis showed that business projects held on Startovač were likely to be funded than on HitHit.

The analysis also confirmed that initiators of crowdfunding projects should be more precise and modest in their expectations in money rising. The results confirmed, that smaller targets are more likely to be achieved. Therefore, if an entrepreneur needs a specific amount and cannot be realised with a smaller amount anyway, the initiators should make use of the benefits coming along with fixed funding targets.

And results proved that people who support crowdfunding projects in the Czech Republic tend to stop contributing when 100 % of campaign is accomplished no matter how many days left of the campaign. However as the beginning stage of business, the rule less is more is not here

the case and therefore if entrepreneurs find the ways to involved people for the whole length of campaing, they could raise more money.

On the other hand, the projects which failed and were not successful, they were very low on fulfillment of their targeted value. Which leads us to two assumptions. First, as Lambert and Schwienbacher (2010) reported, some campaigns fail to get funding from conventional sources because they don't meet the criteria that are important for long-term business success and crowd immediately recognizes it as not attractive campaign with poor rewards. Second, unsuccessful campaigns fail in marketing during the time when they are on crowdfunding platforms.

Aside of the features and options crowdfunding, some general limitations and problems associated with crowdfunding financing needs mentioning. Transaction costs are obviously higher than that of conventional sources of financing, as it is still alternative source of financing and platforms tend to take from 5 to 10 % according to the collected amount of money.

Also the practical use of crowdfunding is much more demanding than a political campaign, as the people behind the campaign can force the starters to finance their project while protecting their intellectual property at the same time? Furthermore, whereas the role of donors is quite complicated in crowdfunding, what are the motivations for their behavior and interests? What are the attributes for a successful project and how different projects carried out across multiple platforms and economic climate and how successful projects led to know about their campaing. Therefore further research will be held on stated issues above stated issues.

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INNOVATIVENESS OF V4 COUNTRIES AS A FACTOR IN THEIR COMPETITIVENESS

Fabová Ľudmila, Janáková Hana

Abstract

Nowadays, economic level of a country and its living standards of population depend on a level of competitiveness that is a source of increasing productivity. If the productivity is currently affected by particular innovation then their impact on competitiveness is important too. The paper deals with the analysis of the competitiveness development of V4 countries and analysing their innovation as well as evaluates the impact of innovation on the competitiveness. Volume of investments spent on research and development is one of the decisive factors that influence the innovations. The level of innovation in a country depends not only on the volume of finance but also on the conditions of enabling creation, deployment and use of innovation in the companies. The competitiveness development of the V4 countries has been assessed on the development of the global competitiveness index of these countries. The Global Innovation Index assessing the innovation capacity of countries has been used to exploit their innovative potential. The aim of this paper is to determine to what extent the innovations can affect competitiveness in the V4 countries and highlight the strengths and weaknesses of the innovation development of these countries, respectively the causes of their backwardness in competitiveness compared to the most developed countries of the world.

Keywords: Innovation, Global Innovation Index, Competitiveness, Global Competitiveness Index, V4countries.

JEL Classification: O31, O47.

1.INTRODUCTION

Competitiveness and its evaluation is important factor for ranking of economic potential of countries over the world, especially in European Union. Effectively analyze competitiveness is based on a defined concept of competitiveness. Competitiveness is one of the fundamental criteria for evaluating economic performance, and also reflects the success in the broader comparison. In present situation economically developed countries of the world, including the V4 countries, are in the construction phase respectively are developing a knowledge-based society which is significantly affected by the ongoing process of globalization. Developing knowledge-based economy (based on the using of knowledge) innovation and information-communication technologies (ICT) is now in globalized world a prerequisite for increasing the competitiveness of individual countries. In the same time this solves the underlying problems of the current advanced economies - ensuring economic growth, employment growth and higher living standards. The economic success of countries depends increasingly on their ability to use effectively intangible assets, particularly including particular knowledge, skills and innovation potential, due to that is necessary to put attention to this issue. In the same time have to respond to the ongoing globalization that is also currently affected by technological change. Under the influence of globalization the national economies are increasingly involved in international economic relations with the result of that is the competition in global character and changing its content. The Visegrad countries have lag in many of the structural indicators and thus have progress to make in raising their competitiveness to general European levels. There are also some surprising areas where these counties are in advance of general European levels – such as in technical education. (Nevima, 2012; Kadeřábková, 2008)

The main source of competitiveness growth is currently considered the productivity growth in advanced economies is driven mainly by innovations. As innovation significantly influences productivity also their impact on competitiveness is significant and still rises steadily.
The paper deals with relationship ~~in~~ between competitiveness and innovation in economical developed countries including countries of V4. The aim of this paper is to determine the extent to which innovation in the V4 countries influences their competitiveness and highlight the strengths and weaknesses of the innovation development of these countries, respectively the causes of their backwardness in competitiveness compared to most developed countries of the world.

2.DATA AND METHODOLOGY

Obtained data in the paper are based on publicly available statistical data characterizing the level of competitiveness in the world and their level of innovation development. The assessment is focused on four Central European countries: Czech Republic, Hungary, Poland and Slovakia that are in regional group – Visegrad group known as the V4 countries. Innovativeness and competitiveness of these countries have been compared among themselves but also with Switzerland that is for several years occupies first a ranking of competitiveness and innovativeness of the world and can be an inspiration for the V4 countries.
To assess the competitiveness development of the V4 countries have been used the Global Competitiveness Report of the World Economic Forum that annually assesses competitiveness of countries in the world by the Global Competitiveness Index. The paper is following development in the V4 countries and Switzerland in the period since 2011 until 2016 and their position in the rankings of competitiveness.
Decisive prerequisite for successful innovation development in a country belong sufficient invested resources to the research and development which are important for a new knowledge and future innovation. Development of research and development in % of GDP in V4 countries have been watched for the period since 2004 to 2014 and compared them with the average of European Union. The level of innovation development in a country depends on the volume of investments and also in addition on the conditions created for businesses that are introducing innovation to the practice.
To assess innovation of V4 countries the paper is built on the report of the World Intellectual Property Organization, Cornell University and INSEAD that are evaluating the innovativeness of a countries in the world using Global Innovation Index, the Index of Efficiency and also two sub-indices indexes which evaluate inputs and outputs of the innovation process. In the paper is followed the development of such indices of the V4 countries and Switzerland over the years 2011 - 2016 and their position in the world rankings.
To process the data above have been used general theoretical methods of information processing as analysis, synthesis, induction and deduction. For clearer presentation of data have been used tables and for some of them for better illustration showing a graph. When considering data for individual countries the method of comparison has been used.

3.PROBLEM ANALYSYS

Paper is determining innovation in the Visegrad group competitiveness and **assets focused** on innovativeness and competitiveness of these countries compared among them and with Switzerland.

3.1.Competitiveness of the countries V4

Competitiveness is menat at the macroeconomic level which is also referred to the concept of national competitiveness. The essence of national competitiveness according to some authors is the ability to achieve certain advantages over other countries. According to others authors it is the ability to make their products in international markets. However, in average they agree that is the source of success and thus also competitiveness of countries is also their productivity (Hvozdíková 2009; Klvačová, 2008; Gontkovičová & Ručinský, 2014).

From the point of view above that is based on the definition of the World Economic Forum the national competitiveness is a set of institutions, policies and factors that determine the level of productivity of a country (WEF, 2016). As the gradually developed individual economies in the same time has been developed competitiveness. M. E. Porter (1994) distinguishes three stages of competitiveness development according to the development of the economy. In the first stage a country getting benefits from cheap labour and natural resources. In the second stage a source of comparative advantages become production efficiency of standard commodities and the third stage is associated with the manufacture of innovative products and providing of services. (Tolochko & Lymar, 2016; Švecová & Rajčáková, 2014).

The competitiveness of individual countries is currently monitored and evaluated at different levels. The national government authorities, integration groupings, as well as major international institutions pay attention a lot to it. World Economic Forum - WEF since 1979 annually publishes the Global Competitiveness Report which assesses the key factor for sustained economic growth and long-term prosperity of economies of individual countries. WEF assesses the competitiveness of countries in the world based on a public statistics and the Global Executive Opinion Survey that compiles the Global Competitiveness Index - GCI. GCI is the result of the evaluation of competitiveness of the world based on 114 indicators grouped into 12 pillars of competitiveness. It is calculated as a weighted average of all evaluated indicators and according to achieved score (1-7) and on the basis of the location of the 12 pillars is compiling the ranking of evaluated countries. In 2016 were ranked 138 countries. Using the pillars is assessing the level of competitive environment in the countries of the world which is in different stages of development and is therefore divided into three sub-indices (Soosova, 2014; Žítek & Klímová, 2015).

Sub-index – basic requirements create 4 pillars that affect the competitiveness of underdeveloped economies, respectively economies that are based on the using of resources. These include: public institutions, infrastructure, macroeconomic stability, health and primary education.

Sub-index – factors that increase efficiency includes six pillars which are essential for developing economies based on efficiency improvements. They consist of: higher education and practice, goods market efficiency, labour market efficiency, financial market sophistication, technological readiness and market scope.

Sub-index – innovation and sophistication factors consist of the last two pillars that are critical to the most advanced - knowledge-based economies driven by innovation. They are: business process sophistication and innovation (WEF, 2016).

The theoretical bases of this evaluation are three stages of development of the economy by M. E. Porter. However, WEF considering also two transitions stages of development countries (between the first and second stages of development and between the second and third) according to the size of GDP per capita. Czech Republic (since 2008) and the Slovak Republic (since 2012 to 2015) were included to the group of most developed countries fuelled by innovation. In 2016 this group was created by 37 countries reaching a GDP per capita more than 17 000 USD and due to this for evaluation is more emphasis pointing on innovation and sophistication factors (weight 30%).

In 2016 were Slovakia, Hungary and Poland included to the group of countries located in the transitional phase between the second and third stages of development. This group were enrolled 19 countries with GDP per capita from 9 000 to 17 000 USD and there is less emphasis

to the innovation and sophistication factors (weight 10 to 30%). Due to the different assessment criteria three countries achieve relatively better results comparing with Czech Republic.

Tab. 1 – GCI development in the V4 countries and Switzerland, in the year 2011 - 2016. Source: own processing based on the WEF, 2011, 2015, 2016.

Year	2011	2012	2013	2014	2015	2016
Economy	rank-score	rank-score	rank-score	rank-score	rank-score	rank-score
Switzerland	1 - 5,74	1 - 5,72	1 - 5,67	1 - 5,70	1 - 5,76	1 – 5,81
Czech Republic	38 - 4,52	39 - 4,51	46 - 4,43	37 - 4,53	31 - 4,69	31 – 4,72
Hungary	48 - 4,36	60 - 4,30	63 - 4,25	60 - 4,28	63 - 4,25	69 – 4,20
Poland	41 - 4,46	41 - 4,46	42 - 4,46	43 - 4,48	41 - 4,49	36 – 4,56
Slovak Republic	69 - 4,19	71 - 4,14	78 - 4,10	75 - 4,15	67 - 4,22	65 – 4,28

Development of the Global Competitiveness Index of the V4 countries in the period 2011-2016 is showing the table 1. For comparison the Switzerland is included and is the eight consecutive years ranked as first in the ranking of competitiveness that suggesting of long-term stable high level of national competitiveness.

The competitiveness of the V4 countries during the reporting period, with the exception of Poland, in several years and deteriorated only in the last 3 years, with the exception of Hungary, began to improve. The highest level of competitiveness throughout the period reached the Czech Republic that the position in competitive ranking for a period of six years has improved by 7 partitions. The worst development took place in Hungary that position since 2011 has deteriorated up to 21 partitions. Poland during the reporting of period 5 partitions improved and Slovakia for 4 screens. In 2016 the competitive ranking the best place has Czech Republic (31st place) followed by Poland (36th place) then Slovakia (65th place) and finally Hungary (69th place). It should be noted that Slovakia has over the horizon rendition of the V4 countries in last place until 2016 ahead of Hungary.

Analyzing the profiles of V4 countries according to various pillars of competitiveness have been found that it is the pillar of innovation in all four countries reached the lowest values. Evidence is shown on the graph – figure 1 that demonstrates the value of 12 pillars of competitiveness V4 countries and Switzerland in 2016. Particular, Hungary reached in 2016 in the innovation the possible score of 7 points 3.2, Slovakia 3.3, Poland and Czech Republic 3.4 and 3.8 but Switzerland up to 5.8. The impact of innovation on competitiveness is also reflected in the location of the country's ranking competitiveness. Czech Republic that reached from the V4 countries in 2016 the highest rating pillar of innovation topped the charts in the best place. In contrast, Hungary with the lowest innovation pillar is among four countries placed in position on the worst spot. (WEF, 2016)

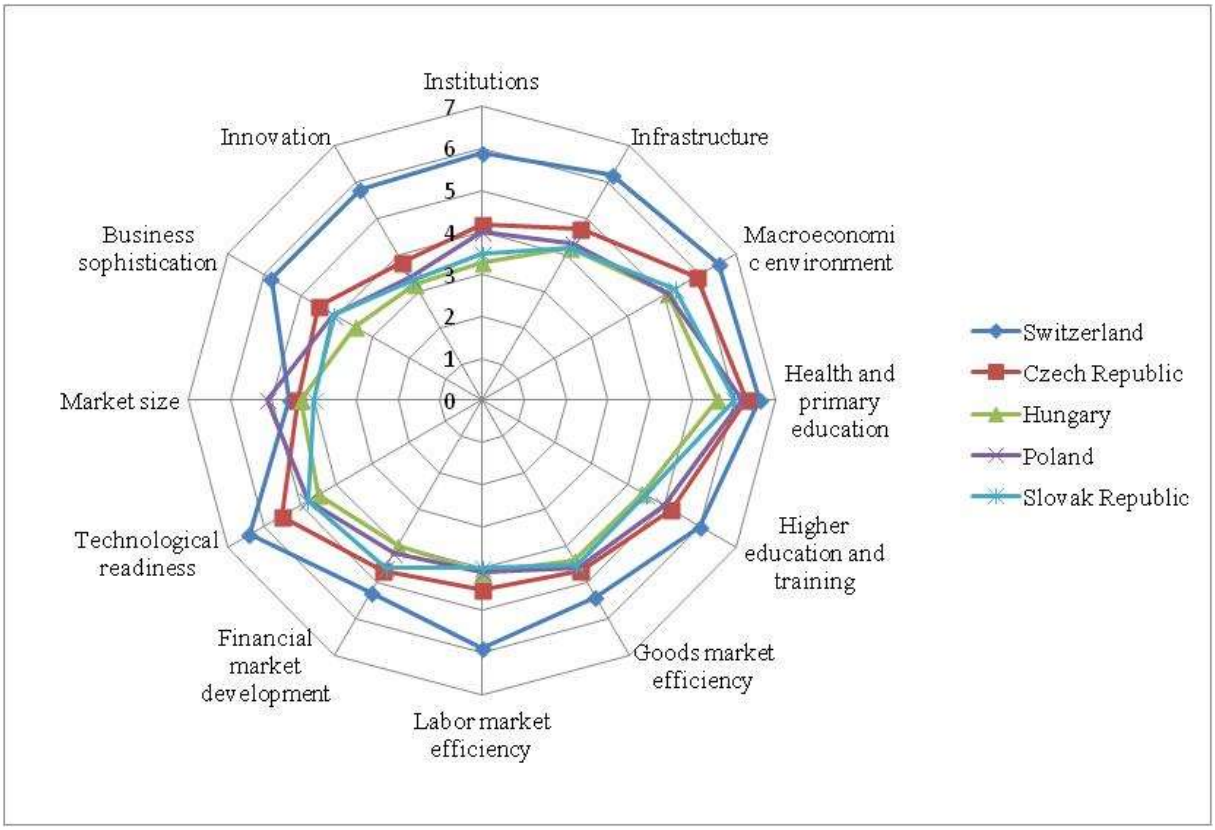


Fig. 1 – Comparison of the GCI pillars in 2016 in V4 countries and Switzerland. Source: own processing based on the WEF, 2016.

Whereas innovations are one of the principal pillars affecting the competitiveness of developed economies and their low level is one reason for the relatively low level of competitiveness in V4. Therefore in the paper is discussing in more detail innovation and innovativeness of V4 countries.

3.2.Innovativeness V4 countries

Innovation is globally considered to be a basic instrument for accelerating economic growth and maintain competitiveness. However, for successful innovation development of a country must be necessary conditions created first respectively suitable innovative environment which also requires considerable financial investment. One important requirement for successful innovation development is existence of effective research and development that are the carriers of new knowledge and of future innovation. The amount of finance invested to the research and development depends not only on the level of innovation environment of a country but also its innovation performance. By the fact the evidence is spending on research and development in countries that are among the innovative leaders has above-average level and therefore these countries have also above-average innovation performance (Özçelik & Taymaz, 2004; Despotovic, Cvetanovic, & Nedic, 2016).
As an example can be used European Union that is intensively engaged in innovation since 2000 but it has not been possible to catch up with the main competitors USA and Japan yet to which it recently added and South Korea. Despite of the increasing EU expenditure on research and development still it lags behind its competitors. The reason for delay that European Union is still being spent on research and development fewer resources than mentioned competitors. Due to this fact in 2010 until 2020 European Union set as a partial goal to invest to the research and development from public and private sources approximately 3% of GDP and of two thirds should consist of private funds. Through these investments should be create 3.7 million jobs

and an annual gross domestic product would have increased by almost 800 billion Euros by 2025 (European Commission, 2014).

Tab. 2 – Development of the R & D in % of GDP. Source: own processing based on Eurostat, 2016.

Economy	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
EU	1,76	1,76	1,78	1,78	1,85	1,94	1,93	1,97	2,01	2,03	2,03
Czech Republic	1,15	1,17	1,23	1,31	1,24	1,30	1,34	1,56	1,79	1,91	2,00
Hungary	0,86	0,93	0,99	0,96	0,99	1,14	1,15	1,20	1,27	1,40	1,37
Poland	0,56	0,57	0,55	0,56	0,60	0,67	0,72	0,75	0,88	0,87	0,94
Slovak Republic	0,50	0,50	0,48	0,45	0,46	0,47	0,62	0,67	0,81	0,83	0,89

Table 2 shows expenditures on research and development in the V4 countries in the period under with the exception of one year increased but even one of these countries did not reach the average European level. Throughout the period the highest was Czech Republic, followed by Hungary, then Poland and Slovakia that had the lowest spending on research and development for long time. In 2014 only reached 43% of the European average and not even half of the expenses of the Czech Republic and it indicates a significant lagging of Slovak republic not only within the EU but also in the V4 countries.

The level of innovativeness in a country depends not only on the volume of finance but also on the conditions enabling undertakings their introduction and utilization. For evaluation of innovativeness of individual countries can be used a multiple indices that comprehensively evaluate the preconditions for the innovative development created in each country. At the global level for innovativeness evaluation among other indicators can be used the Global Innovation Index (GII) assessing the innovation capacity of a countries that are assessed by exploiting their innovative potential.

GII is published every year since 2007 by World Intellectual Property Organization together with Cornell University and INSEAD. The report from 2016 evaluates 128 economies of the world using 79 indicators. The Global Innovation Index consists of two sub-indices that evaluate inputs and outputs of innovation processes. The inputs are evaluated by five pillars forming in the economy environment stimulating the development of innovation. Outputs respectively results of innovation activities are evaluated by two pillars that represent actual achievements in innovation. Global Innovation ratio is obtained by averaging two above mentioned sub-indices and it can reach a high values from 0 till 100. Additionally is published Innovation Efficiency Index – IEI which is calculated as the ratio of the sub-index of innovative products and sub-index innovation inputs. Using Innovation Efficiency Index is possible to assess the effectiveness of innovation systems in different countries (INSEAD & WIPO, 2016). Development of the Global Innovation Index and the order of placing the V4 countries in the period of 2011-2015 shows table 3. For comparison is possible to state also the GII value of Switzerland to which for the fifth consecutive year belongs the first place in GII ratings. According to the World Economic Forum Switzerland can be regarded as an innovative leader due to its global research institutions, high level of spending on research and development from businesses side and intensive cooperation between academic and the private sector. Switzerland also boasts the highest number of patents per capita in the world and excellent education system supporting talents. Swiss innovation ecosystem creates a favourable environment for creative activity supported by public and private sector (WEF, 2015).

Tab. 3 – GII development in the V4 countries and Switzerland in the year 2011 - 2016. Source: own processing based on INSEAD & WIPO, 2012-2016.

Year	2011	2012	2013	2014	2015	2016
Economy	rank-score	rank-score	rank-score	rank-score	rank-score	rank-score
Switzerland	1 – 63,8	1 – 68,2	1 – 66,6	1 – 64,8	1 – 68,3	1 – 66,3
Czech Republic	27 – 47,3	27 – 49,7	28 – 48,4	26 – 50,2	24 – 51,3	27 – 49,4
Hungary	25 – 48,1	31 – 46,5	31 – 46,9	35 – 44,6	35 – 43,0	33 – 44,7
Poland	43 – 38,0	44 – 40,4	49 – 40,1	45 – 40,6	46 – 40,2	39 – 40,2
Slovak Republic	37 – 39,0	40 – 41,4	36 – 42,2	37 – 41,9	36 – 43,0	37 – 41,7

The data in table 3 result that the development values of GII in the V4 countries in the period 2011-2016 was fluctuating during the reporting period. However, in the three countries has increased what can be seen as a slight increase of innovativeness in these countries. In Hungary the index value and also innovativeness for the period decreased. When is comparing the GII value of V4 and Switzerland in 2016 we can find that the value of GII of Czech Republic reached 75%, Hungary 63%, Slovakia 62% and Poland 58% of GII value of Switzerland. If is necessary to notice the location of the development of the V4's position evaluation by the Global Innovation Index is possible to find for the period since 2011 to 2016 that the status of Czech Republic haven't changed, Hungary worsened by 8 partitions, Poland has improved by 4 partition and the position of Slovak republic has also changed. In 2016 the best placed in ranking is Czech Republic (27), followed by Hungary (33), then Slovakia (37) and Poland (39). The values of the Global Innovation Index, Innovation Efficiency Index and value of sub-indices of the V4 countries and Switzerland for the year 2016 show table 4. The table describes GII assessment and evaluating the level of innovativeness are countries of V4 placed in the following order: the Czech Republic, Hungary, Slovakia and Poland. The same order the countries reached evaluation of Innovation Efficiency Index that evaluates the effectiveness of their innovation systems. All of the compared countries achieved in 2016 a higher value than the sub-index of inputs then sub – index of outputs. The comparison implies that the V4 countries as well as Switzerland are still successful in creating an environment that stimulates innovation development which is on average 73% of the Swiss. Less successful are for its use that is reflected in weaker results of the innovation process which is on average just 55% of the Swiss (INSEAD & WIPO, 2016).

In the table 4 can be seen the structure of the sub-indices of inputs and outputs as well as the value of the pillars from which are consist of. Sub-index of inputs characterizes the innovation environment consists of five pillars: institutions, human capital and research, infrastructure, market environment and business environment. The best score obtained in 2016 from all four countries the pillar – institution that assess institutional framework that creates the conditions in the country suitable for economic growth and entrepreneurship particularly the political, regulatory and business environment. The average value of this pillar for the V4 countries reaches 82% of the same pillar of Switzerland.

Tab. 4 – GII structure of the V4 countries and Switzerland in the year 2016. Source: own processing based on INSEAD & WIPO, 2016.

Economy	SW	CZ	HU	PL	SK	V4
Global Innovation Index	66,3	49,4	44,7	40,2	41,7	44,0
Innovation Input Sub-Index	68,4	54,3	48,9	48,7	48,0	50,0
Institutions	90,3	76,1	71,3	75,3	75,0	74,4
Human capital & research	63,3	48,3	41,2	39,6	32,8	40,5
Infrastructure	61,0	53,7	51,1	47,6	53,3	51,4
Market sophistication	69,8	50,5	41,0	46,5	44,2	45,6
Business sophistication	57,6	42,9	40,1	34,6	34,5	38,0
Innovation Output Sub-Index	64,2	44,5	40,5	31,7	35,4	35,4
Knowledge & technology outputs	67,0	42,8	44,4	27,2	32,3	36,7
Creative outputs	61,4	46,2	36,5	36,3	38,6	39,4
Innovation Efficiency Ratio	0,9	0,8	0,8	0,7	0,7	0,75

The second best score gained the pillar - infrastructure which is monitoring the level of use of ICT by governments and citizens, the existence and use of environmentally friendly transport and energy infrastructure and also the level of environmental protection. The average value of this pillar for the V4 countries is 84% of the value the same pillar of Switzerland. The following is a pillar of the market environment which includes the availability of a credit, investor protection, market conditions and economic competition. The average value of this pillar is 65% of the market environment of Switzerland. The worst rating among the entries of all four countries received pillars - human capital and research and business. Pillar - human capital and research evaluates the level of education and research in a country and the main assumptions of innovation development. Specifically it is focused on education expenditures and research and development, education level at all three levels and also the number of researchers. The average value of this pillar for V4 reaches almost 64% of the same pillar of Switzerland. The pillar - business environment is concerned on the way how the business environment affects the development of innovation. It tracks the number of knowledge workers, the existence of services based on knowledge, level of the cooperation in the innovations between the private and public sectors, the number of patents, license fee, the volume of direct foreign investment and the other characteristics affecting the efficiency of the business respectively innovation environment. The average value of this pillar is at less than 66% of the business environment of Switzerland (INSEAD & WIPO 2016).

Sub-index of outputs consists of two pillars assessing the real achieved results in the field of innovations. These include pillars of knowledge and technology and creative outputs. In all V4 countries with the exception of Hungary in 2016 had better assessment the pillar of creative outputs tracing the formation of intangible assets in the form of trademarks and the using of information and communication technologies in business and management, creation of creative goods and services, as well as the participation of the population online creativity. The average value of this pillar for the V4 countries reaches 64% of the same pillar of Switzerland. Except of Hungary is the pillar - knowledge and technology worse evaluated which includes everything that is the result of inventions and innovations. Specifically it deals of the new findings in the form of patents, utility models, scientific articles and citations. The impact of innovation on macroeconomic and microeconomic activities for instance increased productivity, creation of new enterprises, software application and concrete benefits from new knowledge in the form of increasing the income of the country. The average value of this pillar amounts to 54% of the value of same pillar of Switzerland (INSEAD & WIPO 2016).

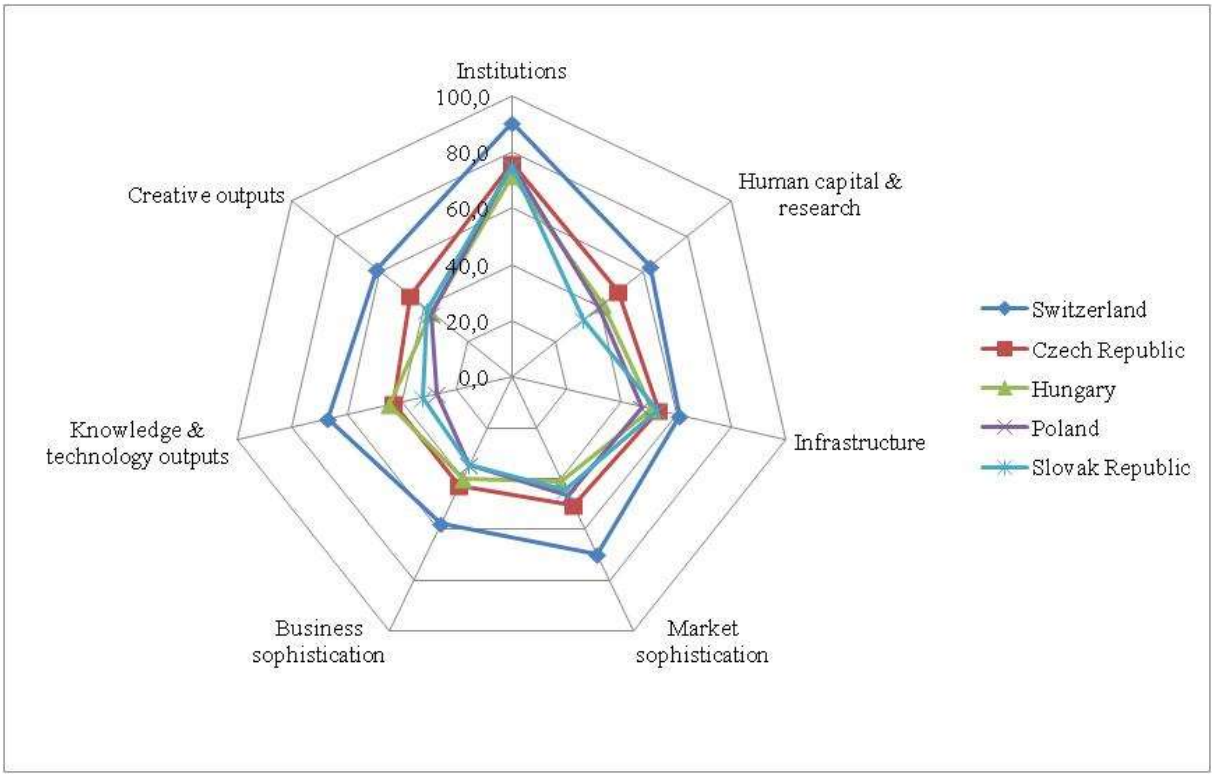


Fig. 2 – Comparison of the GII pillars in 2016 in the V4 countries and Switzerland. Source: own processing based on Index INSEAD & WIPO, 2016.

From the analysis of the various pillars of the Global Innovation Index for the year 2015 in the V4 countries and from the graphically depicted in figure 2, follows that the V4 countries achieve better results in the creation of innovative environment then in exploitation of it. To the strengths that influence the innovation environment in these countries belong institutions market environment and infrastructure; the weaknesses are human capital and research and business environment. To evaluate the real achieved results of innovation development have countries of V4 relatively better results in creative outputs and worse in the creation of new knowledge and technologies.

4.RESULTS AND DISCUSSION

The analysis of competitiveness of the V4 countries has showed that level of competitiveness during the period 2011 to 2016 for several years has continued to deteriorate and only in the last 3 years with the exception of Hungary began to improve. Highest level of competitiveness throughout the period amounted Czech Republic and the worst evolution experienced Hungary. In 2016 Czech Republic was in the competitiveness ranking in the best position - in the 31st place and Poland in the 36th place, Slovakia in 65th place and 69th was placed Hungary. The position of V4 countries in the competitiveness ranking adversely affected especially innovation in which all four countries achieved the lowest values among the 12 pillars of competitiveness. Innovations are considered to be one of the crucial pillars affecting the competitiveness of advanced economies. The impact of innovations to the competitiveness is also reflected in the ranking of the country and placement in competitiveness. Countries that have achieved a higher ranking pillar of innovations also have reached better place in competitive position. In 2016 among the V4 countries Czech Republic achieved the best score in the innovation pillar which is also the position of competitiveness ranked the best place. In

contrast, Hungary with the lowest innovation pillar is among four countries placed in position on the worst spot. (WEF, 2016)

From the assessment of innovativeness of the V4 countries can be seen that in the countries are not created conditions yet which could create conditions for successful innovation development. Insufficient expenditures on research and development are one of them which determine not only the level of innovation environment of the country but also its innovation performance. Expenditure on research and development have grew in the V4 countries from 2004 to 2014 with the exception of one year but even in one of the countries did not reach the average of European level. Throughout the reporting period were the highest in the Czech Republic, followed by Hungary, then Poland and Slovakia that has the lowest long-term spending on research and development. Therefore the long-term low volume of funds invested in innovation development in the V4 countries is in our opinion the root cause of their low innovation performance.

The level of innovation in a country depends not only on the volume of finance but also on the conditions enabling undertakings to the deployment and using them. The V4 countries are ranking under the Global Innovation Index in the order: the Czech Republic, Hungary, Slovakia and Poland. The same order of these countries has been achieved assessing the Efficiency Innovations Index that evaluates the effectiveness of their innovation systems. Evaluating the development of innovation in the period since 2011 until 2016 have been found the development of value of GII in the V4 countries was variable. Innovativeness in the Czech Republic, Poland and Slovakia for that period increased but in Hungary decreased. In 2016 the best position ranked the Czech Republic in the 24th place, Hungary in 35th, Slovakia and Poland in the 36th and 46th place which roughly corresponds to their order with expenditures on research and development.

Assessing the various pillars of the Global Innovation Index for the year 2016 in the V4 countries is concluded that the V4 countries have achieved better results in the creation of innovative environment as in its using. To the strengths influencing the innovation environment in these countries include institutions, market environment and infrastructure, and weaknesses are human capital and research and also business environment. Evaluating the real achieved results in the innovation development has countries of V4 relatively better results in creative outputs and worse in the creation of new knowledge and technologies.

Since innovations is one of the key pillar affecting the competitiveness of developed economies their low level is one reason for the relatively low level of competitiveness of V4 too. The impact of innovations on competitiveness is also reflected in placing country's competitiveness position. Significant impact of innovation on competitiveness is apparent from a comparison of the development of the Global Innovation Index and the development of Global Competitiveness Index of the V4 countries in the period 2011 - 2016. Improving innovation of a country measured by the GII also reflecting the improvement of competitiveness measured by the GCI and vice versa.

5.CONCLUSION

Nowadays competitiveness is one of the most monitored characteristic of national economies and is increasingly appearing in the evaluation of their prosperity, welfare and living standards**.** Despite the fact that V4 countries are considered as economically developed countries compared to the most developed countries of the world and Europe still are lagging behind in several aspects. One of them is their innovation which turn affects their competitiveness. Within the countries of European Union the countries of V4 belong to the less successful innovators and their innovation performance is less than average European level. Relatively the highest level of innovation level among the V4 countries for several years reaches the Czech Republic followed by Hungary, Slovak Republic and the lowest level of innovation has Poland. The root cause of low innovation performance of these countries is in our opinion the long-term low

volume of funds that these countries invest to the innovation development. In addition in these countries are not developed more important prerequisites yet for successful innovation development such as sufficiently-high level of education and also level of research activities. This can be subsequently reflected in the low innovation activity and creativity in particular small and medium-sized enterprises and low innovation performance of the V4 countries. So if they want to be competitive comparing with the most developed countries of the world they must be more focused on creating conditions favourable to innovative development what is the role of the state and its innovation policy. Successful economies in innovation development belong to the most competitive countries in the world. For less developed countries is a way how to increase their efficiency and competitiveness in particular by reinforcing the innovation development. Therefore is necessary in V4 countries to carry out reforms if their existing innovation policies which are not bringing expected effects. Reforms of innovation policies should focus particularly at increasing resources of funding innovative development especially increase resources accruing from the private sector. The countries of Visegrad four should adopt measures that would stimulate in a greater extent the business sector to engage in research, development and innovation as well as in international cooperation which brings the participants in the innovation synergies. If the V4 countries would be able to manage to increase their innovation development it would be reflected in the growth of their efficiency and competitiveness.

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IMPACT OF FOREIGN INVESTMENT ON THE COMPETITIVENESS AND QUALITY OF LIFE IN CONDITIONS OF GLOBALISATION

Gasova Katarina, Stofkova Zuzana

Abstract

Multinational corporations play an important role in the world economy due to the process of economic globalisation. The economic interdependence of national economies is increasing across the world through a rapid increase in cross border movement of goods, services, technology and capital. National and local governments often compete with one another to attract multinational corporation with the expectation of increased tax revenue, employment and economic activity. Political entities may offer multinational corporation incentives such as tax breaks, pledges of governmental assistance or subsidised infrastructure or lax environmental or labour regulations. The contribution is focused on the multinational corporation, global competitiveness index and the foreign investment development in automotive industry in the Slovak Republic.

Keywords: foreign direct investment, automotive industry, global competitiveness index,

JEL Classification: E22, F21, L62

1.INTRODUCTION

Globalisation and global interconnectivity bring changes which affect various areas of everyday life as well as the national economy. The world is currently characterised by explosion of information and increase of innovation. Global production networks were created due to the industrial globalisation. A financial globalisation is based on the connection between global financial markets. It results in foreign investment flow into the country and related multinational corporations creating global business and work environment. Multinational corporation can be defined as dominant corporation whose position extends beyond the borders of one country. A necessary condition for corporation's success is an innovation and technological development. Multinational corporations, globalisation and related innovation are current topic in the Slovak Republic.

2.MULTINATIONAL CORPORATIONS

Multinational corporations as an evolutionary stage of international companies can be defined as an association, corporations, holdings consisting of controlling companies and their foreign affiliates are called subsidiaries, associates or affiliates which are located in at least two other countries. The controlling company is a company that has been involved in the turnover and the basic capital of affiliate at least by 10% in the long term, or owns the voting right in a particular host country. (Dvoracek, 2006).

The term of multinational corporation is mainly understood as a company whose headquarters is located in one country and is involved in foreign trade. It means a subsystem of international organisations of economic specialisation. Essential feature is the aim of business - profit making. Realised transactions are allocated into external, which take place between businesses and these corporations and internal, which are carried out between the controlling company and subsidiary companies in the mother country and abroad. (Lysak & Gress, 2005).

According to organisational aspect can multinational corporations have a form of multinational concern, syndicate, cartel and trust. Corporations can be private or owned by state. Global

multinational corporations concentrate a great economic power and have big influence on the economies of host countries. The positive impact of foreign direct investment is not always beneficial for the development of global economy. (Loucanova et al, 2015)

Factors affecting the growth of cross border activities of multinational corporations include:

- technological changes (results of own research),
- increase in the companies size,
- competitive pressure increase as a result of globalisation, and
- opening of markets as a result of deregulation and liberalisation. (Lysak & Gress, 2005).

2.1.Multinational corporations in globalisation

Currently we live in an age of international business. Companies involved in international trade can be named by different terms e.g. "international corporations", "transnational corporations" or the most common used "multinational corporations". The concept of multinational corporations began to show after the World War II. mainly in industry and banking. Foreign production currently brings higher growth rate compared with export and import. Goods necessary for the effective operation of foreign subsidiaries have significant overbalance in connection with changes in the structure of import and export. (Balaz et al, 1995).

Features of multinational corporations:

- owners are from more than one country,
- turnover more than 1 billion USD,
- high share of foreign sales in total turnover,
- dominating, large companies involved in international business,
- give substantial financial resources to support research and development,
- business is carried out in various sectors and support international diversification,
- controlling company expands business through subsidiaries and branches of affiliates to other countries,
- companies which have shared ownership and global strategy, and
- various and frequent international transactions.(Balaz et al, 1995).

Globalisation has brought important changes mainly in the corporate structure in the global economy. (Majernik 2016) Several multinational companies have become important part of the global governance processes. Each of these companies has a different internal structure and economic dimension in the foreign market, however has an important role in one or more segments. (Stofkova 2015) Chances for small businesses and small national economies are reducing due to these changes. One of the messages of globalisation says: "Who was rich will be even richer, who was poor will be even poorer". (Balaz & Vercek, 2002).

3.AIM OF THE CONTRIBUTION

Authors aim to introduce global competitiveness index of the Slovak Republic, quality of life and foreign direct investment into automotive industry. Theoretical basis gives a description of multinational corporations in globalisation. The contribution presents main reasons motivating the foreign investors into investing in automotive industry in the Slovak Republic, based on the results of current state analysis.

4.MATERIAL AND METHODS

Relevant information sources were used:

- domestic and foreign book literature,
- scientific publications and articles,
- the global competitiveness report 2016 – 2017, and
- report describing automotive sector in the Slovak Republic.

During the research were used following methods:

- data collection method for the theoretical basis creation,
- excerption method for selection of essential information,
- method of analysis during the description of automotive industry and foreign direct investment in the Slovak Republic,
- method of synthesis used for identification of main reasons attracting foreign investors to invest in Slovak automotive industry.

5.GLOBAL COMPETITIVENESS INDEX AND QUALITY OF LIFE

Multi-criteria evaluation, which is analysed and published by the World Economic Forum has a significant influence on the successful competitive position. The evaluation contains of 12 pillars consisting of quantifiable value and questionnaires surveyed indicators as institutional framework, infrastructure, macroeconomic stability, quality of basic education and health of the population, higher level of education and continuing education system, innovation etc. (Porter 2008)
The World Economic Forum (WEF) in Switzerland conducts competitiveness ranking of 138 countries based on a survey among businesses. The survey was conducted from February to April 2016 and more than 14,000 executives from around the world including 130 from the Slovak Republic participated in it. Business Alliance of Slovakia (PAS) is a partner of the WEF and coordinator of the survey in the Slovak Republic. Results of the evaluation reflect the state of the economy and the managers' opinions of large and small companies. Responses were obtained electronically through the WEF website.
The Slovak Republic ranked 65th place which represents a shift by two positions upwards compared to 2015. The global competitiveness index (GCI) has since 2014 increasing trend, as expressed by following figure. (Tab. 1.)

Tab. 1. Trend of GCI of the Slovak Republic Source: PAS, 2017.

Year	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Rank	45	38	40	49	43	43	41	37	41	46	47	60	69	71	78	75	67	65
Change	-	7	2	9	6	0	2	4	4	5	1	13	9	2	7	3	8	2

Rating of the Slovak Republic improved only slightly in technological readiness and innovation, but stagnated in other areas. The shift in ranking is just a little due to a deterioration of other countries. Managers rated the level of health and primary education as the best (6 points out of 7) as well as the macroeconomic environment and technological readiness. (PAS, 2017)
The most serious problems of business in the Slovak Republic were: corruption, which increased to 19.2%, tax rates (17%), inefficiency and bureaucracy of the government (14.8%). The most problematic factors for doing business were expressed following.(Fig. 1.)

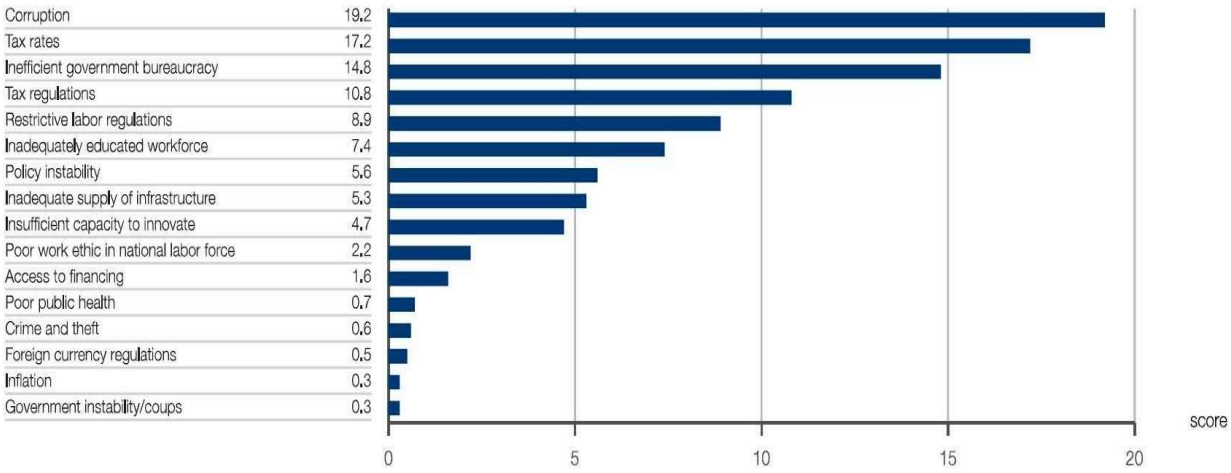


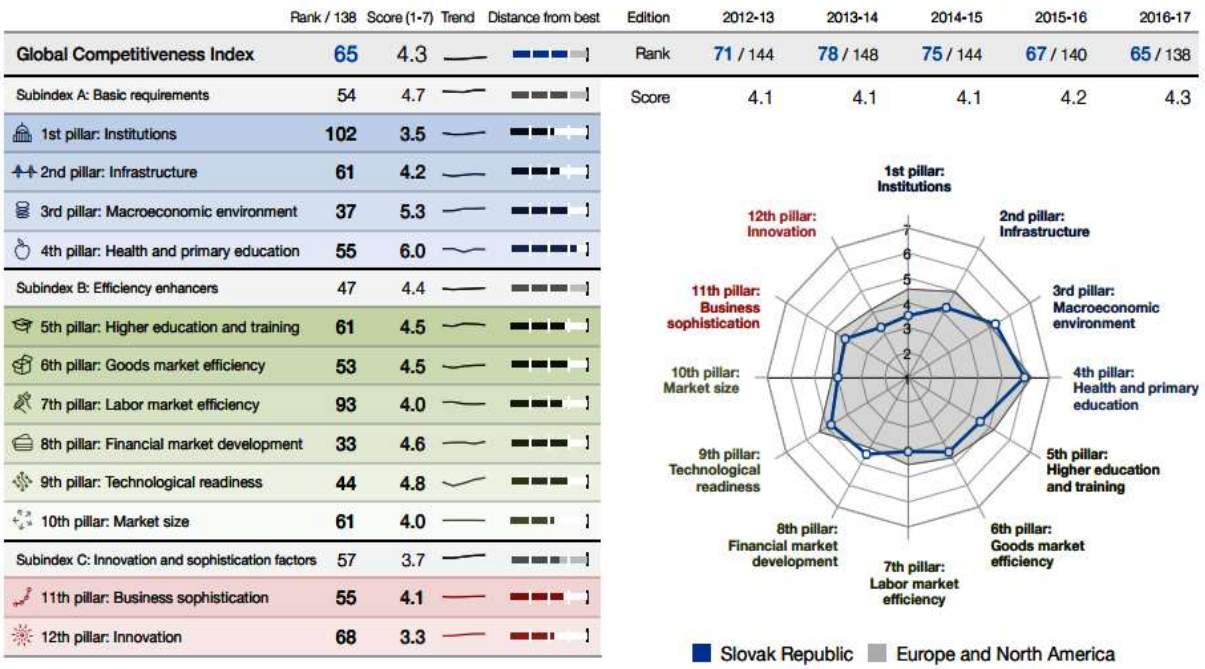
Fig. 1. Most problematic factors for doing business in the Slovak Republic 2016. Source: PAS, 2017.

The Slovak Republic is still in the last ten among of 138 countries of the world due to evaluations of managers. On the contrary, Switzerland takes the leading position for eight years. As expressed by the following figure Singapore took the second place and the United States of America the third. (Tab. 2.) The United Kingdom of Great Britain and Northern Ireland and the Netherlands progressed to the top ten. Japan and Hong Kong drop by two positions. The Czech Republic has the best position among the Visegrad four countries, but the Polish Republic is catching up.

Tab. 2. Global competitiveness Index 2016 Source: PAS, 2017.

Country	Rank		Change
	2016	2015	
Switzerland	1	1	→
Singapore	2	2	→
United States of America	3	3	→
Netherlands	4	5	↓
Germany	5	4	↑
Sweden	6	6	→
United Kingdom	7	10	↓
Japan	8	6	↑
Hong Kong	9	7	↑
Finland	10	8	↑
Czech Republic	31	31	→
Poland	36	41	↓
Slovak Republic	**65**	**67**	↓
Hungary	69	63	↑

The Global competitiveness index (GCI) refers to the country perspective of achieving sustainable economic growth in the medium term. GCI annually evaluates the quality of public institutions, government policies and other factors which determinate the level of productivity and prosperity. Areas evaluated by the GCI are expressed by the following figure. (Fig. 2.)



	Rank / 138	Score (1-7)	Trend	Distance from best
Global Competitiveness Index	**65**	4.3		
Subindex A: Basic requirements	54	4.7		
1st pillar: Institutions	**102**	**3.5**		
2nd pillar: Infrastructure	**61**	**4.2**		
3rd pillar: Macroeconomic environment	**37**	**5.3**		
4th pillar: Health and primary education	**55**	**6.0**		
Subindex B: Efficiency enhancers	47	4.4		
5th pillar: Higher education and training	**61**	**4.5**		
6th pillar: Goods market efficiency	**53**	**4.5**		
7th pillar: Labor market efficiency	**93**	**4.0**		
8th pillar: Financial market development	**33**	**4.6**		
9th pillar: Technological readiness	**44**	**4.8**		
10th pillar: Market size	**61**	**4.0**		
Subindex C: Innovation and sophistication factors	57	3.7		
11th pillar: Business sophistication	**55**	**4.1**		
12th pillar: Innovation	**68**	**3.3**		

Edition	2012-13	2013-14	2014-15	2015-16	2016-17
Rank	71 / 144	78 / 148	75 / 144	67 / 140	65 / 138
Score	4.1	4.1	4.1	4.2	4.3

Fig.2. Dimensions of Global Competitiveness Index of the Slovak Republic. Source: PAS, 2017.

The Slovak Republic lags behind in innovation and quality of public institutions. In comparison with the Czech Republic is Slovak financial market equally advanced. (PAS, 2017)
The competitiveness is closely related to quality of life. Quality of life is becoming in a European and global scale currently very topical and important issue. Among the most famous comparison of the standard of living in terms of value is the size of gross domestic product (GDP) per capita and the Human Development Index (HDI). They are the most widely used methods in a multinational comparison of quality of life. Growth of GDP per capita of the Slovak Republic express the following figure. (Fig. 3)

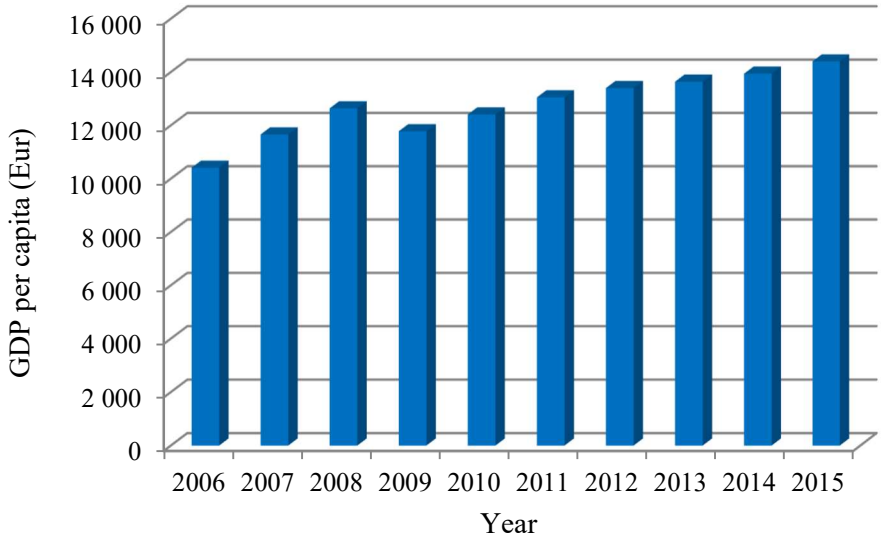


Fig. 3. GDP per capita. Source: Statistical Office of the Slovak Republic, 2016.

Development of indicators in the real economy of the Slovak Republic in the period between 2009 and 2015 has been positive. A slight recovery of the European economy, except the decline of oil prices and low interest rates by the European Commission also supports the

growing export and private consumption growth, which is reflected in the quality of life of citizens. (Soltes 2016)

6. THE CURRENT STATE ANALYSIS

Foreign investments are a realisation form of long term international movements of capital, which is divided into direct and portfolio investment. During the portfolio investments exporter does not control nor manage companies abroad and gets only incomes on foreign capital e.g. interest, dividends, share of profits etc. Foreign direct investment is a category of international investment which reflects the intention of a resident of one economy (direct investor) to obtain a lasting interest in enterprise resident in another economy (direct investment enterprise). The development over time and forecast of foreign direct investment in the Slovak Republic is expressed by the following figure (Fig. 4)
Based on the previous development, analysts' expectations and macroeconomic models is expected that the direct foreign investments will reach by the end of 2016 a level of € 269.09 million. Short term analysis assumes that in 2017 FDI will stabilize at € 234,2 million. Econometric models which provide long term assumptions argue that trend in foreign direct investment in 2020 will be approximately € 233.2 million. (Trading Economics, 2016)

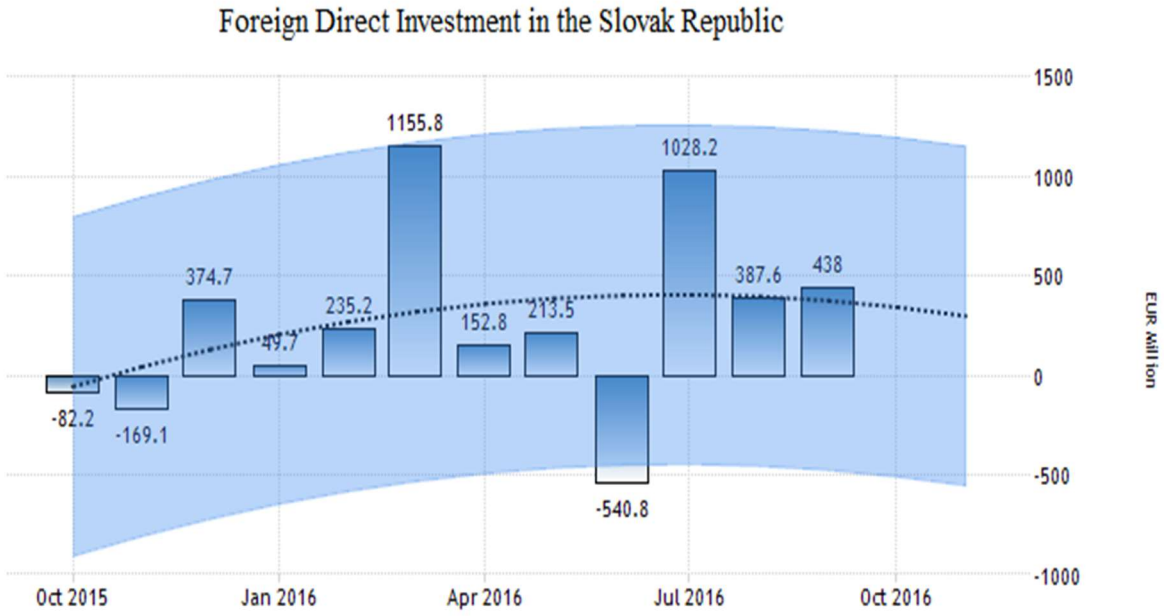


Fig.4. Foreign direct investment in the Slovak Republic. Source: Trading Economics, 2016.

7.RESULTS

The Slovak Republic has a long tradition in many industries such as mechanical, chemical, wood-processing, electronics and food industry. Despite this the country has become one of the leading automotive manufactures in Central and Eastern Europe, mainly due to three global automotive companies which are on its territory: Volkswagen (Bratislava), PSA Peugeot Citroën (Trnava) and KIA Motors (Žilina), including Tier suppliers. (SARIO, 2016)
The automotive industry development was initiated in the early 90's by building up an automotive plant of the German company Volkswagen AG. It has helped the Slovak economy development after the armament production termination and started to build a supply chain, which increased further investment in the automotive industry in the supply sector.

The second important wave of investment in the automotive sector was realised by the arrival of Peugeot Citroën (2003) and KIA Motors which built up the manufacturing and assembly plants in Trnava and Zilina. Both automotive plants had an estimated production capacity of 300,000 cars per year at the entry into Slovak market. Car production increased significantly after the production lines started up and the Slovak Republic has become one of the largest automotive manufacturers of the world in the number of produced cars per 1,000 inhabitants. A range of suppliers Tier-1, Tier-2, Tier-3 series, which can supply the products to other automotive companies abroad, were built due to the mentioned automotive plants. (SARIO, 2016)

Approximately 80,000 people are currently employed in these automotive companies or their suppliers and about 200,000 people are employed directly or indirectly in the automotive industry. The share of automotive industry in overall industrial production of the Slovak Republic is 43% and the share in the total industrial exports accounts for 35%. Automotive plants and automotive industry suppliers in the Slovak Republic are expressed by the following picture. (Fig. 5.) (SARIO, 2016)

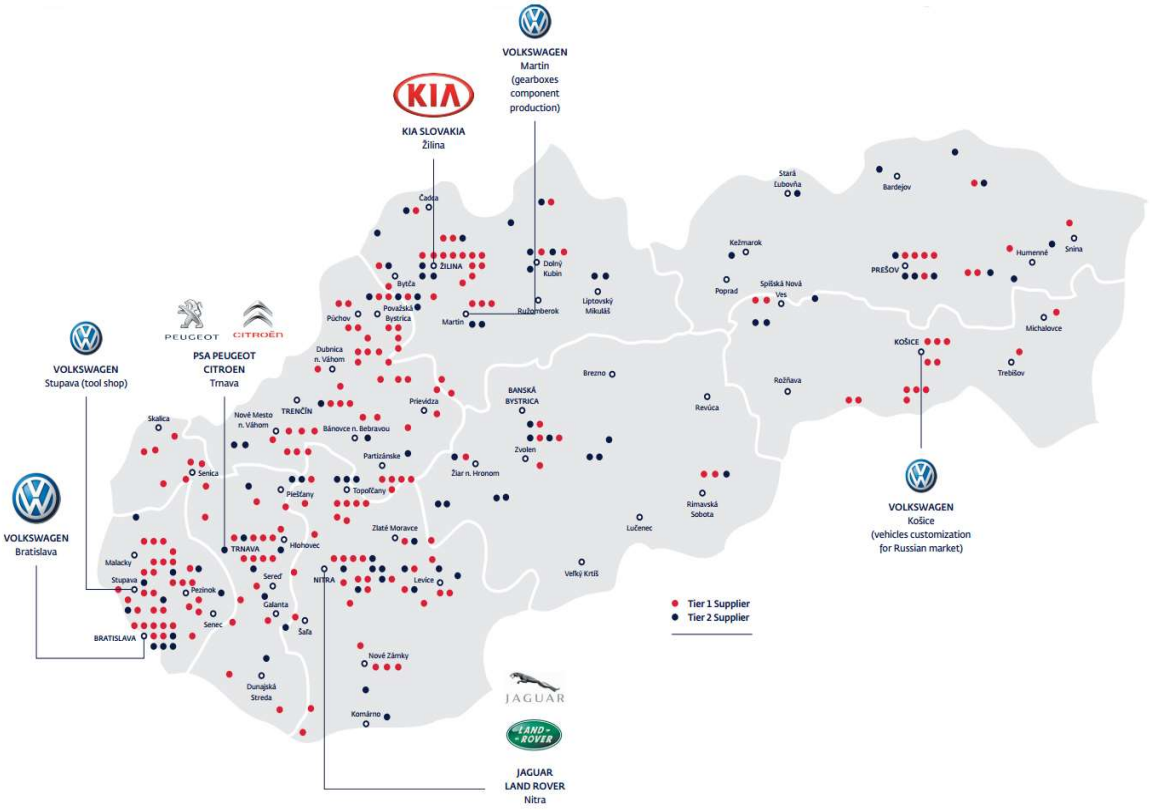


Fig.5. Automotive companies and automotive industry suppliers in the Slovak Republic. Source: SARIO, 2016.

Fact sheet about the main automotive companies in the Slovak Republic provides the following table. (Tab. 3.)

Tab. 3.Fact sheet about the main automotive companies. Source: SARIO, 2016.

Automotive producer	Year of establishment	Production (2015)	Number of employees
Volkswagen Slovakia	1991	397,458	9,900
PSA Peugeot Citroën Slovakia	2003	303,025	3,500
KIA Motors Slovakia	2004	338,000 vehicles 582,000 engines	3,800
Jaguar Land Rover	2015 Start of operation: 2018	capacity: 300,000	estimated: 2,800

The established automotive companies are not the only strength of the automotive industry, but also a quality network of suppliers which includes Tier-1, Tier-2, Tier-3 suppliers, integrated suppliers of engineering services, small engineering companies, university science departments, scientific research institutions, suppliers of consulting services, software services suppliers, suppliers of technologies and local research and development institutions. Category of Tier-1 suppliers represents a system suppliers who have their own established production or assembly and Just-In-Time capacity, or own engineering and development centers. Tier-1 suppliers usually supply seating systems, interior systems and gearboxes. Tier-2 suppliers are suppliers of components and modules and Tier-3 suppliers deliver parts and components such as raw material e.g. metal parts, plastic or aluminium parts.
As expressed by the following figure 1,040,025 cars, i.e. 178 cars per 1,000 inhabitants were produced in 2015. (Fig. 6)

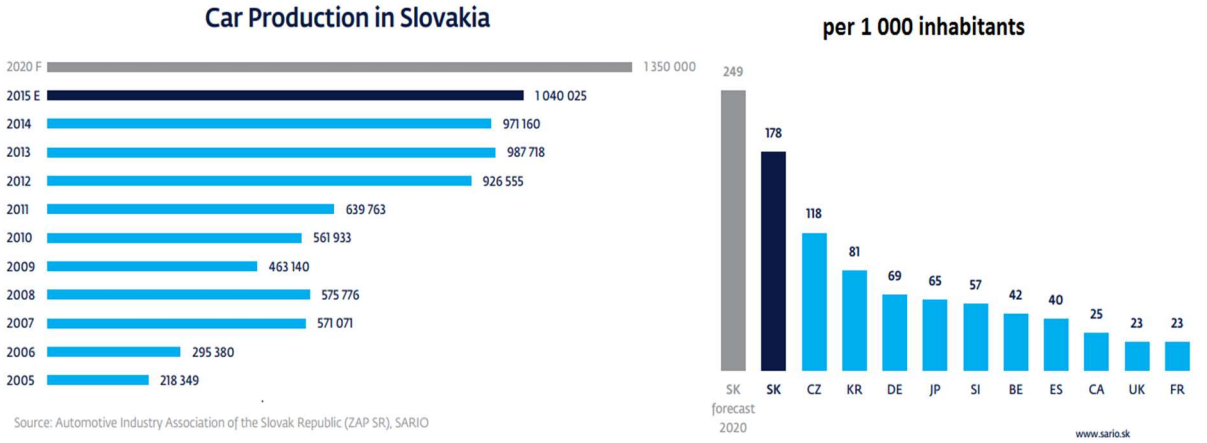


Fig. 6. Car production in the Slovak Republic and per 1,000 inhabitants. Source: SARIO, 2016. In 2020 is planned a production of 1.35 million cars i.e. 249 cars per 1,000 inhabitants. (SARIO, 2016)

7.1.Cluster cooperation

In the Slovak Republic are two types of clusters: industrial and tourism. In the automotive industry operates Autocluster in Trnava. (Stofkova, 2014) It is intended to assist the development of subcontractors in the automotive industry and provide assistance to ensure the competitiveness at home and abroad through the peer grouping of industrial companies, universities, scientific research institutions and other entities of the private and public sector. Autocluster aims to ensure coherence of production demands with academic and scientific research environment. Autocluster helps small and medium-sized businesses to succeed in

foreign markets and supports their involvement in international projects in the innovation and technology transfer field. (Autocluster, 2017)
Cluster provides various services for its members e.g. information services about the possibilities of using the European Union and the Slovak Republic support programs, promoting members on domestic and international events, preparation of analyses and expert studies, international cooperation in the production, research and development, business missions, cooperative exchanges and meetings, professional seminars, conferences and mediation for joint purchase of services, goods and energy.
Autocluster actively participates in the implementation of several international projects which are supported by European Union funds like: Automotive without borders (cross border cooperation programme with the Czech Republic), FastInCHarge (the development of infrastructure offering a global solution for electrified vehicles charging) and React (Cross border cooperation programme with the Republic of Austria).
Autocluster also contributed on the creation of the supply-demand portal (PD Portal) for collaboration between research and automotive companies. Portal is used to enter the business sector demands and the supply of research and development activities. It provides information about scientific research institutions like their technical equipment and possibilities of cooperation with business sphere. Portal represents a database of member of the automotive cluster and provides information on the research and development needs of the automotive cluster members with regard to the improvement of technological processes and production lines. (Autocluster, 2017)

8.DISCUSSION

There are several reasons which attract foreign investors to invest in the Slovak Republic:

- the highest labour productivity among all countries of the CEE region,
- cheap and skilled workforce,
- political and economic stability,
- strategic position in the Europe with good export potential,
- wide network of automotive suppliers,
- growing number or research and development centers,
- technically oriented schools and implemented dual education,
- the currency: euro,
- attractive investment incentives for the automotive industry, and
- well developed infrastructure.

Student in the Slovak Republic can gain knowledge in the automotive industry through five technically oriented universities and 32 faculties. In 2016 exactly 42,453 students studied technically oriented fields of study at universities and 14,468 students graduated in these fields. More than 54 secondary vocational schools prepare students for future career through a dual training and cooperates with 115 companies all over the Slovak Republic. (SARIO, 2016)
Research and development centers are not only trying to offer solutions leading to cost savings but also solutions, which enhance the flexibility of the company so the company become susceptible to the needs of businesses and customers. The government is trying to encourage foreign investors to locate their project in regions with high unemployment rate through various incentives in the automotive industry. These investments will help to create new jobs, increase the chances for graduates to get a job and create new opportunities for local businesses. (SARIO, 2016)

9.CONCLUSIONS

Jaguar Land Rover plans the completion of automotive plant in Nitra in the second half of 2018. Compared with Volkswagen AG, which has invested in the Slovak Republic about 1.65 billion euros since 2012 Jaguar Land Rover plans to invest about 250 million fewer. In October 2016 announced Volkswagen AG its plans to build a new logistics center to the end of 2017,which will cost about 150 million euros. The building of logistics center will reduce costs and contribute in the unemployment reduction in the Slovak Republic. The currently ongoing construction of the Porsche Cayenn body shop, in which Volkswagen AG has invested about 500 million euros, is planned to be completed in 2017. Volkswagen is currently considering countries suitable for placing production plants for car batteries, due to growing interest for electric vehicles. (Toma, 2016)

Despite the fact that the Slovak Republic offers cheap and skilled labour force are automotive companies currently feeling its lack. Hungarian Audi sent 550 employees to assist into automotive plant in Bratislava in November 2016. Volkswagen AG has a dual academy which annually delivers about 100 skilled employees.

We can assume that the current lack of skilled labour force will cause a competition between companies which are currently operating in the automotive industry. It can results in a flow of cheaper labour from neighbouring countries but on the other hand can increase the minimum wage in the Slovak Republic. The automotive industry in the Slovak Republic is not in the direct competition, nevertheless brings innovative development through its impact on other related areas and sectors.

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SUPPORTING INNOVATION: THE ROAD TO CREATIVE EXCELLENCE IN UNIVERSITIES – PRELIMINARY FINDINGS

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Abstract

The capability to innovate is one of the necessary presuppositions of long-term organizational competitiveness and performance. Although the volume of articles and books focusing on innovation management is growing, certain aspects of this problematic seem to be neglected. Firstly, literature focused on innovation management concentrates mainly on business organizations and is not giving details or recommendations on how to innovate in academic environment. Secondly, despite a decent number of articles on innovation management in scientific journals, information about the procedures and tools concerning the creation and support of innovation within organizations lacks details. Therefore, the purpose of this paper is to describe in detail the activities, procedures and tools used for the creation and support of innovation at one of the most outstanding departments of the Faculty of Economics and Administration of Masaryk University in this respect – the Department of Economics. This article is framed as a descriptive single case study that is based on internal and external documents, several semi-structured interviews and observations conducted by us, who have been in the role of faculty members, and instructed students. The presented study is the first phase of a future research project that focuses on the ways of creating and supporting innovation in public universities. Besides the detailed description of the whole process of the creation and support of innovation, this paper also discusses some factors that have been influencing the quality, effectiveness and efficiency of the creation and management of innovation in the studied academic environment. Based on our findings, we consequently formulate first recommendations to improve the creation and support of innovation in academia.

Keywords: creative excellence, innovation management, Masaryk University, case study, recommendations.

JEL Classification: O31

1.iNTRODUCTION

The capability to come up with new and better solutions to given problems in general leads to organizational success and is assumed to explain the latter. Innovation of products/services or processes enables an organization to carry out its activities with lower costs, with lower failure rate or faster, which gives them a market advantage and allows them to cope with austerity measures. Organizations and/or institutions that do not exploit this opportunity and do not innovate, stick to old solutions and are not willing to change the way they do things, eventually lose the never-ending fight for "customers". However, innovation does not happen by itself, it is the result of specific causal conditions being met and of a specific organizational culture being instantiated and cultivated. The identification of these conditions – be they necessary or sometimes even sufficient for the creation and support of innovation – has been subject to many studies conducted especially in diverse industrial and business environments in order to install them in other organizations and, in this way, to reproduce organizational success.

The Department of Economics at the Faculty of Economics and Administration of Masaryk University is one of the most innovative departments according to existing performance comparisons made internally within the faculty. It reliably yields great results not only in the

number and quality of scientific papers, but also in the quality of its curriculum and quality of teaching. That is why we chose this department as a study object for our research focusing on creative excellence and innovation management in public universities. In the delivered study, we will try to find out how the department supports the creation of innovation. Thus, our research question is as follows:

"Which factors influence the innovative capacity of the Department of Economics?"

The structure of this text follows the descriptive nature of the study. Literature background for the management of creativity and innovation with the focus on the individual characteristics and capabilities impacting innovation, work environment created by executives and organizational surroundings, and the methods of new idea evaluation impacting the quality of results is briefly described in section 2. It mainly summarizes our knowledge of the topic and, thus, uncovers the context in which this descriptive single case study was developed. The methodology of this paper and mainly the details of the studied case are presented in section 3. Description of the activities, procedures and tools that are used (and how they are used) at the Department of Economics can be found in section 4. Section 5 concludes the paper, offers first recommendations, and discusses the limits and directions for further research.

2.THEORETICAL BACKGROUND

Throughout the years, innovation has been defined differently by various authors. Weick (1979), for instance, defines innovation as a new combination of old things and an old combination of new things. Usher (1929) argues that innovation is the constructive assimilation of already existing components into new wholes. These two definitions have a lot in common. Both definitions seem to assume or can be understood to presuppose the existence of some previously acquired knowledge and the re-combination with the specific goal of creating new knowledge. Usher (ibid.) adds that these re-combinations are not coincidental, on the contrary, they are created with the explicit purpose of solving a problem or situation.

One of the streams in creativity and innovation management research has focused on "fostering" innovation in business organizations. These studies (e.g. Hargadon & Sutton, 1997; Lingo & O'Mahony, 2010; Amabile, 1998) identified factors which influence the creation of innovation and also the ways of how managers can support the enforcement of some innovation within their company. In order for innovation to occur, there needs to be a variety of pre-knowledge, place where organizational members meet, exchange and re-combine their knowledge, capability of creative thinking and intrinsic motivation to reflect and innovate on the side of organizational members allowing these re-combinations, as well as a suitable management processes to control and evaluate the results.

The first presupposition of creating innovation is the existence of pre-knowledge, which can be re-combined with the intention of creating innovation. This knowledge, or expertise, enacts and allows for reflective use of skills; it constitutes and further enforce organizational capabilities. It is helpful, when expertise is based in many different fields, because heterogeneous expertise is significantly more effective in regard to the creation of innovation than homogeneous expertise.

The problem of homogeneous expertise with respect to innovation can be overcome by creating teams of individuals from various differing backgrounds, which is the case, for example, in the most innovative designer company IDEO (Hargadon & Sutton, 1997). Through mutual communication and collaboration within a team consisting of members with different social,

professional and knowledge backgrounds the overall organizational innovation potential can be increased.

However, widespread expertise as such is definitely not sufficient to create innovation. An individual's creativity plays a central role. According to Amabile (1998), when it comes to increasing individual creativity, motivation is an important key. Especially intrinsic motivation, which comes from within the individual, their personal goals and interests. Extrinsic motivation, "created" usually by means of rewards for success and punishments in case of failures, does help, but its impact is not nearly as significant and by overdoing can cause even harm. So, what sort of tools does a manager have when it comes to influencing co-worker's motivation? For one, assigning the right tasks to the right people is a good start. The task ought to be challenging, but not an unconquerable obstacle. Furthermore, the freedom to choose the means of accomplishing the task, available resources. Especially important is a constructive feedback, and often a simple word of encouragement does the trick. Recognizing how and when using these "tools" is appropriate comes down to the manager's capabilities.

Another important factor in the creation of innovation to be taken into account is "mood". Research in this field was conducted by George, Zhou and Baas (2008). They found out that it is less important whether the mood is positive or negative, as long as it is activating, not deactivating. This means that happiness and anger both have a positive impact on creativity, even though they are positive and negative respectively. Madjar, Oldham and Pratt (2002) also showed, that mood has an effect on creative thinking. All these studies, however, agree that mood itself does not help, and significant support of the manager and the co-worker's surroundings are required to increase motivation. In conclusion, and in order to increase co-workers' creativity, a manager should strive to create an activating atmosphere at the workplace and choose the right people for the job. Research in the field of creativity was also enriched by Hisrich, Peters and Shepherd (2010) who have shown that creativity has a tendency to decline with age.

When it comes to creating new ideas, teamwork is crucial. By working and interacting with team members, individuals can combine their personal knowledge (Sutton & Hargadon, 1997). A team leader can hold great influence over this sort of exchange, and can choose from several approaches to facilitating it. By exercising the *Tertius Gaudens* approach (Obstfeld, 2005), the manager creates a number of connections between him and isolated team members. He then uses his own creativity to create ideas. By doing this, the manager essentially makes himself a central part of all creative processes. For the company, however, the *Tertius Iungens* approach (Obstfeld, 2005) is better (Lingo & O'Mahony, 2010). Using this approach, a manager creates a wide net of connections, however, he also creates them between the individual team members, as opposed to keeping them isolated. This leads to an increase in the creative potential, as more minds become a part of the creative process. The manager in this model gives feedback and sets goals for the innovative process.

For creative process to be sustainable, it is important to have a suitable system of evaluation in order to decide, whether it is feasible to continue the work on a particular idea. There are many ways to evaluate an idea, the *Stage Gate* method being one of them (Cooper, 2001; Cooper, Edgett & Kleinschmid, 2002). This method divides the innovation process into several stages, which are separated by decision gates. In order for an idea to proceed to the next stage, it has to pass through an evaluation gate first, which means that it has to fulfill criteria specific for that gate.

Other streams of creativity and innovation management research looked at the way how organizations influence the innovative capability of companies within a region or industry. The

presence of research institutions such as universities in a region was recognized as an important factor. According to Blazek (2012), universities and other research institutions create a subsystem for knowledge creation, which significantly increases the innovation potential of companies within the region. Similarly, Xu (2016) argues, that building social relationships with universities with the intention of acquiring external resources can lead to an increase in innovation within and by companies. Universities in a region act as catalysts of knowledge exchange, thanks to their widespread contacts across multiple fields of research. Universities are not the only type of organizations suitable to act as catalysts, they do, however, excel in this role, as they generally do not try to dictate other actors in the region what to do and when, and their pursuit of goals generally does not negatively interfere or compete with other companies. On the contrary, it stimulates innovation growth (Powell & Wittington, 2012).

However, despite the consensus within literature about the significant role of universities on innovative processes within regions universities occupy, research focused on creativity and innovation management has concentrated mainly on business organizations and has not been giving details or guidelines on how to foster innovation in academic environment. Furthermore, universities are institutions whose mission is to hold up a mirror to society and to challenge conventional ways of thinking (Ruben, 2004). During recent years, in some countries austerity measures and related attempts of national policies to revise funding mechanisms and focus funding on institutions that perform are visible and universities have to challenge conventional ways of their management practices. Therefore, the purpose of this paper is to contribute to filling the identified research gap and to support creativity and emergence of innovation in academic environment via identifying and detailed describing relevant procedures and tools used by the management at one of the most outstanding departments of the Faculty of Economics and Administration of Masaryk University with respect to creativity and innovation – the Department of Economics. Besides the detailed description of the whole process of the creation and support of innovation, this paper also discusses some factors that have been influencing the quality, effectiveness and efficiency of the creation and management of innovation in the studied academic environment.

3.METHODOLOGY

This paper is framed as qualitative descriptive single case study. Most of the data used in this paper were collected by studying internal and external documents, direct observations and several semi-structured interviews (each lasting about 90 minutes), among others with the head of the Department of Economics and the head of the Centre for Scientific Information at the Faculty of Economics and Administration of Masaryk University, all of them conducted by us, who have been in the role of faculty members, and students of the master program Corporate Economy and Management instructed and accompanied by us. The case, which was studied, is a part of a future larger research project that focuses on the ways of creating and supporting innovation in public universities.

The Department of Economics at the Faculty of Economics and Administration of Masaryk University is a mixture of five university professors, three associate professors and 14 assistant professors. Currently, the members of the department are conducting 15 research projects, among others a research project funded by the European Union (Horizon 2020), and teaching many courses in the field of economics.

The goal we had in mind was to find out how the Department of Economics deals with the topic "innovation". We focused on innovation in the curriculum and how various department's members are involved in the process (especially whether they have the option to become part of this kind of innovative process or not), how they can share their ideas, how their ideas are

evaluated and by whom etc. We also focused on the criteria which are taken into account when choosing the course of innovation, and whether and how the Department of Economics cooperates with outside organizations.

All the interviewees gave us permission to record the conducted interviews. All the obtained recordings were then put into written form. The written form of the interviews became the base of our content analysis conducted with the help of the software program ATLAS.ti, where data became categorized. A greater portion of our attention went into the "How" question type.

Our content analysis gave us a valuable insight into the curriculum innovation process, the ways of gathering and dealing with information from students, the selection of courses offered to students, and cooperation with other universities. We also obtained some knowledge concerning the ways of new ideas creation on the side of the department's members, the ways of personal and group development at the department. An adequate attention was also given to task assignment, time management, team creation, creation of the working atmosphere, staff rewarding system and age structure at the department.

4.FINDINGS

A manager who has the ambition to increase the innovation capability of their organization needs to create suitable working conditions for their co-workers. These conditions should lead to the development of individual skills and intensive communication within the organization. Based on our empirical research, we found out which activities, procedures and tools are used in order to impact the working conditions.

4.1.Individual Expertise

As has been already stated, the innovative capability of an organization depends on the sort of expertise of the organizational members. The innovative capability of an organization is built upon the sum of experiences and expertise of every organizational member as a necessary – but not sufficient - precondition. The innovative capability of an organization can be updated and further developed. Whereas many different methods can be found in theoretical sources, the Head of the Department of Economics leaves it to the sole responsibility of his department's colleagues in dependence on their areas of interest. This is defended by the idea that if the researchers want to remain competitive and desired worldwide, they need to specialize, which is also often required by the department. Thus, the desire to expand one's knowledge is de facto a mandatory part of the researchers' work life. Without staying updated, they would quickly become uncompetitive on the job market. Thus, the Head of the Department does not organize any seminars or lectures. This approach to expertise is also supported by the age of the department's members, 80- 90% of whom are 32-43 years old. Relatively young and prospering people are more passionate about self-improvement and education than older, more conservative researchers.

4.2.Creativity and Intrinsic Motivation

Motivation is an important factor in supporting individual creativity. Intrinsic motivation comes from individual goals and interests. Thus, the Head of the department itself cannot directly designate or increase intrinsic motivation, but he can stimulate it by assigning his co-workers to tasks based on their interests and personality. A co-worker assignment also depends on their abilities and knowledge, which leads to the unleashing of individual potential, which stimulates their motivation.

Assigning tasks also depends on the amount of work that a specific person already has to do in the short term, as overworking negatively impacts an individual's mood, which then has a negative impact on intrinsic motivation. The department puts great emphasis on work-life balance.

Other than that, the Head of the department makes sure to balance time spent on administrative affairs in order to prevent a situation where one co-worker needs to commit all their time to administrative tasks while another has all the time they need for their research. This situation would be viewed as unfair and would lead to a decrease in motivation. Additionally, long-term routine work leads to decrease in creativity. On the other hand, the Head of the department tries to give each of his colleagues a reasonable amount of administrative work. Thanks to this, routine and creative work take turns, which lets the creative parts of the brain rest. This again leads to increased creativity. It is also important not to forget the mutual relationships between the individual members of an organization. "Theory" suggests that a team of well-connected and mutually agreeable members creates an activating atmosphere, which stimulates intrinsic motivation and creativity. As a result, team members rarely change places, which can have negative consequences for creativity. More brains bring more creativity, and an activating atmosphere increases motivation, but a rigid team of the same members that eventually sees a shift to synchronized thinking a creativity fades.

Feedback, as was mentioned, is another important factor which increases motivation, and at the Department of Economics it is given in the form of praise at regular meetings, either via a private dialogue or as a public compliment in front of others. Regular interviews take place once a year, at which a research fellow talks to the Head of the Department about their strong and weak points, and their overall future career and educational goals.

A great effort to provide feedback and support by the Head of the Department of Economics can be seen in these processes. The Head of the Department of Economics fully trusts his co-workers, is convinced of their reliability and gives them enough breathing space for their efforts. Not only that, he also makes an effort not to put unnecessary strain in of administrative affairs on his colleagues. On the other hand, according to our interviewees, the support of creativity at the department is done through what he calls "the sugar and cane method". The researchers have great support in their activities and can expect financial rewards and praise should they succeed. Should they fail to show adequate effort and results, it results in lowered evaluation and other sanctions.

Extrinsic motivation is impacted by the department mainly through rewards for taking part in innovative projects. The initiative of the more active members shows up in their personal evaluation, in form of financial rewards and even prizes from the department or even the faculty itself.

4.3.Intra- and Inter-Organizational Communication

As for combining expertise of individuals into the innovative capability of an organization, this is supported in several ways by the Department of Economics. One of them are regular meetings, organized twice per semester, four times a year. At these meetings, mainly the departmental internal and organizational affairs are discussed. These are mainly informative meetings, which do however offer opportunities to give feedback to new regulations or changes. Doctoral students and external staff are not generally present at these meetings.

A second form are colloquia, at which dissertation theses are discussed. These meetings happen at the department with doctoral students and guests from other departments, opponents, and others. If some urgent matter needs to be discussed, these meetings happen more often.

The third form are presentations of bachelor and master theses. At these presentations, members of a number of different departments have an opportunity to meet for extended periods of time, as the presentations generally take several hours. Between presentations, conversations start and the exchange of knowledge and experience takes place, which leads to an increase in the department's total expertise.

The Department of Economics used to face a problem in the nineties, which one of our interviewees called "academic inbreeding" (other also use "academic incest"). Academic inbreeding occurs, if a university graduate remains at the same institution and build his career there. It inhibits the exchange of lecturers between institutions and thus does not makes innovation more difficult. According to our interviewee, it results in a deficit in diversity and transfer of imperfections to future generations. Cultural differences play in important role in innovation, and academic inbreeding prevents these from occurring. The department has made attempts to combat academic inbreeding by the already mentioned exchange of research fellows between institutions.

4.4.The Process of Choosing and Evaluating New Ideas

Thanks to the policy of actively supporting motivation, there is no lack of new ideas, and as such a framework is necessary, that can be used to choose which suggestions and ideas to develop further. According to the Head of the Department of Economics, new suggestions come from three different sources: from the top, i.e. from the dean and rector, from sub-deans, and from the bottom, i.e. from his colleagues and from students.

When choosing innovation projects, there must be accordance with the faculty's strategy and goals. Various changes can be delegated from the Dean of the Faculty. In these cases, the department must allocate resources to these project, but has some degree of freedom, in the form of the liberty to choose the means and the order in which these changes are implemented. This depends on task importance and priority. Thus, in such situation, the Head of the Department of Economics does not have full control over their choice of projects. In other situations, when the idea comes from the bottom, from researchers or students, the Head of the Department of Economics is fully free in choosing which projects to develop further and which to put on the sidelines. As long as the change makes sense, it is given sufficient consideration and space. The research fellows are rewarded for coming up with new ideas and suggesting changes. The rewards depend on continuality, those who come with ideas gain greater rewards.

An important source of ideas for innovation is the student survey, conducted at the end of every semester. In this survey, students share their opinions about courses and lecturers, in the form of a questionnaire, where they answer questions on a scale from one to seven, to express the relative truthfulness of the respective statement. They can also give their opinions in full text, so that specific complaints or suggestions can be gathered. Thanks to the survey, the department can find out which parts of the curriculum need to be changed and approximately in what way. Deciding which ideas to develop is an important part of innovation management. In case the idea comes from the top, the Department of Economics does not have much maneuvering space, they have to implement it. When the suggestion comes from the bottom, a committee of five to six people is formed to make the decision based on intuition. In case of scientific papers, the decision whether to divert resources to that project is often made by the aspiring researcher himself.

If the Head of the Department of Economics decides to develop a specific innovation, he creates a small team of researchers, who are designated to work on that project. Sometimes, however, this is not necessary, as the researcher who came up with the idea already took initiative and found a team of colleagues eager to work on the project. If a team does need to be created, it is done based on the personal experience of the Head of the Department, who already knows which research fellows are suited for what kind of task. After the project is completed, the team is dispersed. This means that a new team is created for each new project. However, as a result of low rates of turnover at the department, the teams are often made up of the same people.

After a project is launched, the Head of the Department of Economics has little control over the progress of the project itself. The rate of decentralization is quite high. The Head of the Department knows, how many resources in forms of grants to each of his colleague was given, but he does not know how much time it will exactly take to finish the project, nor does he have any researcher's exact work timetable. He does not know, which process takes how much time, as this differs from one research fellow to the next. The Head of the Department of Economics described his control over his co-workers as a sort of game they play, where his colleague keeps saying how overworked he or she is, and the Head of the Department doubting that statement, as he knows how much potential there has still been to unlock in that specific researcher.

Time management is the key, each researcher must manage their time by himself and divide time between their projects, lecturing and other organizational affairs. The Head of the Department himself cannot create anyone's timetable, all he can do is distribute tasks in a fair manner. Through this decentralized leadership style, he tries not to kill researchers' potential by overburdening them with administrative affairs.

Evaluating the success of finished tasks is problematic at the department, especially when it comes to scientific papers. These can be either published or unpublished, but a paper not being published does not necessarily mean that it was bad. The only way of resolving this is the subjective evaluation of the paper by the Head of the Department. In this case, the game is again played, where the researcher can argue that they were overburdened with the project. Published projects are evaluated based on the prestige of the journal which published them.

As for the curriculum, changes are evaluated based on the student survey. However, this survey is usually only answered by about ten to twenty percent of students. In addition, the students who do answer the survey are usually either highly satisfied or dissatisfied, which can lead to polarized results. If there is a problem with a course to be solved, the most used method is a simple conversation with the lecturer or organizer of the course, in which key problems are identified and possible paths of improvement suggested. Another possibility, albeit rarely used, is reassigning the organizer or lecturer do a different course. In extreme cases, the course is simply abandoned. Other valuable sources of feedback are discussions and conversations between students and teachers, who evaluate the students' bachelor and master theses.

4.5.Summary of Findings

When it comes to developing expertise, the Head of the Department of Economics gives great freedom and freewill to his colleagues. Currently, the administration does not organize any events, the sole purpose of which would be expertise acquisition or development. This process is given over completely to the initiative of researchers themselves, who are according to the Head of the Department of Economics so far diligent in fulfilling this duty, since they are driven by their personal passion for knowledge, as well as a need to remain competitive in their career. Regular meetings and numerous opportunities for research fellows to meet and exchange ideas

are definitely worth mentioning, these are however not organized for this purpose and the exchange of information at these meetings is not required by the administration, as is the case at lectures or seminars.

This situation could be resolved by re-instituting the so-called "explorer's afternoons", which, according to one of our interviewees, used to be regularly organized at the department some time ago. They were meetings with the specific purpose of exchanging and summing up recent findings and new knowledge between members of the department, and as such led to the expansion of expertise. One of our interviewees said these meetings were still organized by other departments of the faculty, and bringing them back to the Department of economics could bring positive results.

Because such a great portion of responsibility for expertise is given to the researchers' personal motivation and initiative, a burnout presents a huge threat for the Department of Economics. The only way to resolve a case where motivation is lost and results drop, is a conversation with the Head of the Department. Even during this conversation, however, the researcher can only be disciplined and told that he must improve. Financial sanctions are the other option. On the other hand, the department's members are quite young, which might make this threat a little less urgent for now.

The hierarchical structure at the studied department can be evaluated positively. The organization is not structured according the areas of study and research. In this way, research fellows with different views and professional knowledge can more easily meet and collaborate.

Teamwork is managed in a democratic style. Teams are created for specific projects and dispersed after the projects are finished. Team members are chosen by the manager based on their skills, knowledge and age. A relatively young team has a great impact on creativity, since, as Hisrich, Peters and Shepher (2010) stated in their research, creativity drops with age. If there is good mood and friendliness between colleagues, it has a positive impact on innovation. The department's members trust and support each other, they communicate without a barrier, which has its advantages and disadvantages. The exchange of information is more stream-lined, however, academic inbreeding can occur and indeed used to be a common occurrence. The Head of the Department attempts to combat cultural closemindedness by keeping in contact with foreign institutions by exchanging information, lecturers or keeping updated on economic theory.

Team creation is a responsibility of the Head of the Department of Economics, who was described by his colleague and Head of the Centre for Scientific Information at the Faculty of Economics and Administration of Masaryk University as follows: "He is a man of little conflict, thoughtful, friendly, he communicates with influential people. He can serve as an example for his colleagues from the department, as he can speak English very well, travelled a lot, has many contacts around the world and is capable of publishing." As a Head of the Department of Economics he also gives good feedback and helps his colleagues to find a good target field with little competition. This description and the department's results show that the Head of the Department is a competent manager, which positively impacts innovation. He uses the *Tertius Iungens* method of the coordination of the department's members.

According to Maletz and Nohria (2001), successful innovation management presupposes the capability to convince and support people in an organization and outside, because, contrary to situations in black space, where activities are formally initiated, an innovation manager needs to find time and resources and properly allocate them by himself. Experience and contacts gained by the Head of the Department with various institutions from abroad help find resources

for innovation projects and also create social networks with people from various fields, which, according to Dyer, Gregersen and Christensen (2009), leads to the development of knowledge and increase of innovation potential of an organization.

As for the cooperation with other institutions, lately cooperation has gained in intensity, which can be viewed positively. Professionals from abroad are being invited to the department. Cooperation occurs, when professors of other universities assist with thesis presentations. This can lead to more objective student evaluation and feedback. Collaboration also occurs in form of researchers' visiting foreign universities, where they can again make comparisons and get feedback and resulting space for improvement. This network creation again points towards the *Tertius Iungens* style. A constant obstacle to this kind of cooperation remains the dominance of Czech language in the curriculum.

The student survey is used as a source of feedback when it comes to curriculum. In this survey, students can via questionnaires or direct statements share their opinion as to the quality and form of specific courses. This system yields detailed statistical data about innovation success, which allows the department to evaluate past projects and revisit them if necessary. However, only about 20% of students answer the survey, which can be viewed as a flaw of this system. Additionally, the students who answer are either extremely happy or unhappy with the course, which leads to polarized results.

5.CONCLUSIONS AND RECOMMENDATIONS

In this paper, we focused on the topic of the creation and support of innovation in universities. We tried to identify activities, procedures and tools used for the creation and support of innovation at one of the most outstanding departments of the Faculty of Economics and Administration of Masaryk University in this respect – the Department of Economics.

This article was framed as a descriptive single case study based on internal and external documents, several semi-structured interviews and observations conducted by us, who have been in the role of faculty members, and instructed students.

Besides the detailed description of the whole process of the creation and support of innovation at the studied department, this paper also discussed some factors that have been influencing the quality, effectiveness and efficiency of the creation and management of innovation in the studied academic environment.

By reviewing the scientific literature concerning the creation and management of innovation, we could identify four categories of innovation drivers, i.e. (1) individual expertise and its development to the innovation capability of an organization, (2) creativity and intrinsic motivation, (3) intra- and inter-organizational communication and (4) the process of choosing and evaluating new ideas and suggestions.

Based on this information and the content analysis of our data we came to several conclusions and recommendations concerning the creation of new ideas and management of innovation in universities. Some of them can be formulated as follows:

First, we suggest to establish regular (at least every two weeks) "explorer's half-days" at departments of universities, which would serve as opportunities for researchers to exchange their experience and knowledge, as well as a means of control for the Head of a department.

Our second recommendation is to create incentives for students to take part in the student survey. Possible solutions are rewards for part-taking in the form of discounts in university shops or an opportunity to meet the course's organizer face to face. A greater rate of participation would lead to more accurate evaluation, which would lead to greater quality and less waste of time and energy on unnecessary changes.

The third recommendation touches upon lectures in English. The prevalence of Czech language in the curriculum has been an obstacle to international cooperation with foreign universities. We suggest to increase the number of courses taught in the English language as mandatory for students to pass during their studies. This should improve their ability to study and read in English, which would mitigate language barriers.

Our paper gives some new insights into the field of the creation and management of innovation in universities, which has not got much attention so far. Future research in this field should explore the role of students in innovation processes which take place in universities. Although we did shortly mention this topic in the form of the student survey, it surely deserves a more detailed look.

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WINE TOURISM AS COMPONENT OF SERVICE OF THE WINERIES PRODUCT POLICY IN THE REPUBLIC OF MOLDOVA: MARKETING ANALYSIS OF THE SITUATION AND OPPORTUNITIES

Ghenova Svetlana

Abstract:

Moldova is known as a country with old traditions in grape-growing and wine production, which is why it attracts more and more attention from tourists, businessmen and wine-production specialists. This research publication is aimed to carrying out of marketing analysis the problems and perspective directions of developing of the wine tourism, the overall Moldova's attractiveness as a tourist destination in the world. The importance of this research is determined that it necessary to increasing international awareness towards Wine tourism in the Moldova, despite small funding of the promotional activity and overall problems

Keywords: Marketing, wineries of Republic of Moldova, wine tourism, wine roads, wine day

JEL Classification: M 31, L 66, L 83, Q 13,

1 INTRODUCTION

Agriculture has been one of the key driving forces in shaping Moldovan landscape, nature and culture over centuries. Favorable climate and high quality soils historically have determined Moldova's agricultural specialization, particularly in the production of high value crops like fruits and vegetables. Agricultural production is contributed 24. 3% to the country's GDP in 2014 (1.934 million $). The total GDP was 7. 964 million $ in 2014. The GDP per capita at purchasing power was USD 4.753 thousand per capita in the same year. About 26% of the active population of the country was engaged in agriculture in 2014 (National Bureau of Statistics of the Republic of Moldova, 2006-2015). The integral parts of the Moldovan landscape are the vineyard lines, streaming away from hill to hill, the gardens, the old forest Codru, the blue wayward Dnestr, and the high sky with white clouds. The total area of vineyards in the Republic of Moldova was of 141, 2 thousand hectares in 2014 of which 129 thousand ha are in a bearing fruit age. This includes the area of table grape of 20 thousand hectares, of which 17 thousand hectares are bearing fruits:

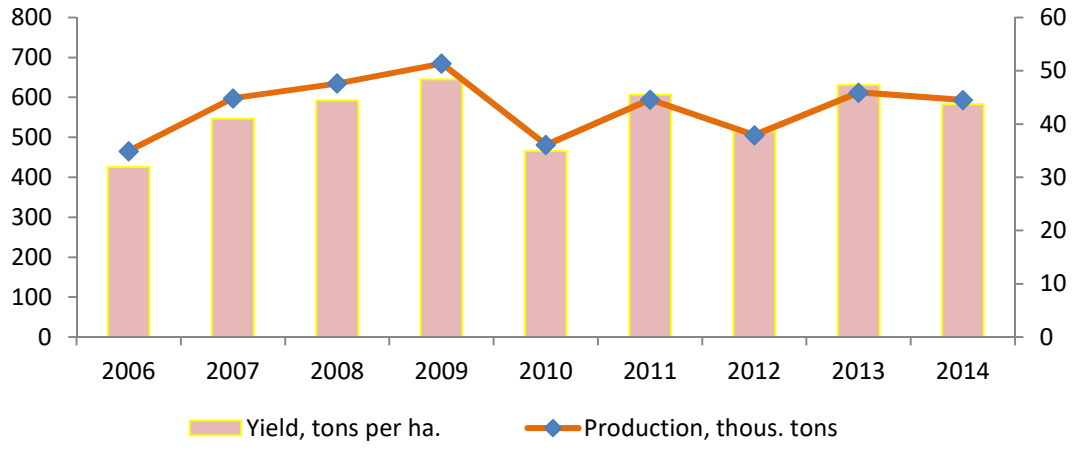


Fig. 1-Production and yield of grapes in the Republic of Moldova, 2006-2014 years. Source: National Bureau of Statistics of the Republic of Moldova, 2006-2015

According to calculations in 2015 Moldova has exported agricultural products for 1966, 9 million US dollars. Thus, there is sufficient evidence to suggest that agriculture relate to the dominant industry in the Republic of Moldova's economy. During the 10 months of 2015 year registered an increase of 24% of wine exports in bottles intended for Western countries from Moldova, reaching more than 15 million. liters. The largest numbers were exported to Poland. After this is followed by the Czech Republic, Romania, Slovakia, Latvia, Germany, Lithuania, the UK, Estonia, Bosnia and Herzegovina. As regards export wine in bulk to the West countries, for the first 10 months of 2015 registered an increase of over 10% compared to the same period of 2014, total exports amounted to more than 62.5 million. liters. Significantly was increased in 2015 year the wine exports to China by 87%, to Japan 73%, and in the US by 13% compared with 10 months in 2014. Thus, the presented statistical database shows the dynamic development of the agricultural sector in the Republic of Moldova, in part significant growth in the development of wine-making industry. In such circumstances, following of the other wine-producing countries in Moldova comes an understanding of the need to develop wine tourism. Although the national program "The Wine Road in Moldova" was adopted by the Government in 2004, it remained only on paper. Moreover, according to the opinion of the scientists of the Republic of Moldova which are exploring issues of "wine tourism" (Certan, S., Certan, I., 2014; Miron, V., 2006) the disadvantages of tourism activity for Moldova were not researched at the national level, and the available data have only local character describing certain companies or branches. What are the situation and opportunities to creation / developing any good conditions on winery tourism in the Republic of Moldova?

2 RESEARCH METHODOLOGY, DATA COLLECTION AND DATA ANALYSIS

The study is performed on selected data and processed by authors based on the statistical yearbooks of the Republic of Moldova. In the research were applied methods and recognized techniques relevant in relation to economic investigations
The modern marketing resources emphasize that, wine tourism is a relatively recent phenomenon and is usually associated as a niche field being part of cultural tourism related to gastronomic tourism. There were multiple authors trying to define the wine tourism concept (table 1):

Tab. -1 The definitions of the wine tourism

Sources	Wine tourism definitions
Johnson, G., (1997)	Visitation to vineyards, wineries, wine festivals, and wine shows for which grape wine tasting or experiencing the attributes of a grape wine region are the prime motivating factors for visitors
Dowling, R.K. (1998)	Experiential tourism occurring within wine regions, providing a unique experience that includes wine, gastronomy, culture, arts, education and travel
Getz, (2000)	A form of consumer behaviour based on the appeal of wine and wine regions, and the development of marketing strategies for the wine industry and destinations in which the wineries and the experiences related to wine are the main attractions

Hall et al., (2002)	Visitation to vineyards, wineries, wine festivals and wine shows, where grape and wine tasting together with the discover of the wine region are the determinant factors for visiting
O'Neill and Palmer, (2004)	The complexity of experiences gained by tourists in their activities related to wineries visitation, wine related shows and events or wine regions
Dubrule, P. (2007)	All the activities for the tourists in the wine-growing regions: visiting wine cellars, wine-tasting tour, accommodation, restaurants and activities related to the wine products of "terroir" and local traditions
Rabotić, B. (2013)	WIne tourism is a specific type of holiday that combines wine tasting of a specific wine-growing region with natural beauty, tradition and cultural - historical monuments of the area. Because the vineyards are characteristic of the rural environment, wine tourism is a segment of rural tourism. However, wine tourists can be found in urban areas, since various wine events are organized, and some wineries have been held in the metropolitan area
Škrbić, I., Jegdić, V., Milošević, S., Tomka, D. (2015)	Wine tourism is widely recognized as a unique tourism product for visitors who are seeking authentic multi-dimensional experience, but at the same time it represents an innovative business opportunity for small-scale wine producers who wish to expand their wine production and meet the international demand

In Australia, New Zealand, but also in Europe, there are lots of articles and studies with theoretical and practical views in terms of wine tourism and factors of success that contribute to attract and motivate wine tourists, in comparison with Romania, where the research in this field is still at an early stage. Hall and Getz are well-known authors in this field who made the first studies in this area. Manila M. (Manila, M. (2012) distinguishes several categories of wine tourism products (table 2):

Tab. -2 The typology of wine tourism products

The wine tourism products	What are these products
Wine Road	Marked itineraries in wine-growing regions for the discovery of the vineyards, wine, cellar;
Hiking in the vineyards	Marked itineraries enabling discovery of the vineyards in a ride;
Organized tours and stays in the vineyards	Packages including accommodation, catering and transport, with a variable duration, in which they are proposed activities of the discovery of the vineyards in one or more components (oenological, gastronomical, cultural, technical, formal dinner);

Oenology internships	Courses more or less detailed allowing for a better knowledge of the product marketing and all that is reported (culture, tradition, technical production etc);
Wine cellar visits Ex: at European level, The Days of Wine Tourism; at the local level, the International Festival of Vine and Wine Bacchus, in Focşani;.	Visiting the cellars; wine producers are known their wine cellars;
Museums of wines	Places of culture with the goal of presenting the world wine and transmitting a "savoir-faire" and ancestral traditions;
Holidays and festivals	Events aimed at keeping local traditions, encourage the promotion of wine and animate the territory;
Professional salons, local fairs, wine actions	These groupings have as their purpose the presentation of products in a strictly commercial Ex: International Salon of Vinvest Wine

Analysis of opinions and confirmations of the researchers give the base of concluding that wine tourism is very large sphere of activity. It including not only organization testing and purchase of wine, also including very important factors of success, as the environment, folk and cultural traditions, national meals. In Moldova the researchers Miron V., Certan S., Certan I., also investigate this question. It very interesting and useful to do this research in this area because Moldova is an important European wine producer country.
According to "The Travel & Tourism Competitiveness Index" (TTCI) presented at the World Economic Forum in Davos, Switzerland, in 2015 the situation with the grape and wine sector (regarding the countries with developed wineries) in the world is as follows (table 3):

Tab. -3 The Travel & Tourism Competitiveness Index (TTCI) in wine oriented countries, 2015

Economy	Rank	Score
Spain	1	5.31
France	2	5.24
Germany	3	5.22
United States	4	5.12
United Kingdom	5	5.12
Switzerland	6	4.99
Australia	7	4.98
Italy	8	4.98
Portugal	15	4.64
New Zealand	16	4.64
China	17	4.54
Greece	31	4.36
Cyprus	36	4.25
Czech Republic	37	4.22
Slovenia	39	4.17
Hungary	41	4.14
Turkey	44	4.08
Russian Federation	45	4.08
South Africa	48	4.08
Bulgaria	49	4.05

Chile	51	4.04
Argentina	57	3.09
Romania	66	3.78
Georgia	71	3.68
Republic Moldova	111	3.16

The rating given in the table 2 clear show us, that from 140 countries which take the first eight places (based on TTCI) all is the wine tourism oriented countries. All of them have a high level of conditions for developing wine tourism. While France provides the most famous wines (In Bordeaux, 75% of tourist traffic is related to viticulture. The Rhone Valley, the second wine region of France, has a true tourism oriented to industrial wine fabrication: 25,000 beds in specialized units with an annual turnover of over 150 million) and Italy produces the largest quantity of wine (In Italy, the latest figures show approx. five million tourists for wine, over 140 routes for enotourists and gourmets), Spain has got the largest wine area in the world (1.8 million ha.). Germany adopted a number of international agreements in the field of travel and tourism. The German Wine Gate in Schweigen-Rechtenbach on the French border adjacent to Wissembourg in France marks the start of the route. Built in 1936, the gate is an imposing ceremonial gatehouse made of sandstone. Currently, the route traverses the Palatinate wine region which lies in the lee of the Haardt Mountains, an area known as .The route runs northward, beside the path of Bundesstraßen B 38 and B 271 for 85 km. Romania's rank is 66 in the world rankings, Georgian's rank is 71, and Moldova's rank is 111. The low rating of these countries is the result of a lack, or lack of important elements of the introduction and development of wine tourism

According to (Sava C., (2013)) the development of wine tourism supposes the existence of an infrastructure and means the promotion of the respective area (table 4):

Tab. - 4 Elements necessary to wine tourism and its results

Elements necessary for tourism development	Results of wine tourism development
-existence of modern access roads;	- sustainable development of the area;
-construction of spaces meant for wine tasting;	- improving the image of local wines;
- construction of spaces meant for wine selling;	- increasing wine sales;
- opening of public food facilities for serving traditional culinary products;	- attracting new segments of consumers;
- opening accommodation facilities;	- promoting local wine and traditional culinary products;
- construction of spaces for selling crafts and souvenirs;	- maintaining traditions and customs

The presented elements and results of the development of wine tourism will allow us to conduct a detailed analysis of the current situation and to identify the potential of wine tourism in Moldova.

The analysis of the current situation in Moldovan wine tourism and the identification of the factors that may contribute to attract and motivate wine tourists is a step forward in the viticulture research and also of the possibilities to increase eco efficiency of investments in this area. Consider some of directions of successful developing of wine tourism in the Republic of Moldova in the context of: problems and their solutions (figure 2):

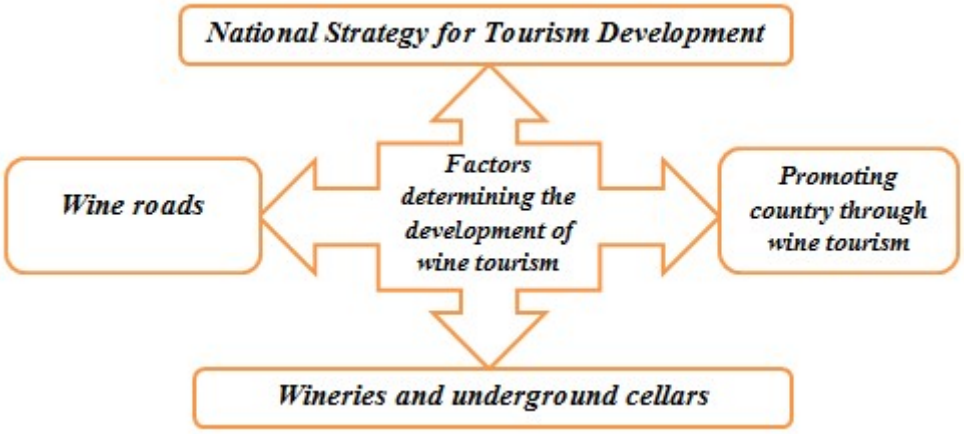
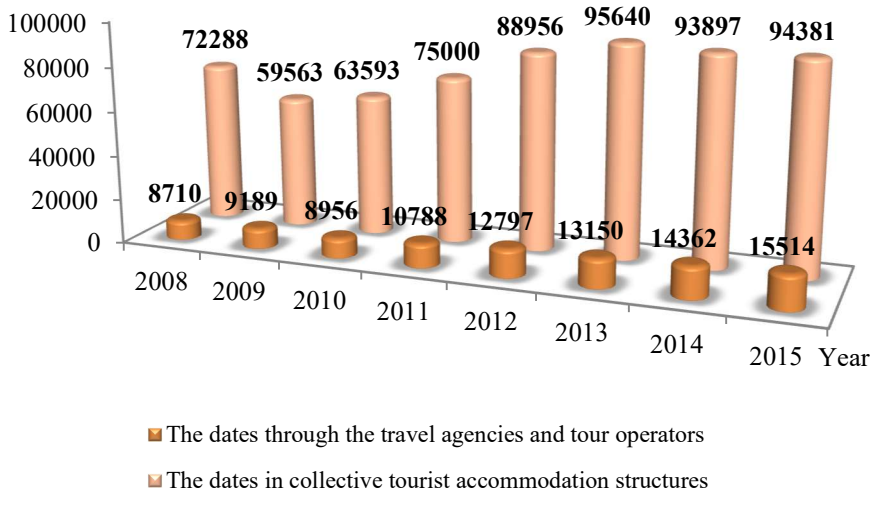


Fig.-2 The main directions of developing of the wine tourism in the Republic of Moldova Source: elaborate by author of publication

First of all, will define the list of the barriers to the successful develop of the industry of wine tourism in Moldova, because is started to attract attention to the tourism sector from the government only some 10 years ago, there is a very wide range of problems and uncertainties in the tourism sector as well as in the other spheres of Moldova (table 5):

Tab. - 5 The barriers of the successful develop of the industry of wine tourism in Republic of Moldova Source: elaborate by author of publication

№	*The character of the barrier*	*Content of problem*
1	The absence the Tourism Satellite Account system	Undoubtedly, Moldova needs to implement the Tourism Satellite Account system. This fact is makes difficult to evaluate the real numbers of tourism activity. Implementation of such a system would lead to the Tourist data volume accounting into a unified measurement. The statistical data are significantly different between the dates through the travel agencies and tour operators and dates in collective tourist accommodation structures of Moldova (figure 2). None of them is analyzing the information from the Moldavian customs, where only for 2015 year, the number for foreign citizens entrance in the country was over 2, 9 million peoples (which is 28.1% more than in 2014 year) 

<table>
<tr><td></td><td></td><td>Fig.- 3 Number of foreign visitors and foreign tourists in Moldova, 2006-2014 years (peoples). Source: National Bureau of Statistics of the Republic of Moldova, 2006-2015</td></tr>
<tr><td>2</td><td>Insufficient management of tourism sector at national level</td><td>Tourism Agency in Republic of Moldova is relatively recent and there were no sufficient institutional stability, very weak statistical data for accounting and evaluating the tourist movement in Moldova, non-transparent decision making and fund sharing by Tourism Agency</td></tr>
<tr><td>3</td><td>Major portions of tourist route are insufficiently equipped</td><td>Portions of tourist route in Republic of Moldova doesn't has fuel and service stations, motels, hostels, pensions and other accessible locations for parking, food and leisure accommodations, with centers for tourist information and for marketing crafts and local food. Lack of knowledge about wine routes and long-term relationships between wineries and tour operators are factors that hinder wine tourism (Kunc, M., 2010) Most tourist routes in rural areas are nonfunctional and are not exploited by the necessary tourism infrastructure. This is a big problem of local rural tourism, because, as a rule, most tourists' arrivals are in accommodation areas, where the catering and leisure centers are:
Tab.- 6 The qualitative structure of tourist routes included in "The Wine Road" Program in Republic of Moldova. Source: Bacal, P., 2013
<table>
<tr><th>Tourism routes</th><th>Wineries</th><th>Natural protected areas</th><th>Monasteries and churches</th><th>Museums, forts, historical monuments</th><th>Craft centers</th><th>Asphalt road (%)</th></tr>
<tr><td>Orheiul Vechi</td><td>5</td><td>1</td><td>10</td><td>11</td><td>-</td><td>100</td></tr>
<tr><td>Codrii Moldovei</td><td>5</td><td>5</td><td>7</td><td>1</td><td>3</td><td>90</td></tr>
<tr><td>Lăpuşna</td><td>5</td><td>2</td><td>4</td><td>5</td><td>-</td><td>90</td></tr>
<tr><td>Stepa Bugeacului</td><td>6</td><td>3</td><td>6</td><td>6</td><td>-</td><td>90</td></tr>
<tr><td>Purcari</td><td>6</td><td>1</td><td>6</td><td>8</td><td>1</td><td>90</td></tr>
<tr><td>Chişinău-Bălţi</td><td>5</td><td>8</td><td>8</td><td>7</td><td>2</td><td>95</td></tr>
<tr><td>Dunărea de Jos</td><td>5</td><td>2</td><td>4</td><td>4</td><td>2</td><td>100</td></tr>
<tr><td>Total</td><td>36</td><td>21</td><td>37</td><td>40</td><td>8</td><td>-</td></tr>
</table></td></tr>
<tr><td>4</td><td>Lack of active promotion of the country</td><td>In 2014, for the first time in Moldova Tourism Encyclopedia was created and in ATU Gagauzia the tourism travel guide. In 2015, Agency Publicis Moldova undertook the rebranding for Moldova, where was included the cup wine glasses (red and white wine). But, still the tourism areas of Moldova has problems with the lack of sufficient financial resources for promotion; dubious spending of allocated resources; almost inexistent production and distribution of promotional materials and touristic brochures or maps</td></tr>
</table>

3 RESULTS

Thus, existence of problems in the tourism sector of Moldova obliges all stakeholders to its resolving. The main directions in this sense is are (figure 2):

3.1. Implementation the National Strategy for Tourism Development "Turism 2020", developed by the government of Moldova in collaboration with the Tourism Agency and Association of Tourism Development in Moldova with the support of USAID CEED II program. The new tourism strategy have the role to ensure the sustainable development of the tourism industry in Moldova, to provide an optimal framework for the development of different sub-sectors of the industry, to provide and apply a decent system of performance monitoring and implementation and to encourage the country's competitiveness as a tourist destination («Tourism 2020», 2014);

3.2. Developing of wineries and underground cellars.

The three most notorious wine tourism suppliers from Moldova: Cricova, Purcari and Milestii-Mici hold the biggest market share of the wine tourism from the country, biggest share of produced and exported products, biggest underground cellars and represent the visit card of Moldavian wine tourism (Colesnicova, T. / Iatisin, T., 2014). Each of them is unique. First, Moldovan wineries underground cellars such as Cricova or Milestii Mici, are the largest in the world, and they recorded in the Guinness book. Second - this is the real underground wine city with its infrastructure, roads (more than 120 km of underground streets!), road signs, traffic lights, wine rivers flowing through wine roads, on the banks of which, instead of houses are huge barrels. No less worthy of attention of the tourists and other wine underground cellars: Purcari, Branest, Cojusna, Romanesti and other. The tourism services that are provided by the wineries companies consist of following: wine tasting, guides through vineyards, production process and underground cellars, accommodation and food and beverage services, at-door sales, history and thematic presentation and conferences, museums of wine and history of wine, availability of conference rooms, tasting rooms, restaurants, cafes, rooms for accommodation, villas for renting. However, for the successful development of wine tourism in each of them it is necessary to adopt a set of effective management measures (table 7):

Tab. -7 The main directions of development of tourist services in wineries of the Republic of Moldova. Source: elaborate by author of publication

Winery	*Directions of development of tourist services*
CRICOVA winery	- to develop the vineyards and production lines tourism side of the company; - to promote the existing services and attractions; -to create developed infrastructure of the private hotels, hostels from neighbors village from Cricova
PURCARI winery	- to maintain a highest quality of the products; - to actively focus on promotion (creation of the new marketing department, new web site in several languages, and new daughter-companies with the sole role to develop and promote tourism activity with the main companies attractions) ; -to promote the new "Purcari academy" which offer specialized courses in wine making process and specialized sommelier courses with the best professional from the country

MILESTII-MICI winery	- the acquisition of electrical cars and trams for underground cellar visits which provide sustainable development of the tourism activity; -to cooperate with private investor for construction of accommodation facilities and for developing different tourist services and attraction

3.3. Developing of the wine roads in Moldova.

For mobilizing and coordinating tourism flows in the country, travel agencies have developed a system of national tourist routes (*Moldova Tourist Guide,* 2009), seven of which are part of a national program named "The Wine Road" (table 2). Tourist wine routes start from the capital city, through all the country's wine regions and include about 20% of wineries, 7% of protected areas, 25% of monasteries, and 16% of museums. In "The Wine Road" there are about 30 wineries, but only 1/3 of them are open to the public, especially underground wineries in Cricova, Mileştii Mici, Brăneşti, Cojusna, the famous wineries in Purcari and in Romaneşti, the modern wine complexes as Chateaux Vartely, and Bostavan. In 2009, was celebrated 650 years since the foundation of the Moldovan state had appeared. In the context of holiday activities, local guides developed five national tourist routes: 1). Chişinău-Orhei-Rezina; 2). Codrii Moldovei; 3). Nistrul Inferior/The Lower Dniester; 4). Prutul de Mijloc/The Middle Prut; 5) Rezina-Naslavcea five tourist routes: 1). Chişinău-Orhei-Rezina; 2). Codrii Moldovei; 3). Nistrul Inferior/The Lower Dniester; 4). Prutul de Mijloc/The Middle Prut; 5) Rezina-Naslavcea. Of special interest on towards of development of the national tourist roads is represent suggestions of experts (Bacal, P., T., 2013):
- developing of tourism business corridors (the transport infrastructure, the accommodation and entertainment units, the efficient economic exploitation of local products, the develop of local population' business skills;
- posting the adequate marking of roads, of routes and of important sightseeing. The following actions should take place: signaling local tourist pathways with boards, information on restrictions in the area, information plates, maps, and marking accessible routes, stops and sightseeing places;
- creating and arrangement of national parks, especially for Orhei and for the Lower Dniester in order to train entrepreneurs and local population in an efficient exploitation of tourism potential;

-construction and modernization of roads to valuable tourist objectives such as to the Vărzăreşti, to Zloty, to Cosăuţi, and to Rudi monasteries, and to "At the Castle", to Tipova, and to Saharna Landscape Reservations, to "Pădurea Domnească" Scientific Reservation, and to attractive geological and hydrological monuments;
- stimulating the development of tourism business in rural areas by providing soft loans, tax exemptions for tourist activities and by simplifying requirements for the classification of tourist facilities with 1* and 2* with accommodation for groups

3.4.Promoting Republic of Moldova through wine tourism.

As there are a lot of barriers for tourism activity in Moldova (poor infrastructure, imperfect legislation, lack of qualified suppliers, poor organizations, few developed attractions) it does not consist the main problem of the little tourist arrivals, as the experience gained by tourists is mostly positive. The biggest problem was identified the lack of promotion and as result a low awareness of the destination among foreign tourist. In the last years the importance of marketing and promotion was increasingly accepted and acknowledged by the tourism and wine tourism

stakeholders and as a result there were implemented several public projects and strategies to focus on tourism promotion (table 8), which necessary to promote more intensively:

Tab. - 8 The main directions of promoting the wine tourism of the Republic of Moldova. Source: elaborate by author of publication

№	Directions of promoting	Content of promoting
1	Promoting through the National Festivals	*Wine Vernissaje* -is an annual fest organized by the National Office of Wine and Vine with in cooperation with CEED II program (inauguration was in 2007 year); *Gustar festival* is an ethno-cultural national festival, which is held annually from 2010 In Orheiul Vechi reservation in the last days of August and with duration of 3-5 days; *Wine fair "Targul Vinului"* is a biannual festival organized from 2006 year in the location of the biggest national wineries; *Sweet Acacia Flower Music Contest (Dulce Floare de Salcam)* is an annual festival held in May from 2009, is an ethno cultural festival of traditional music and dances combining folk brands from Moldova and neighborhood countries *Medieval Festival* Is a thematic festival for the first time held in 2014 at Vatra resort
2	Promoting through the «Wine Days»	*The National Wine Day* in Moldova is considered the biggest national event related to wines. It is held in Chisinau city in the central plaza in the middle of October. For the first time the event was held in 2002 with the patronage of the president of Moldova *The Gagauzia Wine Day* is Regional (south part of Moldova) Day of Wine. Festival organized from the 2005 year and is traditionally held on the first Sunday in November
3	Promoting through the exported qualitative wines	In 2013 Government of Moldova in partnership with CEED II program and National Agency of Wine and Vine have elaborated a national plan for promoting Moldova's image and wine in international market. The program consist of attributing the Wine of Moldova quality brand to the export wines that passes the rigorous control of quality made by specialized organization
4	Promoting through the E-resources	In the new Tourism Development Strategy of Moldova, Tourism Agency has developed a web portal moldovaholiday.travel with the brand name Discover the Roots of Life Moldova, and the resource was launched in 2014 year. The resource is funded by public-private partnership with the mission to update the image of the country in World Wide Web area. The resource is funded by public-private partnership with the mission to update the image of the country in World Wide Web area. Also a priority field of activity for Tourism Agency within Tourism Development Strategy 2020 of Moldova is to help the touristic agency and tour operators to maintain, develop and promote their own web resources. In cooperation with

		CEED II the Tourism Agency will develop and promote 3 thematic wine blogs in internet and will help with consultancies the actual existing resources
5	Promoting through Moldavian country logo and TV spot	In the framework of rebranding Moldova as a tourist destination, Tourism Agency decided to apply new tools of promoting country's image. With the launch of the Moldova Holiday project a new country tourist logo was developed. The new logo will be printed on all touristic promotional material and official websites, also the tourism agencies and operators were suggested to include the logo in their own promotional material, so the country will be promoted as a unique brand. Also, the Tourism Agency of Moldova has elaborated an advertisement clip to promote tourism in Moldova through a unique brand. With a total of 3 different versions made. The clip tries to reveal the beautiful places and attraction from Moldova to present interest to the potential customers: the clip contains images from Cricova, Milestii-Mici wineries, vineyards and underground wine cellars (presenting cellars as a unique feature of Moldavian tourism) (WineofMolova, 2015), images from Gustar and Wine Day festivals, Frumoasa, Curchi, Capriana monasteries, Orheiul Vechi reservation and Soroca fortress. Also it is related the traditional Moldovian hospitality and cuisine, inviting the visitors to taste Mamaliga with a cup of red wine, a must do gastronomic attraction for everyone visiting Moldova
6	Promoting through National and International fares and exhibitions	Moldovan wineries permanent are participated on international fares and exhibitions. Such participation not only promotes their products, but increase Moldova's popularity among interested wine tourism visitors and clients of such exhibitions and contests. For example, the product quality of the winery Tomai-Vinex (ATU Gagauzia) is confirmed by diplomas and medals on many national and international exhibitions and competitions. The company has about 200 awards of various denominations Two times per year, in Moldova is held ExpoVin exhibition from 1992 year. At this exhibition national and international wineries and wine related companies can promote and exhibit their products. Among the exhibitors there are companies making machinery, secondary and tertiary products for wine production, tourism agencies and consultancy service suppliers. Participants of the competition on 2016 year were about 70 producing wineries from Moldova, Armenia, Azerbaijan, Georgia, Russia, Ukraine, Belarus, Romania, Czech Republic, Slovakia, Slovenia, Germany, will present more than 300 samples of alcoholic beverages
7	Promoting through mobile application	On April 2016, the National Inbound Tourism Association of Moldova (ANTRIM), with the support of the USAID Competitiveness Enhancement and Enterprise Development Project II (CEED II), has organized a press conference. The attendants had the possibility to participate in the launch of

		the first mobile application aimed to promote the National Tourism Brand – the Tree of Life as well as Moldova as a tourist destination The application features 50 tourism attractions from Moldova and was developed by a private company, the same that has developed Slovenia's Top 50 application, which was taken for reference. The application presents the major wineries, cultural and architectural monuments, museums, and monasteries in Moldova. It can be downloaded for free, in English, for iOS and Android from AppStore and Google Play

4 CONCLUSION

Wine tourism is large sphere of activity, including not only organization of testing and purchase of wine, also including very important factors of success, as the environment, folk and cultural traditions, national meals. In Republic of Moldova viticulture and wine production has a long tradition. Quality wines, nice vineyards, world famous undergrounds cellars Cricova, Purcari and Milestii-Mici are attractive for the touristic visitors. Having potential is a necessary, but not a sufficient condition of success on the market. Wine tourism market demands more than that. According to the promotional results of the directions which were implemented in wine tourism is necessary to strengthen the better cooperation between National Tourism Agency, wineries, private initiatives, tourism portals and better development and coverage of e-commerce and services. The road to a successful development of wine tourism in Moldova requires the implementation a new tourism strategy which to provide an optimal framework for the development of different sub-sectors of the industry, to provide and apply a decent system of performance monitoring and implementation and to encourage the country's competitiveness as a tourist destination. The wine tourism offer in Moldova should be built through diversification of offer of wineries in to other segments of economic activities (hotels business, catering business, museums of wine and history of wine and other). The future development of wineries in Moldova should be based on targeting these fields with the of creating a high level quality promotional activity and regional integration domestic wineries on the base of wine roads. For this, in the Republic of Moldova has all the necessary conditions, and it will inevitably to become one of the «world tourism country».

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THE USE OF GEOCROWDSOURCING TO REPORT CIVIC ISSUES IN THE CZECH REPUBLIC: A COMPARATIVE ANALYSIS OF GEOCROWDSOURCING MOBILE APPLICATIONS

Haltofová Barbora

Abstract

The growth of information and communication technologies and ubiquitous Internet connections is pushing the limits of public management, allowing public officers to interact directly with citizens and to tap into a crowd of volunteers willing to participate in public administration. The trend for harnessing the wisdom of the public using new technologies, such as WebGIS and smartphones, through an open call is called geocrowdsourcing. Geocrowdsourcing opens up a wide range of new possibilities for gaining information, which are accessible exclusively by means of citizens and which would be otherwise unavailable. Thanks to GNSS integrated in almost every mobile device; any information reported can be located on the map. Thus, modern smartphones provide the versatile and adaptive environment for monitoring civic issues. The paper discusses the benefits and limitations of geocrowdsourcing use in e-government and particularly focuses on mobile applications for reporting civic issues in the Czech Republic. The aim is to identify and examine the factors which contribute to the success of geocrowdsourcing in e-governance, and to evaluate the success of geocrowdsourcing mobile applications deployment in the Czech Republic. In this paper, we provide a comparative analysis of four major geocrowdsourcing mobile applications currently used in the Czech Republic, namely Dej tip, Lepší místo, Plznito and ZmapujTo. To the best of our knowledge, this study is the first to comparatively explore geocrowdsourcing mobile applications used in the Czech Republic.

Keywords: civic issue, critical success factor, geocrowdsourcing, mobile application.

JEL Classification: H83

1.INTRODUCTION

Citizen participation in environmental monitoring is not a new idea. However, recent developments in information and communication technologies, such as WebGIS and the proliferation of smartphones, have created new opportunities to promote citizen participation in environmental monitoring (Gouveia et Fonseca, 2008).

As citizens are increasingly becoming an important source of geographic information, they enter domains that had until recently been exclusive realm of public officers, and establish close collaboration with them (See et al., 2016). There are many cases of successful cases of such collaboration, ranging from land management (Baker et al., 2010), biodiversity monitoring (Gouveia et Fonseca, 2008) to monitoring of non-emergency civic issues or to disaster response (Norris, 2016). All these examples demonstrate that successful interaction is possible. Despite geocrowdsourcing has clearly shown its potential in recent years even in the Czech Republic, there is no evidence in literature on factors that influence the success of implementation and use of such applications.

Although some researchers have clearly acknowledged the existence of critical success factors of crowdsourcing, there has been little attempt to geo dimension of crowdsourcing information. The first objective of this paper is thus to present a critical success factors of geocrowdsourcing. The second objective of this paper is than to better understand the current state of

geocrowdsourcing mobile applications use in the Czech Republic through a comparative analysis of different geocrowdsourcing mobile applications deployed in the Czech Republic.
The reminder of the paper is, hence, organized as follows: Chapter 2 provides a literature review and provides useful insights on the main motivations for geocrowdsourcing use in e-government. In Chapter 3, the methodological approaches are outlined and theoretical framework is established to compare the geocrowdsourcing mobile applications. In Chapter 4, a description of the four selected geocrowdsourcing mobile applications is presented, each examined with the help of the proposed theoretical framework. Then, research findings followed by a discussion on limitations and challenges for future research are presented in Chapter 5. Finally, chapter 6 concludes the paper.

2.THEORETICAL BACKGROUND

Civic issues such as pothole, broken streetlight or illegal dump can be reported by citizens through a geocrowdsourcing mobile application. People can download the application on their smartphones and once come across such an issue they take a photo of the issue and send a report to the officer responsible for its resolution. The idea of using geocrowdsourcing mobile applications which motivate the citizens to download it and use as a common communication tool with their municipal authority is continuously pursued not only in the Czech Republic.
Geocrowdsourcing seems to be an appropriate solution to access a large amount of free and up-to-date information. As stated Brabham (2013), the idea of using geocrowdsourcing in e-government is based on the fact that firstly, it is impossible for public officers to have an information database of every single civic issue occurring in the municipality, and secondly, it costs a lot of public money and time to collect the required information about the issues from all over the society. In this way, public officers can turn to the crowd of citizens and challenge it to help them to find out the civic issues in their municipality: all by using GIS-based crowdsourcing mobile application which takes advantage of geographical dispersion of citizens each having personal knowledge of their surroundings.
While crowdsourcing provides free information coming from the crowd, the WebGIS takes care of data management and mapping. Finally, smartphones facilitate the process by their capabilities and being more accessible (Alikhani, 2011). Therefore, it is necessary to consider geocrowdsourcing initiative as a compound of WebGIS, smartphone and crowdsourcing itself.

2.1.WebGIS

Providing web-based GIS improves public access to GIS in general and this, in turn, leads to enhanced participative processes by conveying information in a more clear and visible form. GIS could communicate information more effectively by illustrating the location of reported issue. The outcome of this research suggested that internet based GIS could facilitate participative processes and has the potential to significantly contribute to the openness and accountability of decision making (González et al., 2008).
The popularization of the Internet has had an enormous impact on geographic information technologies and has opened the potential for new visions of a geospatially enabled world. Making GIS and appropriate datasets available to the public over the Internet may provide an opportunity to improve accessibility to spatial information and promote equal rights for stakeholders to view and evaluate the information being considered by decision-making processes in environmental planning, especially when combined with more traditional ways of gathering and presenting data. Taking into consideration the technological challenges GIS-mediated participative decision-making has the potential to implicate wider public, improve data communication, gathering and analysis, and lead to more comprehensible and egalitarian outcomes (González et al., 2008).

WebGIS is a basic technology for publishing of cartographic applications on the Internet. According to Dangermond (2008), its main advantage is the possibility of accessing data and cartographic services on the web at any time and place, which saves time, energy and money of its users. Moreover, WebGIS enables citizens to work with spatial information and take the advantage of GIS even without knowing what GIS is (Fagerholm et al., 2012). The issue of WebGIS, its basis and possibilities of visualization of geographic information in a web interface is in literature discussed by Fu and Sun (2010). According to this author, WebGIS is any GIS which use web technology to communicate between components. Generally, we can define WebGIS as a geographical information system which provides users with map outputs and related database and descriptive data (ESRI, 2013). From the technological point of view, the system is based on a multi-layer architecture (database, www, map and application server) which functions on the principle client – server, while users are accessing applications by means of a simple Internet browser (Pásler, 2015), which is currently an essential part of almost all smartphones.

2.2.Smartphone and GIS

By enabling citizens to efficiently and conveniently share information with government, the smartphone presents a powerful tool for improving the public officers' awareness about the situation in their municipality.
Rapid ICT development concerns especially mobile phones which have been, in last decades, the most widespread information technology in Czech households. In 2015, there were 206 mobile phones in 100 Czech households. In recent years, an interesting development in the Internet use has occurred. The number of Internet users older than 16 is just slightly higher than the number of computer users, which is caused by the development of smartphones. Last year research shows that the number of users connecting to the Internet from smartphones is quickly increasing. Currently it is about 41% of population, which means approximately four times more than in 2012. It is thus supposed that the Internet, in combination with mobile phone, will soon become widespread technology used by all age and education groups. In 2015, only one third of the adult population was using Internet in mobile phones (37%, which means. 3, 2 millions of people). Almost one third persons were using Internet in relation to public administration (ČSÚ, 2017).
Nowadays, most of new smartphones are featured with the full Internet connection and so it is possible to run user applications on it. Global Navigation Satellite Systems (hereinafter GNSS) are commonly a part of the smartphone function system. GNSS are passive distance measuring systems used for definition of place and time wherever on the Earth. The omnipresence of mobile phones with GNSS thus enables us to use its functions for data collecting and cartographic processing and visualization of geographic data and information. In literature, mapping by mobile devices is commonly marked as *pervasive cartography* (Weiser, 1991), or *participative mapping* in case of involvement of the public into the process (Chambers, 2006).

2.3.Crowdsourcing

The concept of crowdsourcing is not new; the term was coined in by Jeff Howe (2006) in an issue of the Wired magazine as a mechanism for leveraging collective intelligence of online users toward productive ends. Crowdsourcing is described as the phenomenon where large groups of people is used as the primary source of required services or information, typically on a voluntary basis and using internet-based channels. Crowdsourcing can be also described in a perspective of crowd work as the act of rapidly collecting large volumes of up-to-date information on certain events from large group of geographically dispersed crowd of people (Väätäjä et al., 2011). According to Bhana et al. (2013), the dynamic mobility of citizens and their observations and knowledge of their surroundings make them perfect candidates for

collecting information on activities occurring in their environment. In this manner, large volumes of data can be collected in a short period of time and at a low cost. Thanks to citizens' knowledge of their surroundings, Väätäjä et al. (2011) had found crowdsourcing to be the most appropriate method for collecting public safety data. In literature, there are many different manifestations of crowdsourcing principles. All of them emphasize the same principle of employing the collective capacities of a crowd to address a challenge in a more profound or efficient manner than through traditional supply channels.

2.4.Geocrowdsourcing

Information and spatial data collection are two activities that have occurred as a result of technological advances during the last decade. This include the ability to create content online more easily through Web 2.0, the proliferation of smartphones with GNSS that can record the location of features, and open access to satellite imagery and online maps. This phenomenon of acquiring volunteered geographic information from crowd is described by a variety of terms emerging from different disciplines. The most cited in literature are Volunteered Geographic Information, Participatory GIS, Public Participatory GIS or Geocrowdsourcing, all describing citizen sensing of geographic information (Brown & Kyttä, 2014).
Tulloch (2008) defines *Participatory GIS (PGIS)* as a new way of GIS use based on public participation. Participatory GIS originates from the late 90s fuelled by criticism of traditional GIS technology as representing only the privileged knowledge of experts and using only the official data. PGIS builds on the principle of participatory approaches to spatial planning and management, involving the general public and local communities in the process of creation and collection of information. This method is often associated with the *Public Participatory GIS* which are described by Sieber (2008) as a set of GIS applications that facilitate wider public involvement in planning and decision making processes. Spatial information collected voluntarily by the public is called *Voluntary Geographic Information* (hereinafter VGI). First coined by Goodchild (2007), VGI is defined as harnessing of tools to create, assemble and disseminate geographic data provided voluntarily by individuals. In this context, Goodchild perceive citizens as human intelligent sensors, whose advantage is the ability to perform data processing and analysis. According to Elwood et al. (2012), VGI is spatial information voluntarily made available, with an aim to provide information about the world. The most simple definition of proposed by Fast and Rinner (2014) according to whom VGI is geographic information obtained by way of crowdsourcing. In literature, VGI is commonly interchanged with the term *geocrowdsourcing*, which can, according to Qin et al. (2016) be seen as an umbrella term for all the terms mentioned above, all indicating the process of voluntarily creating geographic information used for the needs of public administration. In this context, the term geocrowdsourcing is presented in this paper.

2.5.Factors influencing the success of geocrowdsourcing

To analyse, compare and evaluate the success of geocrowdsourcing mobile application deployment in the Czech Republic we adopt the theoretical framework defined by Sowmya and Pyarali (2014) supplemented by other factors that had been identified in the literature as factors which influence the success of geocrowdsourcing initiatives in e-governance.
The Sowmya and Pyarali´s theoretical framework to evaluate success of crowdsourcing deployment in e-governance includes the strategic and functional components drawn from Sharma´s (2010) "Crowdsourcing Critical Success Factors Model" and "Web 2.0 – 4 Factors Model" defined by Wirtz, Schilke and Ullrich (2010). The components of the framework defined by Sowmya and Pyarali (2014) are explained as follows:

- *Vision and Strategy*: it is central that contributors of the platform are identified with the vision of crowdsourcing initiative (Brabham et al., 2009), that is why there is a need for

government organizations to develop a coherent and well-defined set of goals and objectives.

- *Citizen-centric Approach*: to enhance government-citizen interaction it is necessary for public officers to take a citizen's view of what e-governance will look like and adopt technology accordingly (Fink et al., 2014).
- *Infrastructure and Inter-operability*: according to Donner and Walton (2013), every crowdsourcing initiative requires accessible and reliable communication technologies with robust and cheap internet access.
- *Reward for Participation*: the most critical factor is motive alignment of the crowd. According to Bott (2012), performance expectancy refers to the degree to which a person believes that using a crowdsourcing platform will help him in gaining profits, in terms of recognition as well as monetary benefits (Bott, 2012). However, as observed in an empirical investigation conducted by Zheng el al. (2011), people usually consider recognition as a more valuable and motivating factor to participate in crowdsourcing activities than monetary allowances.
- *Financial Capital*: every crowdsourcing initiative requires the monetary investment (Bott, 2012). However, the amount of finance can be reduced supposing that crowdsourcing initiative is built on existing ICT infrastructure (Roos et al., 2015).
- *Information Management*: in terms of the way in which acquired data and information from the crowd are processed and shared among the government entities in a timely and secure manner (Sowmya and Pyarali, 2014).
- *Social Networking* (Wirtz et al., 2010).
- *Interaction Orientation*: public officers should be able to manage and encourage the crowd to participate in the challenge.
- *The Customization / Personalization:* the crowdsourcing platform should support users' needs.
- *The User-Added Value* in terms of the value generated by tapping the intelligence of the crowd through meaningful crowd participation (Sowmya and Pyarali, 2014).

This framework is widely accepted by many researchers. However, when evaluating a success of crowdsourcing initiatives in specific domain, the framework gets insufficient. That is why some researchers adapt the framework by supplementing it by other factors depending on the surveyed area. For example, Roos et al. (2015) compile the framework with factors affecting intrinsic motivation of the crowd to participate in crowdsourcing challenges in crisis situation, and present an integrated model of critical success factors for disaster crowdsourcing platforms. The crowdsourcing critical success factor modes as described by Sharma misses a geographical element when applied to geocrowdsourcing initiatives that are specifically aimed at non-emergency reporting of civic issues. Considering the "geo" dimension of our research, the aim of this paper is to enlarge the framework of factors that has been identified in literature as factors which influence the success of geocrowdsourcing initiatives in e-governance. These factors are briefly explained as follows:

- *Acceptable number of users involved*: according to Fang and Neufeld (2009), the number of participants that actively report civic issues is very crucial for the success of the geocrowdsourcing initiative.

- *Design of application itself*: when speaking of users´ motivation, it is crucial to design a useful and user-friendly application which motivates users to download and use it (Speigel, 2011). This is confirmed by Lohr (2009), according to whom the application

should be acceptable through different cultures and societies. Sun (2015) adds that the application should be as simple as possible to be understandable with a little effort for anyone. According to Pratt (2011), it is crucial that the application interface is fast to load and compatible with any of operational system (Android, iOS, Windows Phone and BlackBerry).

- *Privacy*: being reliable is one of the factors that influence the success of geocrowdsourcing initiative. As stated by Kanhere (2011), when dealing with users´ private information, the privacy of users should always be considered and well-protected. Therefore the need of private information should be minimal.
- *Data accuracy:* offering up to date and accurate data through the application is one of the most important success factors. Therefore, an accurate position of the reported issue is crucial (Haklay et al., 2014).
- *Feedback:* as cited by many researchers, in every geocrowdsourcing initiative the feedback determines users' tendency to continue to use the application. Therefore, public officers should take reported issues into the consideration and inform the crowd about the solution.
- *Support by stakeholders*: according to Sharma (2010), the geocrowdsourcing initiative would be more successful if it is based on scientific grounds and is linked to *universities* or well-known and expert companies.

3.METHODOLOGY

There is a growing literature on geocrowdsourcing that combines crowdsourcing and GIS to collect, analyse and interpret so-called non-emergency civic issues for purposes of the public administration. Despite the growing number of academic literature dealing with the use of geocrowdsourcing even in developing countries (Haklay et al., 2014), (González et al., 2008), (Bugs et al., 2010), there is a lack of systematic and synthesizing studies indicating how geocrowdsourcing is used in the Czech Republic. To tackle this issue we propose a comparative analysis of geocrowdsourcing mobile applications currently employed in the Czech Republic.
A qualitative method was used to study the effective use of geocrowdsourcing mobile applications in the Czech Republic. As a part of the qualitative study, a descriptive and comparative approach was adopted. The assessment was conducted of the four geocrowdsourcing mobile applications used in the Czech Republic, namely Dej tip, Lepší místo, Plznito and ZmapujTo. These applications were searched and downloaded in the Czech Republic using a Czech-based Google Play Store and the Apple App Store account. The applications were evaluated using predetermined criteria drawn from the Crowdsourcing Critical Success Factors Model of Sharma (2010), the Web 2.0 – 4 Factors Model of Wirtz et al. (2010), and other critical factors identified in the literature. Data collection and analysis occurred in January 2017.
By merging the core factors of the theory that focuses on success factors of crowdsourcing in general and additional knowledge on success factors of geocrowdsourcing gained from literature study, we conducted a comparative analysis of geocrowdsourcing mobile applications for reporting civic issues used in the Czech Republic.

4.COMPARATIVE ANALYSIS OF GEOCROWDSOURCING MOBILE APPLICATIONS USED IN THE CZECH REPUBLIC

Research shows that geocrowdsourcing offer great opportunities for public officers who can gain a great deal of valuable up-to-date information which are accessible exclusively by means

of citizens and which would be otherwise unavailable. The potential of geocrowdsourcing use is huge, and this this worldwide commonly used method of obtaining geographic information is getting to be employed even in the Czech Republic where they seem to be a suitable alternative to traditional methods of contacting public authorities.
In the Czech Republic, four geocrowdsourcing reporting platforms that give citizens the ability to report various civic issues using their smartphone are available. This chapter provides a description of four most employed geocrowdsourcing mobile applications, namely Dej Tip, Lepší místo, Plznito and ZmapujTo, putting them to comparative analysis. Each of these applications is hereinafter examined with the help of proposed theoretical framework supplemented with additional success factors.

4.1.Dej Tip

The Dej Tip application is a commercial product of the company Gefos, a. s. This application was established in 2013 and it is based on cooperation between smartphones and Internet services. Dej Tip enables citizens to send reports about problems and various civic issues discovered in the municipality to its representatives. The smartphone user can take a photo of the issue by means of the application, select the appropriate category and add a comment. On the basis of the mobile phone location gained from the GPS, the server localizes the announcement and completes it with the nearest available address. If the municipality is involved in the program, the server, by means of the Integraph, s r. o. company, transfers the announcement to the relevant municipality. All announcements are being sent anonymously. The announcement consists of a photo, location data gained from mobile location services, a comment related to the defect, information about the operating system and the type of a mobile device which were used.
Processing and evaluation of announced defects are very simple. The municipality does not need any special equipment and there are no special acquisition expenses. Each municipality, which is involved in the program, receives an email twice a day. All municipalities also have at their disposal three levels of administration interfaces which enable them to sort and to process received announcements. The Dej tip application is compatible with iOS and Android systems and it is available for downloading for free (DejTip, 2013).

4.2.Lepší místo

Lepší místo is a mobile and web application operated by the company Prostor plus, s r. o. It serves towns and municipalities, but also companies and other organizations. The application registers particular tips and demands issued by citizens who are then forwarded to relevant authorities (officers, companies or colleagues). The application is supposed to improve the state of public environment and it is available for free for iOS, Android and Windows systems as well. The application also offers the administration interface thanks to which its users can manage projects, delegate missions, prioritize issues and fix deadlines. By the end of January 2017, the application was being used by 7 048 users in 97 towns and municipalities across the Czech Republic with 4 605 announcements (LM, 2017).

4.3.Plznito

The city of Pilsen launched its own application Plznito. By means of this application, citizens of Pilsen can announce civic issues they encounter in the city. The name of the website is the same, www.plznito.cz or www.plzni.to. These websites have the same purpose as the application. Announcements can be sent even from the www.plznito.cz or from a smartphone,

by means of application Plznito which is available for download for free. The application is available for iOS, Android and Windows operating systems. All defects which can be announced are classified into categories and then forwarded to relevant officers who are responsible for processing them. The state of particular announcements can be tracked by citizens on the above mentioned website. On this website, the announcements are recorded on the map with detailed information.
Municipality officers have access to the data in a non-public project map Správa (Administration), which is structured into layers which makes the announcement processing easier. Thanks to the available municipality equipment, officers can gain detailed information from cadastral map, or use information from the technical map of the city (MPMP, 2015). By the end of January 2017 there were 883 announcements in process and 2 066 of announcements had been already solved (Plznito, 2017).

4.4.ZmapujTo

ZmapujTo is an application intended for towns and municipalities, its citizens and visitors, which enable them to announce a disorder or other defects discovered in the given area. Thanks to this application, citizens have the possibility to quickly and in a very easy way warn the authority about all kinds of defects, or to propose a motion, by means of taking a photo, specifying its GPS location, matching the issue with the appropriate category, commenting it and forwarding to the relevant authority. The announcement can be sent not only by means of the phone application, but also by filling and sending the web form which is available on www.ZmapujTo.cz. Announcements are stored in a secured backup server, treated and forwarded to officers who are responsible for its handling. Each municipality which is a part of the ZmapujTo system automatically receives email with information about the nature of the defect, a photo, GPS coordinates and comments, if provided by the sender. All municipalities have thus the possibility to administrate announcements concerning the area of its interest. In such a way, the announcement goes quickly from a particular citizen to the relevant person who is responsible for handling the problem. At the same time, users have the possibility to track the state of the announcement and the development of its solution. Moreover, they can actively participate in its solving (Marek, 2013). The very first version of the web and mobile phone application was established in 2012 as an ecological project of Miroslav Kubásek, an environmentalist from Ekosmák Association in Brno. Its main purpose was to fight against illegal waste dumps in the Czech Republic. The second updated version of the application was launched in 2014 and it provided also the possibility to announce other problems which citizens can encounter in their towns and municipalities (Kubásek, 2015).

Citizens have the possibility to send the announcement directly from the place where the problem was discovered, or later on by means of the web form. The registration of the municipality and the access to the administration are for free. Supplementary services like data export, statistics and integration into the municipality websites, are provided in compliance with the demands of the municipality. The application is compatible with operating systems iOS and Android, and the second version is newly compatible also with Windows Phone operating system. The application offers also a possibility to participate in one-time ad-hoc mapping activities like mapping of billboards of political parties before European elections or mapping the activities of Let´s Clean the Czech Republic movement (Ukliďme Česko) (UČUS, 2017). By the end of January 2017, the application ZmapujTo had 1 405 users from towns and municipalities authorities in the Czech Republic.
To provide a comparative analysis, all geocrowdsourcing mobile applications mentioned above are introduced in a comparison table (see Table 1 - Critical Success Factors of Geocrowdsourcing mobile applications deployed in the Czech Republic).

Tab. 1 - Critical Success Factors of Geocrowdsourcing mobile applications deployed in the Czech Republic. Source: author

		Geocrowdsourcing mobile application			
		Dej Tip	***Lepší místo***	***Plznito***	***ZmapujTo***
CSF	***Vision and Strategy***	Enable citizens to report and view various civic issues to the respective council using app Dej Tip.	Enable citizens to report and view various civic issues to the respective council using app Lepší místo.	Enables citizen to locate and view civic issues reported in the area of the city of Pilsen.	Enables citizens to report civic issues in their neighborhood and get them resolved by the public officers in charge.
	Citizen-centric Approach	Offers citizen empowerment and provides constant updates to citizens on the status of reported issue.			
	Infrastructure and Inter-operability	Reporting via municipality webpage or mobile app Dej Tip.	Reporting via mobile app Lepší místo. Additional functionalities for businesses ("guard", intranet, administrator).	Reporting via municipality webpage or multipurpose mobile app "Plzeň občan". Well established infrastructure, high availability and interoperability of the site.	Virtual network established to look into the civic issues in many cities in the Czech Republic, reporting via web or mobile app ZmapujTo. Well established infrastructure, high interoperability. Ad-hoc monitoring (Let´s Clean the World initiative).
	Reward for Participation	No reward for participation.	No reward for participation.	No reward for participation.	No reward for participation.
	Financial Capital	-	Approx. 20 000 CZK/year.	-	Less capital intensive, from 150 CZK/month.
	Information Management	Issues reported are publicly broadcasted which in turn are directed to the public authorities in-charge to resolve them.			
	Social Networking	No registration/user profile creation.	Possibility to register and create user profile.	Possibility to register and create user profile.	Possibility to register and create user profile.
	Interaction Orientation	Interaction process is configured in ways to facilitate interaction among citizens and public officers.			
	Customization	No personalisation or customization provided.			
	User-Added Value	*Civic issues reported by users are value added.*		*User contributions are high in terms of reported issues.*	*User contributions are high in terms of reported issues. Reports about the illegal landfills are used within the world´s initiative Let´s Clean the World /Uklidˊme svět, uklidˊme Česko).*
	Number of users / reports	- / 10 615	97 / 4 605	1 / 330	1 405 / 13 866

	Design of application itself/accessibility	Android, iOS	Android, iOS, Windows phone	User-friendly interface, issues are classified into 12 categories. App available for Android, iOS, Windows phone	User-friendly interface, easy and intuitive use, issues are classified into 5 categories and subcategories. App available for Android, iOS. Added functions "Mobile radio": tourist guide, news, information about the city, emergency lines.
	Privacy	Anonymous reporting.	Anonymous reporting.	Anonymous or voluntarily public reporting.	Anonymous or voluntarily public reporting.
	Data accuracy	-	-	-	-
	Feedback	Yes: information on the municipality webpage.	Yes: information and communication via application.	Yes: feedback in the detailed report on the web.	Yes: information in the detailed report on the map, or if indicate contact details, citizens can be informed about the issue directly.
	Support by stakeholders (provider)	Municipality. (Integraph Maps Apps)	Municipality, Nadace Vodafone ČR, Microsoft, T-Mobile, TPCA, Nadace Open Society Fund Praha, Fond Otakara Motejla, Foxconn. (Prostor PLUS o.p.s.)	Municipality.	Municipality, Envi Web, Nanoion.

* The data in Table 1 were acquired in January 2017. Given this fact, a growing trend is possible.

5.DISCUSSION AND LIMITATIONS

The findings show that each geocrowdsourcing application allows citizens to participate proactively on public governance by allowing them to report various civic issues occurring in their neighbourhood. It was discovered that each application is supplemented by website with an interactive map on which reports are being displayed. Equally, each application offers an administrative interface for public officers. What differs is the price of offered services. While Lepší místo seems to be the most expensive, ZmapujTo is the most affordable. The price for basic services at ZmapujTo starts at 150 CZK per month. This could be regarded as a negligible sum in municipality budget.

Another difference observed among applications is their additional functionalities. Apart from civic issues mapping, ZmapujTo app, for example, offers the possibility of ad-hoc monitoring. These one-time-mapping activities are used for example to map illegal landfills within the nationwide cleaning initiative Let´s Clean the World (in Czech Republic called Ukliďme svět, Ukliďme Česko). Also Lepší místo app disposes additional functionalities which can be used not only by public offices but also by businesses.

Results show that Plznito exceeds other applications. Compared to other applications, Plznito is a specific app launched and designed only for a city of Pilsen. This app is embodied in wider application called "Pilsen – Citizen" ("Plzeň – Občan") which is an interactive guide of public life for Pilsen citizens offering them various functionalities such as interactive directory of public authorities, online registration system for visiting the office or online information about traffic and parking situation in the city.

Concerning the number of users, it was very difficult to determine the exact quantity of active users of each application. That is why we compared the number of users in terms of public authorities using the app. As already stated, Plznito app is used only by Pilsen city. The most commonly used geocrowdsourcing app in the Czech Republic is thus ZmapujTo with more than 1 400 municipalities involved. It was unfortunately impossible to find out the exact quantity of Dej tip app users. However, according to number of reports we presuppose that Dej tip app is the second most commonly used geocrowdsourcing app in the Czech Republic, followed by Lepší místo app on the third place.

Differences among the apps were also found in context of design application and their accessibility. While Lepší místo and Plznito apps are available for all three most commonly used operational systems Android, iOS and Windows phone, Dej Tip and ZmapujTo are available only for Android and iOS.

The findings of this study should be interpreted in the context of some key limitations. Firstly, the applications examined in the study were viewed on only one occasion. Secondly, for the objective evaluation of the geocrowdsourcing critical success factors, multiple evaluation methods such as questionnaires or discussion sessions could be used. Focus group experiment could be conducted too to assess the influence of determined geocrowdsourcing critical success factors. Within this focus group experiment, participants could be asked to use and explore each of proposed apps, and then to evaluate their functionalities via an online questionnaire. Each another method would have its own contribution to gaining user experience of the geocrowdsourcing mobile application. Therefore, as a whole, the various methods should be used to assess critical success factors of geocrowdsourcing defined in this research. Thirdly, with regards to the validation approach, we only incorporate the results of case studies in the Czech Republic. The research is limited geographically, and thus, more case studies are needed to establish. As geocrowdsourcing mobile applications have gained a lot attention not only in the Czech Republic but almost all around the Europe, the issue requires to the broader international discussion. Least but not last limitation of this research could be the fact that some of geocrowdsourcing mobile applications assessed in the current study have accompanying websites. These were not considered into comparative analysis.

6.CONCLUSION

Mobile devices such as smartphones have the capability to run applications (Sherwin-Smith and Pritchard-Jones, 2012) which, together with WebGIS, seem to be a powerful tool for public officers to collect spatial data and information about the situation in city surroundings. Geographical citizen science has clearly grown lately and is showing significant potential in e-government. Despite this phenomenon known as geocrowdsourcing has been extensively studied until recently, little attention is given to understanding what factors contribute to the success of geocrowdsourcing.

In this paper we propose a set of critical success factors of geocrowdsourcing mobile applications use in e-government. Based on existing critical success factors models and results from literature reviews, we defined factors that assess the success of geocrowdsourcing mobile applications for reporting of non-emergency civic issues. Thereafter, the critical success factors served for a comparative analysis of current geocrowdsourcing mobile applications deployed in the Czech Republic, namely Dej Tip, Lepší místo, Plznito and ZmapujTo. The analysis approach reveals the differences among the compared applications. Particularly, functions vary considerably in terms of their interoperability and accessibility. Discrepancies were also found in terms of number of users.

Furthermore, the results of the comparison illustrate the advantages of each geocrowdsourcing application. To the best of our knowledge, this study is the first to comparatively explore geocrowdsourcing mobile applications deployed in the Czech Republic. This study provided a

basis for understanding the successful implementation and use of geocrowdsourcing mobile applications and for identifying opportunities for development of these kinds of applications.

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MORTGAGE BANKING IN TERMS OF KNOWLEDGE TECHNOLOGIES

Hedvičáková Martina, Pozdílková Alena

Abstract

During 2016, there was a continuous decline in the interest rates (except July when rates grew by 0.1%) for mortgages. At the end of this year, decrease stopped in October 2016. The interest rate of mortgage loans increased to 1,97 % in December 2016. According to the prognosis of the Czech National Bank, growth will occur after mid-2017. The consequence of this growth should also include the increase in mortgage interest rates.
The paper deals with the mortgage market in the context of knowledge technologies. Subsequently, mortgage banking is analysed in terms of knowledge technologies and the process of obtaining a mortgage loan using an expert system is described.
With the use of a conceptual map, the basic concepts and their mutual inter-relationship included in mortgage banking will been created.

Keywords: mortgage banking, knowledge technologies, expert system, conceptual map, expert system rules

JEL Classification: G21, D83

1.INTRODUCTION

The euro area economy is maintaining stable growth. According to revised data, annual GDP growth stood at 1.7% and quarterly growth at 0.3% in Q3. Household consumption remained the driver of growth. The unemployment rate dropped to 9.8% in October, declining for the second consecutive month. Despite still subdued wage growth, the improved labour market situation was reflected in an increase in retail sales in October, with rising sales being recorded for most goods. Annual industrial production growth slowed to 1.2% in September. It can be expected to have slowed further in October. Nevertheless, leading indicators suggest a positive outlook. Both the ZEW indicator of economic sentiment and the PMI in manufacturing increased in November. The December CF left its GDP growth outlook for 2016 at 1.6% and increased that for 2017 to 1.4%. The OECD raised its growth forecasts for both years by 0.2 pp. The ECB published the most optimistic forecast. It expects growth of 1.7% for both this year and the next. CNB monetary policy (2016)

The forecast assumes that market interest rates will be flat at their current very low level and the exchange rate will be used as a monetary policy instrument until mid-2017. Consistent with the forecast is an increase in market interest rates thereafter. CNB Monetary policy (2016)

Current developments of interest rates in 2016 in Czech Republic is illustrated by following graph.

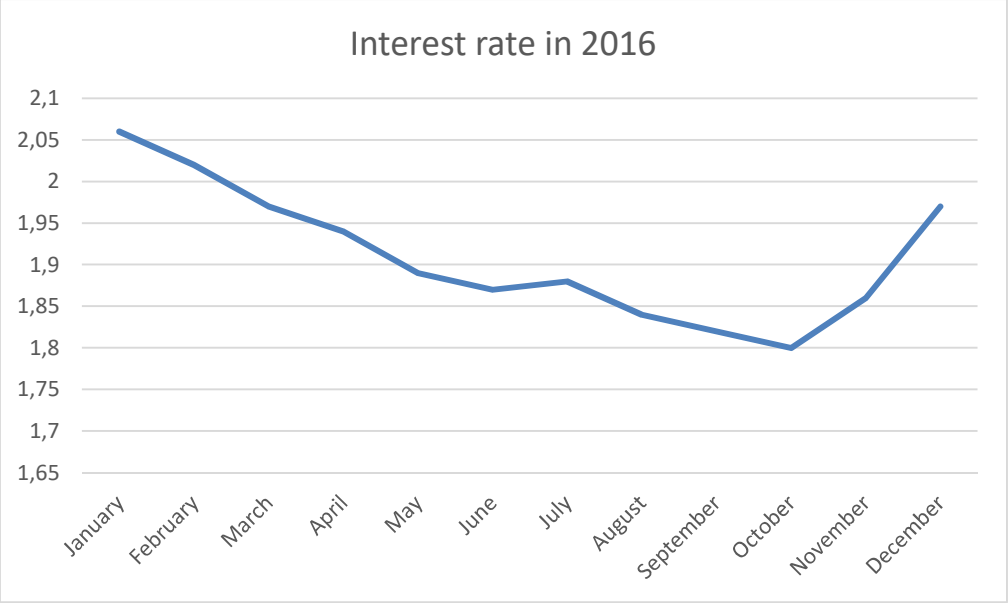


Fig. 1 – Development of interest rate in % in January – October 2016 in Czech Republic. Source: own processing, data source Hypoindex (2016)

According to the Czech National Bank (2016) the rate on mortgage loans has reached a record low of 1.91% and the volume of these loans was CZK 34.6 billion. This was almost CZK 7 billion higher than the previous highest volume observed in June 2016.

The average interest rate was 1.97% for mortgage loans in December. The minimum achievable fixed rate is now 1.54% for mortgage loans. In December 2016, 8,684 mortgage loans were agreed on, but that is about 5,702 contracts less than in November. Overall volumes of these loans fell by more than 12 billion CZK to 17.665 billion CZK.

In early December interest rates of the Hypoteční Bank were raised. Shortly after, UniCredit Bank joined the rate hike, and by the end of the month, Sberbank and Expobank followed. The main index GOFI 70, which measures the average minimum bid rate mortgages up to 70% LTV, rose sharply in December by 11 basis points from 1.86 to 1.97. But the mortgages with 70% are still cheaper than the other mortgages. Last December, this index stood at 2.13%. In January 2017 Česká Spořitelna announced the increase in interest rates on mortgage loans. Česká Spořitelna ranks among the three largest banking institutions in the Czech banking market.
Banks granted mortgages worth 208 billion in the first 11 months of 2016. They outperformed the overall result of the previous year. This above average result could have been expected in December 2016 too. The total sum will exceed 220 billion CZK. (GolemFinance, 2017)

2.GOALS AND METHODOLOGY

This paper is based on the analysis of the literature and articles on housing. Important informations are available on the official websites of each bank institution, the Czech National Bank, the Czech Statistical Office, as well as of some financially oriented portals like Hypoindex, GolemFinance, etc. CNB statistics (2016), Hypoindex (2016)

Mortgage loans are a widely studied subject and there is an extensive literature dealing with mortgages on the Czech market, which enables us to gain insight into the selected areas of mortgages from multiple sources which deepen or complement the issue. The development of mortgage loans in the Czech Republic is included in order to depict the situation on the Czech

market. Allen, Paligorova, (2015), Soukal, Draessler, 2015, Hedvicakova, Pozdilkova, (2016), Hedvicakova, Svobodova (2016).

The goal of the article is to analyse the situation on the Czech mortgage market and encounter a different view on mortgage banking, which is an area of knowledge technologies. Specifically, the expert system modelled describing the process of obtaining loans for housing. This system provides basic orientation in mortgage banking through concepts occurring in the field and the conditions necessary to obtain the loan itself.

In artificial intelligence, an expert system is a computer system that emulates the decision-making ability of a human expert. Expert systems are designed to solve complex problems by reasoning about knowledge, represented mainly as if–then rules rather than through conventional procedural code. Expert systems were among the first truly successful forms of artificial intelligence software.

An expert system is divided into two subsystems: the inference engine and the knowledge base. The knowledge base represents facts and rules. The inference engine applies the rules to the known facts to deduce new facts. Mikulecký, Lenharčík, Hynek (2002)
Rules of knowledge systems to mortgage banking will be applied in next chapters.

3.LITERATURE REVIEW

Mortgage markets support the provision of housing by channelling savers' surplus funds to households who need loans to finance the purchase of a home. How well mortgage finance systems function relates to a number of factors, including (but not limited to) the availability of funds for lending and the ability of lenders to mitigate information asymmetries and interest rate, liquidity and credit risks. Macroeconomic stability is a necessary precondition for the development of mortgage markets. (Warnock, Warnock, 2012)

Despite several European Union (EU) initiatives, there is only limited pan-European mortgage market regulation. The EU strategy can be characterised as one of parallel liberalisation and consolidation. Mortgage market integration has been limited despite factors pushing for less national and more supranational regulation. (Aalbers, 2012)

Actual foreign prognoses show, that interest rates reflect improving economic outlook (see Fig. 2):

- Recovery of interest rates slower in euro area.
- Prolongation of ECB quantitative easing to end of 2017.
- Decrease in natural interest rates hypothesis
- Structural factors and/or cyclical factors?
- Implications for monetary policy.

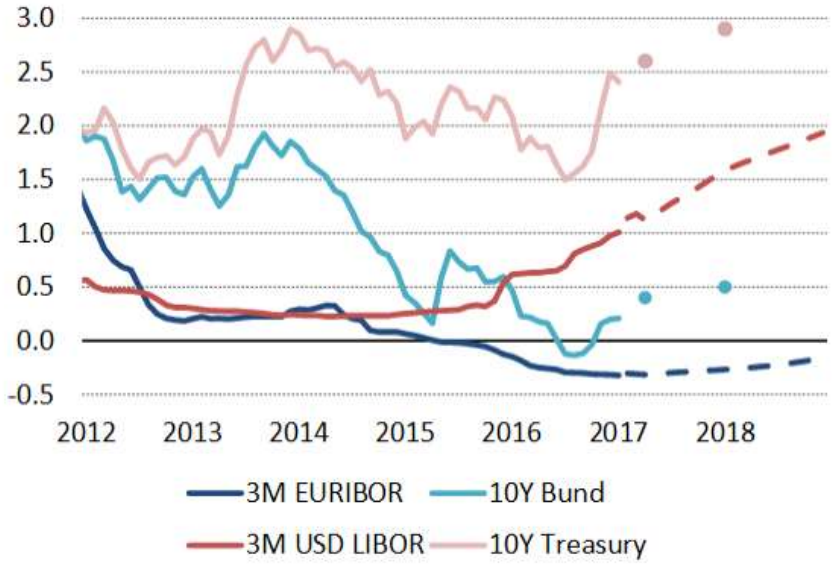


Fig. 2 – Interest rate in %. Source: CNB Global Economic Outlook (2017)

Kim (2015) analysed households' optimal mortgage and unsecured loan borrowing and default decisions in the context of the recent recession.

There has been a decline in interest rates in the Czech Republic since 2008. Interest rates on mortgage loans were 5.82% in August 2016. This interest rate was the highest since 2003, when it reached similar values. In 2016 there has been a continuous decline in interest rates due to the financial crisis, which lasted, without interruption, until the end of 2016. A decline in interest rates was more than 4% over these 8 years.



Fig. 3 – Development of interest rate in Czech Republic in 2003-2016. Source: own processing

The prognosis of the Czech National Bank talks about a rise in interest rates in mid-2017, which will be reflected in the prices of mortgages. In this time, there should be a further decline in interest rates in the Eurozone and the end of exchange rate commitment which holds the weakened exchange rate. The question is, how will be the prognosis of Czech National Bank be fulfilled. It may be helpful for Fed, which also plans to increase interest rates. And investment in the US dollar will be more attractive than depositing money into CZK for many investors. Hypoindex – sazby (2016)



Fig. 4 – Prognosis of interest rates in Czech Republic. Source: Hypoindex – sazby (2016)

4.MORTGAGE BANKING IN TERMS OF KNOWLEDGE TECHNOLOGIES

In this part will be the expert system analysing the process of obtaining a loan for housing described. It includes basic concepts occurring in the area and the conditions that must be met to obtain the loan itself. Knowledge application can be used for banking institutes providing housing loans, particularly mortgages.

Application is made to the organization, which is a bank. The bank will use the application specialists' loans for housing. They enter into the system the necessary information (for example credit amount by which the client requests, the amount of monthly income, type of employment contract, if any, etc.) and the system will assess the conditions for obtaining a loan. Based on this evaluation specialist informs the customer about obtaining or rejecting the loan.

The model range is for smaller regional bank branch with a total of 1000 clients. The total number includes clients of all ages that we start from the assumption that every fifth would be interested in a home loan. Each fifth client will thus be in the age group 20-50 years and is interested in its own housing, reconstruction of existing housing or repay debt. The project will cover in detail this very specific group of clients. Other clients do not expect interest on a loan or are in the age group 20-50 years. All this is a model example.

Model example will be displayed using conceptual maps. In the conceptual map can be seen the fundamental concepts in mortgage banking, their interaction and relations between them.

4.1.Expert system rules

This section represents the rules of the expert system. The rule generally has a simple structure: Under certain assumption of hypothetical part (variable values) indicates a consequence, or if consequential part.
For this part is taken by a model example - the loan amount is 1.5 million CZK, maturity period of 30 years and a fixed interest rate period of 5 years. Poklopová, N. (2015) If the client reaches all the above conditions obtains a loan. Failure to comply with the loan amount, maturity period and fixation could be changed. If neither arrangement that does not allow the client to obtain a loan, the loan is denied, see Table 1.

Tab. 1 – Expert system rules. Source: own processing, data source Poklopová (2015)

No.	Predictor part	Consequential part
1	Age between 20 and 35 years.	Fulfils the conditions for the next step to get the loan.
2	Net monthly income more than CZK 20,000.	Fulfils the conditions for the next step to get the loan.
3	Citizen of the Czech Republic.	Fulfils the conditions to advance to the first approval level.
4	Advance to the first approval level.	
5	Household expenses do not exceed 1/3 of monthly income.	Fulfils the conditions for the next step to get the loan.
6	Clients are insured (life insurance).	Fulfils the conditions for the next step to get the loan.
7	The number of people dependent in the household does not exceed 2.	Fulfils the conditions to advance to the second approval level.
8	Advance to the second approval level.	
9	Not in prison or suspended sentences.	Fulfils the conditions for the next step to get the loan.
10	Not execution or insolvency.	Fulfils the conditions for the next step to get the loan.
11	Not declared personal bankruptcy.	Fulfils the conditions to advance to the third approval level.
12	Advance to the third approval level.	
13	Not in a notice period.	Fulfils the conditions for the next step to get the loan.
14	Is employed with a contract of indefinite duration.	Fulfils the conditions to advance to the fourth approval level.
15	Advance to the fourth approval level.	
16	Not a guarantor for another home loan.	Fulfils the conditions for the next step to get the loan.
17	Can provide collateral.	Fulfils the conditions for the next step to get the loan.
18	Not loan more than 100 000 CZK.	Fulfils the conditions to obtain the loan.
19	Final approval	

4.2.Linkages between the rules

Linkages reflect the interdependence of the rules of the expert system. In Table 2 will be captured hierarchical structure rules.

Tab. 2 – Linkages between the rules. Source: own processing, data source Poklopová (2015)

Description of the relationship between the rules
IF 1 AND 2 AND 3 THEN 4
IF 5 AND 6 AND 7 THEN 8
IF 9 AND 10 AND 11 THEN 12
IF 13 AND 14 THEN 15
IF 16 AND 17 AND 18 THEN 19
IF 4 AND 8 AND 12 AND 15 THEN 19

5.CONCEPTUAL MAP

Conceptual map is constructed from past experiences, knowledge, variously information obtained through them and extending the knowledge structures. Its use is widespread due to the easy and clear visualization. Each represented map becomes unique. Using conceptual maps will achieve understanding of complex topics, structured overview and easier to remember information and knowledge. For this model example has been created a conceptual map with the basic concepts and their mutual interrelationship included in mortgage banking, see Fig. 5. In the conceptual map can be seen the fundamental concepts in mortgage banking, their interaction and relations between them.

Conceptual map contains always the question that defines the model and determines what model is focused, in this case: Why do we need a loan for housing?

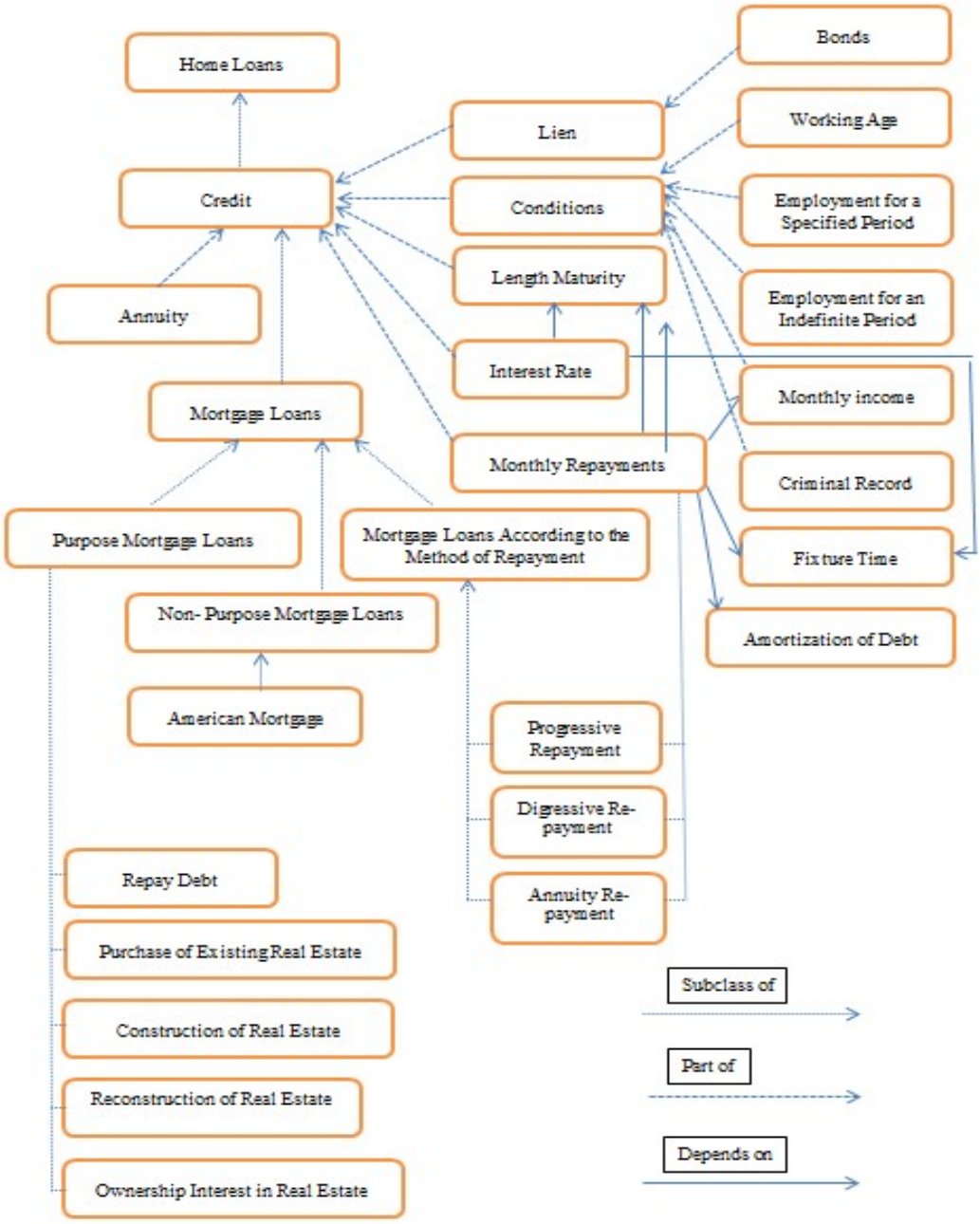


Fig. 5 – Conceptual map. Source: own processing, data source Poklopová (2015)

6.MULTICRITERIA ANALYSIS OF MODEL EXAMPLES

Comparison of mortgage loans in selected banks is realized in the following part. Four selected banks, currently operating on the mortgage market are chosen for this example. The first two banks are Česká Spořitelna and Komerční Bank. Both of these banks have a long tradition in the Czech market. They are not specializing only in mortgages, but also provide common services like personal accounts, savings accounts, loans, etc. Hypoteční Bank specifically specializes in mortgage loans. The last choice is Equa Bank as a low-cost bank operating which has existed in the market for only a short time.

The following indicators will be used in comparison: value of real estate, amount of the loan, value of LTV, interest rate, value of interest rate, duration of fixation, maturity, amount of monthly instalments.

The first model example - a young family (2 adults and 2 children)

A client is a married man aged 30 years, employed as a mechanical engineer with a contract of indefinite duration. His average net monthly wage is 35 500 CZK. His wife is currently on maternity leave. She previously worked as a personnel manager in a multinational company, where she still has a contract for an indefinite period. Her net income amounted to 21 000 CZK. Spouses have the intention to buy property; houses totalling 2.5 million CZK, which also may be liable. They have CZK 500 000 available from their own resources. The client wants a 25-year maturity loan.

The client is interested in which bank will be the best option for him - whether he would receive a loan and under what conditions. The model compares values of two possibilities LTV (80% and 100% LTV) with fixed and variable interest rates.

The second model example - elderly couple and housing reconstruction

The second model is an example of a man and a woman aged 50 years, who want to reconstruct their own house. Total reconstruction amount is 550 000 CZK. The value of the property has been appraised at 1 500 000 CZK. Both have a steady monthly income. The man earns 17 000 CZK and woman earns 12 000 CZK. They currently can afford to pay 6500 CZK per month on mortgage loan repayments. The client is interested, whether or not they receive a loan, under what conditions and in which bank will be the best option for him. In the model, the profitability of the purpose mortgage loan for reconstruction (Option I) is compared with the non-purpose mortgage loan, called American mortgage (Option II). Another variable is the duration of fixation which in the example is shown for the 5th and 10th year of fixation.

6.1.Results

The first model example - a young family (2 adults and 2 children)

A loan product with the lowest interest paid for the young family was offered by Equa Bank, Česká Spořitelna and Komerční Bank (mortgage loan at 80% LTV). If you choose option mortgages to 100% LTV, the best offer is a loan from Komerční Bank. All three banks at 80% LTV, offer the same interest rate of 1.99%, Hypoteční Bank 2.39%. Total results are in Tab. 3. The total interest paid on the loan would amount to 658 600 CZK.

Tab. 3 – First model example results. Source: own processing

Mortgage loan	**Equa bank**	**Česká Spořitelna**	**Komerční banka**	**Hypoteční banka**
Monthly repayments	8467 CZK	8467 CZK	8467 CZK	8862 CZK
Total sum	2540100 CZK	2540100 CZK	2540100 CZK	2658600 CZK

The second model example - elderly couple and housing reconstruction

The comparison gives us the optimal way to finance the reconstruction of the house mortgage loan. In evaluating the products of individual banks, alternative US mortgages were included. Its advantages for the client include obtaining the loan without documenting the purpose, and submitting subsequent documents related to the fulfilment of purpose. Another finding which goes against US mortgages, was interest rates, which tend to be higher due to targeted mortgage. Results and interest repayments are in Tab. 4.

Tab. 4 – Second model example results. Source: own processing

Mortgage loan	**Equa bank**	**Česká Spořitelna**	**Komerční banka**	**Hypoteční banka**
Monthly repayments	5220 CZK	5385 CZK	5308 CZK	5157 CZK

Overpayment	626400 CZK	646200 CZK	636960 CZK	618840 CZK

7.CONCLUSIONS

The goal of the article was analysis of the situation on the Czech mortgage market and encountering a different view on mortgage banking, which is an area of knowledge technologies. Specifically, the expert system, which describing the process of obtaining loans for housing, was modelled. Knowledge application can be used for banking institutes providing housing loans, particularly mortgages. Application allows users to determine whether an applicant for a mortgage loan meets the specified conditions and may be given the actual mortgage.

We can say that mortgage loans reached their bottom after evaluating the development of interest rates on mortgage loans in 2016. Mortgage loans remain highly competitive despite a slight rise at the end of the year. If we compare this results with the development of interest rates in 2015, rates in 2016 are 0,2 - 0,3% lower than in the same period last year. This means that a mortgage loan in the amount of CZK 2 million for a 20-year maturity will save several hundred crowns for each monthly installment, according to specific conditions. The most important is the purchase price or the cost of the reconstruction.

An increasing trend in interest rates in 2017 is expected. However, the development of interest rates is influenced by many other factors, for example by the demand for mortgage loans. Future development of interest rates depends on CNB politics, and the rate in the interbank lending market, which is derived from the price of money, at which banks lend to themselves. CNB previously advised that this year will end the currency intervention. The likelihood of an increase in key interest rates by the CNB increases due to inflation and other indicators of the real economy. The trend of increasing rates can be predicted on the interbank rate market. (GolemFinance, 2017)

An increase in interest rates on mortgage loans by Česká Spořitelna should be in January 2017. Česká Spořitelna is the last of the three major banks operating on the Czech banking market, which still has not increased interest rates.

The second part of the contribution is focused on usage of conceptual maps in mortgage banking. Application is made to the organization, which is a bank. The bank uses the application specialists' loans for housing. For this model example has been created a conceptual map with the basic concepts and their mutual interrelationship included in mortgage banking. In the conceptual map the fundamental concepts in mortgage banking, their interaction and relations between them can be seen.

Expert systems and knowledge technologies are very interesting and current issues. Mortgage banking is nowadays very actual theme, because during 2016 there was a continuous decline in interest rates of mortgage loans. According to the Czech National Bank has in 2017 cause it to grow. Many interesting results could be made in conjunction with mortgage banking in further research.

Acknowledgements
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FINANCIAL LITERACY AND MONEY MANAGEMENT OF THE PUPILS IN THE CZECH EDUCATION SYSTEM

Hedvičáková Martina, Svobodová Libuše, Dittrichová Jaroslava, Král Martin

Abstract

The paper is focused on the financial literacy of Czech individuals and pupils in the selected school. The paper is divided into three parts. The first part attempts to define financial literacy and state institutions which affect it. It also summarizes and describes the researches which the Czech Republic participated in financial literacy. The second part consists of quantitative research that charts the financial literacy of pupils 8th and 9th grades of selected primary schools in Liberec. The next part follows the first two. It tries to give examples of options to increase financial literacy. The aim of the paper is to analyze the selected issues of financial literacy in selected primary schools in the statutory city Liberec and propose possible solutions for the improvement of this literacy. Primary and secondary sources focused on the financial literacy were used within preparation of the paper.

Keywords: financial literacy, pupils, budget, survey, primary school

JEL Classification: I22, G02

1.INTRODUCTION

The issue of financial literacy appears to be for somebody boring and usual. In the connection with reality of everyday life, life style and society is getting as interesting and hot topic of this century. Importance of the knowledges from this field must highlight also due financial and economic crisis. Higher impact was in the last years given on the topics of financial education and financial literacy.

Today´s society is so advanced and educated that state alone, what is necessary to do those citizens will know and do not neglect. As well as computers became the integral part of each household, also financial literacy is becoming as phenomenon that is necessary to absorb. One of the factors that affect economy is also the financial issue.

Understanding financial literacy among young people is essential for developing effective financial education programmes. (Astuti, Trinugroho, 2016). Financial literacy (FL), its importance, measuring issues, implementation of financial education programms and related topics are frequently discussed in academic and public environment. High level of financial literacy makes a large contribution to the financial well-being of individuals, because financially literate individuals are more likely to plan for retirement (Almenberg & Save-Soderbergh, 2011), more likely to participate in financial markets and perform better on their portfolio choice (van Rooij, Lusardi & Alessie, 2011) and more likely to accumulate higher amounts of wealth (Lusardi & Mitchell, 2011). In turn „lack of financial literacy was one of the factors contributing to ill-informed financial decisions and that these decisions could, in turn, have tremendous negative spill-over" (PISA/OECD, 2012). In many countries governments are increasingly concerned about financial illiteracy of their citizens. (Ciemleja, Lace, Titko, 2014) Kantnerová (2015) shows the level of financial literacy in different countries and find, if there is any, some methods, differences or connecting matters, what can be used for the improvement of the situation, if needed.

The article will focus on how the financial literacy is defined, what are the standards of the financial literacy and what means and what institutions determine financial literacy and how was the Czech Republic evaluated in national and international investigations in the financial

literacy. Selected results of the questionnaire which was carried out in the eighth and ninth grade of primary schools and was focused on the financial literacy and that was done by the empiric method of the study will be presented in the article. The investigation was divided into two parts – budget management and financial literacy. The possibilities for better financial literacy will be presented in the last part of the article.

2.METHODOLOGY AND GOAL

The article is based on primary and secondary sources. Secondary sources comprise information about financial literacy and education in the Czech Republic and abroad, professional literature, information collected from professional press, discussions or previous participations in professional seminars and conferences relating to the chosen subject. Primary sources are based on the data from the investigation that was done in 2016 in selected primary schools in Liberec. Then it was necessary to select, classify and update accessible relevant information from the numerous published materials that would provide the basic knowledge of the selected topic.
Processing of the survey results was carried out by empirical research. The survey was compiled from a questionnaire that included test questions that were designed to determine not only the level of knowledge of financial literacy, but also how the kids manage money. For the evaluation of survey were used an analysis of individual data. After that data were compared using methods of synthesis and formulated conclusions. The questionnaire was anonymous and before the filling was communicated to the pupils the purpose of the survey and also were given instructions how to fill the questionnaire. The questions were formulated clearly so pupils can understand them. The questionnaire consisted of questions that have been concluded with one correct option. Three questions were possible to fill up. The questionnaire contained 22 questions in total.
The survey was conducted in 2016 in the period between January and February at four primary schools in Liberec. Total number of 105 pupils took part in the survey at the primary school Ještědská, 29 pupils in primary school Kaplický (8^{th} and 9^{th} grades), 46 pupils in primary school Barvířská and 57 pupils in primary school U Soudu. Therefore, 237 pupils in total participated the survey - 128 of them were from 8^{th} grade and 109 from 9^{th} grade. Total number according to sexes is shown in Fig. 1.

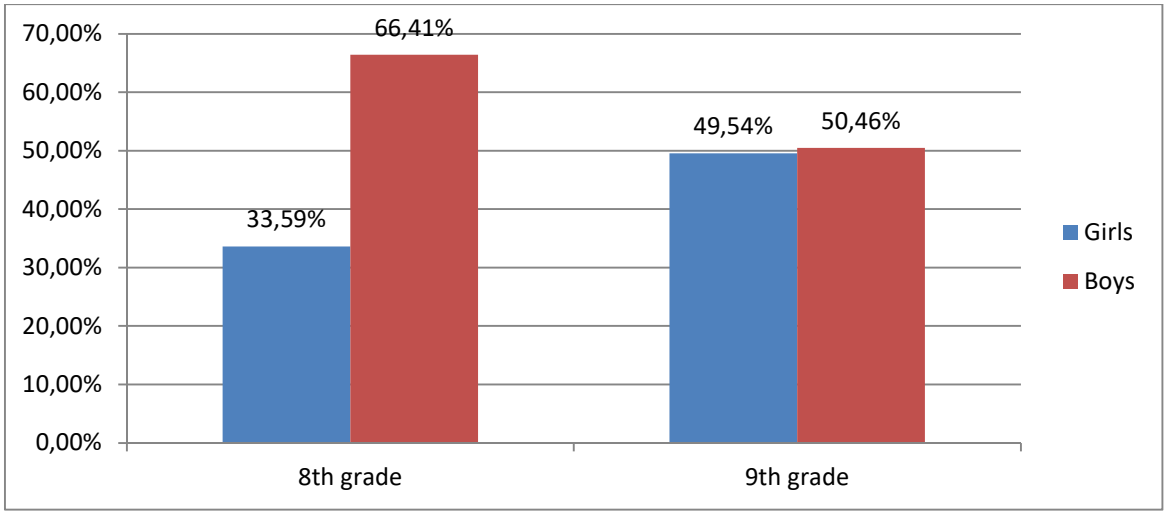


Fig. 1 - Gender of respondents. Source: own processing

The distribution of girls and boys is not uniform. The reason is the distribution of the genders in the classes. In selected eight classes were 43 girls and 85 boys. The difference was not significant at nine classes, but also here were more boys. In total there is almost 1/3 more boys.

Following topics were used for the evaluation of the questionnaire to determine the financial literacy of the pupils.
Issue of the budget management – will be described in more details on the basis of the gained information.
Issue of the financial literacy – 13 questions were given in total. 5 of them will be solved in the article. 12 questions were focused on the level of the financial literacy (only one correct answer). The last question asked pupils whether they met the game that affect financial literacy. The pupils were warned to fill only questions they are able to answer, not only guess the correct answers.

2.1.Goal

The goal of the article is to focus on the financial literacy and to present results from the selected questions focused on the financial literacy in the 8th and 9th grade at the primary schools in the Liberec town and to design possibilities how to improve the financial literacy.
The key hypothesis of the paper is that older pupils achieve better results in chosen areas of the financial literacy. This hypothesis works on partial hypotheses:

- At least 50 % of all pupils get pocket money in an amount which psychologists recommend.
- Older pupils tend to save money more than younger pupils who rather tend to spend it immediately.
- Older pupils are better in answering the knowledge questions related to financial literacy.

To test these hypotheses the Chi-squared test is used with a significance level of 5 %.

3.ACTUAL SITUATION IN THE FINANCIAL LITERACY

PISA (2012, p. 36) defines the financial literacy as: „Financial literacy is knowledge and understanding of financial concepts and risks, and the skills, motivation and confidence to apply such knowledge and understanding in order to make effective decisions across a range of financial contexts, to improve the financial well-being of individuals and society, and to enable participation in economic life."
The definition of financial education developed by the OECD in 2005 and endorsed by G20 leaders in 2012 is used in a majority of countries to refer to: "the process by which financial consumers/investors improve their understanding of financial products, concepts and risks and, through information, instruction and/or objective advice, develop the skills and confidence to become more aware of financial risks and opportunities, to make informed choices, to know where to go for help, and to take other effective actions to improve their financial well-being."(OECD, 2005a).
As such, financial education is a process that covers and takes into account the varying needs of individuals in different socio-economic contexts. Financial literacy that is the outcome of this process is defined as a combination of financial awareness, knowledge, skills, attitude and behaviours necessary to make sound financial decisions and ultimately achieve financial well-being(OECD/INFE, 2012). (OECD, 2013)
National strategies have been designed in countries with different economic and social conditions and with varying levels of financial market development (see table 1). (OECD, 2013)

National Strategy	Numbers	Countries
Countries that have implemented a National Strategy	**20 (7 G20)**	Australia, Brazil, Czech Republic, El Salvador, Estonia, Ghana, Ireland, Japan, Malaysia, Netherlands, New Zealand, Nigeria, Portugal, Singapore, Slovenia, South Africa, Spain, United Kingdom, United States, Zambia
Countries that are at an advanced state of design of their National Strategy	**25 (7 G20)**	Armenia, Canada, Chile, Colombia, India, Indonesia, Israel, Kenya, Korea, Latvia, Lebanon, Mexico , Malawi, Morocco, Peru, Poland, Romania, Russian Federation, Serbia, Sweden, Tanzania, Thailand, Turkey, Uganda, Uruguay
Countries that are considering the design of a National Strategy	**5 (all G20)**	Argentina, China, France, Italy, Saudi Arabia

Tab. 1 - Status of National Strategies, Source: OECD (2013)

The National Strategy for Financial Education (hereinafter the "strategy") is a comprehensive and systematic approach to reinforcing the financial literacy of citizens of the Czech Republic. The objective of the strategy is to create a financial education system aimed at increasing the level of financial literacy in the Czech Republic. The strategy defines the main issues as well as consequential priority tasks in the area, including specific tasks of the key players, with an emphasis on the public administration entities.
Financial education is a key element in consumer protection in the financial market and represents one of the objectives stipulated in the Framework Policy of the Ministry of Finance on Consumer Protection in the Financial Market. (MFCR, 2009)
Documents published in the United States, United Kingdom , Canada, Australia, OECD and the European Union mention terms such as 'financial capability', 'financial literacy' and 'financial education' (Orton, 2007, p. 7–8).
These terms are applied differently in different contexts based on the specific circumstances in the aforementioned countries. For example, the Policy Research Initiative defines the difference between financial capability and financial literacy and understands financial capability as a broader term than financial literacy, because it more accurately captures its essence and includes (Orton, 2007, p. 15):

- Financial knowledge and understanding,
- Financial skills and competence,
- Financial responsibility. (Opletalová, 2015)

3.1.Financial education principles

- Objectivity principle

In order to generally consider financial education projects as a part of the financial education system,31 they have to develop and increase the level of financial literacy within the meaning of basic understanding and knowledge of the financial products and/or services, whereas they cannot promote specific products and services.

- Expertness principle

In order to ensure successful and proper promoting of financial education, it is necessary to ensure both the correctness of the content and expertness of the educators. The educators should have sufficient capabilities and skills in education as well as in finance.

- Targeting principle

Specific projects or programs should clearly define the target group, for which they are intended, and use appropriate information channel with respect to the selected target group in order to avoid misinterpretation. (MFCR, 2012)
Existing empirical evidence shows that adults in both developed and emerging economies who have been exposed to financial education are subsequently more likely than others to save and plan for retirement (Bernheim, Garrett, & Maki, 2001; Cole, Sampson, & Zia, 2010; Lusardi, 2009). This evidence suggests a direct causal link between financial education and outcomes; it indicates that improved levels of financial literacy can lead to positive behaviour change. (OECD, 2012)
Higher levels of financial literacy have been found to be related not only to asset building but also to debt and debt management, with more financially literate individuals opting for less costly mortgages and avoiding high interest payments and additional fees (Gerardi, et al., 2010; Lusardi & Tufano, 2009a, 2009b; Moore, 2003). (OECD, 2012)

3.2.Financial literacy components

The definition of financial literacy is structured. Financial literacy as the management of personal/family finances comprises three components: money literacy, price literacy, and budget literacy.

- Money literacy comprises capabilities necessary for the management of cash and noncash resources and transactions with such resources, as well as an administration of instruments intended for this purpose (e.g. current account, payment instruments, etc.).
- Price literacy comprises capabilities necessary to understand price mechanisms and inflation.
- Budget literacy comprises capabilities necessary to manage personal/family budget (e.g. an ability to maintain a budget, set financial goals, and decide on an allocation of financial resources). It also includes an ability to cope with different life situations from the financial perspective. In addition to the above described general component, budget literacy also includes two specialized components: management of financial assets (e.g. deposits, investments, and insurance) and management of financial liabilities (e.g. loans or lease purchases). In both cases, it implies knowledge of the market of differently complex financial products and services, ability to compare individual products and services with one another, and to select the most appropriate products and services with respect to a specific life situation. (MFCR, 2012).

3.3.Working Group for Financial Education

Working Group for Financial Education is a long-term independent platform for discussions, exchange of information and experience and coordination of upcoming activities among all

relevant stakeholders. Members of this WG represent: governmental institutions, financial industry associations, consumer associations and education experts.
The overall objective of the WG is to ensure an effective cooperation among all of the above mentioned groups in the area of financial education. (MFCR, 2009)

3.4.Role of key stakeholders and coordination of activities (MFCR, 2012)

- Role of the public administration (The Ministry of Finance, Ministry of Education, Youth, and Sports, The Ministry of Industry and Trade, The Czech National Bank, Ministry of Labor and Social Affairs, Ministry of the Interior)
- Role of professional associations
- Role of social partners
- Role of nongovernmental/nonprofit organizations
- Role of educational institutions
- Role of media
- Role of other entities (Universities/colleges)
- The main role of pupils in primary schools is undoubtedly the family background and a primary school, which is attended by pupils.

4.**RESULTS**

4.1.Money management

The first part of the questionnaire was focused on money management of pupils 8th and 9th grades in primary school in Liberec. The goal of this part was to found out how the pupils manage their money. The questions were focused on the value of pocket money that children get from their parents and what are they doing with the money. We also asked them how much, for what and for how long are they able to save the money and whether are they open to lend their money and for what interest. All questions from this field will be solved in the article.
The first question asked children whether they get the pocket money from the parents (fig. 2). 30 children do not get pocket money. It is almost 13% of the children. Regularly get pocket money more children from 8th grade in primary school than from 9th grade. 52% from all included pupils get pocket money regularly. Irregularly, based only on pleas for money get pocket money 35% of pupils. 52% of them are from the 8th grade and 48% of them from 9th grade. It was expected and from results it's evident that the first income the children get is basically from their parents or family members.

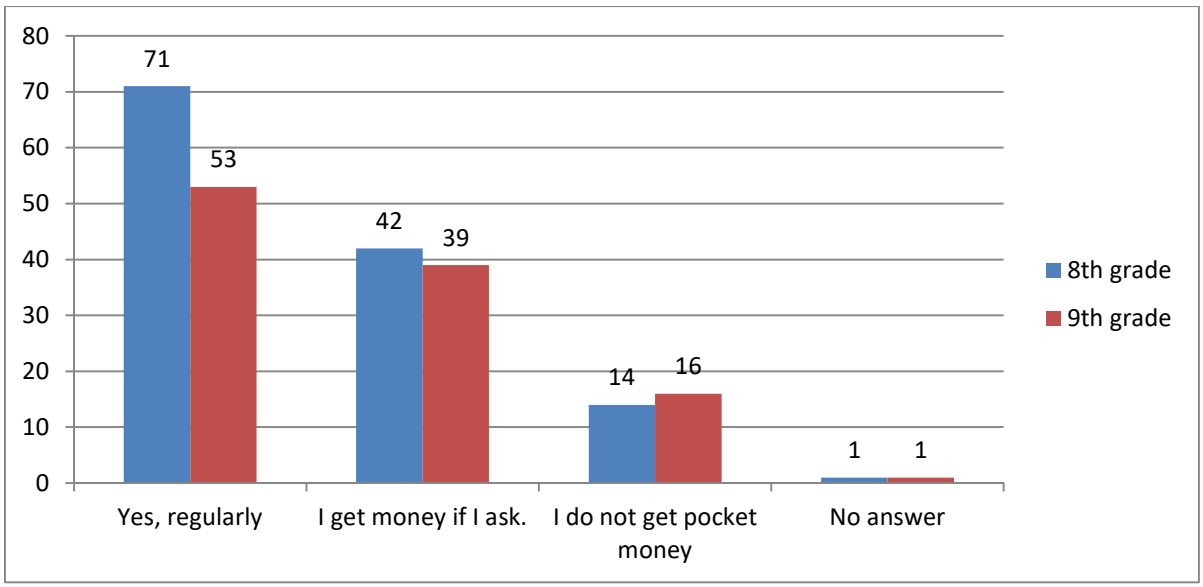


Fig. 2 - Pocket money from parents. Source: own processing

The second question has to map the value of the pocket money that children get. The responses relate on the first question. In the situation when children do not get the pocket money they gave no to answer. On this question answered only children who get pocket money regularly. On the fig. 3 are presented the results. The most of the pupils answered they get less than or just 200 CZK monthly. It was 34% of children. There were more children from 8th grade than from 9th grade. Children who get money from 201 CZK to 500 CZK were 67. It is 29% from all pupils. More than 501 CZK to 1.000 CZK get 31 children - it is 13% of all. More respondents were from 9th grade than from 8th grade. Interesting were answers with the fourth possibility. Only 8 children were in this group which monthly get more than 1.000 CZK. 5 of them were from 8th grade and 3 from 9th grade.

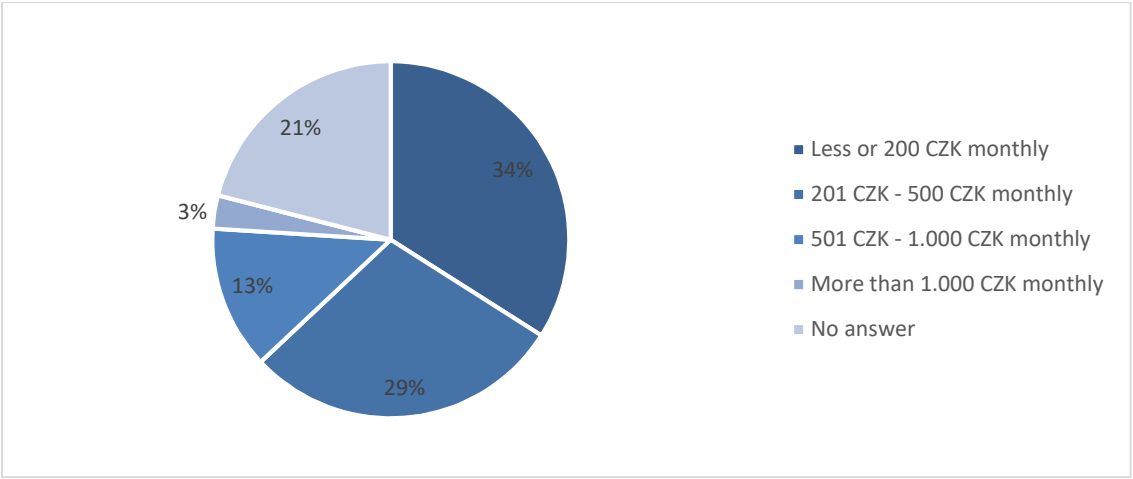


Fig. 3 - Value of pocket money. Source: own processing.

The psychologists recommend that value of the pocket money on the second level at the primary school have to be 300 – 500 CZK monthly (see table 2).

Age category	**Pocket money**
5 – 6 years	5-10 CZK/weekly
1. class	10-20 CZK/weekly
2. class	20-30 CZK/weekly
3. class	30-40 CZK/weekly
4. class	40-50 CZK/weekly
5. class	50-60 CZK/weekly
Second grade of primary school	300-500 CZK/weekly
High school	500-800 CZK/weekly
University	1.000-1.500 CZK/weekly

Tab. 2 – The value of the pocket money. Source: iDnes.cz, Finance (2009), own processing.

When we take into consideration that the optimal size of the pocket money on the basis of the Czech psychologists is 300 – 500 CZK, this size get only 29% of the respondents.
The third question of this part was focused on the managing of the money (see fig. 4). The most of the pupils reply, that they spare on something what they would like to have. It was 48% of them. 53 of pupils reply that they will let them for the case of poverty. Only 28 pupils from all from total answered that they spend them immediately. It was 18 pupils from 8th class and 10 pupils from 9th grade. Other response marked 40 pupils. Mostly were written: "I will gradually spend it", "I will pay what is necessary" or "on the basis of the situation".
The probability of Chi-square test of goodness of fit (p-value) is 0.245, so it is more than set significance level. Therefore it is possible to say that is no significant difference between older and younger pupils, the difference is random-character only and not indicate that older pupils are more careful.

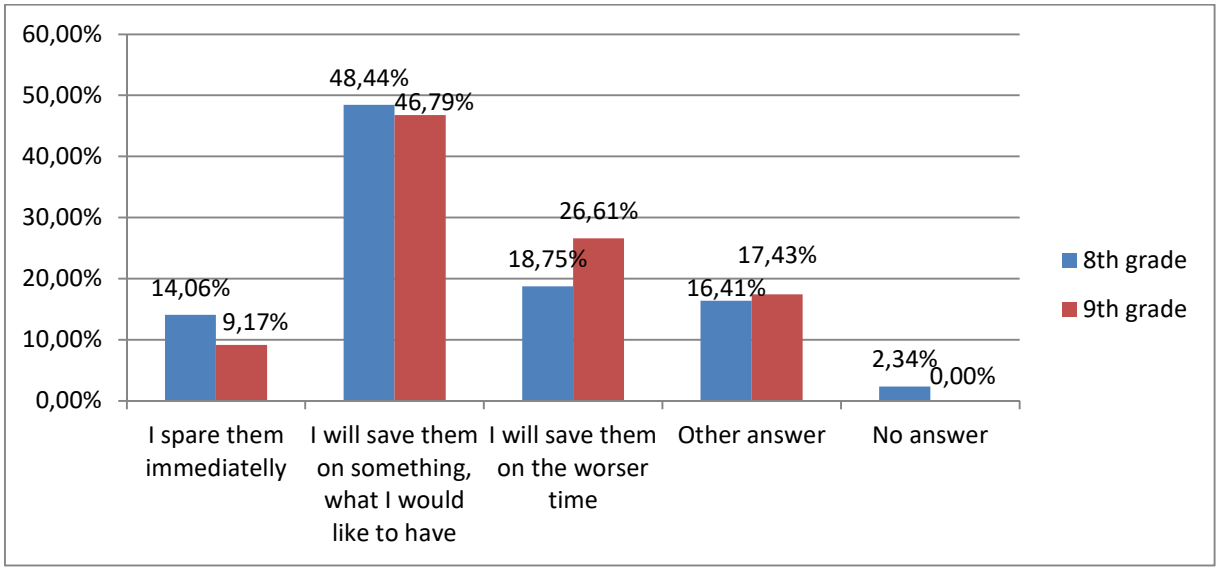


Fig.4 – Money management. Source: own processing

On the basis of the answers it is possible to expect that children are able to spare when they know for what to spare.
The next question was focused also on sparing. We asked the children if they had sparing money before, for what it was, for how long and how much. Answers were similar in both groups. 54% and 53% had sparing money before (see figure 5).

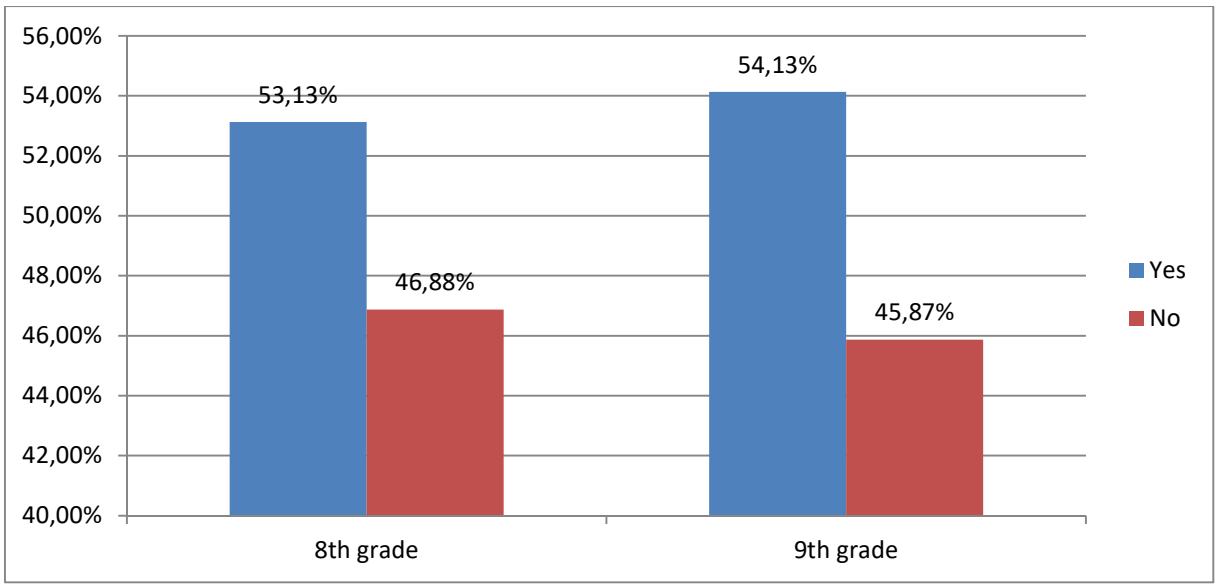


Fig. 5 – Ability to spare. Source: own processing

The most often children (54 %) reply that they spare on computer (personal computers and notebooks) or accessories to computers. The next issue are mobile phones, tablets or Microsoft Xbox 360 with accessories. Exemption was not even medical devices (braces, hearing aids) or necessary things for hobbies (longboard, musical instruments, ski, bike etc.).
The amounts were varied. The highest amount was 10.000 CZK which spare a lot of children. The time of this spare was different on the basis of the pocket money and other incomes. Some children reply that they spare this amount for a long time, others spare 1 – 2 years. Some of them spare this amount up to half a year. The most often spared amount was 2.500 – 3.000 CZK and time of spare was 3 – 6 months.
The last two questions in this field finds out whether are children able to lend the money and for the high interest. The question was done as the example with numbers and calculations. The pupil will the bid accept or not. 23% of pupils, 54 children will be able to lend the money for the interest that they will pay 100% more. For the higher one answered only 4 children.

4.2.Financial literacy

The second part of the questionnaire was focused on knowledge of financial literacy. The questionnaire was designed for this part so that the area contained Money and Financial Products of Financial Literacy Standards for basic education. According to Standard pupils should be able in Money area describe the impact of inflation on the value of money, illustrate the influence of supply and demand on price formation and its changes, to show price formation on examples and demonstrate appropriate use of various instruments of cash and cashless payments. In the area of financial products, pupils should be able to distinguish between active and passive operations, to distinguish certain services of banks, give examples of the use of debit and credit cards and to explain their limitations, state and compare the most common ways of dealing with free financial resources (consumption, savings, investment) and bring common ways to cover the deficit (loans, hire purchase, leasing). Furthermore, the pupil should be able to use simple interest calculation and should be able to distinguish between paid and income interest. Finally, pupil should be able to specify the types of insurance and suggest when it is appropriate to use. The following section identifies issues that deal with cashless payment and payment cards.

- Question number 1: "What is a cashless payment?"

On the figure 6 can be seen the success of answers to this question. We can state, that there is no difference between these older and younger pupils (p-value of Chi-square test is 0.744). Only 26% of those surveyed answered correctly. Most pupils (72%) were wrong (they believe that cashless payment is only a payment by card). It is important that children realize that there's no physical flow of money, but that payments are made through funds between bank customers.

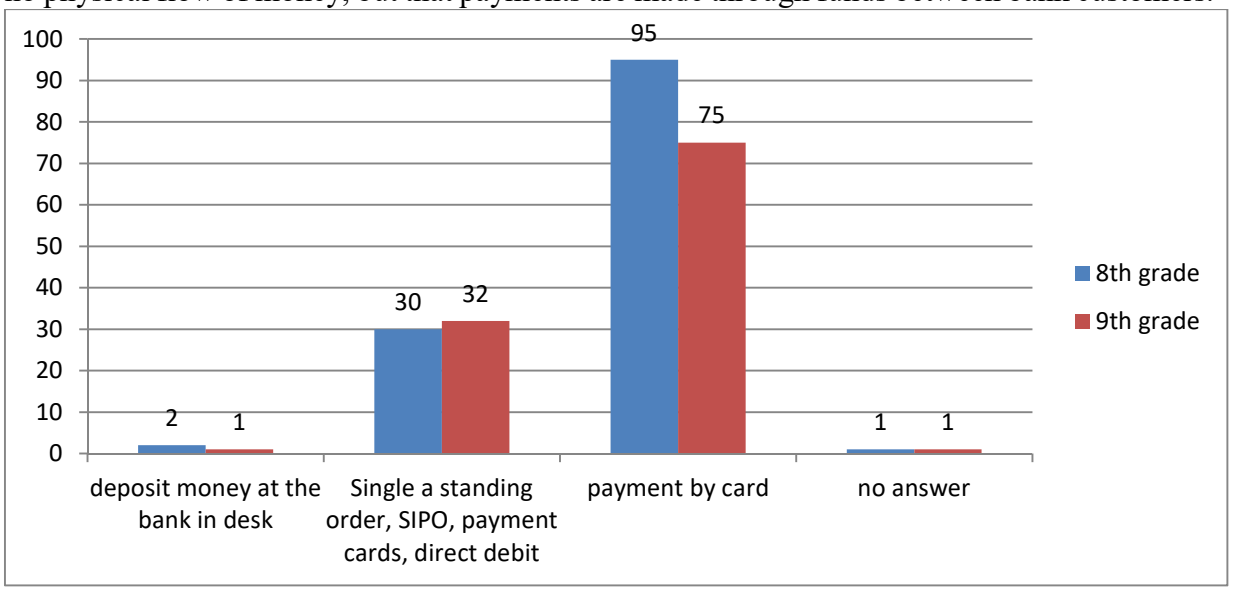


Fig. 6 - Financial literacy – cashless payment. Source: own processing

- Question number. 2: "What is the difference between credit and debit card?"

a) The credit card gives its holder possibility of credit from bank; with debit cards can I draw money only to the balance on the account.
b) The debit card gives its holder possibility of credit from bank; a credit card can draw money only to the balance on the account.
c) There is no difference.

Only 43 % of all pupils marked the correct answer. Whereas only 36 % of pupils of the 8th grade marked the answer, pupils of the 9th grade were not wrong from more than 53 %. Answers of younger and older pupils were significantly different on the significance level of 5 % (p-value is 0.002). It is important to realize the difference between these products, because wrong usage of them can lead to financial difficulties (see fig. 7).

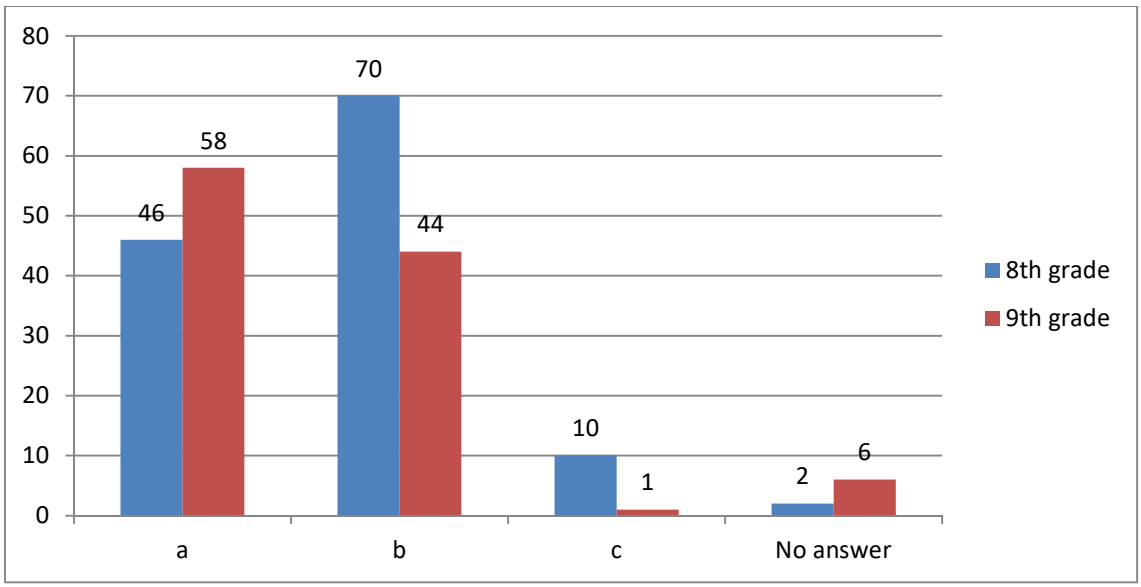


Fig. 7 - Financial literacy – The difference between credit and debit card? Source: own processing

- Question number. 3: "Calculate interest when you borrow from a bank 50.000 CZK per 1 year with an annual interest rate of 10%. How much do you return to the bank? "

In this question, pupils were successful in their responses. 72% responded said that they will return 55.000 CZK to the bank, which was the right answer.

- Question number 4: "If you invest CZK 5.000 for one year, which possibility is more profitable?"

a) 15% (= 750 CZK) b) CZK 500 c) CZK 1,000 (the correct answer)
The most important and probably also the most difficult step was realizing that we income interest from investments (evaluate money), and also to convert 15% on certain amount of money. The figure 8 reveals that 102 pupils (43%) answered correctly. A total of 60 pupils (25%) were fooled percent and marked the response of 15% and 51 pupils replied for b). In contrast to question number 2 there is no difference between answers of both pupils groups on the significance level of 5 % (p-value 0.259).

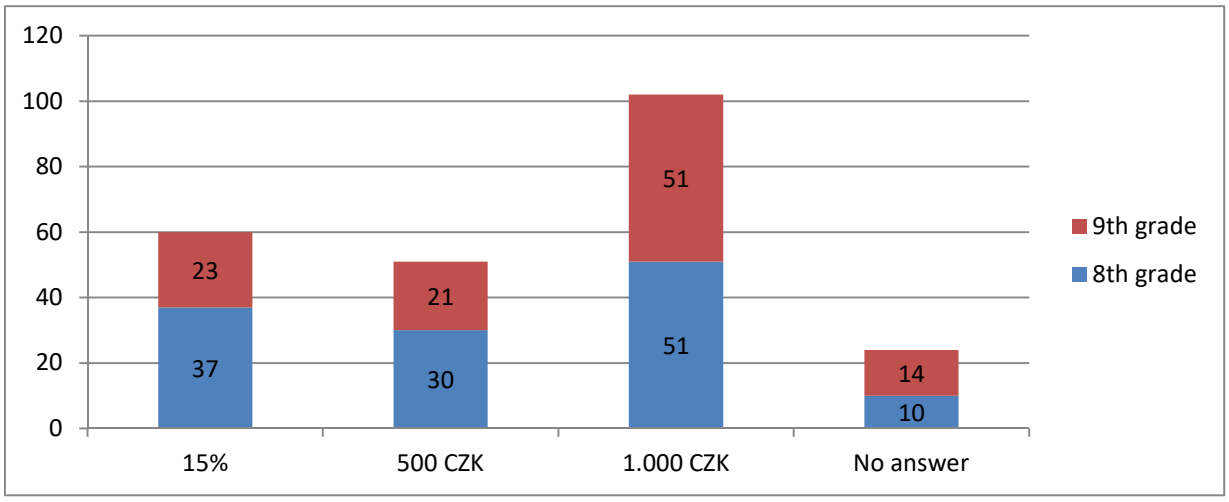


Fig. 8 - Financial literacy – Investment return after 1 year. Source: own processing

In the final step we compared a number of correct answers of younger and older pupils. The total number of correct answers of pupils of the 8th grade was 127 (33 %) and the number of pupils of the 9th grade was 141 (43 %) in the questions 1, 2 and 4 (see Tab. 3).

Class * answer Crosstabulation				
Count				
		class		
		8,00	9,00	Total
answer	,00	257	186	443
	1,00	127	141	268
Total		384	327	711

Tab. 3 – The total number of correct and wrong answers. Source: Own processing

To know the results of the overall Chi-square test see Tab. 4.

Chi-Square Tests					
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	7,590[a]	1	,006		
Continuity Correction[b]	7,168	1	,007		
Likelihood Ratio	7,586	1	,006		
Fisher's Exact Test				,007	,004
Linear-by-Linear Association	7,579	1	,006		
N of Valid Cases	711				
a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 123,26.					
b. Computed only for a 2x2 table					

Tab. 4 – Overall Chi-square test. Source: Own processing

We can state, that the answers of younger and older pupils were significantly different on the significance level of 5 % (p-value is 0.006). Older pupils on an average achieve better results in chosen areas of the financial literacy.

5.WAYS TO IMPROVE FINANCIAL LITERACY

Below there are divided possibilities how to increase financial literacy among pupils. However, we should keep in mind that the problem of financial illiteracy is not only among pupils and students, but also in adult population, that has a larger deficit due to the absence of financial or economic education in schools from previous times.
There are many projects and learning materials. Some ways to improve financial literacy are:

- Czech Banking Association website on financial education - The Czech Banking Association initiated the creation of a financial education website on a non-commercial basis (http://www.financnivzdelavani.cz/). This website is dedicated to the general public and covers all the financial market sectors. It should help the consumers with information on financial terms and products. (MFCR, 2009)
- Czech National Bank - project „Peníze na útěku", https://www.penizenauteku.cz/
- The subject of financial literacy – setting up a new compulsory subject of financial literacy on primary and secondary schools.

- Project Days - One of the ways to increase financial literacy can be a specialized day (called Project day). During this day will be pupils and adult people teach with experts by funny way how to orient in world of finance and economy.
- Compulsory reading - integration of compulsory reading from topics of finance and economics in the subject Czech language or Financial literacy. Encourage discussions with experts on these topics. Among the recommended books include for example: from R. T. Kiyosaki: Rich Dad Poor Dad or Rich Dad Poor Dad for Teens: The Secrets About Money--That You Don't Learn in School!,
- Traditional games - for example: Monopolies, Racing and betting, Financial freedom.
- Modern games: In the case of selection of board games for increasing financial literacy are all built on the same principle, that player is usually in the position of businessmen, trying to get as much wealth. Among the most interesting are Tycoon Deluxe Hotels, Airlines Europe, 1853: India, Planet Steam or Oeconomica.
- PC games: For example: SimCity, Transport Tycoon, etc.
- Use of modern information technologies in education etc.

To increase financial literacy, it is necessary to start educating young children from kindergarten and focus on increasing the literacy of their parents (who are fully responsible for the education of their children) and after then school and other institutions.

6.CONCLUSION AND DISCUSSION

The attention in the article was focused to financial literacy. Further work evaluated the Czech Republic in national and international research in the area of financial literacy. Another part deals with ways to improve the financial literacy and how it would be possible to maintain the level of financial education.

The objective of the paper was to accept or reject key hypothesis that older pupils achieve better results in chosen areas of the financial literacy than younger pupisl. From the research we can state that answers of all pupils were very similar – both groups get pocket money mostly regularly and save it on what they would like to have, but even 50% of them do not get amount of pocket money which psychologists recommend (CZK 300 – 500). On the other side,pupils´ answers in the “knowledge part” of questionnaire were not same, despite the fact that three quarters of younger and older pupils as well did not know what the cashless payment is. On the base of the research, we can state that pupils on an average achieve better results in chosen areas of the financial literacy.

We have similar research as Opletalová (2015) in primary and secondary schools. According to the respondents’ reactions, we can assert that financial literacy education has its solid base and merit because people are not well informed about the world of finances in terms of both managing their financial means and unwise indebtedness. Consequences can in fact lead to catastrophic results such as foreclosures and personal bankruptcies. One way to eliminate this negative development is to educate new generations of people.

One of the ways to learn more is to use the portal "Why are financially educated?" Another starting point would be to introduce the subject of financial literacy in the primary school curriculum.

Irreplaceable part in child development is inherently a game, which is dedicated to the last chapter of the third section. Children can play Racing and betting or Monopoly to develop their financial literacy, so there is paid attention on these games in the last part.

In modern society, we must not neglect computer games that are today's trend. There are also mentioned the so-called Tycoon and SimCity, which could help (using virtual world)

understanding how real world works (exchange of goods, buying process and money management).
The question for discussion is: "Who is to educate the pupils more? Family, school or the various institutions?"

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THE EFFECT OF STATE OWNERSHIP ON EARNINGS MANAGEMENT: EVIDENCE FROM VIETNAMESE LISTED FIRMS

Hoang Trang Cam

Abstract

Using financial data from Ho Chi Minh Stock Exchange and Hanoi Stock Exchange during the ten-year period from 2006 to 2015 and the published annual reports of the firms listed in Vietnam, this study examines the effect of state ownership on earnings management of Vietnamese listed firms. This study measures earnings management by using 10-year rolling windows of earnings smoothness. This paper found that SOEs manage earnings less through earnings management, in contrast with the conventional belief that State-owned enterprises (SOEs) are more likely to manipulate earnings. This paper offers the insight into the effect of the state ownership on earnings management, which extends the existing literature on emerging economies.

Keywords: state ownership, earnings management, Vietnam.

JEL classification: G32, M41.

1.INTRODUCTION

A large body of literature has examined the impact of state ownership on firm performance and showed mixed results. For example, Alfaraih et al. (2012), Truong and Lanjouw (2006), and Bai et al. (2004) find that state equity ownership is negatively related to corporate performance. In contrast, Yang et al. (2012) find a positive correlation.

Studies examining the relationship between state ownership and earnings management are few to date. Additionally, the existing literature provides the inconsistent evidence with mixed implications on this relationship, which requires further research (Wang and Yung 2011). This paper examines the effect of state ownership on earnings management of listed firms in Vietnam, which may provide more insights for this issue in emerging market context. The case of Vietnam is interesting because as part of the 'Doi Moi' (reform) economic renovation in 1986, the Vietnamese government attempted to reduce the level of state intervention in the economy by reducing state ownership in state owned enterprises (SOEs), in term of privatization. However, Vietnam is unique in the sense that unlike most other Asian developing countries, the Vietnamese government still retains a substantial amount of ownership in many of the listed firms, especially those deemed to be large and strategically important to the nation such as electricity production, telecom infrastructure, mineral exploration and water supply.

This study measures earnings management in terms of earnings smoothness (Francis et al. 2004). The empirical results finds that SOEs have less earnings management.

The next section reviews the most relevant literature related to this study and develops the hypotheses. Section 3 describes methodology, sample and variables. Section 4 reports the empirical results. The final section concludes this research. .

2.LITERATURE REVIEW AND HYPOTHEIS DEVELOPMENT

2.1.Earnings management definition

Healy and Wahlen (1999, p.368) define earnings management as follows:
Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company, or to influence contractual outcomes that depend on reported accounting numbers.
Earnings management is viewed as having an inverse association with earnings quality (Schipper and Vincent 2003), i.e. the greater the extent of earnings management, the lower the quality of earnings and vice versa.

2.2.The impact of state ownership on earnings management

Studies examining the effect of state ownership on earnings management are limited and the findings are inconclusive. Specifically, Ding et al. (2007), Wang and Yung (2011) find that at lower levels of state ownership there is a positive relationship with earnings management and a negative relationship at high levels of state ownership. In contrast, Firth et al. (2007) find higher levels of earnings management among state-owned enterprises than privately owned enterprises (POEs). Meanwhile, Liu and Lu (2007) find that the relationship between earnings management and state-owned enterprises is not significant.
It is widely believed that SOEs are more likely to manage earnings (Wang and Yung 2011). This is because with ineffective corporate governance, inadequate market discipline, the multiple interest conflicts, and for the benefit of controlling parties in SOEs, managers are more likely to exercise discretion in reporting accounting information (Wang and Yung 2011). Additionally, firms with high state ownership have fewer incentives to report higher quality earnings due to political benefits (Dewenter and Malatesta 2001, Fan et al. 2007).
In Vietnam, the government still holds a large proportion of ownership in many listed firms. There is no real owner of these state shares because in its communist view, the state is of the people, by the people and for the people, who do not have direct control of or interests in these assets (Vu 2012). This leads to poor corporate governance among these firms (Shleifer 1998) and to more managerial opportunistic behaviours for personal benefits instead of acting in the interests of the shareholders such as earnings management.
Based on the above arguments and agency theory, the following hypothesis is posited:
Hypothesis: Firms with higher state ownership are likely to exhibit a higher level of earnings management.

3.MEASURES AND THE SAMPLE

3.1.Measurement of earnings management

This study adopts the measure of earnings smoothness (SMOOTH) in Francis et al. (2004). Earnings smoothness is a desirable attribute from the view that managers use the discretion available to them to smooth out earnings volatility which are time-bounded and hence transitory, but convey a more representative and useful reported earnings number by using firm-related information which is not known to the public. Hence, the purpose being to match earnings information with cash flows from operations.

Although smoothness has been measured in several ways, all of which are likely to be highly correlated (Francis et al. 2008), this study adopts the measure of smoothness in Francis et al. (2004) with the following equation:

$$SMOOTH_{j,t} = \frac{\sigma(Earn_{j,t} / Assets_{j,t-1})}{\sigma(CFO_{j,t} / Assets_{j,t-1})} \quad (1)$$

Where $Smooth_{j,t}$ = firm j's earnings smoothness in year t; σ = firm j's standard deviation; $Earn_{j,t}$ = firm j's net income before extraordinary items in year t; $CFO_{j,t}$ = firm j's operating cash flows in year t. Larger values of SMOOTH imply higher earnings management. If the above hypothesis is valid, then the value of SMOOTH should be higher in firms with high state ownership.

3.2.Measurement of state ownership

The proxy for state ownership (STATE) is calculated as the percentage of common shares owned by the state.

3.3.Measurement of control variables

This paper controlled for several variables that are described as 'innate determinants' in prior research where they were found to be related to earnings management (Francis et al. 2005). They include cash flow variability, sales variability, and incidence of net loss realizations. Other control variables are leverage and return on equity (ROE), which are determinants of the earnings management activity (Park and Shin 2004, Firth et al. 2007). These control variables are defined in Table 1.

Tab. 1 - Definitions of the control variables

Variables	Measurement
Cash flow variability (STD.CFO)	The standard deviation of the firm's cash flows from operations, scaled by total asset, using rolling 10-year windows
Sales variability (STD.SALES)	The standard deviation of the firm's sales revenues, scaled by total asset, using rolling 10-year windows
Incidence of net loss realizations (LOSS)	The number of years where the firm reported loss over 10 years
Leverage (LEV)	The ratio total debt to the total value of assets
Return on equity (ROE)	The rate of return on equity

3.4.The relationship between state ownership and earnings management

This study tested the hypothesis regarding the effects of state ownership on earnings management, using an ordinary least squares (OLS) estimator. The regression functions is:

$$SMOOTH_i = \alpha_0 + \alpha_1 STATE_i + \Sigma \gamma_{j,i} control\,variables_i + \varepsilon_i \quad (2)$$

where $SMOOTH_i$ is firm i's earnings smoothness; $STATE_i$ is firm i's state ownership; cash flow variability (STD.CFO), sales variability (STD.SALES), incidence of net loss realizations (LOSS), leverage (LEV), return on equity (ROE) are control variables.

3.5.The sample

The sample consists of all Vietnamese listed firms for which the required data items were available, except for those in banks and other financial industries. Banks and financial institutions were excluded because their financial statements are prepared in accordance with

their special regulatory environment, which results in their financial statements being of a different format where different financial information is disclosed. The financial statement data items were extracted from the Ho Chi Minh stock exchange (HOSE)'s website and the Hanoi stock exchange (HNX)'s website for the fiscal years 2006 to 2015.
The earnings smoothness was estimated using 10-year rolling windows. This paper generated the 2015 earnings smoothness measure of the sample by using observations with 10 years from the fiscal years 2006 to 2015. The state ownership was hand collected from the 2015 annual reports. The final sample, with all required data available, includes 97 firms.

4.FINDINGS

Table 2 presents summary statistics for the dependent variable (earnings management), the independent variable (state ownership), and control variables. From Table 2, Panel A, we can see that Vietnamese listed firms have a high level of state ownership with a mean of 24.71 per cent. The maximum is 69.01 per cent and the minimum is 0 per cent.

Tab. 2 - Descriptive statistics. Source: own

Variables	Mean	Std. Dev.	Min	Max
Dependent variable				
SMOOTH	0.566945	0.481396	0.031943	3.345674
Independent variable				
STATE	0.247171	0.210484	0	0.69009
Control variables				
LEV	0.441615	0.230205	0.04041	0.87076
STD.SALES	0.426812	0.442898	0.049934	2.163582
STD.CFO	0.145013	0.115447	0.033516	0.637103
LOSS	0.412371	0.746556	0	3
ROE	0.117741	0.15487	-0.50058	0.98213

This table shows summary statistics for variables used in this paper. The final sample consists of total 97 firms listed on the Ho Chi Minh and Hanoi stock exchanges, each with a continuous listing history over the entire period from 2006 to 2015 for the 2015 sample.

Table 3 reports the pairwise correlations for the variables used in the regression. Interestingly, the correlation between SMOOTH and STATE is negative and significant. This evidence suggests that firms with higher state ownership are less likely to engage in earnings management. Table 3 also shows that all the correlation metrics between independent variables are less than 0.5511, which indicates a low probability of multicollinearity.

Tab. 3 - Correlation matrix. Source: own

		1	2	3	4	5	6	7
1.	SMOOTH	1						
2.	STATE	-0.1872* 0.0663						
3.	ROE	0.5511* 0	0.0324 0.7528	1				
4.	LEV	-0.3313* 0.0009	0.061 0.553	-0.2485* 0.0141	1			
5.	STD.CFO	-0.3019* 0.0027	-0.0691 0.5013	-0.0283 0.7831	0.0036 0.9721	1		
6.	STD.SALES	-0.2456* 0.0153	0.1413 0.1674	0.0082 0.9366	0.131 0.201	0.4050* 0	1	
7.	LOSS	0.0393 0.7022	-0.1944* 0.0564	-0.2624* 0.0094	0.0836 0.4158	0.0457 0.6569	-0.0303 0.7686	1

* p value ≤ 0.10.

Tab. 4 - Effect of State Ownership on Earnings Management. Source: own

AQ	Coef.	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
STATE	-0.3785**	0.1769	-2.14	0.035	-0.730	-0.027
ROE	1.7080***	0.5299	3.22	0.002	0.655	2.760
LEV	-0.3909**	0.1537	-2.54	0.013	-0.696	-0.085
STD.CFO	-1.1245***	0.3036	-3.7	0	-1.727	-0.521
STD.SALES	-0.0952	0.0695	-1.37	0.174	-0.233	0.042
LOSS	0.1138**	0.0504	2.26	0.026	0.013	0.214
_cons	0.7888***	0.1335	5.91	0	0.523	1.054

R^2 = 0.5057, F-Test (p-value) = 0.0000 and N = 97.
*Statistical significance is indicated by ***, **, and * for 1%, 5%, and 10%.*

This paper checked the variance inflation factor (VIF) for the regression models. The maximum VIF is 1.26, which is less than 10 for all the regression models. Thus, the multicollinearity does not seem to be a problem for the test models (Gujarati and Porter 2009).
To confirm whether or not heteroscedasticity exists, this paper use the Breush-Pagan test. If the p-value is not significant, then the null hypothesis not rejected, and that is the variance of the residuals is constant. If the p-value is significant, then the null hypothesis would be rejected, suggesting the presence of heteroscedasticity. This study finds (untabulated results) that p-values are significant ($p < 0.01$). Therefore, the null hypothesis is rejected, indicating the presence of heteroscedasticity. To correct it this study used ordinary least squares (OLS) regression with heteroscedasticity robust standard errors (White 1980).
Table 4 reports the results of the regression analyses using the value of earnings smoothness (i.e., *SMOOTH*) as the dependent variable; and state ownership (i.e. *STATE*) as the independent variable. As shown in the table, the coefficient estimate of STATE is negative and significant (p-values of 0.035). Because higher the value of earnings smoothness implies higher earnings management, this result suggests that SOEs manage earnings less through accruals than POEs, in contrast with the empirical prediction of the above hypothesis. This finding is consistent with the findings of Ding et al. (2007), Wang and Yung (2011), who investigated the impact of state ownership on earnings management of Chinese listed firms. Wang and Yung (2011) contend that state managers are under less pressure to manipulate earnings due to the different incentive structure facing state-owned firms, such as guaranteed returns by the state or easily obtaining additional funds (Ding et al. 2007, Jiang and Habib 2009).
Turning to control variables, the coefficients on LEV and STD.CFO are negative and significant (p values < 0.014), indicating that firms with large capital structure, and firms with the higher cash flow variability are less likely to manipulate accounting figures. In contrast, ROE and LOSS is positively associated with SMOOTH, suggesting that profitable firms and firms with larger incidence of net loss realizations are more likely to engage in earnings management. Meanwhile, the relations between earnings management and STD.SALES is not significant.

5.SUMMARY AND CONCLUDING REMARKS

This paper explores the impact of state ownership on earnings management of Vietnamese listed firms. This study hypothesizes that state ownership is positively associated with earnings management. The result contrasts with the empirical prediction of the hypothesis. Specifically, the findings suggest that state ownership has a significant negative impact on earnings management. This study also conducted other robustness checks to explore the robustness of the results, but the main findings and inferences were not affected.
This study makes contributions. First, this is the first concerted attempt to examine the impact of state ownership on earnings management for a small and newly emerging market, Vietnam. Vietnam is one of the lowest ranked countries for protecting investors among the southeast Asian countries (World Bank, 2016). The findings of this study assist Vietnamese policymakers in reviewing the implications of the current frameworks in the context of Vietnam to increase firms' reporting transparency and accountability to investors. Second, this study not only adds to the earnings management literature the effect of ownership structure, but also sheds light on the corporate governance literature regarding the debate over the effect of state ownership.

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EVALUATION OF FINANCIAL PERFORMANCE OF CZECH BIOETHANOL PRODUCERS

Hönig Vladimír, Strouhal Jiří

Abstract

In recent decade there is visible a significant trend in shift in fuels from conventional sources to new more ecologic-friendly ones. This is in line with the European Union strategy which was incorporated also into Czech legislature. This paper approaches the topic of the production and consumption of bioethanol being understood as a modern biofuel of the second generation. There is realized an initial analysis of financial performance of Czech bioethanol producers, companies Ethanol Energy (part of Agrofert Group) and Tereos TTD (largest ethanol producer). There is firstly evaluated the financial stability through the financial rules and through the bankruptcy indicators – Altman's Z score and index IN. Finally we aim to calculate company's cost of capital and economic value added. From the performed analysis we can conclude that Czech sector of bioethanol producers is stabilized and there cannot be expected significant declines in financial performance of these companies in the near future.

Keywords: ethanol, bioethanol, financial performance, index IN, Altman Z-score, EVA

JEL Classification: G30

1.INTRODUCTION

Biofuels are understood as a very controversial and discussed topic in the European region in recent years. EU Directive 2009/28/EC requires that the Czech Republic shall have a 13% share of energy from renewable sources in total energy consumption by 2020. The share of this energy in the transportation industry is set to be at 10% level. In addition, the EU Directive 2009/30/EC adds an obligation for fuel suppliers requiring them to reduce the emissions of greenhouse gases by 6% compared to their basic value from 2010. This requirement shall be also achieved by 2020, mostly through the usage of biofuels (Hromádko and Miler, 2011).
The above mentioned directives were transposed into the Czech legislature by the Act on the Protection of the Air No. 201/2012. According to paragraph 19 there is a requirement that 4.1% out of the motor gas shall be based on biofuels, for diesel even 6.0%. Furthermore, the paragraph 20 requires the reduction of greenhouse gas emissions in transport by 4% by 2017 and by 6% by 2020. This requirement shall be fulfilled either by the usage of clear biofuel or by the usage of the mixed fuel. According to Hönig and Smrčka (2016) the most suitable biofuels in the Czech Republic would be bioethanol and methyl ester rapeseed oil.
This paper aims to evaluate the economic conditions of companies producing bioethanol in the Czech Republic. Currently there are two companies engaged – Ethanol Energy JSC and Tereos TTD JSC. The reminder of this paper is as follows. Firstly there would be theoretically discussed the issues linked with the use and production of bioethanol and would be described the basic methods for the evaluation of the corporate economic conditions. In practical part would be discussed the financial health of above presented companies.

2.THEORETICAL PART

2.1. BIOETHANOL PRODUCTION AND CONSUMPTION

Under the term bioethanol is understood ethanol produced by the fermentation of biomass. These are the crops rich in carbohydrates and starches. Mostly we can deal with sugar cane, sugar beet, potatoes, corn or grain (Kumbár et al., 2015).
Bioethanol along with other biofuels can be used in transport. Among the positives of the biofuels usage shall be according to Konšel (2009) mentioned:

- The improvement of the environment;
- Processing and utilization of the agricultural overproduction;
- Positive impact on the employment, especially in rural areas. This implies also in a positive impact on GDP;
- Lower dependence of the country on the imported oil.

Among the negatives shall be mentioned:

- Recovery of food production for the biofuels production;
- Production of biofuels is more energy-intensive compared to the amount of energy created by the biofuel;
- The hazard of chemicals used in cultivation process.

There exist also some more negatives, but those are not very relevant for Czech environment. There is mostly mentioned the devastation of the rain forests in Brazil due to the growing planting of biofuels and for the creating of the infrastructure to reach those plantations. Due to the fact that the demand for rape used for biofuels is rising, even the price of rape is increasing. The increase in this price may affect the producers of cosmetics and food products shifting from the rape use to palm oil. From this perspective there might be said that the usage of the first generation of biofuels in the Czech Republic also may have a negative effect on the devastation of the rain forests. All these negatives might be eliminated by the usage of the second generation of biofuels.
The first generation of biofuels covers those needed for the production of crops. There is a risk that their consumption for the production of biofuels is a direct competition for the food production. For the second generation of biofuels the crops are not used anymore.
The bioethanol could be produced either as a first generation biofuel or as a second generation one in case of the use of lingo-cellulosic materials. These ones must go through a much more complex physico-chemical treatment before the fermentation process causing a negative impact on the price of the biofuel (Roth, 2015; Paulová et al., 2010; Tromborg et al., 2013).
From Table 1 there is visible the positive link between the gross bioethanol consumption and domestic production. In 2015 the domestic production of bioethanol reached 104 715 tons what was the record production for the whole history of the Czech Republic. Therefore also the gross consumption reached its historical maximum.

Tab 1. Production and consumption of bioethanol (in tonnes). Source: www.mpo.cz

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015
Domestic production	26 509	60 236	89 625	94 523	54 412	102 195	104 488	104 112	104 715
Import	0	20 404	32 939	10 361	35 696	5 184	1 979	37 352	37 342
Export	17 027	31 909	50 953	36 556	7 378	16 644	17 475	22 812	31 066
Change in inventories +/-	9 195	-1 990	-3 325	-710	3 769	1 144	2 561	-390	-8 558
Gross consumption	287	50 721	74 937	69 037	78 961	89 592	86 432	119 042	119 548

There is arising a question about the possible evolution in future years. In 2015 there was provided an inadequate support from 1.7.2015 till 31.12.2015 when producers reached this support despite the grant period terminated soon. Later on, there was approved the new version of the grant support program for the usage of biofuels in the transportation. The new program however has a lower financial support compared to the previous one and therefore we are mentioning the inadequate part. As a possible compensation of this support there was increased an excise duty on mineral oils for the period 1.1.2016 to 30.6.2017. This rate is visible from Table 2. There shall be noted, however, that the tax rate itself is still 12.84 CZK per liter, but the compensation varies from 2016 (Mládková, 2016).

Tab. 2 – Excise duty rates on bioethanol. Source: own analysis based on Mládková (2016)

Period	Tax	Tax rate Ethanol E85	Compensation	Tax rate Ethanol E95
before 31.12.2015	zero	12.84 CZK/l	12.84 CZK/l	0 CZK/l
1.1.2016 – 30.6.2017	increased	12.84 CZK/l	10.23 CZK/l	0 CZK/l
1.7.2017 – 31.12.2020	reduced	12.84 CZK/l	10.97 CZK/l	0 CZK/l

There are different views for the use of bioethanol or biomass of the first generation. Ecological organizations are mostly calling for the elimination of their use having no future, however producers see their economic potential in transportation industry. The biofuel producers have the capacity nearly double to their current production, guaranteeing for the Czech Republic independency on its potential import in the near future (Tramba, 2015). There shall be noted that the statistics in this regard are relatively inaccurate as they are counting in production potential also two companies not existing anymore – Korfil and PLP. The real current potential without these two companies is approximately 134 000 tons and this result is relatively close to the consumption in 2015. According to the requirements of the EU the Czech Republic will no longer support the first generation of biofuel after 2020.

2.2.Analytical Background

In this paper there would be applied simplified financial statements analysis tools. This analysis is based on publicly presented financial statements retrieved from the Business Register and in case they were missing there, there was used as an alternative source Albertina database.
In corporate finance theory there are discussed four financial rules. First one is rule of balanced financing. This rule states that non-current assets shall be covered by non-current sources of capital, i.e. equity and non-current liabilities. There is reasoning that if the non-current assets are financed from short-term liabilities, company may have problems to settle its liabilities. This may cause the selling off of non-current assets what may affect the company's going

concern. The par rule believes that non-current assets shall be covered by equity only. Behind this rule is visible a conservative approach in financing and in practice is not much used as there is impossible to use the effect of financial leverage efficiently. The risk settlement rule believes that the liabilities shall be maximally equal to the equity. In case liabilities are much higher the new creditors are undertaking higher risks and the terms of borrowing might be much unfavorable for the company, mostly in terms of higher interest rate. The last rule focuses on the growth rate of investments and growth rate of sales. It believes that the growth rate of sales shall be higher than growth rate of investments. In case this rule is not fulfilled, company may record some problems in terms of its liquidity, profitability, unused capacity and the competing inability (Kislingerová, 2010).
In this paper there would be tested two bankruptcy models – Altman's Z score and Czech index IN. Altman's Z-score covers profitability, liquidity, debt position and the capital structure. The first version of model was published in 1968 as follows (Altman, 1968):

$$Z = 1.2 \times X_1 + 1.4 \times X_2 + 3.3 \times X_3 + 0.6 \times X_4 + 1.0 \times X_5$$

where:
X1 – net working capital to assets
X2 – retained earnings to assets
X3 – EBIT to assets
X4 – equity to liabilities
X5 – revenues to assets

There was proven that Altman's Z score is not very suitable for the Czech environment and the score is not such reliable like in other countries (e.g. USA). This is mostly caused by the different business environment and different economic conditions. For this reason there was realized certain adjustment by Kislingerová and Neumaierová (2000) adding the parameter X6 – liabilities after due date to revenues, holding other parameters the same:

$$Z = 1.2 \times X_1 + 1.4 \times X_2 + 3.3 \times X_3 + 0.6 \times X_4 + 1.0 \times X_5 - 1.0 \times X_6$$

The interpretation of this modified Z score is visible from Table 3.

Tab. 3 – Modified Z-score interpretation. Source: Kislingerová and Neumaierová (2000)

Evaluation	Z score
bankruptcy trends	< 1.8
grey zone	(1.8 – 2.99)
good conditions	> 2.99

The second model being tested in this paper is index IN created by Czech researchers Inka and Ivan Neumaiers. This model slightly differs from Altman approach as it not only tests the bankruptcy trends but also try to evaluate the value creating issues. Among the advantages of this model may be mentioned the fact there is no need to know current capital market prices (due to the lack of liquidity and transparency of Czech capital market) and the fact it was many times verified in the Czech business environment. The last version of this index is from 2005 (Neumaier and Neumaierová, 2005):

$$IN\ 05 = 0.13 \times \frac{Assets}{Liabilities} + 0.04 \times \frac{EBIT}{Interest\ paid} + 3.97 \times \frac{EBIT}{Assets} + 0.21 \times \frac{Revenues}{Assets} + 0.09 \times \frac{Current\ assets}{Current\ liabilities}$$

The most problematic element of this model is interest cover (EBIT to interest paid) where Neumaier and Neumaierová (2005) propose to set the maximum barrier as 9. The interpretation of the index IN05 is visible from Table 4.

Tab. 4 – Index IN05 interpretation. Source: Neumaier and Neumaierová (2005)

Evaluation	Index IN
Evaluation	< 0.9
bankruptcy trends	(0.9 – 1.6)
grey zone	> 1.6

The economic value added (hereinafter EVA) concept was firstly described by American consulting company Stern Stewart and Company. They believe that EVA measure is the closest one to the economic concept of company's profit. EVA is also understood as a performance measure linked to the creating of the potential wealth for shareholders. It is defined as a difference of the taxed operating income and cost of capital as follows (Dodd and Chen, 1997):

$$EVA = NOPAT - WACC \times C$$

where
NOPAT – net operating income after taxes
C – non-current invested capital
WACC – weighted average cost of non-current invested capital

Weighted average cost of non-current invested capital might be computed as follows:

$$WACC = r_d \times (1 - t) \times \frac{D}{C} + r_e \times \frac{E}{\mathrm{C}}$$

where
r_d – cost of debt
t – income tax rate
r_e – cost of equity
D – interest bearing non-current liabilities
E – equity

For the computation of the cost of equity there would be used Capital Assets Pricing Model (CAPM) which was in parallel developed by several academicians (Shih et al., 2014). Its mathematical expression is as follows (Gentzoglanis, 2011):

$$E(R_i) = R_f + \left[\beta \times (E(R_M) - R_f)\right]$$

where
$E(R_i)$ – expected return, i.e. cost of equity
R_f – risk free interest rate
β – coefficient of industrial systematic risk
$E(R_M)$ – expected rate of return in relevant market

In other words we believe that the owners of capital would require such rate of return being equal to the risk-free investment increased for a margin for a market risk in the respected sector. Authors are aware that CAPM is based only on enterprise market data of listed companies. Despite the analysed companies are not publicly traded, we believe that deriving cost of equity via CAPM would bring the vital output.

3.ANALYTICAL PART

3.1.Ethanol Energy

This company has more than 140 years tradition. Currently this company mostly focusses on the bioethanol production. The company uses for this production the corn and wheat both being purchased from primary producers. By the production of bioethanol there are also formed other products like technical alcohol, fusel oil and grains – both being sold as a livestock feed. The company is equally owned by Agrofert and Enargo. Based on the focus of these two companies it is clear that these are also suppliers of raw material for Ethanol Energy and customers for their secondary production.
In Table 5 there is visible the fulfilment of the rule of balanced financing. In 2011 and 2012 we can see that non-current assets significantly exceed non-current sources. Non-current assets are significantly covered by short-term liabilities, what may cause certain financial problems to this company, however, in reality of Ethanol Energy, this was not proven. There is visible a significant increase of the equity in 2013 due to the new investor – company Enargo. From 2013 the rule of balanced financing is fulfilled and there is no need in the near future to sell off some non-current assets.

Tab. 5 – The Rule of Balanced Financing. Source: own analysis

Item (thousands CZK)	2011	2012	2013	2014	2015
Non-current assets	848 684	1 052 063	789 236	824 000	792 454
Equity	421 015	378 727	778 369	727 230	858 231
Non-current liabilities	0	0	39 738	88 235	43 200
Non-current sources	421 015	378 727	818 107	815 465	901 431
Difference	-427 669	-673 336	28 871	-8 535	108 977
Difference in %	-50.39%	-64.00%	3.66%	-1.04%	13.75%

In table 6 there is visible a fulfilment of the risk settlement rule. In first two analyzed years (2011 and 2012) this rule is not fulfilled because of the excess of liabilities to equity. If we analyze deeply the structure of company's liabilities the most significant part of these are liabilities to parent and subsidiaries. In 2013 there was completely settled this liability (the amount of 520 259 thousands CZK) and there were firstly used non-current bank loans for financing of planned investments. This might be used as a scholar case for the proof of the fulfilment of this rule to be able to gain more favorable conditions for the new bank loans.

Tab. 6 – The Risk Settlement Rule. Source: own analysis

Item (thousands CZK)	2011	2012	2013	2014	2015
Equity	421 015	378 727	778 369	727 230	858 231
Liabilities	568 410	673 336	298 297	317 795	293 270

From table 7 there is visible a fulfilment of the par rule. From 2013 there is visible a trend of fulfilment, in last analyzed year the rule is fully fulfilled. The results indicate that company's management tends for the conservative approach in financing. In recent years company finances purchases of non-current assets mostly by equity sources. From this perspective company does not undertake any significant financial risks, however this position could be considered relatively expensive for the company due to insufficient use of financial leverage effects.

Tab. 7 – The Par Rule. Source: own analysis

Item (thousands CZK)	2011	2012	2013	2014	2015
Non-current assets	848 684	1 052 063	789 236	824 000	792 454
Equity	421 015	378 727	778 369	727 230	858 231
The excess of equity	-427 669	-673 336	-10 867	-96 770	65 777
The excess of equity (in %)	-50%	-64%	-1%	-12%	8%

From table 8 there is visible the fulfilment of the growth rate rule. In 2011 there was realized the testing operation of the production only, therefore there is visible such significant difference between the growth rate of sales between 2012 and 2011. In all other years the growth rate of sales significantly exceeds the growth rate of investments. Therefore we cannot expect some potential problems for Ethanol Energy company. In 2013 and 2014 the results were affected by significant investment activities – new dryer cut parts, instalment of the gas boiler for steam production, increase of fermentation capacities and improvement of distillation production process. These investments were finished in 2014.

Tab. 8 – The Growth Rate Rule. Source: own analysis

Item	2012/2011	2013/2012	2014/2013	2015/2014
Growth Rate of Sales	336.6%	14.0%	3.0%	28.5%
Growth Rate of Investments	-7.0%	1.5%	2.9%	-3.8%
Fulfilment?	YES	YES	YES	YES

In table 9 could be seen individual parameters for the computation of Z-score and Z-score itself. As there was realized the shift in production activities around 2011 there is visible the significant bankruptcy potential what is for newly established productions typical. The reasoning might be explained also by the testing operations. In 2013 and 2014 company reached the grey zone interval and despite of still rising sales the positive results of Z-score was firstly achieved in 2015. The liabilities after due date (for parameter x6) were taken from Bisnode Gnosus database.

Tab. 9 – Z-score. Source: own analysis

	Weight	2011	2012	2013	2014	2015
x_1	1.2	-0.44	-0.39	0.01	-0.01	0.07
x_2	1.4	-0.15	-0.18	-0.22	-0.28	-0.14
x_3	3.7	-0.04	-0.03	-0.04	-0.03	0.09
x_4	0.6	0.74	0.56	2.61	2.29	2.93
x_5	1.0	0.21	0.78	0.89	0.91	1.01
x_6	1.0	0.0006	0.0008	0.0007	0.00003	0.00008
Z-score		-0.24	0.29	2.02	1.78	3.00

If we study the results in detail we can see that the better performance was reached due to the combination of the decrease in liabilities and increase in registered capital after the entry of new investor Enargo in 2013.
Index IN confirms to the certain extent the findings of Altman's Z score – see table 10. In first two years the company was classified as a one with bankruptcy potential mostly due to the reached losses. From 2013 the results are improved due to the decreasing liabilities.

Tab. 10 – Index IN. Source: own analysis

Item	2011	2012	2013	2014	2015
Assets/Liabilities	1.74	1.56	3.61	3.29	3.93
EBIT/Interest paid	-9.00	-2.86	-7.68	-9.00	9.00
EBIT/Assets	-0.04	-0.03	-0.04	-0.03	0.09
Revenues/Assets	0.21	0.78	0.89	0.91	1.01
Current Assets/Current Liabilities	0.25	0.39	1.07	0.96	1.53
Index IN	-0.25	0.18	0.29	0.23	1.58

In table 11 there is visible the value creation by the company. The background for the data is visible from appendix 5.1.

Tab. 11 – Economic Value Added (in thousands CZK). Source: own analysis

	2011	2012	2013	2014	2015
NOPAT	-35 921.88	-23 701.41	-33 849.09	-24 227.10	84 319.38
C	421 015.00	378 727.00	818 107.00	815 465.00	901 431.00
WACC	0.10	0.11	0.09	0.10	0.09
EVA	-77 738.77	-66 736.92	-107 025.09	-103 713.57	6 154.50

As the operating income was negative in periods 2011 – 2014 even the economic value added reached the negative results. The first positive EVA was recorded in 2015 when company gained approximately 6 million CZK. Company creates a value for the very first time as the profit was much higher than cost of creditors and shareholders.
Based on the above presented results of EVA, bankruptcy models and golden rules, we can state that after the initial problems after the shift in production towards bioethanol, the company is currently stabilized, currently it creates value for stakeholders and there cannot be expected some significant negative differences in asset structure and capital structure in the near future.

3.2.Tereos TTD

Company Tereos TTD is not only focused on bioethanol production. It is the largest producer of ethanol and sugar in the Czech Republic currently having six factories. For the production of ethanol are important the factories in Dobrovice, Chrudim and Kojetín, however, the pure bioethanol is produced in Dobrovice only. As a raw material for the production of bioethanol is used sugar root. This factory began its bioethanol production in 2006 and its capacity is approximately 1 million of hectoliters.
As it is clearly visible from table 12, Tereos fulfils the rule of balanced financing without significant problems in all analyzed years. It shall be however said, that from 2012 is visible that non-current sources significantly exceed non-current assets; in 2013 even for 40%. It could be explained by a very conservative financing strategy applied by Tereos. It is questionable if there is a possibility to improve the balance between non-current and current sources of capital as currently there are financed current assets from non-current sources what is not very favorable for the company.

Tab. 12 – The Rule of Balanced Financing. Source: own analysis

Item (thousands CZK)	2011	2012	2013	2014	2015
Non-current assets	3 296 214	3 759 270	3 759 270	3 798 910	3 677 229
Equity	3 407 914	4 291 919	4 817 300	4 939 109	4 703 924
Non-current liabilities	194 575	326 723	497 168	355 603	236 245
Non-current sources	3 602 489	4 618 642	5 314 468	5 194 712	4 940 169
Difference	306 275	859 372	1 555 198	1 395 802	1 262 940
Difference in %	9.29%	22.86%	41.37%	36.74%	34.34%

In table 13 there are visible the results of the risk settlement rule. In all analyzed years this rule is fulfilled because of the significant excess of equity. From this perspective we believe that company can have very easy access to favorable loans. In 2013 there is visible the significant increase of liabilities mostly because of short-term bank loans which increased for 800 million CZK. Year 2012 was very successful for Tereos company and these loans were accepted for the increase in production for 2013 period. Year 2013 was, however, not such successful as predicted and the stock of inventories raised from 434 908 thousands CZK to 2 000 056 thousands CZK. From the financial statements of 2014 and 2015 is visible the trend of decreasing this stock.

Tab. 13 – The Risk Settlement Rule. Source: own analysis

Item (thousands CZK)	2011	2012	2013	2014	2015
Equity	3 407 914	4 291 919	4 817 300	4 939 109	4 703 924
Liabilities	1 334 922	1 617 968	2 915 975	2 919 797	2 592 538

The fulfilment of the par rule is visible from table 14. Because of the application of conservative strategy in financing this rule is fulfilled without significant problems. The volume of non-current assets could be recognized as stabilized one, however the volume of equity between 2011 to 2013 raised significantly. The increase in equity is caused by retained earnings which raised for almost 1.5 billion CZK in analyzed years.

Tab. 14 – The Par Rule. Source: own analysis

Item (thousands CZK)	2011	2012	2013	2014	2015
Non-current assets	3 296 214	3 759 270	3 759 270	3 798 910	3 677 229
Equity	3 407 914	4 291 919	4 817 300	4 939 109	4 703 924
The excess of equity	111 700	532 649	1 058 030	1 040 199	1 026 695
The excess of equity (in %)	3%	14%	28%	27%	28%

In table 15 could be seen the fulfilment of the growth rate rule. With the exemption of the period 2012/2011 Tereos company faces problems in fulfilling the criterion. There shall be said that certain investments are needed for the future production process and they are planned for the longer period. The long-term trend in this criterion may cause some possible problems in the future in terms of competing inability and unused capacities.

Tab. 15 – The Growth Rate Rule. Source: own analysis

Item	2012/2011	2013/2012	2014/2013	2015/2014
Growth Rate of Sales	47.9%	-10.5%	-6.3%	-17.0%
Growth Rate of Investments	14.0%	-0.5%	1.5%	-3.2%
Fulfilment?	YES	NO	NO	NO

Altman's Z score is visible in table 16. The results prove the good financial conditions of the company in the period 2011 – 2013. From 2014 the results worsened to the grey zone. There shall be noted the decline of the score in last years, mostly because of the worsening of the parameters x3 and x4. The reason is the wider use of the new short-term bank loans. Despite of this worsening we still can say that there is a minimum chance for bankrupting of Tereos in long-term run.

Tab. 16 – Z-score. Source: own analysis

	Weight	2011	2012	2013	2014	2015
x_1	1.2	0.06	0.16	0.20	0.18	0.16
x_2	1.4	0.40	0.47	0.45	0.45	0.46
x_3	3.7	0.18	0.26	0.14	0.08	0.05
x_4	0.6	2.55	2.65	1.65	1.66	1.81
x_5	1.0	1.17	1.30	0.90	0.83	0.76
x_6	1.0	0.009	0.015	0.043	0.020	0.022
Z-score		3.99	5.23	3.34	2.97	2.91

In table 17 is analyzed index IN and the results prove the findings of Altman index. The results based on index IN could be interpreted in more critical way for last two years in terms of company's financial wealth. Most problematic is the significant decrease in return on assets and lover financial leverage after the acceptance of short-term bank loans. Asset turnover and current ratio could be interpreted positively.

Tab. 17 – Index IN. Source: own analysis

Item	2011	2012	2013	2014	2015
Assets/Liabilities	3.58	3.67	2.66	2.66	2.81
EBIT/Interest paid	9.00	9.00	9.00	9.00	9.00
EBIT/Assets	0.18	0.26	0.14	0.08	0.05
Revenues/Assets	1.17	1.30	0.90	0.83	0.76
Current Assets/Current Liabilities	1.34	1.90	1.66	1.57	1.55
Index IN	1.89	2.30	1.61	1.32	1.24

In table 18 is visible the value creation which is affected by the problems in last two years. There are two aspects behind the results of EVA indicator. After the record year 2012 in terms of operating income after taxes the NOPAT decreased for 75 % in 2015. Cost of capital for this company is now lower around 9 %. Second aspect visible mostly in 2013 is the volume of invested capital. From 2013 company aims to use in wider proportion the interest-bearing capital in the form of short-term bank loans. This have positive impact on EVA indicator, however, because of the decreasing NOPAT the final results are worsening. The background for the date is visible from appendix 5.2.

Tab. 18 – Economic Value Added (in thousands CZK). Source: own analysis

	2011	2012	2013	2014	2015
NOPAT	680 435	1 227 895	901 858	478 633	317 443
C	3 438 614	4 431 919	5 103 966	4 972 443	4 703 924
WACC	0.10	0.11	0.08	0.10	0.09
EVA	326 982	721 872	468 552	-19 374	-83 048

4.CONCLUSIONS AND BASIS FOR THE FUTURE RESEARCH

This paper dealt with the production of bioethanol in the Czech Republic. There were discussed legislative approaches in the Czech Republic as well as within the European Union. In application part there were evaluated our two Czech producers of bioethanol – companies Ethanol Energy and Tereos TTD. While the relatively newly formed Ethanol Energy is still improving its financial performance, Tereos TTD follows rather the declining trend from 2013. Based on the study of the financial performance of these companies we may conclude that the sector of bioethanol producers in the Czech Republic is stabilized and companies are not facing significant problems for the near future.
The potential limitation of the paper is the country study approach, which is limited in terms of the total number of companies being analyzed. Second problem is the production portfolio of Tereos TTD which is not specializing only on bioethanol production but has much wider spread of activities.
As an area for the future research might be stated the analysis of the impact of the changes in excise duties on companies producing bioethanol. As there would be clearly visible the trends from previous years, it would be much easier to separate the effect of the change in excise duty on the financial performance of these companies.
For the broader evaluation of the producers there is also expected to conduct a deep financial analysis in terms of trends analysis and ratio analysis, despite certain measures were testing due to their coverage in Altman Z-score and index IN.

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1 APPENDIX

r_f – the average of the Czech National Bank auctions in respective years

r_m-r_f – see Damodaran (Czech Republic)

β_u – see Damodaran (Europe, industries)

1.1 Ethanol Energy

	2011	2012	2013	2014	2015
WACC	0.0993	0.1136	0.0894	0.0975	0.0867
r_d			0.1369	0.02441	0.0718
(1-t)	0.81	0.81	0.81	0.81	0.81
D	0	0	39 738	88 235	43 200
C	421 015	378 727	818 107	815 465	901 431
r_e	0.099	0.114	0.088	0.107	0.088
E	421 015	378 727	778 369	727 230	858 231
NOPAT	-35 921.88	-23 701.41	-33 849.09	-24 227.1	84 319.38
EBIT	-44 348	-29 261	-41 789	-29 910	104 098
r_f	0.039	0.040	0.022	0.025	0.011
$r_m - r_f$	0.0728	0.0708	0.0605	0.068	0.0709
β_L	0.830	1.040	1.093	1.208	1.082
β_U	0.83	1.040	1.050	1.100	1.040

1.2 Tereos TTD

	2011	2012	2013	2014	2015
WACC	0.1028	0.1142	0.0849	0.1002	0.0851
r_d	0.5414	0.0880	0.0241	0.0759	
(1-t)	0.81	0.81	0.81	0.81	0.81
D	30 700	140 000	286 666	133 334	0
C	3 438 614	4 431 919	5 103 966	4 972 443	4 703 924
r_e	0.100	0.116	0.089	0.101	0.085
E	3 407 914	4 291 919	4 817 300	4 839 109	4 703 924
NOPAT	680 434.83	1 227 895.2	901 858.05	478 633.05	317 443.05
EBIT	840 043.00	1 515 920.00	1 113 405.00	590 905.00	391 905.00
r_f	0.039	0.040	0.022	0.025	0.011
$r_m - r_f$	0.0728	0.0708	0.0605	0.068	0.0709
β_L	0.836	1.067	1.101	1.125	1.040
β_U	0.83	1.040	1.050	1.100	1.040

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INFLUENCE OF THE ECONOMIC INDICATORS ON GDP IN THE CONTEXT OF THE FINANCIAL CRISIS IN THE V4 COUNTRIES

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Abstract

GDP monitoring over time has been a burning topic in the last 5 years; the impact of the debt crisis is analysed constantly. Various papers discuss the emergence of the debt crisis and its impact on economic indicators. We follow the development of GDP with respect to various sectors in the V4 countries. On this basis, we employ statistical methods to compare the development of indicators in the V4 countries and the impact of the debt crisis on different industries. In addition, we also monitor the impact of other economic indicators on GDP over time with respect to the emergence of the crisis in the V4 countries. We expect that the impact of the crisis in these countries was not equally intense and that it depends on several factors, which we try to describe and quantify. For this purpose, we employ various statistical methods, regression and correlation analysis, etc.

Keywords: GDP, crisis, economic indicators, sectors in V4

JEL Classification: E23, R11, F63

1.INTRODUCTION

The recent financial crisis has led to a widespread and severe crisis in the world economy, the worst since the Great Depression started in the late 1920s (South Centre, 2010). The global financial crisis has had an adverse impact globally – on various countries as well as industries. For example, many Hungarian residents incurred debt in foreign currencies. The situation is better in Romania whose residents have savings predominantly in EUR, while loans are also mainly in EUR and not in CHF. A similar situation can be observed in Croatia where 74% of bank loans are in a foreign currency, of which 4/5 in EUR. Due to the high proportion of people working in the West and the country's role in international tourism, this type of indebtedness does not create major problems. In the Czech Republic and Slovakia, foreign currency debt was not significant, and the foreign currency loan portfolio in Poland remained at a low level as well (Egedy, 2012). By the end of 2008, the world economy had rapidly entered a phase of globally synchronized slowdown and, in the first quarter of 2009, it headed towards a global recession. Motor vehicles and transport equipment, basic metals and steel, chemical and chemical products, rubber products and construction materials appear commonly in the list of severely affected sectors. These require roll-over financial requirements of considerable size and, hence, tend to be exposed to a vagary of credit crunches. Naturally, significantly weakened domestic investment and consumption demand in the face of high uncertainty is behind the marked decline in production in these sub-sectors. They are typically the sectors that constitute the mainstay of industrial activities and produce strategic industrial inputs in the form of intermediate goods such as basic metals or non-metal products or steel, as well as consumer durables, such as motor vehicles or electrical and electronic products (Nissanke, 2010). Another sector affected by the crisis is the automotive industry. In October 2008, the sales of cars fell in Europe and the U.S. Among developing regions, only Africa has a deficit in car production relative to car sales. The development of the global automobile industry during the 2000s until the global financial crisis does not seem to have modified the inter-regional imbalances between

the West and the East (Asia), on the contrary. Europe is seeing a slow shift of car production from Western Europe to Eastern Europe but a balanced growth of car production relative to car sales in Eastern Europe. The increased imbalance seems to be caused by the automobile industry in Japan where output increased more than demand from 2001 to 2007 (Wad, 2010).
Crises generally tend to have a permanent negative effect on the level of GDP, while financial crises could also weigh on the long-term growth of output (European Commission, 2009).
The highest comparable GDP level ever recorded was seen for Q3 2008 before the impacts of the global financial crisis related to the fall of Lehman Brothers investment bank (Czech Statistical Office 2014). The global economic and financial crisis that fully affected all parts of the world in 2009 resulted in a sharp drop in gross domestic product in most countries, including Slovakia. Despite the present recovery in economic activity, the level of production lags far behind the pre-crisis period. An analysis of the current global economic and financial crisis raises a wide range of questions on whether the consequences of the crisis, i.e. GDP losses and/or the decline in the global economy, are permanent, or whether they can be recovered within a couple of years (Huček et al, 2011).
In the aftermath of the crisis, we see many papers on its negative impact on sectors and the whole economy that is in red numbers. Macroeconomic indicators reveal much about the economic situation of various countries. They include data on the gross domestic product, inflation and unemployment. Relevant information can also be derived from the development of financial and currency markets, direct foreign investments, gross domestic expenditures on research and development and its share in the gross domestic product.
The question about promotion of foreign investment is very frequent in countries in transition, and it widely discussed from the economic and political point of view (Andrejkovič & Hricová, 2015). Furthermore, with the accession to the European Union, inflows and outflows of investments are interrelated, and the economy is more open. Foreign direct investment (hereinafter "FDI") reflects the objective of obtaining a lasting interest by a resident of one economy in an entity seated in another economy (Czech National Bank, 2015). FDI is an important phenomenon in the global economy (Melo & Quinn, 2015). Economic theories and empirical studies support the notion that foreign direct investment is conducted in anticipation of future profit (Ang, 2009). Generally, foreign direct investment has positive effects on the economy of the host country.
The importance of research and development expenditure within countries has been studied for a long time. It is precisely the period of economic crisis that puts pressure on budgets for GERD. Crises undoubtedly slow down the technological progress. Lower R&D expenditures combined with reduced investment in new technologies hamper growth in the overall productivity of production factors and may cause technologies to stagnate. However, a substantial decline in the total factor productivity would only be justified by a restructuring of the economy followed by reallocation of resources from high-productivity to low-productivity sectors, which has thus far not been a characteristic of the Slovak economic environment. (Huček et al, 2011). According to the Nevima (2012), gross domestic expenditures on research and development are sources of a further increase in economic growth as the stimulation of basic and applied research creates large multiplication effects with long-term efficiency and prerequisites for a long-term economic growth. We can mention several studies regarding the impact of GERD on macroeconomics indicators. As an example, Metehan et al (2014) say that there is much controversy in the literature over whether military expenditures have a positive, negative or no impact on economic growth. The empirical evidence shows the pro-cyclicality of GERD (Guellec & Pottelsberghe 2008): a crisis reduces the expected return of GERD investments, while at the same time reducing the cash flow of firms, which is a major source of innovation funding, especially under credit constraints.

Unemployment is usually measured by national labour force surveys and refers to persons who report that they have worked in gainful employment for less than one hour in the previous week, are available for work and have taken actions to seek employment in the previous four weeks (OECD, 2013). Before the crisis, the business cycle was in a phase of decreasing unemployment. However, this trend stopped in 2008 and with a time lag of approximately one year, the recession translated into higher unemployment. This delay was partly caused by policy measures such as the adjustment of work hours to mitigate the negative employment effects. The increase in unemployment was not evenly shared between certain socio-economic subgroups, and the biggest differences arose due to sex, age and education (Barakat et al, 2010). Some authors agree that learning-by-doing plays a vital role in the growth process. In this case, production and productivity-increasing activities are complements, and recessions may reduce the long-term growth rate. Recessions are indeed periods in which skills are lost: unemployed persons become less productive over time because they lose opportunities to learn by doing (Martin & Rogers 2000). In this way, a temporary increase in unemployment can have long-lasting negative effects on productivity and thus on long-run economic growth (European Commission, 2009).
Based on the aforementioned theoretical assumptions, this paper discussed the impact of the financial crisis on various sectors of the V4 countries and their development over the selected time period with respect to GDP according to NACE. The Visegrad group is an informal grouping of four Central European countries – Slovakia, the Czech Republic, Hungary, and Poland. It is a lively, informal regional structure of four EU and NATO member countries that are committed to the same values, have a common history, culture and geographical position (MZV, 2015). The "Results" chapter focuses on the GDP indicator and on how it is influenced by the monitored factors. A detailed description of the chosen factors (GDP, unemployment rate, foreign direct investments and expenditure on education) is available in the "Introduction" part in connection with the financial crisis.

2.METHODOLOGY

This paper aims to analyse the similarities in the development of the structure of GDP generation in the V4 countries based on the NACE classification (rev. 2) and the development of various industries with respect to selected macroeconomic indicators. We employ mathematical and statistical methods to monitor and quantify the variable. The "Results" part includes graphs created in Excel worksheets, and we have also used the SAS statistics software to apply the regression and correlation methods and the goodness of fit test.

The paper has three interlinked objectives:

1. *To monitor GDP in various industries of the V4 countries according to the NACE classification (rev. 2).*
2. *To quantify the shares of various industries in each country.*
3. *To analyse the impact of GDP development in various industries on selected macroeconomic indicators.*

Hypothesis: We assume that the development of the GDP structure in each V4 country is different.

We use values for the V4 countries. In general, the values can be represented as for each country and year where the parameters are defined as follows: $i = \{CZ, HU, PL, SK\}$
$j = \langle 2000;2013 \rangle \cap N$

We used the Eurostat dataset with 2013 being the last year available.
In addition, we follow the GDP generated in various industries and distinguish the values by sectors as follows: $GDP_j^{i,k}$ where $k = \{1,2,\ldots,K_i\}$
To describe the values, we use the following characteristics of each region (Table 1):

Tab. 1 – Industries according to NACE (rev. 2), Source: Eurostat, 2015

Agriculture, forestry and fishing	A
Mining and quarrying	B
Manufacturing	C
Electricity, gas, steam and air conditioning supply	D
Water supply; sewerage, waste management and remediation activities	E
Construction	F
Wholesale and retail trade; repair of motor vehicles and motorcycles	G
Transportation and storage	H
Accommodation and food service activities	I
Information and communication	J
Financial and insurance activities	K
Real estate activities	L
Professional, scientific and technical activities; administrative and support service activities	M
Public administration, defence, education, human health and social work activities	N
Arts, entertainment and recreation; other service activities; activities of household and extra-territorial organizations and bodies	O

We monitor the influence of three indicators on GDP values:

- unemployment rate (UNP),
- foreign direct investment (FDI),
- education expenditure (GERD).

In general, the variables can be represented as UNP_j^i, FDI_j^i $GERD_j^i$ for each country and year where the parameters are defined as follows:
$i = \{CZ, HU, PL, SK\}$
$j = \langle 2000;2013 \rangle \cap N$

The influence of FDI on GDP is probably not a one-time effect so that it is appropriate to define a long-term impact. For this reason, we decided to define an artificial variable created based on moving averages over 3 consecutive values of FDI. We call this variable FDI_AVE (moving average of foreign direct investment over 3 years).

The variable is computed as follows:

$$FDI_AVE_i^c = \frac{FDI_i^c + FDI_{i-1}^c FDI_{i-2}^c}{3} \quad (1)$$

where $c = \{CZ, SK, PL, HU\}$ and $i = \{3,4,\ldots,n^{c}_{FDI}\}$

When analysing the aforementioned variables, we follow their development and characteristics using descriptive statistics. To identify interdependencies, we use correlation and regression analysis. We analyse the linear dependency of two variables using the Pearson correlation coefficient, and to quantify the impact of the dependency, we employ linear regression analysis. We build on defined relationships and procedures according to Šoltés (2008). We correlate GDP with other variables: UNP, GERD, FDI (or FDI_AVE). To analyze the relationship between GDP and GERD, we are not analyzing the movement of impact over the years. For next analysis, this impact could be measured. To ensure the same logic also for FDI and GERD data, we used the nominal GDP.

3.RESULTS

3.1.Development of GDP structure by industry using the NACE classification

We have decided to analyze the development of GDP structure by industry using the NACE classification (rev. 2). In this case, we can see that in the Czech Republic (Figure 1), the volume of the C category decreased compared to other industries between 2008 and 2010. This can be considered an impact of the crisis because the relevant sector is industrial manufacturing.

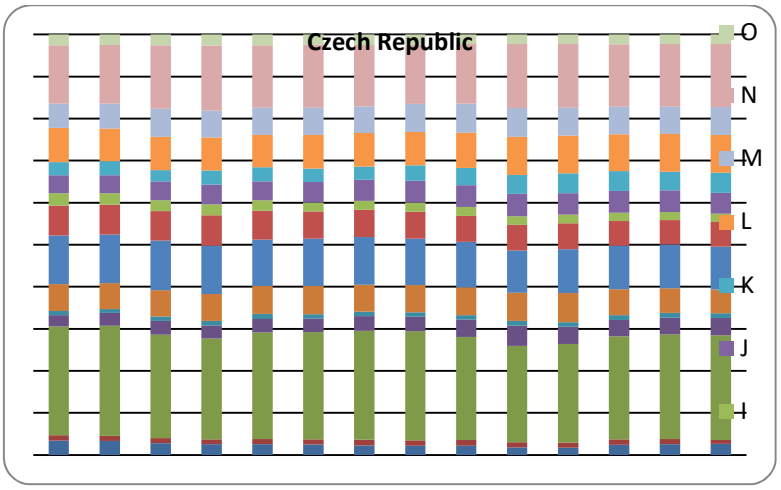


Fig. 1 – GDP in various industries in the Czech Republic Source: own processing

The Hungarian example (Figure 2) shows a similar development but the decline of the C category in 2012 and 2013 was reversed and its share returned to the original value. Small differences can also be seen in the A category where the decline was less steep than in the C category.
Hungary's situation has deteriorated significantly during the economic crisis, and the country can be classified as one of the biggest losers. The main reason behind is the openness of its economy. The ratio of companies participating in international production systems is 40 percent, and the contribution of these companies to the export reaches 75 percent (Egedy, 2012).

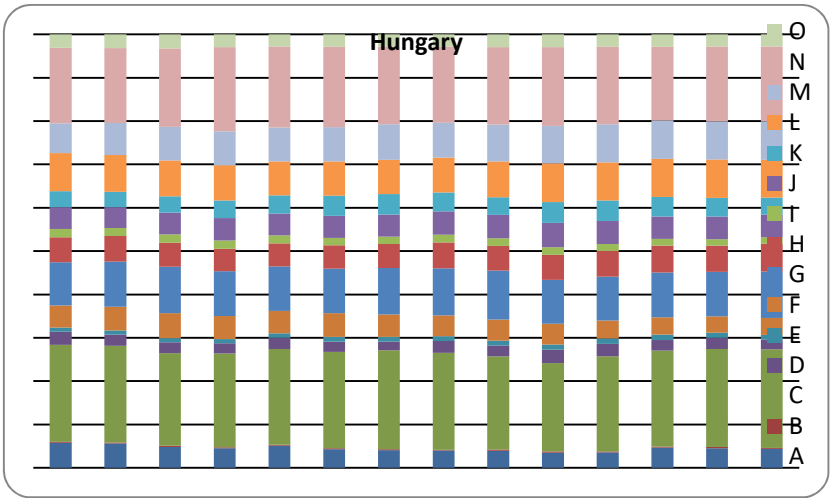


Fig. 1 – GDP in various industries in Hungary Source: own processing

For Poland, Figure 3 shows that differences between years are very small so that we cannot say that the crisis has had a major impact on the structure of the economy. The hypothesis that the development of the GDP structure in the V4 is different is thus confirmed.

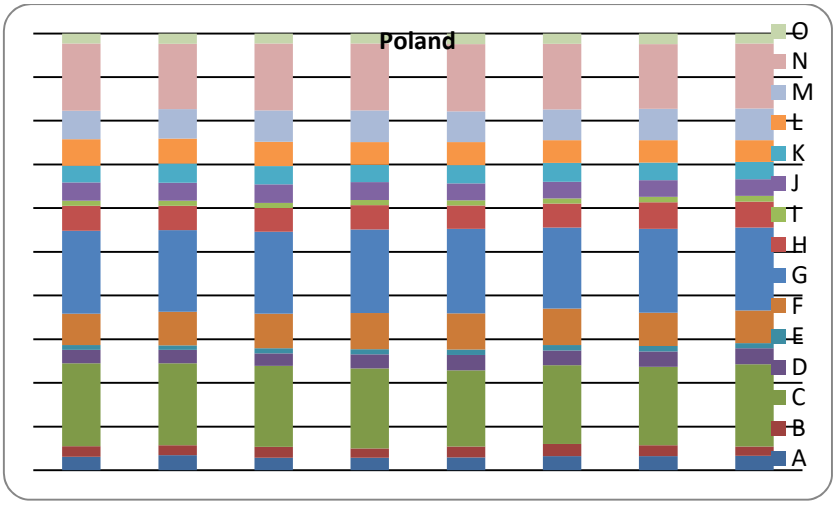


Fig. 1 – GDP in various industries in Poland Source: own processing

For Slovakia, Figure 4 shows major differences compared to previous years in 2009 and 2010. The oscillations in category C are caused mainly by the economic crisis and also by concerns related to the possible gas crisis (suspension of natural gas deliveries to Slovakia).

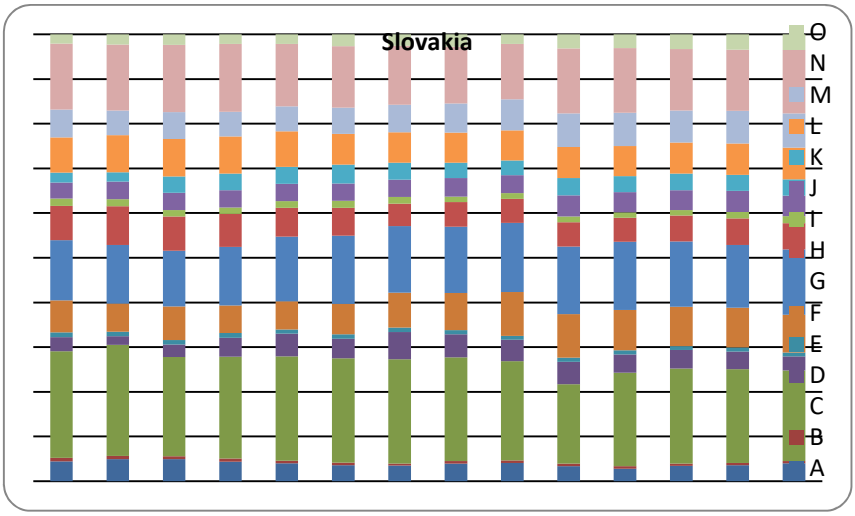


Fig. 1 – GDP in various industries in Slovakia Source: own processing

3.2.The impact of macroeconomic indicators on the performance of various sectors

To elaborate on the aforementioned results, we analyse the impact of macroeconomic factors on the performance of various sectors. Based on that, we identified the impact of these factors regardless of the country (i.e. taking all V4 countries as a whole). The results yielded the following conclusions that also show differences between the values. There is a significant correlation between GDP and GERD in all sectors in the table 2.

Tab. 2 – Correlation regardless of the country Source: Own computation

Pearson Correlation Coefficients Prob > |r| under H0: Rho=0 Number of Observations				
	FDI	UNEMPL	FDI_AVE	GERD
A_NACE	0.38987	-0.22867	0.74763	0.75071
	0.0051	0.1102	<.0001	<.0001
	50	50	47	46
B_NACE	0.34813	-0.13796	0.67080	0.76681
	0.0132	0.3394	<.0001	<.0001
	50	50	47	46
C_NACE	0.34785	-0.37150	0.65993	0.91750
	0.0133	0.0079	<.0001	<.0001
	50	50	47	46
D_NACE	0.27789	-0.25313	0.59722	0.87721
	0.0507	0.0761	<.0001	<.0001
	50	50	47	46
E_NACE	0.35791	-0.26547	0.69962	0.86754
	0.0107	0.0624	<.0001	<.0001
	50	50	47	46
F_NACE	0.33132	-0.19687	0.66136	0.79084
	0.0188	0.1706	<.0001	<.0001

	50	50	47	46
G_NACE	0.34411	-0.14114	0.68987	0.74872
	0.0144	0.3282	<.0001	<.0001
	50	50	47	46
H_NACE	0.32547	-0.28517	0.67583	0.88140
	0.0211	0.0447	<.0001	<.0001
	50	50	47	46
I_NACE	0.27122	-0.50438	0.54423	0.94484
	0.0568	0.0002	<.0001	<.0001
	50	50	47	46
J_NACE	0.39614	-0.38082	0.71662	0.90867
	0.0044	0.0064	<.0001	<.0001
	50	50	47	46
K_NACE	0.39184	-0.29122	0.72664	0.87087
	0.0049	0.0402	<.0001	<.0001
	50	50	47	46
L_NACE	0.39839	-0.43829	0.68401	0.94699
	0.0042	0.0015	<.0001	<.0001
	50	50	47	46
M_NACE	0.38017	-0.28691	0.73901	0.85431
	0.0065	0.0434	<.0001	<.0001
	50	50	47	46
N_NACE	0.39759	-0.30497	0.73584	0.85664
	0.0042	0.0313	<.0001	<.0001
	50	50	47	46
O_NACE	0.37297	-0.29237	0.72137	0.84917
	0.0076	0.0394	<.0001	<.0001
	50	50	47	46

We identified major differences in the unemployment rates – not all industries experienced the same development.
After performing a detailed analysis for each country, we identified the following results (Table 3).

Tab. 3 – Relationship between GDP and GERD Source: Own computation

Pearson Correlation Coefficients Prob > |r| under H0: Rho=0 Number of Observations				
vs. GERD	CZ	HU	PL	SK
F_NACE	0.88210	0.46449	0.83991	0.86086
	<.0001	0.1098	0.0180	0.0002
	13	13	7	13
K_NACE	0.94695	0.89746	0.78977	0.85993
	<.0001	<.0001	0.0346	0.0002
	13	13	7	13
L_NACE	0.95528	0.97193	0.76542	0.91197
	<.0001	<.0001	0.0449	<.0001
	13	13	7	13

For GERD, we found a difference in Hungary where the construction sector had a different development with respect to the volume of GERD than the other countries. Poland has had a similar experience in industries such as the financial sector and real estate, which can be caused by the economic crisis and unchanged or slowly affected research and development expenditures.

Tab. 3 – Development of GDP and FDI Source: Own computation

Pearson Correlation Coefficients, N = 14 Prob > |r| under H0: Rho=0				
vs. FDI	CZ	HU	PL	SK
A_NACE	0.49247	0.54585	-0.68516	0.07164
	0.0736	0.0435	0.0608	0.8077
B_NACE	0.47260	0.49290	-0.23609	0.37915
	0.0879	0.0733	0.5735	0.1812
C_NACE	0.57663	0.48746	-0.76712	0.28560
	0.0309	0.0771	0.0263	0.3223
D_NACE	0.54072	0.30279	-0.65326	0.54063
	0.0459	0.2927	0.0790	0.0459
E_NACE	0.51371	0.47765	-0.61387	0.37484
	0.0602	0.0841	0.1055	0.1867
F_NACE	0.50009	0.02824	-0.41297	0.35845
	0.0686	0.9237	0.3092	0.2082
G_NACE	0.57320	0.38808	-0.67583	0.35205
	0.0321	0.1703	0.0658	0.2170
H_NACE	0.57494	0.46226	-0.79402	0.13796
	0.0315	0.0961	0.0186	0.6381
I_NACE	0.59604	0.11933	-0.71830	0.10666
	0.0245	0.6845	0.0447	0.7167
J_NACE	0.53006	0.41512	-0.66504	0.26934
	0.0512	0.1399	0.0719	0.3518
K_NACE	0.48851	0.42078	-0.50265	0.31342

	0.0763	0.1341	0.2042	0.2752
L_NACE	0.51324	0.46981	-0.52855	0.23565
	0.0605	0.0901	0.1781	0.4174
M_NACE	0.57236	0.46274	-0.70695	0.28074
	0.0324	0.0957	0.0499	0.3309
N_NACE	0.50755	0.36866	-0.60620	0.29037
	0.0639	0.1946	0.1111	0.3139
O_NACE	0.53392	0.34211	-0.60900	0.18967
	0.0492	0.2312	0.1090	0.5161

For Poland (Table 4), we also see that the impact of FDI is opposite compared to the other countries where correlation coefficients are not always significant and have reverse signs. In addition, we see that the significance of dependency is almost non-existent for Slovakia with the exception of the relationship between FDI and the D sector at the 0.05 level.

5 CONCLUSION AND DISCUSSION

Various papers offer scenarios of the global economic development. Some economists even predicted that the crisis would result in a war. Nowadays, we can state that the economies of many countries have fortunately returned to black numbers. Naturally, there are global problems related to the conflict between Russia and the U.S. Dollar faces a decline, euro is not as strong as had been expected, and these factors can have a negative influence on the development of industries in various countries.

This paper discusses the development of industries in the V4 countries since the beginning of the financial crisis until the end of 2013 based on the development of the GDP structure by industry using the NACE classification. The results show that various industries have not experienced the same development across all countries. In the Czech Republic, the crisis had the most severe impact on manufacturing industries, as the literature predicts. One of the reasons is that the Czech industry has a major share in the economy compared to other industries. One example is the Škoda Auto company that restricted production in response to the crisis. In 2008, all production lines actually limited production for two days, with the exception of the new Superb vehicle (Černý, 2008). Other companies reacted in a similar fashion. By 2013, the share of the industry in the GDP started increasing but it failed to reach pre-2008 levels. Other industries did not respond to the crisis so sharply.

Hungary experienced the same but with a better ending; industrial production returned to the pre-crisis level. Agriculture, forestry and fishing is another industry that suffered under the crisis.

The situation in Poland is interesting in that differences between years are very small. It is interesting to analyse why the crisis had a muffled impact on various industries. It can be caused by various factors, e.g. the distribution of sectors and political leadership. At the same time, we could confirm the hypothesis that the development of GDP in various V4 countries varies.

In Slovakia, we observe a development similar to that in the first two countries (not Poland). Slovakia has become a major car producer. One example is the Kia plant. Like in the Czech Republic, it experienced troubles during the crisis. To conclude, we can say that the crisis has had a negative impact in particular on Hungary and, in the particular, on agriculture, forestry and fishing, which can be confirmed by the geographic division of this not so small country.

The impact of macroeconomic indicators on the performance of economic sector was another topic to be studied. We found out that the relationship between GDP and GERD is significant

in all sectors. Based on correlation analysis (Pearson coefficient), we identified major differences for the unemployment rate. Not all economic sectors experienced the same development.

The speed at which the world economy had fallen victim to the recessionary wave of financial turmoil in the United States and Europe caught everyone by surprise. In the second quarter of 2009, some signs were emerging indicating that the worst might be over following the large-scale counter-cyclical policy packages put in place by a number of larger developed and emerging market economies together with their massive liquidity injections into banking systems to mitigate the scale and depth of the recession. Yet, enormous damage has already been inflicted on the real sector activities resulting, in particular, in a worldwide contraction of industrial production due to the severe global credit crunch and fall in world trade unprecedented in the post-war era (Nissanke, 2010).

To conclude, we need to state that this research faces one major limitation. In our case, we could consider using unemployment and FDI data by sector but this is impossible due to the unavailability of data. Otherwise, we would have been able to identify the influence of variable directly on various industries, which would have greatly improved the usefulness of our results.

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SOCIO-ECONOMIC EFFECTS OF EXPENDITURE ON SOCIAL PROTECTION

Hronec, Hirková, Gogora, Mihályi

Abstract

Redistribution is an important part of the economic system. The redistributive function is related to addressing those issues which society considers a fair distribution of assets and income. Instrument of redistribution is social policy, which has distributive (redistributive), homogenising, growth, stimulative, preventive and protective function. The aim of the study aims is to quantitatively analyze and confirm the existence of direct and indirect dependence between the total sum of funds for social protection per capita in various EU countries and selected indicators. The object of quantitative analysis were selected EU countries: Western Europe (Belgium, Germany, Ireland, France, Luxembourg, the Netherlands, Austria, United Kingdom), the V4 countries (Hungary, Czech Republic, Poland and Slovakia), and Slovenia. The subject of the research is defined in accordance with the objectives of the study and formulation of the research premise which is the correlation between the amount of total expenditure on social protection and selected indicators of social policy action and also the economy. Article is supported by project VEGA 1/0405/15 - Program budgeting as part of the New Public Management.

Keywords: redistribution, social protection, expenditure on social protection, social policy, government expenditure

JEL Classification: H7 State and Local Government • Intergovernmental Relations, H5 National Government Expenditures and Related Policies

1.INTRODUCTION

Recently, the debate is not whether intervention of the state in social policy is appropriate or not. Discussions are held about the extent to which the state should intervene, on which concept should its social policy be built, what is the best theoretical basis, to which “welfare state” model should the state approximate itself. Admittedly, Krebs can be argued that "a systemic change to social policy is associated with the weakening of the institutional redistributive elements of the model, which means limiting the generosity of the welfare system while strengthening the performance elements and residual led efforts after a money-saving yet effective social policy." The facts speak for not only constrained public finances, but also the need to restore individual responsibility and follow-up support for a proactive attitude and motivation to work and performance. These are the foundations to create the conditions for the long-term prosperity of a society. The aim of the study is to quantitatively analyse and confirm the existence of direct and indirect dependence between the total sum of funds for social protection per capita in various EU countries and selected indicators. As independent variables, we chose the total expenditure on social protection per capita in €. Expenditure on social protection contains: social benefits, which consist of transfers in cash or in kind to households or for individuals to alleviate their burden defined by a set of risks or needs, furthermore included here are administrative costs, which represent the cost of management and administration of social protection systems and other expenses, which consist of various expenditure under the programmes of social protection.

2.TEORETICAL BACKGROUND

Through a number of redistributive activities, each state commits itself in the social sphere on the basis of that which guarantees a minimum standard of living and other social areas. The role of the state and therefore its economy is to create resources to provide social services and the payment of social benefits. The economic system creates conditions enabling part of the funds from wealthy individuals to be transferred to the poor.

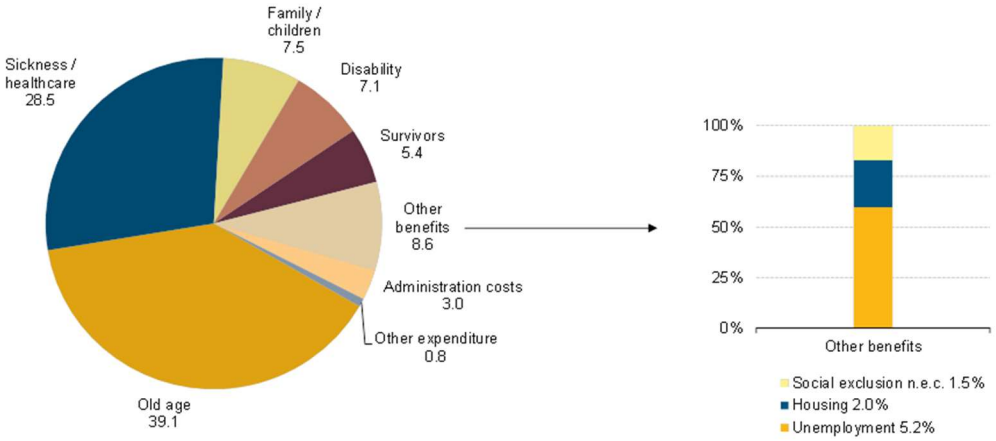
2.1.Social policy as an instrument of redistribution

Definitions of social policy are mixed. Some understand it as a scientific discipline whereas others as a field of observation. As in the past, contemporary literature has more than enough definitions, so we shall present a few theoretical perspectives by several writers. While Macek (1925) argued that social policy must permeate every policy, Smith (1958) perceived social policy as a cognitive activity, dealing with inequality and its distribution. Masaryk (1932) considered inequality as injustice, which approximated the view of Engliš (1916), who considered justice a driving force of social policy. We have defined its basic functions on the basis of works by Kliková, Kotlán (2003) and Žižková (1997). In a general definition of social policy, we were assisted by publications from Bulmer, Lewis and Piachaud (1989), who decided to define it negatively. We look at this issue from the perspective of other authors such as Krebs (1997, 2005), Žižková (1997) Rievajová et al. (2006), Tomeš (2000, 2010), Dřízová (2001), Radičová (1998), Purkrábek, Vavroušek (1994), Potůček (1994), Korimová, Ľapinová, Vargová (2014). Social policy as a scientific discipline is defined according to the authors Pinker (1971) and Abel-Smith (1992). In contrast, publications from authors like Wilensky and Turner (1987), Marshall (1975), Titmuss (1979), Krebs (2007), Benčo (2000) assist us in dissecting social policies as practical activity. Social policy is understood as the direction, the approach, the decision-making processes in politics in general, not only as part of it, or of a department. This view is especially held by Macek (1925), who emphasizes that social policy must permeate every policy. Only then, according to him, can politics in particular be preventive. It must be politics in which the "interests of the people in society were satisfied in a manner that will permanently benefit the whole." Smith (Žižková, 1995) finds one of the specific characters of social policy as a systematic cognitive activity that addresses inequalities and their distribution in society. It also deals with the political process, institutions and activities that affect these inequalities. According to E. Rievajová (Booth et al., 2008) social policy, through social security, has broader objectives than just to prevent or alleviate poverty. It is the response of modern societies to the question of security in the broadest sense. Then, according to her, it is a fundamental objective of social security to provide families and individuals assurance that the level and quality of life will not be reduced in a risky social or economic situation. This means not only meeting the needs, but above all, risk prevention and assistance to individuals and families in situations which could not be prevented. Therefore, social security has not only cash benefits at its disposal, but also a wide range of services. According to Masaryk (1932), social issues are associated with inequality and with the awareness of this fact as an injustice. It emphasizes the fact that social policy is not just similar to other policies, but as a practical activity it leads to tackling the social issues of all classes and levels, not just of workers. (Korimová, Ľapinová, Vargová, 2014).

2.2.Basic subsystems of social policy

The role of the welfare state in the broadest sense is to provide social support to citizens with regard to social security, healthcare, education and housing, and endeavour to provide a helping hand if other options fail, prioritizing the family. To this end, states transfer a wide range of activities in the field of social policy, the exact form of which depends on the current conditions in the relevant country and the social levels of the population to which social assistance is targeted. The priority of social policy focuses on four main components, namely employment policy, education policy, social and labour legislation and family and health policy. In addition to the foregoing; there are a number of subsystems to the various aspects of the objectives of social policy. We can rank here culture, sport, leisure and housing policy (Korimová, 2014).
Tomeš (2011) defines up to 21 subsystems of social policy which, in their mutual interdependence, constitute a single system of social protection. Prevalent are, for example, the policy of "social security" and the policy of "support for national minorities and migrants" (Korimová, 2014). In terms of allocation of resources the complex structure of the social system is composed of many institutions and various kinds of benefits. Defining the boundaries of the social system is conditioned by classifying public services as part of the social policy of the state. (Štrangfeldová, self, 2007). Social policy utilises the instruments of all sub-segments and policies of economic policy. Institution and instrument content can be differentiated, especially those that are used primarily in regulatory policies and market distribution policy. In particular, for example, we speak about the system of legislative regulation of social relations and the competent authorities, furthermore about the system of financial security (subsistence minimum, pensions, sick pay, social security, etc.), likewise of the Labour Code and the Employment Services Act and also on collective bargaining for collective agreements concluded between employers and employees' representatives. Social policy implements its objectives through a system of financial security, consisting of several financial instruments. In relation to a citizen, we differentiate financial and non-financial instruments. Instruments for collecting funds (taxes and levies) and instruments for distribution of resources we class as financial instruments, while the non-financial represent the legislative regulation of the social environment (job counselling, and labour and civil rights (Korimová, 2014). The grouping of these instruments and institutions (groups and relations) is concentrated in social security. According to Article # 39 of the Constitution of the Slovak Republic, citizens have the "right to adequate material security in old age and incapacity to work, as well as in the loss of a breadwinner."
During development of social security, the following adverse social events were recognised, the occurrence of which required intervention by the state social policy: poverty, disability, illness or injury, dependent childhood, motherhood and parenthood, old age, death of breadwinner and unemployment. Polonský and Pillárová (2002) define social security as a set of legal, financial, organizational tools and measures designed to offset the adverse social consequences of those financial and life situations that threaten social rights or preclude such life situations. Social security can be understood as a package of measures to create solidarity with people facing the threat of insufficient income from paid work or are in a situation that requires uncommon expenditure (Rievajová et al., 2006). Goldmann (2007) defines social security as a package of institutions, facilities and measures which preclude, alleviate or remove the consequences of social events. "Social security is understood by international law as a package of institutions and institutes which provide protection and assistance to people health threatening situations, illness, unemployment, injury, invalidity, work-related accident, old age, pregnancy and motherhood, parenthood and death of a breadwinner." In the broadest terms, the social security system consists of three pillars. In terms of volume of funds, social insurance is

the dominant, further parts represent state social support and social assistance (Štrangfeldová, Šebo, 2007; Korimová, 2014).
Social insurance is a form of security for a citizen which is drawn on in the event of foreseeable events against which an individual insured in advance. Such events can be, for example illness, serious injury, disability and so on. In case of such an event, a citizen, on the basis of their insurance contract, is compensated from the sum insured. Using the purchasing power standard (PPS) facilitates comparison of the level of social protection expenditure per capita between countries, taking into account differences in price levels (see figure 1).



(*) Provisional.
Source: Eurostat (online data code: spr_exp_sum)

Fig. 1: The structure of expenditure on social protection, the EU - 28, 2012 (% of total expenditure). Source: Eurostat, 2016

One of the central issues in providing assistance in the form of social policy is its financing. Social policy can be financed in two ways. The first is financing from public budgets, which are collected through taxes and the focus is mainly on ensuring the subsistence level for the whole population. The second method is financed by insurance funds, which consist of payments made by insurance policyholders. This approach is based on institutions of mutual assistance and the individual schemes for social contributions are dependent on levels of income and are specified for categories of the economically active population (Potůček 1995). The following table 1 shows the differences in the financing of social policy from public budgets and insurance funds.

Tab. 1: Differences in the financing of social policy. Source: Potůček, 1995

	Public financing	Financing from insurance funds
Principle of provision of services	need	equivalence
Principle of availability	compliance criteria necessity, individual assessment	formalized categorized demands
Financing	taxes	contributions
Benefits	Singular	according to the amount of income
Socio-economic effects	redistribution	maintaining inequality solvency
Ethical base	solidarity	maintaining statutes

Tomeš (2001, p. 205) succinctly and eloquently expressed the idea concerning the problem of the social security system: "inherited welfare systems did not correspond to the needs of the transition to a market economy. Everyone would like to reform the economy, but would like to retain the inherited generous social support. The attitude toward the state as a "cash cow" results in increased welfare costs, and because they are covered by the state budget, means pressure on public expenditure, market economy conditions and taxes. Inherited systems do not rely on the civil responsibility of citizens for their own future and the future of the family. Since they are continuously funded this places pressure on the economically active population. The mass of social benefits financed by employers in a state-run economy cannot be transferred to a private market economy with no significant impact on its economic performance. It is therefore clearly essential to reform the benefit systems in order to reduce costs."

3.RESEARCH METHODOLOGY

The aim of the study aims is to quantitatively analyse and confirm the existence of direct and indirect dependence between the total sum of funds for social protection per capita in various EU countries and selected indicators. As independent variables, we chose the total expenditure on social protection per capita in €. Expenditure on social protection contains: social benefits, which consist of transfers in cash or in kind to households or for individuals to alleviate their burden defined by a set of risks or needs, furthermore included here are administrative costs, which represent the cost of management and administration of social protection systems and other expenses, which consist of various expenditure under the programmes of social protection. As dependent and independent variables, we chose:

x - total expenditure on social protection per capita (independent variable)
y1 - severely materially deprived persons as a % of total population (dependent variable)
y2 - people living in households with very low work intensity as a % of total population under the age of 60 (dependent variable)
y3 - people at risk of poverty or social exclusion as a % of the total population (dependent variable)
y4 - employment growth in % (dependent variable)
y5 - GDP per capita (dependent variable)

Material deprivation is presented by y1. It applies to indicators related to the economic burden, consumer durables, housing and the environment. Severely materially deprived persons have living conditions severely limited by the lack of financial resources. These are the people who

suffer deprivation in at least 4 out of 9 of the following items: cannot afford i) to pay rent or bills, ii) keep the home adequately heated, iii) face unexpected expenses, iv) do not eat meat, fish or equivalent proteins at least every other day v) fail to take a week's holiday away from home, vi) do not own a car, vii) a washing machine, viii) a colour television, or ix) a telephone. A further indicator by which we tested disincentive effects of social support is y2. It represents people living in households with very low work intensity (they are people aged 0-59 living in households where the adults worked no more than 20% of their total work potential during the past year). Indicators y4 and y5 represent the motivational aspects of public spending.

The object of quantitative analysis were selected EU countries: Western Europe (Belgium, Germany, Ireland, France, Luxembourg, the Netherlands, Austria, United Kingdom), the V4 countries (Hungary, Czech Republic, Poland and Slovakia), and Slovenia.

The key methods of scientific research are the methods of classification analysis, comparison and abstraction in the development of the theoretical and methodological framework for dealing with; methods of quantitative analysis using statistical methods of processing and evaluation of information and methods of synthesis and partial induction in drawing research conclusions.

The subject of the research is defined in accordance with the objectives of the study and formulation of the research premise which is the correlation between the amount of total expenditure on social protection and selected indicators of social policy action and also the economy. In the analysis, we presumed that the increasing volume of expenditure has positive effects on selected indicators such as y1, y2 and y3 in the direction of decline, and on y4 and y5 in the direction of increase.

Time horison of analyzed variables was 11 years ago.

The complexity of the object of study in the field of the world economy implies a high degree of abstraction in the research of a secondary nature. The secondary collection of information from available statistics of the Statistical Office regional databases and Eurostat databases is realized through constructive methods of scientific observation. The information obtained is processed and evaluated by means of statistical methods with emphasis on correlation regression analysis where:

For y dependent on x, the relationship is:

$$a = \frac{\sum (x-\bar{x})(y-\bar{y})}{\sum (x-\bar{x})^2}, \qquad (1)$$

constant b is in the form:

$$b = \bar{y} - a\bar{x} \qquad (2)$$

For x dependent on y, the relationship is:

$$a = \frac{\sum (y-\bar{y})(x-\bar{x})}{\sum (y-\bar{y})^2}, \qquad b = \bar{x} - a\bar{y}. \qquad (3)$$

The research sample was 13 EU countries. We conducted the selection according to the complexity of the data over the entire time period and with regard to the homogeneity of the groups in terms of the historical development of each country. We conducted the final assessment of the positive impact by means of a points method, which attributed strong dependence and high reliability from 0 to 1 points, 2 in the event of positive impact and – 2 for negative impact. The final sum of points determined the ranking of the countries in terms of spending power impact on the selected variables, whereby the highest score is the highest level of impact.

4.RESULTS AND DISCUSSION

In accordance with the aims of the study, we investigated the correlation between the amount of total expenditure on social protection and selected indicators of social policy action and also the economy. In the analysis, we presumed that the increasing volume of expenditure in social policy and social protection consequently has positive effects on selected indicators such as y1, y2 and y3 in the direction of decline, and on y4 and y5 in the direction of increase. Table 2 presents the results of an impact analysis of total expenditure on social protection for the number of materially disadvantaged people. Among the countries surveyed in Western Europe it has been possible to demonstrate a relationship only in the case of Ireland. In other cases, the value of P regression coefficient exceeded 0.05 and was therefore not possible to explain the relationship between the set dependent and independent variable. In the case of Ireland, only moderate dependence has been demonstrated, whereby the reliability value was only 0.38. This means that the development of materially disadvantaged people cannot be explained only through the independent variable, but other factors, to a greater extent, also have some influence.

Tab. 2. Analysis of the impact of social protection expenditure and the number of severely materially deprived persons as a % of the total population in Western European countries. Source: author's own (y1 - severely materially deprived persons as a % of total population - dependent variable)

y1	coeff. R	reliability value	value P regr. coeff.	value P lok. const.	regr. coefficient	lok. const.
Ireland	0.6202	0.3846	0.0418	0.5509	0.0011	-2.2643

In the countries of Central Europe, dependence could be proved in nearly all cases. The only exception was Hungary. For the Czech Republic, Poland and Slovakia, high dependence with a high level of reliability was demonstrated. This means that overall spending on social protection has a positive impact on the decrease of number of materially deprived persons (persons in material need). The opposite effect was found for Slovenia, where, with increasing spending the number of people in this group grew. The strength of impact is however, in this case, of little significance.

Tab. 3. Analysis of the impact of social protection expenditure and the number of severely materially deprived persons as a % of the total population in Central European countries. Source: author's own (y1 - severely materially deprived persons as a % of total population - dependent variable)

y1	coeff. R	reliability value	value P regr. coeff.	value P lok. const.	regr. coefficient	lok. const.
Czech Republic	0.9200	0.8465	0.0001	0.0000	-0.0094	27.9341
Poland	0.9588	0.9192	0.0000	0.0000	-0.0534	98.5623
Slovenia	0.7767	0.6033	0.0049	0.1792	0.0027	-3.7305
Slovakia	0.9459	0.8947	0.0000	0.0000	-0.0259	50.5265

In the next part of the analysis we aimed to confirm or refute the negative side of social support and disincentives on the part of the recipient. In the case of Western European countries, the opposite effect has been proved in two countries. A demotivating effect was observed only in the case of Ireland. For other countries, it was not possible to explain the correlation between variables.

Tab. 4. Analysis of the impact of social protection expenditure and the number of people living in households with very low work intensity as a % of total population in Western European countries. Source: author's own (y2 - people living in households with very low work intensity as a % of total population under the age of 60 - dependent variable)

y2	coeff. R	reliability value	value P regr. coeff.	value P lok. const.	regr. coefficient	lok. const.
Germany	0.7901	0.6242	0.0038	0.0002	-0.0024	32.3087
Ireland	0.9147	0.8366	0.0001	0.0112	0.0043	-15.8163
Netherlands	0.7132	0.5087	0.0137	0.0000	-0.0006	15.6063

In the countries of Central Europe, strong dependence was proved in the Czech Republic and Poland, where with increasing spending the number of people in this risk group decreases. At the same time, in the case of both countries, a high value of reliability was achieved. Partially negative effects of spending occur in the case of Slovakia. The relationship between variables was mild with low value of reliability - 0.40. It follows that the number of people with a very low work intensity is influenced by other factors.

Tab. 5. Analysis of the impact of social protection expenditure and the number of people living in households with very low work intensity as a % of total population in Central European countries. Source: author's own (y2 - people living in households with very low work intensity as a % of total population under the age of 60 - dependent variable)

y2	coeff. R	reliability value	value P regr. coeff.	value P lok. const.	regr. coefficient	lok. const.
Czech Republic	0.9299	0.8646	0.0000	0.0000	-0.0055	19.3665
Poland	0.9583	0.9184	0.0000	0.0000	-0.0190	37.1848
Slovakia	0.6338	0.4017	0.0363	0.4697	0.0036	1.5373

Table. 6 presents the results of the regression analysis in the case of the influence of expenditure on social protection and the number of people at risk of poverty or social exclusion. Correlation between the variables of interest were proved in the case of the 5 countries. Moderately strong dependence albeit with low reliability value was demonstrated in all 5 countries (in each country it ranged around 50%). It follows that a certain influence of expenditure occurs, but this effect is very weak. On the other hand, in three of the surveyed countries, Ireland, Luxembourg and Austria, increasing costs showed more of a negative impact.

Tab. 6. Analysis of the impact of social protection expenditure and the number of people at risk of poverty or social exclusion in Western European countries. Source: author's own (y3 - people at risk of poverty or social exclusion as a % of the total population - dependent variable).

y3	coeff. R	reliability value	value P regr. coeff.	value P lok. const.	regr. coefficient	lok. const.
Belgium	0.7533	0.5674	0.0074	0.0000	-0.0014	32.9642
Ireland	0.7131	0.5085	0.0138	0.0159	0.0017	12.8723
Luxembourg	0.7515	0.5647	0.0077	0.0951	0.0007	5.9861
Netherlands	0.7161	0.5128	0.0132	0.0000	-0.0004	20.0280
Austria	0.6720	0.4516	0.0235	0.8660	0.0021	-1.2433

When examining the countries of Central Europe, a very strong dependence was demonstrated in 3 cases. In the case of Hungary, it was not possible to prove any relationship. The positive impact of the independent variable was found in the Czech Republic, Poland and Slovakia. The closeness of dependence, as well as that of the reliability value, was in all cases at a high level, which follows from the logic of public spending on social protection. There was negative impact in the case of Slovenia. The impact is, however, negligible.

Tab. 7. Analysis of the impact of social protection expenditure and the number of people at risk of poverty or social exclusion in Central European countries. Source: author's own (y3 - people at risk of poverty or social exclusion as a % of the total population - dependent variable).

y3	coeff. R	reliability value	value P regr. coeff.	value P lok. const.	regr. coefficient	lok. const.
Czech Republic	0.9020	0.8136	0.0001	0.0000	-0.0085	34.2964
Poland	0.9551	0.9123	0.0000	0.0000	-0.0471	102.0175
Slovenia	0.6028	0.3634	0.0496	0.3162	0.0035	5.7816
Slovakia	0.8991	0.8084	0.0002	0.0000	-0.0238	56.6572

The last 2 cases of dependence researched focused on the possible economic effects of social spending. In the first case, the increase in employment and in the second the growth of GDP per capita. Moderately strong correlation between spending on social protection and employment growth has been demonstrated in almost all cases except Germany, France and the United Kingdom. Reliability values are low, which means that other factors affect the development of the indicator of employment growth. In each case, it was an indirect linear relationship with negative impact on employment.

Tab. 8. Analysis of the impact of social protection expenditure and employment growth in Western European countries. Source: author's own (y4 - employment growth in % - dependent variable)

y4	coeff. R	reliability value	value P regr. coeff.	value P lok. const.	regr. coefficient	lok. const.
Belgium	0.7605	0.5783	0.0066	0.0039	-0.0012	11.5055
Ireland	0.7539	0.5684	0.0074	0.0066	-0.0028	22.2529
Luxembourg	0.6982	0.4875	0.0169	0.0047	-0.0007	14.1263
Netherlands	0.7504	0.5631	0.0078	0.0051	-0.0011	12.0691
Austria	0.6367	0.4054	0.0351	0.0212	-0.0011	10.9046

For the countries of Central Europe, an equivalent indirect strong linear correlation with low reliability value was proved. No correlation could be proved in the case of Hungary.

Tab. 9. Analysis of the impact of social protection expenditure and employment growth in Central European countries. Source: author's own (y4 - employment growth in % - dependent variable)

y4	coeff. R	reliability value	value P regr. coeff.	value P lok. const.	regr. coefficient	lok. const.
Czech Republic	0.7414	0.5497	0.0090	0.0062	-0.0048	11.0574
Poland	0.7782	0.6056	0.0048	0.0027	-0.0110	17.6675
Slovenia	0.7078	0.5010	0.0148	0.0142	-0.0063	22.5127

Slovakia	0.6826	0.4659	0.0206	0.0134	-0.0069	10.5759

The last variable in which we examined the impact of expenditure on social protection is GDP per capita. In this case, relatively strong dependence with a high reliability value were proved. Indirect linear dependence was demonstrated in the case of Ireland, where increased expenditure decreases the level of GDP per capita. Similar effects were seen when examining the relationship of expenditure and propensity to work; such expenditure is most disincentive in the case of Ireland. In other cases, there is a positive relationship. The strength of the effect of expenditure is different in individual countries, as is the intensity of the impact of other factors.

Tab. 10. Analysis of the impact of social protection expenditure and GDP growth per capita in Western European countries. Source: author's own (y5 - GDP per capita - (dependent variable)

y5	coeff. R	reliability value	value P regr. coeff.	value P lok. const.	regr. coefficient	lok. const.
Belgium	0.8733	0.7627	0.0004	0.5992	4.2571	-3,636.9190
Germany	0.7146	0.5106	0.0135	0.4542	4.9277	-10,613.3792
Ireland	0.9700	0.9410	0.0000	0.0000	-2.9823	64,537.8877
France	0.8798	0.7741	0.0004	0.8949	3.4271	-751.9234
Luxembourg	0.9041	0.8174	0.0001	0.3479	5.8574	-13,844.3391
Netherlands	0.8789	0.7725	0.0004	0.1268	2.8494	8,488.6999
Austria	0.8792	0.7731	0.0004	0.0303	6.9218	-29,271.1330

In the Central European countries, a positive relationship was observed in all countries except Hungary. The strongest direct linear dependence was demonstrated in the case of Slovakia, where the highest effect of expenditure on social protection was also found.

Tab. 11. Analysis of the impact of social protection expenditure and GDP growth per capita in Central European countries. Source: author's own (y5 - GDP per capita - (dependent variable)

y5	coeff. R	reliability value	value P regr. coeff.	value P lok. const.	regr. coefficient	lok. const.
Czech Republic	0.9352	0.8746	0.0000	0.0581	8.7902	-5,134.7677
Poland	0.8419	0.7087	0.0012	0.4212	7.2133	-1,890.1571
Slovenia	0.8551	0.7312	0.0008	0.0301	9.6221	-17,589.5794
Slovakia	0.9429	0.8891	0.0000	0.0253	11.6710	-5,139.2994

The analysis shows that the effect of expenditure on social protection is, at the individual monitored variables, different, and in addition to differing closeness of dependence, different reliability was also detected in the researched relationships. The differences could be caused by the application of various principles of social policy in the individual countries.

5.CONCLUSION

Recent years have shown a high share of mandatory expenditure in the state budget of developed economies. The largest share is expenditure on social policy, which is a gradually growing trend and thus detract from the state budget more and more resources. Their impact is debatable and is different in each country. In one group, it is possible to identify the positive effects of this expenditure, in other countries it is more often than not negative. The last group of countries are countries where it was not possible to demonstrate a relationship between the amount of expenditure and the researched variables. Among the western countries it was possible to prove the highest strength of the effect of expenditure in the Netherlands and Germany. On the contrary, the lowest strength was able to be proved in the case of the UK.

Tab. 12. The final ranking of the impact of social protection expenditure and dependent variables examined in the social and economic areas - Western European countries. Source: author's own

	y1	y2	y3	y4	y5	total	ranking
Belgium	0.0	0.0	3.5	-0.5	4.0	7.0	3
Germany	0.0	4.0	0.0	0.0	3.5	7.5	2
Ireland	2.5	0.0	-0.5	-0.5	0.0	1.5	7
France	0.0	0.0	0.0	0.0	4.0	4.0	4
Luxembourg	0.0	0.0	-0.5	-0.5	4.0	3.0	5
Netherlands	0.0	3.5	3.5	-0.5	4.0	10.5	1
Austria	0.0	0.0	-0.5	-1.0	4.0	2.5	6
United Kingdom	0.0	0.0	0.0	0.0	0.0	0.0	8

The following figure represents the strength of the effect of social protection expenditure in each country.

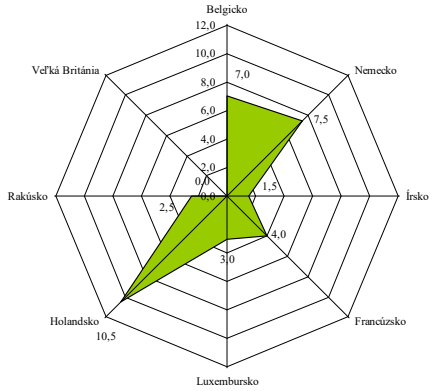


Fig. 2. The potency of social protection expenditure in the countries of Western Europe. Source: author's own

The following table presents the final ranking of the effects of expenditure in the countries of Central Europe. In last place, is Hungary, which failed to show any relationship between the monitored variables. The highest values in a positive sense have been identified for the Czech Republic and Poland.

Tab. 13. The final ranking of the impact of social protection expenditure and dependent variables examined in the social and economic areas - Central European countries. Source: author's own

	y1	y2	y3	y4	y5	total	ranking
Hungary	0.0	0.0	0.0	0.0	0.0	0.0	4
Czech Republic	4.0	4.0	4.0	-0.5	4.0	15.5	1
Poland	4.0	4.0	4.0	-0.5	3.5	15.0	1
Slovenia	-1.0	0.0	-1.0	-0.5	3.5	1.0	3
Slovakia	4.0	-1.0	4.0	-1.0	4.0	10.0	2

The following figure represents the strength of the effect of social protection expenditure in the countries of Central Europe.

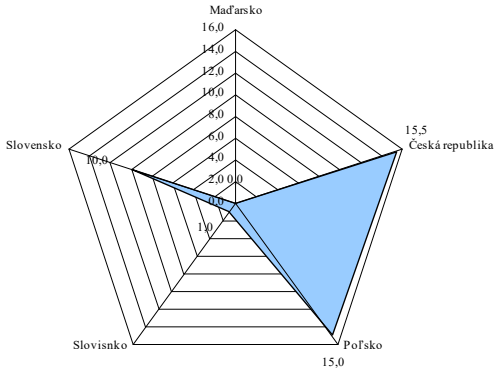


Fig. 3. The potency of social protection expenditure in the countries of Central Europe. Source: author's own

Different results, when examining the impact of this type of expenditure, are based on the different applications of the model of social policy, of different conditions, customs and traditions in the provision of social services and divergent views on ensuring the minimum needs of its citizens. It is therefore not possible to determine whether the state implementation of social policy as in the Netherlands is better than in the case of the UK, because both countries operate within the frameworks of different initial conditions.

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POSSIBILITIES OF USING SPECIFIC TYPES OF PRODUCTION INDICATORS IN FINANCIAL ANALYSIS ON EXAMPLE OF WINE AND AVERAGE COMPANIES

Chajdiak Jozef, Mišota Branislav, Coskun Lucia

Abstract

The paper is focused on financial analysis and financial planning. The tasks of financial analysis are specified in accordance with business management. In this context, the authors specify a unique schema with five types of indicators of production (total output, value added, net production, net cash and results of operations). The article specifies elements from which various types of indicators are composed. Individual types of production indicators of average and wine companies in the Slovak Republic were studied.

Keywords: financial analysis, financial planning, types of production indicators, economic efficiency, wine companies

JEL Classification: C18, D01, D24

1.INTRODUCTION

The issue of financial analysis is one of the stages of economic analysis itself. Own financial analysis begins with the formulation of the economic process parameters in natural kind. It is followed by transformation of natural economic process parameters into financial terms. During the production process we have achieved a greater or lower economic efficiency. When the production process is finished a product is put on the market. The decision-makers in business enterprises have to consider a variety of important factors such as profits, costs, production and labour in the process of determining the successful use and control of performance measures and tools [Kazan et al, 2015].

During the last 20 years, companies aim not only for earnings but also profitability, and not just winning but retaining consumers as well [Dumitrache et al, 2016]. Explaining the sources of performance differences among firms is a key theoretical and empirical issue in the field of strategic management [Hawawini, 2003]. We may conclude that the measurement and analysis of planned and actual effects of economic processes, is one of the tasks of financial analysis and also financial planning. Spanos and Lioukas [2001] describe an effect between firm assets and performance as an efficiency effect, it is the impact on performance that results from "the possession of a superior stock of available resources".

Measurement of economic efficiency is based on the difference or share of output and input of the economic process. For their particular specification the elaborated scheme by authors for the calculation of various types of indicators can be used (Figure 2).

The tasks of financial analysis are specified in accordance with business management. This paper specifies a unique schema with five types of indicators of production (total output, value added, net production, net cash and results of operations) on example of average and wine companies in the Slovak Republic. Wine became a daily used product [Coskun et al, 2016]. Strategies that create competitive advantages for wine businesses are understudied [Delmas and Grant, 2008]. The wine industry is facing several global challenges that are shaping the competitive environment [Contó et al., 2015]. One of the challenges will be the case of tourism

and movement of persons deploying SMART technology and innovation in the field of data [Bawa, et al., 2016].
This work analysis individual types of production indicators using average and wine companies.

2.MEANS OF FINANCIAL ANALYSIS AND PLANNING OF COMPANIES

The first step is data collection and analysis. The collected data are expressed in natural kind. Getting kind produced amount of the i-th type of product in the company (for all i). It is the total produced quantity.
In a second step the kind data are changed into economic data (either directly through the collection of economic data or indirectly using transformation calculations of the natural kind data into economic data). A big part is a collection of economic data of business operations. It appreciates their accuracy respectively. It shows the effects of uncertainty on the results of the analysis of economic processes.
The goal is to:
- determine the stability or future positive results
- determine the expected potentially impaired results or
- determine the expected results leading to an indefinite state of development of the company

The above object can be seen as a model of the financial health of a company, i.e.
determination of the financial health of the company with options:
"Healthy"
"Sick" and
"Indefinite" (something between healthy and sick).

2.1.Financial Planning

Financial planning is a practical result of the financial analysis, the last stage of the analysis. The practical consequence of the analysis is to take measures to:
- design and work intended to maintain (in natural expression) good financial trend in the short and long-term aspects or
- the adoption and substantial measures to reverse the trend, leading to the collapse of the enterprise (company) or
- work to eliminate potentially bad implementation results of our competitive products (as opposed to the status quo or competition) or
- the introduction of products with higher sales into sales

A part of the planning is to determine the work to maintain or improve our market position (increase the competitiveness of our products or of new innovative products from the factory). Under the conditions of conclusion implementation of the planning it is desirable to:
- assess the level of fulfillment of the planned objectives in kind as well as in financial terms,
- make a new financial analysis of expected numbers
- assess of possible causes clearly different parameters which analyzed development of the process with new numbers characterizing the (further) development of the environment and expected numbers for the competition.

Financial analysis of the company represents the collection of economic (financial) data of business activities, their valuation in terms of accuracy and inaccuracy on the results of the financial analysis. In the financial analysis and financial planning the economic process is modeled in order to:
- determine the stability of future positive results
- determine expected potential worsening results
-determine expected results leading to the collapse of the company.
These problems also deal with the authors [Hyránek, 2016]. It is important to model production process of competitive companies in these respects. This is also the assessment of economic (financial) implications of preparation, implementation and return on investment of environmental factors on the results of the financial analysis.

Financial planning is the last stage of the financial analysis (in a broader view). It should be noted that analyzes are ongoing daily activities and their results either generate additional analysis of a given fact or conclusions for their practical implementation. Another of the steps are environmental factors on the results of the financial analysis. One step is to improve or at least maintain economic results, assess the financial implications of preparation, implementation and return on investment.

3.INTRODUCTORY ECONOMICAL SCHEMES

The economic process is a subsystem of the economic system. It is an economic process model black box. It exists in countless versions of their concrete achievements (such as manufacture of the individual components, product, service, complex investment activities, job, work unit, workshop, establishment, factory, company, group of companies, company, industry, national economy, the EU, the world, person, couple, family, group of people, mankind). The economic processes are transformed bound enters into the economic process to the output product to meet the needs of serving and having monetary value. In figure 1 we have shown a model of the main scheme of the economic process.
Inputs into the economic process, we have divided the bound version of the input sources and consumption version bound input sources. The output of the economic process, we spread into the version of the output, and the output version of the effect of the economic process.

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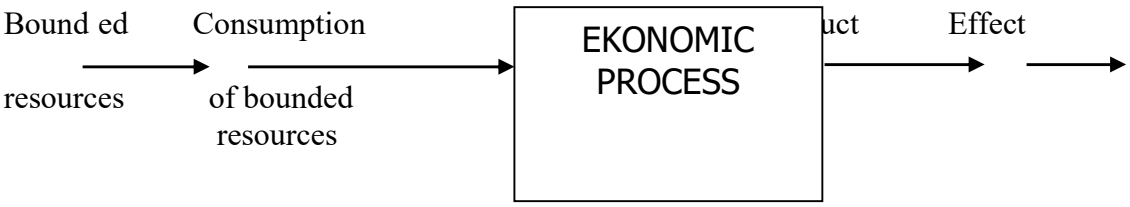


Fig. 1 – Model of economic process. Source: own research

Bounded resources can be viewed in a version of property (assets) or version liabilities (capital, equity and liabilities total). Bounded work as bounded labor is expressed by the source. As part of the analysis will be the bounded volume of consumption of labor measured in units of personnel costs.
Bounded resources can be divided into:
- Basic bounded resources
- Productive bounded resources

The essence of the basic bounded resources (current assets) is that they carry the kind of new (additional) product (the output of the economic process). The economic process is fully consumed and thus transmits its monetary value to the cost of a new product, service or goods in their full amount of the acquisition. Any differences in the positive or negative direction are transferred in full to the income.
The essence of productive commitments of resources (fixed assets, workforce) is that economic processes wear out, and their functionality remains and the price of a new product (the output of the economic process - product, service or goods) in economic processes add their wealth generating capacity to transmit part its value gradually. Bounded resources are consumed in the economic process. The level of consumption of boundedresources reflects the cost of items. The volume of consumption of the workforce as a productive bounded resource (labeled Wage) is expressed by the volume of personnel costs. Also, the average number of employees is not the number of employees, but the number of hours of a working man (resp. other units of time or money). The volume of consumption of fixed assets as a second component of productive bounded resources (labeled Write off) is expressed in depreciation and increased the net book value of disposed fixed assets. The sum of depreciation and personnel costs represents the volume of consumption of productive bounded resource (SPVZ= Write off+Wage). The volume of consumption of basic bounded resources (labeled MAT) is the sum of other cost items.

In general, the effect of the difference calculated by the input and output:

effect = output – input

The effect can also be analyzed as the ratio of output and input, for example in [Hyránek, 2014], [Hyránek et al, 2016]. The economic system operates at the same set of individual economic processes, which influence each other. The degree of interdependence between economic processes is indeed important, but the purpose of this paper is to measure the economy, measured values will define only one general economic process.

The total volume of production (sales) is realized as the amount of money in the economic process output volume Q. For its production is the bounded resources were consumed

(MAT + Wage + Write off)
MAT - Consumption of bounded resources,
Wage - Consumption of bounded workforce (measured in personnel costs PC),
Write off - Productive consumption of non-current bounded resources.
Effect of the output of the economic process is the difference between the output and the input. In general

effect = output – input

and the specific conditions of the market in the privately owned economy.
PROFIT = (Q) – (MAT + Wage + Write off)

The effect can be counted in terms of private owners, in terms of the human factor in the economic process and also in terms of society. Effects from the perspective of the private owner of the profit or loss are calculated as the difference between revenues and expenses or net cash calculated as the sum of profit and depreciation charges. Effect in terms of added value is calculated as the sum of profitable items, personnel costs and depreciation. Each of these effects is the aim of the ingredient of the economic process. In the financial analysis we should

distinguish the owners (employers) and employees. Both groups are interested in the longest liquidity - the ability to pay its obligations in time in full and in the long and short aspect. If the Q output is realized (paid), the equation can be transformed into the equation calculating the total volume of production Q as the sum of costs of items MAT, Write off and Wage and profitable items PROFIT:
{PROFIT = Q - (MAT+Write off+Wage)} → {Q = (MAT+Write off+Wage+PROFIT)}
Scheme characterizing the content of each type of output characteristics is shown in figure 2.

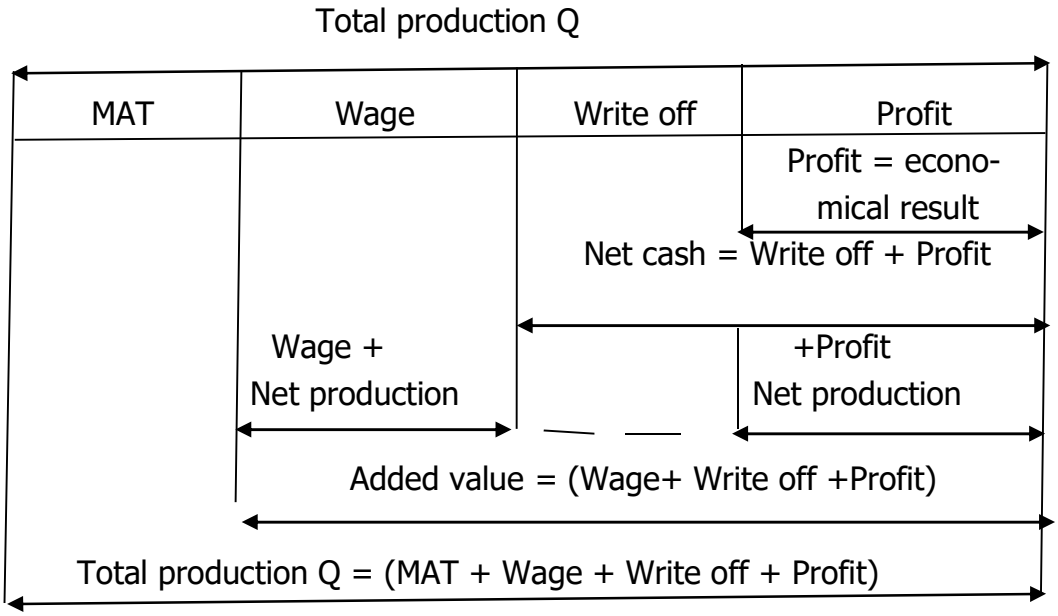


Fig. 2 Scheme - types of indicators of production

Indicators of production can be divided into five types:

- Total volume of production (Q=MAT+Wage+Write off +Profit),
- Added value (AV= Wage +Write off+Profit),
- Net production (NP = Wage + Profit),
- Net cash (NC = Write off+ Profit),
- Economical result (Profit).

4.TYPES OF PRODUCTION VOLUME INDICATORS

Issues

4.1.Type 'total production volume' Q.

The sum of all four components (input + effect):

Q = (MAT + Wage + Write off + PROFIT)

The most important indicators of income can be considered in total, own sales and turnover.

4.2.Type 'added value' AV.

It represents the volume of production reduced by intermediate goods:
AV = (Q) – (MAT) = (MAT + Wage + Write off + Profit) – (MAT)
AV = (Wage + Write off + Profit)
A straightforward calculation is the sum of personnel costs, depreciation and income.

The most important operation may be considered an indicator of added value AV (profit and loss), indicator of value added of the total activity AV1 indicator of added value of the total activity, including the balance of value added tax (ΔVAT) and, where applicable, the balance of excise duties (ΔSD) AV2.

4.3.Type 'net production' NP.

It represents the volume of production reduced by intermediate consumption and depreciation, respectively the sum of personnel costs and profitable items:
NP = (Q) – (MAT + Write off) =
= (MAT + Wage + Write off + Profit) – (MAT + Write off) =
= (Wage + Profit)
In terms of the private market economy are items Wage and Profit in antagonistic position and thus the economic indicators of the type of practice clean production practice, even to the detriment of financial analysis used.

4.4.Type 'net cash' NC.

It represents the volume of production reduced by intermediate consumption and personnel costs, respectively the sum of depreciation and profitable items:
NC = (Q) – (MAT + Wage) =
= (MAT + Wage + Write off + Profit) – (MAT + Wage) =
= (Write off + Profit)
In economic practice is also used the label EBITDA, cash flow.
For owners this type is in strong competition to the type of trading income.

4.5.Type 'economic result' PROFIT.

Q represents the volume of production reduced the volume of consumption of input sources (total costs):
Profit = (Q) – (MAT + Wage + Write off) =
= (MAT + Wage + Write off + Profit) – (MAT + Wage + Write off) =
= (Profit)

There are more types of profit indicators. Most important is the profit for the period after tax profit and loss account, in the interim evaluation finds place profit for the period before tax from the front (proft and loss account). Both indicators have fairly high variability. Moreover, their value may be included systematic reporting interests (reduction value in order to reduce income taxes), respectively increase in value in order to increase the credibility of the company in the process of obtaining a loan. Other indicators are Gross margin profit from operations profit, from financing activities profit for the period before tax and after tax. In the type of indicators and results of operations also interest expense are included. Although the profit or loss are cost items, both are the reward (profit) for foreign capital involvement in the economic process. Similarly, taxes and fees are virtually in the form of distributed profits.

The evaluation of economic processes as a set of economic processes using EBIT, comprises earnings before tax and interest expense. A more accurate version with EBIT should also include taxes and fees. The theoretical aspects of EBIT enter the balance of value added tax and excise duties balance.

5.TYPES OF INDICATORS OF PRODUCTION VOLUME

The primary output of the economic process is the volume of production (sales). It belongs to the type of indicators of total production and we can say that cash sales value is obtained by multiplying physical quantities and prices of output produced. When this initial output in the next step we want to see what the economic effect brought implemented economic process. The various types of effects were specified in the preceding section as the types of indicators of production, namely:
- Type of profit.
- Type of clean money.
- The type of added value.

The following chapter shall specify appropriate indicators and formulates population groups whose objectives are expressed.

5.1.Profit - destination of a private owner.

Type profit means the volume of production Q reduced with the volume of consumption of input sources (total costs):

$$\text{Profit} = (Q) - (\text{MAT} + \text{Wage} + \text{Write off}) =$$
$$= (\text{MAT} + \text{Wage} + \text{Write off} + \text{Profit}) - (\text{MAT} + \text{Wage} + \text{Write off}) =$$
$$= (\text{Profit})$$

The main form is the form of the indicator Profit for the period after tax, for which also the names profi, net profit and earnings are used.
Profit or loss reflect the interests of private companies in the economic process, the aim of the private owner. It reflects the effect of consumption of commitment and resources reasonably regarded session

$$(Q) \geq (\text{MAT} + \text{Wage} + \text{Write off})$$
$$\text{Profit} \geq 0$$

Maximizing profit is composed of two sub-tasks: maximizing output volume of money in the economic process (type of volume of total production) while minimizing the amount of consumption of resources committed (total costs). Minimising the volume of the component MAT (e.g. in material) is generally desirable. Minimizing ingredients ‘Wage’ and ‘Write off’ brings it into the contradictory interests. Wage component includes personnel costs, which maximize the interests of the workforce, but in terms of their profit or loss should be minimized. Similarly, the ‘Write off’ containing component depreciation, which is the interest of maximizing reproduction of fixed assets (such as machinery), but in terms of their profit or loss should be minimized. It is obvious that we have a contradiction between the social character of work (hard to imagine the economic process without manpower and fixed assets) and the private form of appropriation (target profit). Nevertheless, in the current market economy, maximization of profit is a key factor for economic development.

5.2.Net cash - destination of a private owner.

Type net cash NC is production volume reduced by intermediate consumption and personnel costs, respectively. It is the sum of depreciation and profitable items:

NC = (Q) – (MAT + Wage) =
= (MAT + Wage + Write off + Profit) – (MAT + Wage) =
= (Write off + Profit)

In a way expresses the interests of the private owner. Non-current assets and consumption of depreciation (Write off) are non-living components of the economic process and it is up to private owner how he will dispose the fixed assets - whether it will increase or decrease the volume. Whereas, in describing the input of the owner we've defined it as an increase of the volume of net assets, for a constructive private owner, it seems reasonable to increase the volume of fixed assets and consumption. In this situation, an indicator of net cash is defined as the sum of the indicator Profit for the period after tax and component 'Write off'. So the aim of the private owner is to maximize the volume effect of the economic process of expressing relevant clean money.
From the perspective of private owners of economic processes we define the indicator of net cash (2) as the sum, the indicator Profit for the period before tax, 'Write off' components, interest expense, taxes and charges. This version can be expanded by the balance of VAT and possibly excise balance. Indicator of clean money (2) sets the objective of private land.

5.3.Net production - goal for employees and owners.

Type of cleaner production NP represents the volume of production decreased by MAT and Write off:
NP = (Q) – (Write off + MAT) = Wage + Profit
Indicator net production is a further indicator to illustrate the division between content owners and staff.

5.4.Added value – goal of company.

Type of value added AV represents the volume of production of intermediate goods decreased:
AV = (Q) – (MAT) =
= (MAT + Wage + Write off + Profit) – (MAT) =
= (Wage + Write off + Profit)
Indicator Value Added Profit and loss account represents the version of the value-added economic activities. This is roughly a fifth less than the added value of the total business (net of VAT and excise duties).

A more precise version of the added value can be calculated as the sum of:
- Personnel costs,
- Depreciation,
- Pre-tax profit.
- Interest expense and
- Taxes and charges.

If available data we can also be extended for
- Balance of value added tax (VAT collected and sold for economic output process of the company minus the VAT paid within the consumption of commitment of resources for inputs)

and
- Balance of excise duties.
The growth of added values will increase the volume of implemented economic process on the one hand and minimizing the volume of the component MAT (such as material consumption).

Direct structure of value added tax (Wage + Write off + Profit) expresses the interests of all components of the economic process. Personnel costs represent the targets of labor, depreciation goals reproduction of fixed assets, profit or loss after tax interests of private, interest expense interests of the owners of foreign capital, taxes and government interests and profit tax, VAT balance and balance of interests of the state excise tax. The place of the gross domestic product (GDP) in economic life is practically not pronounced doubt of the methods of calculating GDP volume, it is the sum of added values of business.
It can be stated that the added value is a view of society as a whole.

Example of calculation of individual types of production indicators

From the data available from about 85753 organizations in the Slovak Republic accounting in double-entry accounting, we specify the specific values of the most important indicators mentioned in this paper. Selected data is in millions of euro for organizations accounting in double-entry accounting and submitting the declaration of taxes. In total 85753 organizations in the Slovak Republic achieved total revenues of 111.316 billion euros. The total revenues from sales of own products and services acieved 70,611 billion euros. The table below shows total revenues for sales of own products and services, own revenues and services, material costs, personnel costs, depreciation including book value, profit, value added, net output, net cash.

Table 1 Characteristics of the set of companies, sum of values of individual indicators

Characteristic	Set of companies (million eur)
Q	111,316
Q_TPT	40,705
Q_TVVS	70,611
MAT	86,926
Staff costs	11,760
Write off	8,297
Profit	4,333
Added value	24,390
Net production	16,093
Net cash	12,630

Based on Table 1, an average enterprise by computing the averages for the individual indices was created.
For the sake of clarity, we compared the average enterprise with the chosen wine industry sector. Our task was to compare the size of the average enterprise with the selected enterprise from the wine sector based on the absolute indicators in Tab. 2.
In Tab. 2 the characteristic of the average enterprise and selected enterprise from the wine sector is shown.
Table 2 Characteristics of the average enterprise and selected enterprise from the wine sector

Characteristics	Selected wine company (eur)	Average company (eur)
Q	26,478,690	1,298,100
Q_TPT	12,942,012	474,677
Q_TVVS	13,536,678	823,423
MAT	21,218,552	1,013,679
Staff costs	1,879,697	137,138
Write off	3,075,997	96,755
Profit	304,444	50,529
PH	5,260,138	284,422
Net production	2,184,141	187,667
Net cash	3,380,441	147,283
Added value/Q	0.1987	0.2191
Net production/Q	0.0825	0.1446
Net cash/Q	0.1277	0.1135
Profit /Q	0.0115	0.0389
Added value/staff costs	2.7984	2.0740
z/Q	0.0115	0.0389

Due to the file size, we can consider the selected winery as a representative one.

In the Tab. 3 the relative indicators of the average company and of the selected wine company are shown. We can see that financial productivity of work is higher in the selected wine company than in an average company. Similar result gives also the Net Cash to the total revenues for sales of the wine companies. The other relative indicators show contrary results.

Characteristics	Selected wine company (eur)	Average company (eur))
Added value/Q	0.1987	0.2191
Net production/Q	0.0825	0.1446
Net cash/Q	0.1277	0.1135
Profit /Q	0.0115	0.0389
Added value/Staff costs	2.7984	2.0740
z/Q	0.0115	0.0389

6.CONCLUSION

Financial analysis in our country is the insufficient intense discipline.
It has defined, although has not a completely clear role. Generally, the role of financial analysis is to recognize the financial health of the economic subject. It transforms the kind indicators on economic indicators and more precise financial ratios. They are analyzed in order to assess the financial health of the company. Financial analysis has defined the data sources that are essentially clear and understandable. There are defined methods of financial analysis. On the other hand, the financial analysis is intensively developing discipline. It also means potential losses of ambiguity or incompleteness of formulated tasks. A possibly contradictory conclusions are present and based on analytical materials, which were formulated at different levels of depth financial analysis. There are also specified tasks and methods of financial

analysis.
The main benefit is the originaly presented production indicators developed by the breakdown of the types according to their content. The paper outlined the typological breakdown characteristics of the total output, value added, clean production, clean money and the result of economy.
This work compared the relative indicators of the average company and of the selected wine company. It was shown that financial productivity of work is higher in the selected wine company than in an average company. Net Cash to the total revenues for sales of the wine companies gave a similar result. The other relative indicators showed contrary results.

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DEVELOPING CONCEPTUAL UNDERSTANDING FOR INFORMATION SYSTEM ADOPTION IN HOSTEL BUSINESS: AN ACTION RESEARCH APPROACH

Chao Amber P. J., Ngan Pham Thi

Abstract

Recently hostel businesses are facing a lot of competition. With information technology matured, hostel services information system may be a brilliant strategy to increase business performance. This aim of this qualitative study is to investigate the risk factors of hostel information system adopted for hostel services by action research approach. It includes five-step procedures— identify risk factors and determine proper tolerance, measure risks, monitor and report risks, control risks and oversee, audit, fine tune and realign risks in the process of the hostel services information system adoption. The result of this study can provide a guideline for adoption of information system to hostel business or other service businesses in Taiwan.

Keywords: hostel information system, information system adoption, risk management, action research, hostel businesses

1. INTRODUCTION

The hostel's owners in Taiwan are mostly the property owners or the constructional professionals. They were usually short of hostel management knowledge and did not seek help from the professional analyst of management when they started running hostel businesses. Previous research in the hostel industry showed that the critical factors to the successful hostel management are service, equipment, marketing, reputation, and market segmentation (Geller, 1985; Yesawich, 1988). The fast development and prevalence of information technology in recent years have driven it becomes the powerful tool to increase organizational competence. Information technology and/or information system would provide an advantage in improving service quality to the hostel industry as it provides the information needed by the consumers and efficiency for the organization and hence causes the differences on service and cost advantage (Schertler, 1994).

The hostel (called Hostel A in the following) in the study is a middle-sized hostel located in the downtown of Southern Taiwan. Hostel A has experienced from the decreasing profit for many years since the modern and well-equipped hostels appearing in the city and urban area. Being a successful organization with a great share of the hotel market in the city hostel A insist on its management style although the change of the social and economic environment. Until recent hostel A sensed the crisis caused by the competence of the hostel businesses and asked for professional assistance on satisfying the demand from the customers. Hostel A then decided to adopt the information system in the organization.

Most researches on information system adoption were concentrating on obtaining the critical successful factors. Less discussed uncertainties usually occurred in the adoption process. The purpose of this study is to identify the problem and risk factors in the process of information system adoption and help hostel A deal with the following risk management activities: (DeMarco and Lister, 2004)

1. Risk discovery: Hold brainstorming discussion about risks may occur during the process of information system adoption, then analyze and categorize those risks. Make this procedure the routing for risk discovery to identify the new risks in a certain period.

2. Exposure analysis: quantify every risk based on the probability of the risk occurring and the degree of its impact.

3. Contingency planning: if risks occur, the actions to take.

4. Mitigation: the steps taken before the risk transiting to make the contingency planning effective.

5. Ongoing transition monitoring: after listing of the risks, those risks should be monitored carefully.

Besides those risk management activities, the study uses the action research approach to identify the risk factors of adopt information system for hostel business and find out the concerns and changes of the business process after Hostel Information System adoption.

Most studies on the adoption of information system rely on quantitative methods, e.g. self-report survey (Mohd Salleh, Rohde, and Green, 2016; Yang, Liu, Li, and Yu, 2015; Bordonaba-Juste, Lucia-Palacios, and Polo-Redondo, 2012; Hung, Hung, Tsai, and Jiang, 2010, Sharma, 2009). As such, these studies rely on deductive reasoning to examine hotel business practices and content. Mostly these studies focus on the antecedents or consequences of information system adopted behaviors. While survey research and self-report can explain why and with what consequences the organization adopts information system, it cannot reveal what organizational member think and feel, and explores issues by understanding how their attitudes and motivations influence their adopted behaviors.

This study applies action research as the research method, which is a qualitative method mostly, used by the researches on the education issues. Checkland (1981) was the first one who adopted action research method on the work of the development of information system. By the procedure of action research, the researchers and hostel A employees will work together, to find out the risk factors and fine tune and realign those risk factors to achieve the success of hostel information system.

2. LITERATURE REVIEW

2.1 Information System adoption

Information system adoption would more or less affect the organization. Desanctis and Courtney (1983) designated six factors that cause the successful information system adoption are (1) top management support, (2) intended user has desire to the information system, (3) user provides urgent problem, (4) forms computer team, (5) user participation in system design procedure, and (6) users are friendly to the information system and the team of the system implementation.

System transformation or adoption in different organization requires different strategy. The proper strategy and steps to take for information system implementation are according to the characteristics of the organization and the experience and capability of the information department. Welti (1999) indicated three different kinds of information system adoption that are Big-bang, Roll-out, and Step-by-step.

2.2 Risk Management

The organization usually adopts risk management for reducing the impact should the organization faces risks. Vaughan (2000) mentioned risk management is a scientific method for predicting possible loss and designing and practicing the steps for preventing or reducing the impact of the financial loss. Mehar and Hedges (1974) indicated two goals of Risk Management: (1) the goal of preventing loss, and (2) the goal for economic concern, reduction in anxiety, meeting the externally imposed obligation, and social responsibility.

Scholars have given abundantly of discussions about risk management procedure. Those discussions have systemized risk management and thus led the organization in performing Risk Management effectively. Culp and Planchat (2000) posit that five activities in the process of risk management: (1) identify risks and determine tolerance, (2) measure risks, (3) monitor and report the risks, (4) control risks, and (5) oversee, audit, tune, and realign. The flow of Risk Management process is as Figure 1.

The activities of identifying and measuring risks are the most difficult parts with no standard method to follow. The risks measuring method is, therefore, different from organization to organization. The common methods used are an investigation, financial report, and expert consultation.

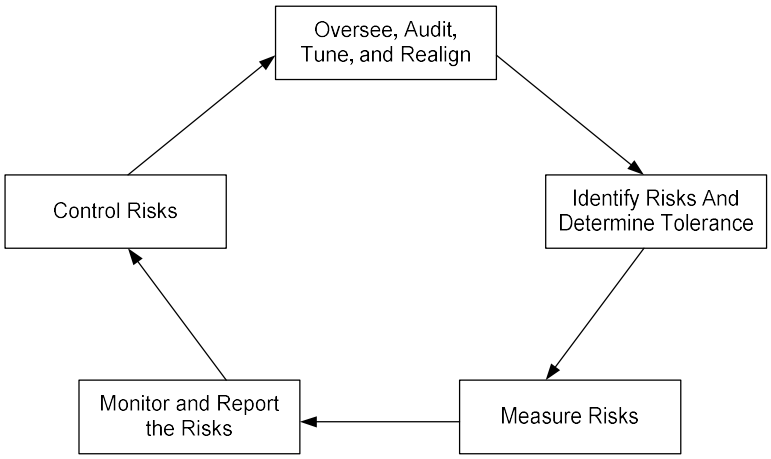


Figure 1 The internal risk management process (Christopher L. Culp, 2001)

2.4 Information System Adoption and Risk

Alter (1978) identified eight critical risk factors after he interviewed the designers and users of 56 information systems. Those factors are stated below:

(1) Designer is lack of similar system design experience.
(2) No user or imposed user.
(3) Many users or designers.
(4) User, designer, or maintainer replaced often.
(5) Lack of system support.
(6) Cannot confirm the system goal or user mode in advance.
(7) Cannot predict the impact of the team and mitigate the impact.
(8) Encounter technological problem and cost consideration.

The first factor is caused by the lack of consideration and skills of designers and thus the information system cannot be successfully designed. The 1st, 2nd, 5th, and 8th factors are all categorized into the kind of "Process Failure" risk. Those risk items could be traced and resolved during the development and adoption of the information system. The 3rd and 4th risk factors which are caused by many users and change or replace user, designer, or maintainer are categorized into the kind of "Contributing Factors" risk. The two factors could happen at any time during the information system life cycle.

Alter (1978) also provided several strategies to prevent risk from disaster. For example, the problem of "No user or imposed user" is known before system development, so three strategies could be planned to prevent the risk becoming a disaster. The three strategies are "acquire user participation", "acquire user commitment", and "sale the information system". The strategy for prohibiting the maturing of risk factor "lack of system support" could also be done in advance.

3. METHODOLOGY

This study is to investigate the risk factors of information system adoption for hostel businesses by action research approach. Action research method was developed by social psychologist Kurt Lewin. Lewin indicated that action research is a method that combines scientist's wisdom and practitioner's capability in a cooperation way of doing research. Action research has four elements of characteristics: (1) cooperation of researcher and practitioner, (2) feasible problem-solving method, (3) change the real situation and (4) development of theory. (Holter and Schwartz-Barcott, 1993).

According to different research domain, action research has developed into several different types. In the organizational research domain, the most used type of action research is "participatory action research". It is a method that the employees of the organization participate the research process, from the research design, action means discussion, through result presentation. (Whyte et al. 1991)

Action research is a qualitative research. It emphasizes the process of the construction of social events and the explanation of human experience under different cultural and social system. Research content includes five steps: (1) planning, (2) action taking, (3) observing, and (4) evaluating.

The data collection and analysis are in several ways. One is the research diary that the researchers jotted down the contents of a conversation with the employees of hostel A and observation of the business process of hostel A. Another is the audio data that were recorded during the interview.

4. RESEARCH PRACTICE

4.1 Case Study

Hostel A is located in Southern Taiwan. The existing building was built in the late 2000's. It provides single, double, deluxe double, and family rooms. All rooms are equipped with internet access. The situation is the decoration has faded away and cannot compete with other new and well-decorated hostels and hotels. Hostel A thus lost its old customers and cannot attract the new customers. Even though hostel A is facing its difficulty, it holds the competences as:

It is located in downtown of the city of southern Taiwan. It is near the popular sightseeing spots. Hostel provides parking space for customers. It is hard for finding a parking spot in downtown area.

Room price is cheaper than other hostels.

4.2 The Action Research Cycle

The researchers held the interviews with the relative employees of hostel A in order to find out the risk factors the hostel might face during the process of information system adoption.

The following presents the interview contents in four steps of Action Research process.

(1) First cycle action planning

Hostel A wish to apply computer and information system to meet customer needs to compete with other hostels. Hostel information system could include many subsystems, such as room service, meal service, procurement system, and customer relationship management system. Hostel A decided to adopt the information systems to keep the old customers. The chosen method for information system adoption is the one that combines "roll-out" and "step-by-step".

"Is it expensive the information system? Our organization is only a middle-sized hostel. We would like to use the computer for the business process but are afraid of the information system

that is too expensive to afford. In addition to, if the information system were too complicated, my co-workers would spend too much time on learning the operation of the system. My co-workers and I are aging and not familiar with the operation of the computer. We expect the custom-made hostel information system." (The 1st week, manager 1)
(2) First cycle action taking

After knowing the hostel is going to adopt the information system, two employees responded as following:

"I respect owner's decision in adopting the information system for the hostel business operation. Just we are all so familiar with the customers. If the customers came in a team, they usually have no special request as they would state request to tourist bureau. We won't get the chance of contacting with them in a direct way." (The 3rd week, employee 2)
"I agree with the idea of using a computer in the hostel operation. We are in the 21st century, the internet era. In the century, we should build up a strong relationship with the information system, especially in the competitive service industry. I believe information system would make our work much easier." (The 3rd week, employee 1)

Those opinions are the future users of the information system. According to the information system adoption method of integrating "roll-out" with "step-by-step", the hostel administration department would be the first department in adopting information system. In the early stage of adoption, the manual operation is still used along with the information system to avoid delaying the process due to the system unfamiliarity. The researchers were trained the employees to quick pick up the information system and to reduce the resistance to the system from the employees.
In the interview and other informal conversation, researchers keep diffusing the information about the functions of the Hostel information system, its easy operation and learning characteristics, and its ability to simplify the business process. Most of employees thus are gradually familiar with the system and its capabilities.
(3) First cycle observing
Hostel A used to collect only the basic data of customers since the manual operation could not do any further.
"After we use the hostel information system, front desk could provide better service to customers and the customers are satisfied with our services. E.g. when a customer checks in, we can find out his/her preference." (The 7th week, employee 2)
"I am still a little fright of computer operation. When the computer or the system is down, who can help me to deal with the situation? I think some problems would emerge after the implementation." (The 10th week, employee 2)

After the information system adopted, the employees asked for help on system operation and help build up customers' data. The employees who resisted the use of the information system now would use the system to query customers' information. The system is maintained in good condition.

The customers of hostel A could be categorized into two groups. One is individual and the other is tourist bureau. Hostel information system could well manage the data of those two groups and thus suit their different needs. The two groups of customers are all satisfied with the service of the hostel. They stated they might come again next time.
(4) First cycle evaluating

"I think it was a good idea about using information system. From the system, I realize the characteristics and the favorites of our customers. This information is a great help to our planning of marketing strategy. A fine marketing strategy could bring us new customers. Another important advantage of the information system is that I can get the data I need once I make a query to the system. It is so convenient and neat." (The 11th week, manager 1)
In the first cycle of evaluating, hostel A analyzed customers' data in order to find out the characteristics of customers and build up the effective marketing strategy.

4.3 Case Analysis and Results

This study has resulted in five risk factors when hostel A had the information system adopted. The five risk factors are (1) the cost of the information system has exceeded the budget for purchasing the system, (2) delay of the information system development, (3) user resistance on using the information system, (4) the information system maintenance, and (5) the performance of the information system adoption is behind the expectation.

(1) The cost of the information system has exceeded the budget for purchasing the system

Since hostel A is a middle-sized hostel and is facing the situation of decreasing profit gained, top management has many concerns about the cost of the information system development. Hostel A holds only a small budget for the information system development.

(2) Delay of the information system development

The custom-made information system for hostel A takes a lot of time to develop. The small budget and lack of labors caused the delay of the information system development.

(3) User resistance on using the information system

The building of Hostel A is too old and its employees are not familiar with computer operation. They are scared of using the digital machine for the business process.

(4) Short of hands of maintaining the information system

Hostel A employees are not comfortable with the computer operation and thus is hard to find a skillful employee to maintain the information system.

(5) The performance of the information system implementation is behind the expectation

The top management of hostel A was eager to see the efficient performance of the information system adoption. The problem is the employees need time to get familiarized with the computer and/or the electronic device that has never or seldom use.

5. CONCLUSIONS AND LIMITATIONS

This study is to investigate the risk factors of information system adoption for hostel services by means of action research. By the cycle of action research, researchers and employees who use the information system worked together, to identify and well manage the risk factors during the process of the information system adoption at hostel A. In the first cycle of the action research, researchers found that the information system gained strong support from the top management of hostel A and it is treated a quite important system for the hostel services at hostel A. The strong top management support is the critical factor that caused the information system implementation successful.
In the case study, the risk factors have been identified during the adoption of the information system at hostel A are: (1) the cost of the information system has exceeded the budget for acquiring the system, (2) delay of the information system development, (3) user resistance on using the information system, (4) short of hands of maintaining the information system, and (5) the performance of the information system adoption is behind the expectation.

Under the constraint of labor and time, the researchers chose hostel A in representing the middle-sized hostel organization. It may not be representative in inferring the risk factors to general hotel industry. In addition, with the limitation of interview time, this study may not find out all of the risk factors in the adoption process of information system in hotel businesses. More research is needed in this research area.

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PREMIUMS AND DISCOUNTS OF EUROPEAN EXCHANGE-TRADED FUNDS

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Abstract

Exchange-traded funds have become one of the most popular investment tool during the short period of last years and are considered to be a top product of marketing in 21st century. This contribution is aimed at the examination of premiums and discounts, at which European equity exchange-traded funds are traded. We focus on the correlation between ETF´s price deviations from their NAV and their liquidity, type and volatility of underlying stocks, as well as persistence and predictive power of premiums and discounts. We have found out that exchange-traded funds of higher liquidity and funds with stocks of companies with higher market capitalization in their portfolios tend to exhibit lower price discrepancies from their net asset value. Volatility of underlying securities does not pose as an indicator of Price/NAV ratio. On average, premiums or discounts used to persist more than three days at the same level and there is confirmed very limited ability to predict future returns of European exchange-traded funds by them.

Keywords: exchange-traded funds, premiums, discounts, net asset value

JEL Classification: G11, G12, G15

1.INTRODUCTION

Since the inception of the first index fund, that has been traded on the exchange, in the early 90s, the market with such funds has increased radically reaching more than 2.2 trillion USD of net assets (Investment Company Institute, 2016) under the management in U.S. exchange-traded funds. At the beginning they started on the American Stock Exchange that remains the largest market for ETFs, but after a short time they have occurred on other regional exchanges and New York Stock Exchange as well, which entire has caused significant changes in liquidity and spreads. In Europe, there began trading with exchange-traded funds almost ten years after their origination, initially on the stock exchange in Brussels, where BEL 20 or Dow Jones Euro Stoxx 50 have posed as a benchmark for these instruments. Euro Stoxx became an underlying index for so-called Leaders, whose shares have been traded on German Deutsche Börse. European exchange-traded funds are traded on Euronext, which operates as mutual stock exchange for Brussels, Paris and Amsterdam, as well as on XETRA in Frankfurt. A special platform extraMARK for these index funds has been created by London Stock Exchange, but trades take place on the OTC markets, too.
ETFs differ from other types of collective investments especially in their operation mechanism, which allows the price to change during the trading day depending on conditions on the market. However this price should fluctuate around the value of underlying securities included in ETF´s portfolio that is set just once a day. Positive or negative distortions between these values then give the opportunity for arbitrage activities. In this contribution we examine the existence of premiums and discounts arising from the trading with European equity exchange-traded funds.

2.LITERATURE REVIEW

The expansion of the funds whose shares are traded on the exchange has brought except of the enthusiasm of their many advantages the doubts about their impact on the rest of the market. The change of its functioning in the direction of higher correlation and volatility is a consequence of macroeconomic uncertain environment and there is just minimal impact of ETFs on correlation (Mazza, 2012). However, there is an evidence of the influence of ETFs on the prices of underlying securities. Ben-David, Franzoni and Moussawi (2014) confirm the relationship between ETF ownership and volatility using a regression discontinuity analysis. An increase of 1 % in standard deviation of such ownership results in rise of intraday stock volatility of 19 % and it affects the non-fundamental volatility also on the daily basis. The deviations from the changes in prices of stock from ETF´s portfolio in the term of random walk are attributed to arbitrage activities. The grater the extent of the arbitrage is, the stronger the effect of ETF ownership is. On the other hand, securities experiencing higher costs of arbitrage are less exposed to the pressure on the volatility of prices.

Thus, the coverage of stocks by ETFs causes the noise in prices of these stocks, particularly of small stocks (Ben-David, Franzoni & Moussawi, 2012). Moreover, it is not definite, that the conducted arbitrage activity leads to higher efficiency of their prices, because it can derogate the prices of securities that are priced correctly, not just move the prices of mispriced stocks. In addition, exchange-traded funds pose as an intermediary for the transmission of stocks from the futures market to the equity market.

ETF ownership influences securities landing, too. Securities that are added to the ETF´s portfolio for the first time experienced in average 33 % higher average monthly short-selling activity during the next six months after the inclusion into the fund compared with the same long period prior to this event (Bansal, Mckeon & Svetina, 2013). This effect becomes weaker with subsequent inclusions of securities into the portfolio and in the case of stocks that are less short-sale constrained.

Staer (2016) has examined the relation between exchange-traded fund-level flows and the daily returns of the relevant index on the sample of 286 U.S. equity ETFs in the horizon of 17 years, where he has explored cross-sectionally consistent positive linkage. 38 % change of the price connected with the flow shock is reversed in five days. Naturally, the volatility of ETFs prices are affected by many other factors, such as Halloween effect, which is described by Árendáš (2017).

Determinants of European ETF liquidity with an emphasis on bid-ask spreads have been investigated by Calamia, Deville and Riva (2013). They identify positive correlation between liquidity of these funds and volatility of their underling securities and negative correlation between stock spreads and trading volume, while physical exchange-traded funds exhibit higher spreads than synthetic ETFs. The replication method loses significance by including the number of exchange-traded funds competing on the same index. European ETF market is characterized by fragmentation and low transparency. These factors together with cross-listing of exchange-traded funds cause the differences in liquidity between fund providers (Roncalli & Zheng, 2014).

Engle and Sarkar (2006) have compared U. S. domestic with international exchange-traded funds from a perspective of the end of the day and on the intra-day basis. When creating an errors-in-variables model they came to the results, that premiums or discounts in U.S. domestic ETFs´ prices are smaller compared to international funds and they used to last only several minutes, while on average their standard deviation is 15 basis points. These results are documented by Petajisto (2016) as well. Data from the period of four years, namely from 2007 to 2011, show that funds with international or illiquid securities in their portfolios exhibit nontrivial premiums, respectively discounts, whereas ETFs with liquid holdings are priced

relatively efficiently. In the case of U. S. leveraged and inverse ETFs, higher discounts are experienced by bull funds compared to bear funds (Charupat & Miu, 2013). There is a positive, respectively negative correlation between the price distortions of funds with negative, respectively positive multiple and the returns of their benchmarked index and these patterns are stronger with the increasing level of leverage.
Price efficiency is also discussed by other authors focusing on different markets. Maluf and Albuquerque (2013) have analysed Ibevospa iShare fund as a representative fund of Brazilian market. After applying the time series bootstrap in order to avoid data-snooping the fund has shown to be price efficient and there is no chance to gain abnormal returns from the discrepancies between the value of its shares and relevant index. Also the ETF tracking the Taiwan 50 Index poses as priced efficient (Lin et al., 2006). It exhibits the average mispricing at the level of 0.383 %, what together with the maximum regulated costs required for transactions in order to ensure arbitrage profit, namely 2.385 % for the premium arbitrage and 1.585 % for the discount arbitrage, offers just negligible arbitrage opportunities.
Chen, Chou and Chung (2009) have studied the impact of decimalization on the cash/futures pricing system in the case of E-mini futures on three most famous ETFs. They have found out that the penny pricing has reduced the admissibility of arbitrage trading because of the diminished profitable market depth. Therefore conditions for conducting of arbitrage require the mispricing size which will be able to cover the execution risk.
The persistence of premiums and discounts of bond exchange-traded funds has been investigated by Fulkerson, Jordan and Riley (2014). According to their findings the premiums or discounts of these types of ETFs used to maintain for up to one month after the day of high or low deviations of ETF´s price from the net assets value. During this period ETFs with large discount exhibit higher returns than the ETFs with large premium. Moreover, large premiums are followed by negative overnight returns and high discounts by positive overnight returns. Fulkerson and Jordan (2013) analysing even larger sample of different ETFs have discovered that price derogations from the net asset value tend to persist over the following five days. It was shown that ETFs after the day, when they exhibit high level of premium, have experienced significant overnight decline from the closing price of the previous day to the opening price on the next day. There are also documented substantial positive returns of both ETFs and benchmark index on the following day. This effect appears also in the case of discounts, however with smaller power. Thus, the premium and discounts pose to some extent as an indicator of future ETF´s returns.

3.MODEL AND DATA

As we can see, there are several studies that deal with the premiums, discounts and price efficiency of exchange-traded funds in the literature, but not with the European ETFs. In this article we examine the existence of premiums and discounts of equity European exchange-traded funds in several respects. In order to gain broader sample of ETFs, we had to make the observation period shorter to one year, namely from 1st January 2016 to 31st December 2016. We have been using the data of 37 ETFs from U.S. stock exchange due to better comparison. Only one of these fund is from the category Emerging Europe – broad, all other funds track the broad indexes of developed European countries, while the ETFs are issued by many different investment companies, of which of course dominate the most famous and biggest ETFs issuers such as Black Rock with their brand iShares, State Street Global Advisor, Wisdom Tree, ProShares or Deutsche Asset Management.
In our examination we use the data of the ETF´s bid-ask spreads, net asset value, closing prices and traded volume on the daily basis, which we have gained especially from the financial portals and websites of particular ETF issuers. The value of premium or discount of ETF, thus the value

of the extent to which the price of the ETF deviates from the net asset value of the fund is calculated as follows (Fulkerson & Jordan, 2013):

$$Price/NAV\ ratio = \frac{CPt}{NAVt} \quad (1)$$

where:
CP_t – closing price of ETF´s equity in the day "t";
NAV_t – net asset value of ETF in the day "t".

If this ratio is at the level of 1, the ETF is priced efficiently. If it is higher than 1, the ETF is traded at the premium, if it is lower than 1, the fund is traded at the discount.
In order to explore dependences between individual characteristics of exchange-traded funds we use Bravais-Pearson´s correlation coefficient, in the form:

$$r = \frac{\Sigma xy - n * Øx * Øy}{(n-1) * SD(x) * SD(y)} \quad (2)$$

where:
r – the value of correlation coefficient;
Σxy – sum of the product of two characteristics "x" and "y";
n – number of observations;
Øx ; Øy – average value of "x" respectively "y";
SD(x) ; SD(y) – standard deviation of "x" respectively "y".

In order to investigate the impact of premiums and discounts on the future returns of ETFs, we use regression analysis, which was applied separately on every fund. We construct the equation in the form:

$$TDR_{(t+1)} = \alpha + \beta * Price/NAV\ ratio_{(t)} + u \quad (3)$$

where:
$TDR_{(t+1)}$ – total daily return in the time t+1;
Price/NAV ratio $_{(t)}$ – Price/NAV ratio exhibited in time t;
α, β – coefficients;
u – error.

We set several hypotheses about the premiums and discount of ETFs resulting from theoretical economical foundations and empirical researches.
Hypothesis 1: Exchange-traded funds with lower bid-ask spreads, higher daily traded volumes and funds with stocks of large-cap companies in their portfolios tend to exhibit lower premiums and discounts.
Hypothesis 2: Premiums and discounts of ETFs are thanks to the mechanism of creation-redemption short-lived and they disappear in short time and very large price discrepancies from the NAV assumes high positive (in the case of discount) or negative (in the case of premium) return on the following day.
Hypothesis 3: Exchange-traded funds exhibiting higher volatility of underlying assets tend to experience higher premiums and discounts.
The majority of our hypotheses results from the principle that the sufficient liquidity on the ETF´s and underlying market and functioning mechanism of creation-redemption in-kind assumes minimal appearance of premiums and discounts and in the case they occur their quick removal.

4.PREMIUMS AND DISCOUNTS OF EUROPEAN ETFS

Exchange-traded funds differ from the other types of funds in their operation mechanism and in the method of determining their values. Similarly as in the case of mutual funds, net asset value of exchange-traded fund is calculated at the end of each day. However, since these funds do not issue standard certificate but just stock, which is traded on the exchange, their price, respectively the price of their stock, varies permanently during the whole trading day on the exchange. This price fluctuates around the net asset value of the fund, which represents the value of its underlying assets, respectively intraday indicative value in the case of intraday net asset value, which is calculated in the middle of the day. If the price of exchange-traded fund is higher than the net asset value, the ETF is traded at a premium, if lower than NAV it is traded at a discount.

The more volatile the financial markets are, the more distant the ETF´s price from the value of underlying securities is, because the ETF quickly reacts to the market conditions and sentiment and the time of NAV´s adjusting is longer. Premiums or discount used to arise in the case of excessive purchases, respectively sales compared to underlying assets. These discrepancies between the price and the fundamental value of ETF offer the opportunity for arbitrage activity, however it can be fully implemented under those circumstances surrounding the process, upon which the ETFs work, proceeds smoothly.

The exchange-traded funds work on the principle of creation-redemption in-kind. In this mechanism there acts the authorized participant, whose task is to obtain the required amount of underlying securities for the ETFs issuer in order to exchange them for ETF´s equities in the process of creation. Subsequently this participant sells the equities to other investors. This process works conversely, as well. Thank to this in-king process the arbitrage can be conducted. If the ETF is trading at a premium, the arbitrageur buys underlying stocks and contemporaneously sells the ETF´s equities and if at a discount, he firstly sells the underlying securities and then buys the ETF. It causes that ETF´s price get closer to the net asset value of the fund.

The premium or discount does not disappear in a short time always. Lower liquidity at the market of underlying stocks might cause the difficult access for authorized participant to these securities, which the participant could have also due to the fact, that the ETFs have in their portfolios international stocks. In addition, creation and redemption is difficult in terms of time. Bid-ask spreads are the mirror of liquidity. Our results shows that in the case of separate analysis of premiums and discounts the level of Price/NAV ratio moves away from 1 with growing difference between bid and ask prices. Thus, the correlation coefficient between bid-ask spreads and discounts is -0.5611 and between spreads and premiums is 0.6506 (see Tab. 1). Calculated average discounts or premiums express average values of Price/NAV ratio separately in the case of discounts, respectively premiums for each ETF.

Tab. 4 – Correlations between selected parameters of exchange-traded funds. Source: own processing, data extracted from Yahoo Finance, NYSE, Morningstar, ETFdb

Correlated parameters		**Correlation coefficient**	**T-statistic**	**Critical value (at 5 % level of significance)**
Standard deviation of returns	Average discounts	0.08	0.4742	
	Average premiums	-0.16	-0.9712	
Standard deviation of returns	Count of discounts	0.20	1.2121	
	Count of premiums	-0.20	-1.2189	
Average volume	Average deviation from effective valuation	-0.30	-1.8676	
Average volume (log)	Average deviation from effective valuation (log)	-0.74	-6.5870	1.6896
Average volume	Average discounts	0.25	1.5287	
	Average premiums	-0.30	-1.8811	
Average volume (log)	Average discounts (log)	0.61	4.5366	
	Average premiums (log)	-0.66	-5.2078	
Average bid-ask spreads	Average discounts	-0.56	-4.0101	
	Average premiums	0.65	5.0683	
Average bid-ask spreads (adjusted)	Average discounts (adjusted)	-0.68	-5.3343	1.6924
	Average premiums (adjusted)	0.73	6.2241	

Moreover, if we remove two extreme values in average bid-ask spreads and average discounts, respectively average premiums, we document even higher correlation. The statistical significance of these results has been validated based on the critical values of Student´s distribution at 5 % level of significance. Thus, if the absolute value of t-statistic (see Tab. 1) is higher than the critical value for given grades of freedom, correlation coefficient is significant.

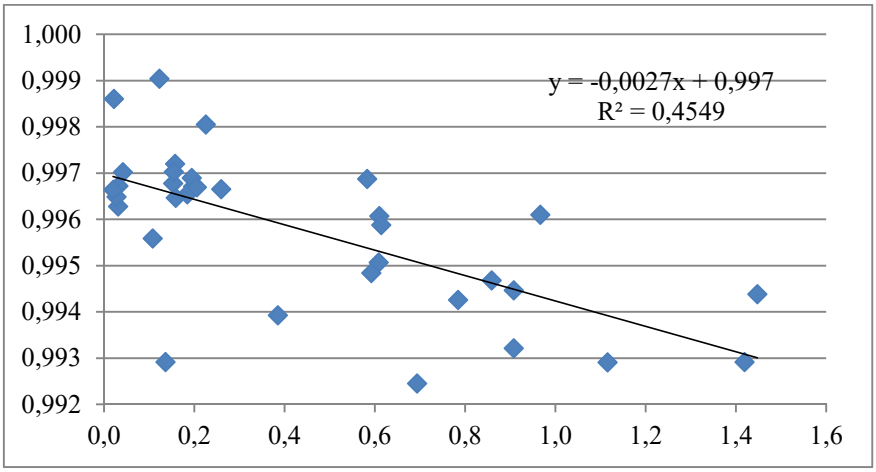


Fig. 5 – Correlation between average bid-ask spreads (x-axis) and average discounts expressed as a Price/NAV ratio (y-axis). Source: own processing

Strong negative correlation between average bid-ask spreads and average level of Price/NAV ratio in the case of discounts and very strong positive correlation between average bid-ask

spreads and average level of Price/NAV ratio in the case of premiums with linear regression equations are illustrated in graphs (see Fig. 1 and Fig. 2).

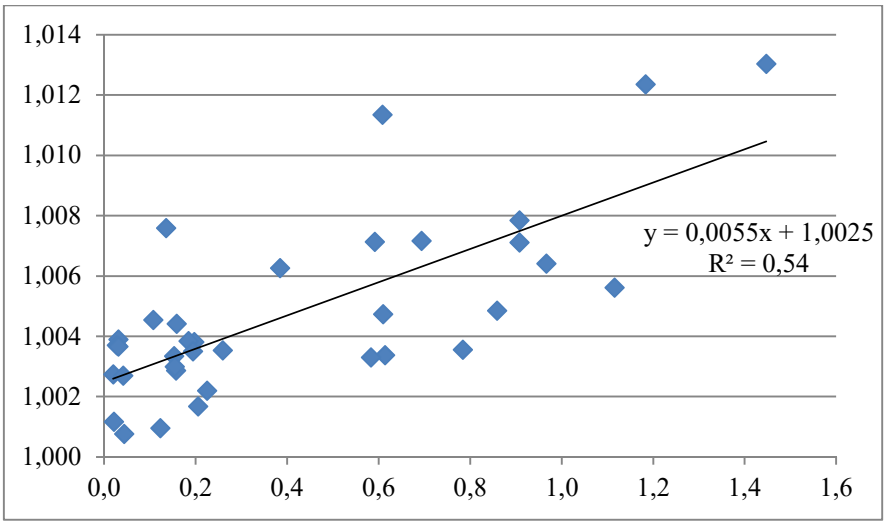


Fig. 6 – Correlation between average bid-ask spreads (x-axis) and average premiums expressed as a Price/NAV ratio (y-axis). Source: own processing

Although there is no significant correlation between the discounts and average daily traded volume, when we calculate with logs of these parameters, we get a linear process. It shows strong correlation, i.e. 0.61, between logs of average volume and logs of average discounts, respectively strong positive correlation, i.e. 0.66, in the case of logs of average premiums. It means, that with the increasing trading volume is associated more effective valuation of ETFs. These finding are also apparent when we look at the very strong correlation between logs of average volume and logs of average deviation from effective valuation. It is at the level of -0.74, so higher trading volumes assume lower absolute values of deviation of Price/NAV ratio from the level of 1, when the price of ETF corresponds with the value of underlying securities (see Fig. 3).

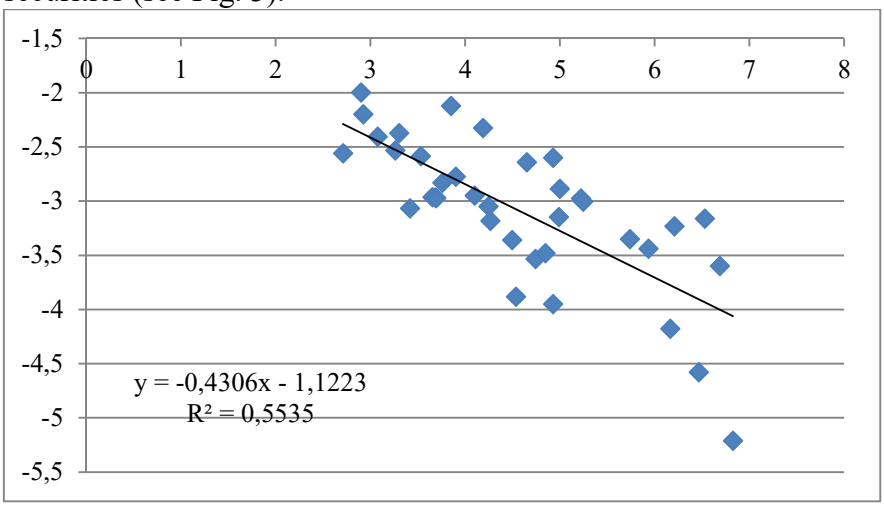


Fig. 7 – Correlation between logs of average daily traded volumes (x-axis) and logs of average absolute deviation from effective valuation (y-axis). Source: own processing

In addition, exchange-traded funds, which exhibit substantially more days (from 21 up to 82), when they are priced efficiently, thus the Price/NAV ratio is 1, are traded more than the others in the terms of number of traded stocks and that more than four times (our calculations). Exchange-traded funds with the multi-cap and mega-cap equities as underlying securities have

been shown as funds which are traded at the lowest premiums and discount. Conversely, small-cap ETFs pose as the worst, what is consistent with findings of other studies. These results confirm our first hypothesis. Investment strategy of ETFs has been shown as an unimportant indicator in the context of this topic. Based on the analysis of standard deviations of NAV returns (see Tab. 1) it could be said, that volatility of underlying securities do not correlate with the level of ETFs´ premiums or discounts, which refuses the last hypothesis.
In our investigation we have come to the results that the premiums persist on the same level for 3.09 days and discounts longer, 3.35 days on average during the observation period. In addition, there is no relationship between premiums or discounts and total daily return of the ETF on the following day (based on our calculations, where regression model proved to be insignificant and meaningless) what refutes our second hypothesis. However if we adjust the ETF returns for returns of underlying assets, we document the dependence of future return on current level of Price/NAV ratio, but, as we said, discounts and premiums used to persist several days. The linkage between adjusted returns of funds and discounts, respectively premiums for average fund is reflected in equations (4) and (5).

$$ATDR_{(t+1)} = 1{,}150 - 1{,}146\ Price/NAV_{D\ (t)} \quad (4)$$

$$ATDR_{(t+1)} = 1{,}050 - 1{,}053\ Price/NAV_{P(t)} \quad (5)$$

where:

$ATDR_{(t+1)}$ – adjusted total daily ETF return in time t+1
$Price/NAV_{D(t)}$ – level of Price/NAV ratio when ETF is trading at discount in time t
$Price/NAV_{P(t)}$ – level of Price/NAV ratio when ETF is trading at premium in time t

These equations contain average values of observed coefficients obtained by carrying out single regression analysis for each fund. Regression outputs pose as statistically significant and average value of R-squared in the first case is 0.64 and in the case of premiums models explain about 60 % of the variability of future returns. The higher is the premium at which the ETFs are traded, the lower is the rate of yields on the next day respectively the higher is the negative return, thus total daily loss. On the other hand, the closer is the Price/NAV ratio to the effective pricing in the context of discounts, it means the lower the discount is, the lower is the forthcoming returns. These regression equations also show that European ETF price changes are more sensitive to the states when these funds are traded at discounts. It implies that arbitrageurs tend to conduct arbitration activity, if any, when the price of ETF stock is under the value of underlying securities and enter into long positions.
In addition we have found out that European equity ETFs experience discounts more days on average than premiums, however the average level of discount is 47.5 bps and premiums is 50.9 and they are traded at premium on average. The largest reported values of discount is 607 bps and of premium 871 bps, but there are just 8 funds that have reported both the premium and the discount at the level at least 300 bps. These funds also experience greater persistence of high level of these price deviations and in the terms of investment style most of them are from the category of hedged. The premium above 300 bps is recorded also by the fund that differs from other funds from the regional perspective, namely by ETF tracking stock from European emerging countries.

5.CONCLUSION

Exchange-traded funds are considered to be one of the most attractive type of passive investment with a constantly increasing share on fund industry. From the other types of funds they differ mainly in the way of their trading process giving rise to premiums and discounts of ETFs. Our analysis confirms that ETF´s price deviations from the value of underlying assets are correlated with the level of liquidity on the market. They are growing with the rising value of bid-ask spreads. Then we document very strong negative correlation between logs of trading volume and logs of derogation from effective valuation and prices of ETFs are at the level of their net asset value more times in the case of higher traded volume of ETF´s stocks. We have also come to the results, that European ETFs used to maintain premiums or discounts for several days, thus they do not disappear in short time, what is consistent with findings of mentioned studies and they have no ability to predict the future returns. However premiums and discounts affect the forthcoming ETFs returns adjusted for NAV returns. Thus, higher premiums or discounts indicate higher relevant adjusted price changes on the following day, while these changes are more sensitive to exhibited discounts than to premiums. This could indicate the arbitrage activities more in the direction of opening the long positions by arbitrageurs. Moreover, European exchange-traded funds that track stocks of companies with smaller market capitalization tend to exhibit larger price discrepancies from NAV compared to those with large-cap or multi-cap securities. In addition, the volatility of underlying stocks does not pose as an indicator of Price/NAV ratio.

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Databases:

1. ETFdb, available at: http://etfdb.com/
2. Morningstar, available at: http://www.morningstar.com/
3. New York Stock Exchange, available at: https://www.nyse.com/index
4. Yahoo Finance, available at: http://finance.yahoo.com/

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COUNTRY RISK AND CAPITAL MARKET

Chovancová Božena, Slobodník Patrik

Abstract

Equity market risk is the focus of every investor. It is the principal component of every risk and return model in finance. Equity risk premium depends on several determinants, including investor risk aversion, information uncertainty and a few macroeconomic perceptions. Correct calculation of the country risk premium is becoming a more and more important step for investors when they are in the process of deciding the best option for the allocation of their funds and eventual investment. Countries of the Eurozone have always fulfilled their bonds before the financial crisis; this was the reason why investors didn't have any suspicions about entry in these markets. The financial crisis has evolved to debt crisis in countries of Eurozone, which has made bonds and stock markets riskier. The purpose of this paper is to specify and quantify the country risk premium for bond markets and stock markets from the investor's point of view.

Keywords: credit default swap, equity risk, stock market, country risk

JEL Classification: G12, G19

1.INTRODUCTION

The issue of country risk became a much discussed topic in recent years, because of the relationship between country risk and debt crisis in Eurozone. Before the financial crisis, investors had rated government bonds of Eurozone as a so-called "safe haven". Investors hadn't identified big differences between countries of Eurozone, because government bonds had minimum risk and were credible. In 2008, when the financial crisis hit the world, investors had to rethink their financial decisions about choosing the right country for their investments. Enormously growing risk spreads had been pure evidence of increasing risk of countries in the Eurozone. Country risk relates not only to bond markets but the equity markets as well. On the bond market, we understand country risk as the risk of creditor insolvency or default risk as a borrower. On the stock market, country risk is affected by many economic factors such as: economic growth, the level of interest rates, inflation, taxation etc. Political factors play an important role in country risk, too. Political factors can include political situation, the ability of government authorities to create great conditions for business, political turbulence, dysfunctional legal system and high levels of corruption which can all significantly affect the risk of investing in the country and the stock market.

2.LITERATURE REVIEW

In financial markets, investors are exposed to various types of financial risks. Some risks are common to all financial instruments, others are specific to a segment of the financial market. Investors understand risk as the certain deviation of the actual return from the expected return. In general, higher risk must be compensated by higher returns. It should be noted, that high risk—high deviation of actual return from expected return, signals not only potential loss, but also potential higher profit. In the bonds market, we consider the significant risk of insolvency creditor, so-called credit risk (default risk). We talk about country risk in the situation, if the issuer of bonds is the state. This issue is discussed by many globally top-rated economists. One

of those authors is J. F. Fabozzi (2007) who in the publication, *Bond Markets, Analysis and Strategies*, described basic characteristics and types of bonds, particular risks of the bond market and several methods for evaluating bonds. The issue of bonds related to mortgage loans and various innovations such as securitized products like CMO, CDO and ABS, deserves special attention. The monograph, *Bond and Money Markets: Strategy, Trading and Analysis* by author M. Choudhry (2003) introduces the basic rules of investing in the bond markets. He describes the specifics of government and corporate bonds. He also describes various risks of the bond market, and how we can measure and manage those risks. In his book, he quantifies the risk with the method of VAR—Value at Risk.

Many other foreign authors have dealt with the issue of country risk. Many working papers have been prepared by experts of the OECD, IMF and ECB. These works reflect the current problems of the Eurozone's bond market that are closely associated with the rising country's debt. The working paper called *What drives sovereign risk premiums?: An analysis of recent evidence from the Euro area* by authors D. Haugh, P. Ollivaud and D. Turner (2009), is dedicated to the government bond's growing risk spreads in countries of the Eurozone during the financial crisis of 2008-2009. They compare yields of government bonds of individual countries to German government bonds (Bunds). They see the problem of high spreads in the inefficient and deficit economy of countries, as well as higher investor risk aversion during crisis. Authors S. Sgherri and E. Zoli (2009) have a similar approach in their working paper *Euro area sovereign risk during the crisis.* They examined the relationship between growing risk spreads of countries of Eurozone and the market concerns about the insolvency of the country. Another working paper, *Determinants of government bonds spreads in new European countries*, has been processed by I. Alexopoulou and A. Ferrando (2009) within the ECB. The authors examined the impact of individual fundamentals on the growth of long-term government bond spreads. Fundamentals which affect bond spreads are external debt, exchange rate, inflation, economic openness, etc.

A well-known and respected author on the issue of country risk is Professor A. Damodaran from the New York University Leonard N. Stern School of Business in the US. In his book, *Damodaran on valuation: Security analysis for investment and corporate finance* (2006) he focuses on the quantification of the country risk premium. He describes the reasons why risk premium should be different in different countries where investors invest. The benefit of his papers is the fact that he deals with issues that are more complex when compared to other authors. He does not only quantify the risk spreads on the bond market, but also in the stock market. He describes various methods for measuring country risk, as well as the factors that an investor should take into consideration, when deciding or choosing the best fitted method for measuring risk. Damodaran also discussed the above issues in his working paper, *Equity risk premiums* (2016), which is updated every year.

In Czech Republic, there are several authors who are also concerned with the issue described above. Rejnuš (2010) with his publication *Finanční trhy* concludes that government bonds are considered the safest type of assets of all, because there is no chance that developed countries would stop paying their obligations. Government bonds are issued at high volumes and are traded in prestigious stock markets, which makes them high liquidity. Other bonds can be traded OTC, so the trade time could be more than weeks. That is the reason why investors analyse issuers just in case of emerging markets and countries. Investors reconsidered the approach to understanding the risks because of financial and debt crisis in Eurozone, and concluded that investors need to analyse the country risk of not only emerging countries but also of developed countries. Another author dealing with the bond issue is Jilek J. (2009) with his publication *Finanční trhy a investování*. He is also the author of *Finanční rizika* (2000), where he describes the core of the risk, methods of measurement, control and regulation of individual risks. Musílek P. (2011) and his publication *Trhy cenných papíru* is devoted to individual bonds and

the risks affecting the bond market. He describes methods and situations in which it is appropriate to use that particular method.
However, while we mentioned a few monographs which were especially aimed at the study of the theoretical background of country risk, we need to look at current literature—working papers and their research problems. Beirne—Fratzscher (2013) analysed country risk determinants like public debt/GDP, real GDP growth or current account/GDP to CDS spread in 31 countries. They found that there is a "wake-up call" contagion, as financial markets have become more sensitive to countries. Aizeman et al. (2013) analysed sovereign risk for fifty countries based on fiscal space and other economic fundamentals. They found out that CDS spreads are partly explained by fiscal space and other economic determinants. Arghyrou—Kontonikas (2012) also analysed macroeconomics factors to country risk. They found evidence of contagion effects, particularly among EMU periphery countries. Longstaff et al. (2011) analysed CDS spread in emerging markets and they found that sovereign spreads are more influenced by global factors, rather than local factors. Micu et al. (2006) found that credit rating announcements have a large influence on CDS spreads. Lee et al. (2017) analysed oil prices and country risk. They found that country risk is significantly affected by oil price shocks, but the impacts were different.

3 AIM AND METHODOLOGY

The goal of this contribution is to show the importance of the country risk, which has become more important in recent years because of the debt crisis in the Eurozone. Also, we will quantify the risk which investors are faced with when they invest in the bond and stock markets of different countries. The point of this contribution is to quantify the country risk of Italy, Spain, Austria and France and compare country risk of Italy with bond and stock markets in Germany. We will measure the country risk by methods based on the rating and scoring. We can also use alternative market-based methods, which are based on historical data about government bonds and different indices of stock markets.
We will also use the combined method from Damodaran to quantify country risk of different countries. This method is based on multiplying default spread or CDS (Credit Default Swap spread) by a factor of volatility of the equity and bond market of the country. Default spreads or CDS spread represents the difference between the bond yields of a risky country and bond yields of a non-risky (benchmark) country. Both bonds have a maturity of 10 years. We will quantify credit spread in Italy, Spain, France and Austria in the period between 2000–2016, so we will see the growth of spread during crisis. We choose German Bunds as risk-free bonds.
In this work, we used data from different databases. We used mathematical and statistical methods to compile acquired data. We processed the data from the Eurostat database and available sites, www.tradingeconomics.com and www.yahoofinance.com, along with the ECB published data on www.ecb.org.

3.1 Market-based Measures

Investors who don't think that rating or scoring are sufficient and reliable methods of measuring country risk can use one of the alternative market-based methods. Investors see the advantage of these methods and that the results reflect the actual situation on the market. It should be noted that they are characterized by frequent fluctuations in comparison with rating or scoring evaluations. These fluctuations are caused by market reactions to different events or irrational behaviour of market participants which explains the psychological analysis.
Damodaran (2016) offers three market rates of country risk. Default spread (country default spread) is the most commonly used and simplest measurement model of country risk. This

model (also referred to as equation 1) is simply the difference between the bond yields of the risk country and the bond yields of the benchmark country (top rating country). This method can be applied only if both bonds are denominated in the same currency. Emerging markets don't have government bonds denominated in foreign currency but in case they have set rating from one of the world's rating agencies, we can determine the spread of these countries. The method is based on the assumption that countries with similar credit risk should have the same rating and based on this, we assign a given country spread. That method is used for comparison of countries that issue bonds in two different currencies, and therefore, we are comparing spreads with the second method.

$$CDS = bond\ yield\ of\ country\ X - bond\ yield\ of\ riskfree\ country \quad (1)$$

According to Damodaran (2016), another conventional instrument to measure the country risk is volatility of stock prices, expressed as standard deviation. Higher deviation means higher risk. The standard deviation reflects not only the risk but also the liquidity of the stock market of the country. Emerging markets are often less liquid than big ones, which is why stock prices have lower volatility. Lower volatility means lower standard deviation and that is the reason why we can underestimate some risk of the stock market, however the opposite should be true—low liquidity should signal higher risk of stock market. High liquid and quality markets would have higher volatility; therefore, risk should be higher. The relative standard deviation is relative due to the fact that we compare the volatility of stock prices of the country against the volatility of stock prices of another benchmark country. In our case, we chose Germany as the benchmark. The relative standard deviation for the country is calculated in equation (2).

$$\text{Relative Standard Deviation}_{\text{Country X}} = \frac{\text{Standard Deviation}_{\text{Country X}}}{\text{Standard Deviation}_{\text{Ge}}} \quad (2)$$

If we assume a linear relationship between equity risk premiums and equity market standard deviations, we can calculate the equity risk premium for country X in equation (3).

$$\text{Equity risk premium}_{\text{Country X}} = \text{Risk Premum}_{\text{Ge}} * \text{Relative Standard Deviation}_{\text{Country X}} \quad (3)$$

We can combine the above methods. We assume, that CDS spread is a good indicator of credit risk, but does not cover all aspects of country risk. To do this, we must increase the credit risk by some co-efficient. We multiply country default spread by a relative relationship between the volatility of the equity and bond markets of the country as defined by equation (4).

$$\text{Country Risk Premium=Country Default Spread} * \left(\frac{\sigma_{\text{Equity}}}{\sigma_{\text{Country Bond}}} \right) \quad (4)$$

3.2 Determinants of spreads

We can divide factors, which affect the level of risk spreads of government bonds, into three groups. The first group is **credit risk** or the level of government debt. In this group, we also talk about macroeconomics factors, which affect the ability of countries paying their obligations

on time. The ability of countries paying their obligations on time is determined by several factors. The condition of public finance is one of the most important and significant factor which influences government bond yields. Sustainability of public finance of the country is weakened by repeated budged deficit and thus, also increases public debt. Problems of public finance are one of the reasons for downgrading the rating of government bonds, which increases the cost of debt service. The growing debt of a country may not be a problem if it grows slower than the GDP. Therefore, it is important to pay due attention to the overall aspect of the economy—GDP growth. Real effective exchange rate and balance of payments are also very important factors. Both are indicators of the competitiveness of the country. If the country has a long-term problem of deficit balance of payments, the exchange rate of the country will be depreciated. Inflation rate is one of the macroeconomic indicators of financial stability. Optimal rate of inflation is now considered below and close to 2%, which is the ECB's inflation target. However, at present we have a deflation problem in Europe. One of the problems of deflation is that it disadvantages borrowers. Nominal debt is fixed but decreasing prices increase the real debt burden. Decreasing income is caused by decreasing prices, however, the debt remains unchanged. Public sector entities are forced to use a greater part of their income to repay their debt and this eventually restricts the consumption.

The second group is **liquidity risk**. Low liquidity of the market can mean significant problems for the investor if they suddenly need to sell their assets and get cash. In case of a low liquidity market, investors will suffer huge losses. Because of the issue described above, investors require liquidity premium on emerging markets.

The third group is **risk aversion**. This factor has come to the fore, especially in times of financial crisis. In these times, investors don't want to undergo high risk, so they allocate their investment into safer assets. There are also investors who are looking for risky assets, but require higher risk premium. Risk premium affects bond yields. Index of volatility is used as an indicator of an investor's risk sentiment. We can also use an alternative method—measured by spreads. If the spread is growing between two countries with different ratings, investors will shift from a risky country to a less risky country.

3.RESULTS

In the table below, we can see individual risk spreads in basis points assigned to country ratings. In our case, Germany has the best credit rating, so the country's risk premium is 0. Italy and Spain, both of them have a rating of Baa2 with a spread of 210 basis points. That means that bond yields of Italy or Spain should be higher by 2.1 percentage points than bond yields of German Bunds. Austria has a rating of Aa1 and a risk premium of 0.44 percentage points, while France has a rating of Aa2 and a risk premium of 0.55 percentage points.

Table 6 Rating and Default Spread. July 2016. Source: own processing—(www.stern.nyu.edu)

investment grade										
Rating	Aaa/AAA	Aa1/AA+	Aa2/AA	Aa3/AA-	A1/A+	A2/A	A3/A-	Baa1/BBB+	Baa2/BBB	Baa3/BBB
Spread	0	44	55	67	78	94	133,00	177,00	211,00	244,00
speculative grade										
Rating	Ba1/BB+	Ba2/BB	Ba3/BB-	B1/B+	B2/B	B3/B-	Caa1/ CCC+	Caa2/CCC	Caa3/ CCC-	Ca/CC
Spread	277	333	399	499	610	721	831	998	1108	1330

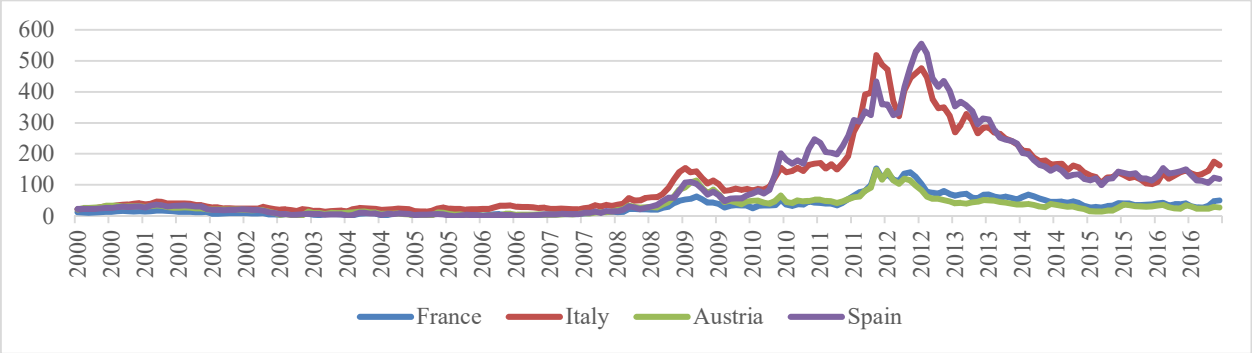
In next figure, we can see the growth of the spreads in a long timeframe. We selected Italy and Spain as risky countries because of their public debt. France and Austria represent less risky countries. Italy and Spain have problems with public debt and therefore, have a rating grade of Baa2. According to this evaluation, bonds issued by those countries should have 2.1 % country

risk premium over risk-free bonds, in this case, German Bunds. Figure 1 depicts the spreads—the difference between the yields of the bonds of risky countries and the yields of German Bunds as per equation 1. We can see that the spreads of Italy and Spain were below the level of 210 basis points in 2016, which is lower than what risk premium should be determined by the rating of the country. Austria has a rating of Aa1 and a risk premium of 0.44 percentage points; France has a rating of Aa2 and a risk premium of 0.55 percentage points. We can say that bond yields of Austria and France were correctly increased, coincident with rating. From a historical point of view, from 2000 to 2008, we see stable spreads for government bonds.

The technological bubble also known as the "dot.com" bubble, which popped up in the early 2000s caused huge losses for stock markets. However, spreads in the 2000s showed small volatility and therefore, the technology bubble affected not only the stock markets, but the bond markets too. During a market crisis, investors demand "safe haven" assets like bonds or gold. This causes the bond yields to fall. It is true that bond yields of our selected countries fell but those movements had the same trend. In other words, the dot.com bubble and its collapse didn't affect the terms or the country risk, because the phenomenon didn't make any changes in the riskiness of our selected countries

Another case of crisis was the mortgage bubble in the US market in 2008. The core of this bubble was the fact that US banks provided mortgages to risky clients. These kind of mortgages, when the borrower is very risky, are known as subprime mortgages. In the next step, banks sold these assets to other financial institutions via securitization. The mortgage problem became a worldwide problem through these financial operations. Because of factors like level of globalization and specific relationships between financial institutions of different countries, we saw and experienced a worldwide crisis. In the first half of 2008, we saw growing spreads of government bonds. In 2011 and 2013 we saw enormous increased risk spreads for countries like Italy and Spain, because of disproportionate growth of government debt in those countries. Since 2014 we have seen relative stable spreads, however we can also see the difference spreads of countries with different ratings. Since this moment, investors have begun observing and marking differences between the countries of Eurozone. They have started understanding and measuring the risk associated with investments in government bonds of risky countries. It should be noted, that during the stock bubble in 2000s, spreads slightly increased. In 2008, during the mortgage bubble in the US we saw increased spreads. But we are talking about extreme growth from 2010–2014 because of debt crisis in the Eurozone.

Figure 1. Default risk spreads (in BP) in selected countries between 2000 and 2016. Source: own processing—(ec.europa.eu)



In the figure above, we can also see the growth of Spain's spread, which was similar to the spread of Italy's bonds. The higher volatility we can see during the debt crisis starting in 2010. During the debt crisis, Austria and France showed only a small increase in spreads in comparison to Italy or Spain.

4.1 The situation in Italy

High public debt is currently the main problem of the Italian economy, which is ultimately reflected in the level of yields of Italian government bonds. Italy has been affected by the low economic growth too. The increasing public debt as part of GDP in recent years has been caused by low, sometimes negative economic growth, as well as low inflation. Low inflation causes an increase in real interest rates, and therefore, the dynamics of Italian economy is getting worse. Italy's debt problem is a long-standing problem which can trace its roots back to 1999, when it adopted a common currency, the Euro, and became a member of the Euro area. Italy had undertaken to reduce the level of debt from 110% to 60% of GDP on entry into the Eurozone. Italy has accomplished this criterion just in part. In 2008, many countries were forced by the financial crisis to spend a considerable amount of money to support the economic recovery. In 2009, efforts to improve the situation in the fiscal area were renewed. The project EDP—Excessive Debt Procedure was launched in this year, too. The purpose was to ensure better management of public funds. Since that year, we are watching decreasing public debt in Italy. The deficit was at 5.3% in 2008, while in 2016 it was at 2.6 %

In table 2, we can see the Moody's rating for Italy. Before 2002, Italy had stable and quality rating. The year 2008 did not bring any changes in the rating of the country. In 2011, the debt crisis caused downgrading of the rating of Italy to Baa2 with negative outlook, which suggests a possible downgrading again.

Table 2. Rating and outlook for Italy—Moody's. Source: own processing—(www.tradingeconomics.com)

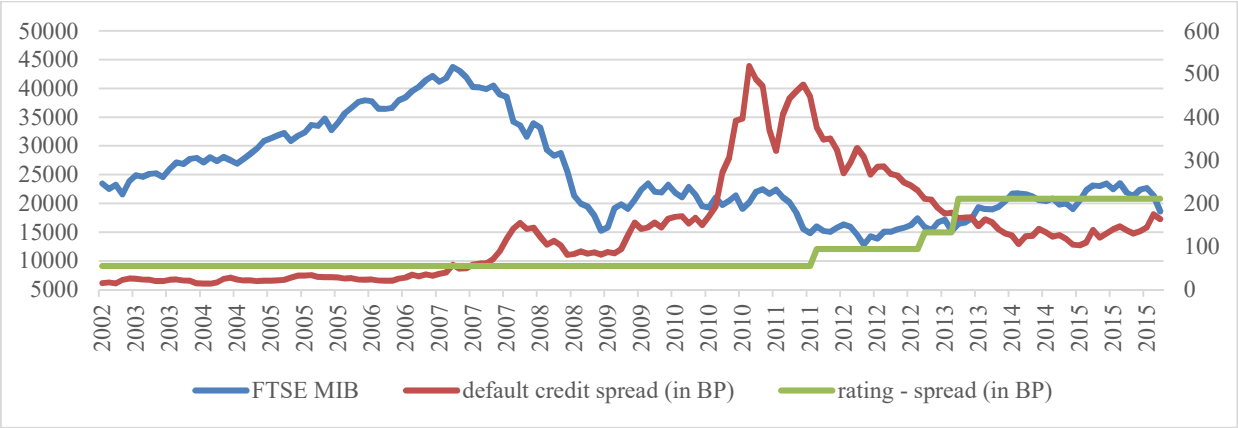
	Rating	Outlook
May 1996	A1	stable
July 1996	Aa3	stable
May 2002	Aa2	stable
June 2011	Aa2	negative watch
February 2012	A3	negative watch
July 2012	Baa2	negative watch
February 2014	Baa2	stable
December 2016	Baa2	negative watch

If we assume that Germany has the best rating AAA, the risk premium for German Bunds is equal to 0 %. If Italy has a rating of Baa2, we can deduce that bond yields of Italy should be higher by 2.2 percentage points. The equity risk premium for the stock market in Germany is at 5.69% and in Italy at 8.4%. Country risk premium is calculated using the formula 4 mentioned earlier in the text.

We can see in the figure 2, the development of Italy bond spreads calculated as the difference between the bond yields of Italy and bond yields of Germany—(CDS spread). Risk spreads are based on Moody's country ratings and the development of stock index FTSE MIB, which is a benchmark for the stock market in Italy. Between 2000 and 2007 we saw a bullish trend on stock markets and stable situation on bond markets; spreads had minimal volatility. In 2007 and 2008 we saw a dramatic fall of stock prices, because of the mortgage bubble in the US market. In this year, we also saw increasing CDS spread, however the rating stayed unchanged. Since

2008, we have seen a calm situation in the stock markets. In 2011, with the outbreak of the debt crisis in the Eurozone, we saw a dramatic increase in CDS spread. This situation was followed by a bearish trend on stock market, and Italy also got a terrible rating. Since 2012, the stock market has been calm, risk spreads fluctuate at around 100 basis points, while Italy's rating was downgraded again.

Figure 2. Italy's, stock FTSE MIB, CDS spread in Italy between 2002 and 2016. Source: own processing—(finance.yahoo.com)



From the chart above, we can conclude that the risk spread, calculated as the difference between the bond yield of Italy and bond yields of the benchmark country (1), responded to the market situations much earlier than country rating. We see that the risk spreads as per equation 1 increased earlier than downgrading or country rating. We can conclude that risk spreads predicted downgrading of the country rating.

4.2 Comparing Italy and Germany

Sovereign CDS spread is calculated from equation 1. We chose USA for the risk-free country (Germany and Italy compared to the US bonds). German Bunds have yields that are higher by 0.06 percentage points than the US T-Notes. Yields of Italy bonds are higher by 1.84 percentage points. In table 3, we can see that the country risk premium for Italy, calculated from equation 4 is higher than the country risk premium calculated with rating spreads.

Table 3. Risk Premiums—January 2017. Source: own processing - (pages.stern.nyu.edu)

Country	Rating	**Rating - spread**	Total Equity Risk Premium	Country Risk Premium	**Sovereign CDS**	Total Equity Risk Premium	Country Risk Premium
Germany	Aaa	0 %	5.69 %	0 %	0.06 %	5.76 %	0.07 %
Italy	Baa2	2.20 %	8.40 %	2.71 %	1.84 %	7.95 %	2.26 %

As we discussed in the text above, this causality is due to the fact that the method of CDS spread is more sensitive to market events rather than rating. Country risk premium of Germany is at 0.07 % which tells us that even a risk-free country has a certain risk, when we compare it to other countries.

5 CONCLUSION

Before the financial crisis, the situation on the bond markets of the Eurozone was relatively stable. Spreads fluctuated at low levels, while the markets didn't showcase any significant differences between countries of the Eurozone. Spreads of countries, with high debt such as Italy and Spain, were above the level of other non-risky countries, but differences in the spreads did not correspond to differences in the growth of macroeconomic factors. The financial crisis has been critical for Italy. The situation was calm in France and Austria, while their spreads were located approximately at the same level. The debt crisis has influenced the behaviour of investors on the European bond and stock markets. Investors have begun to differentiate between countries already affected during the financial crisis, but during the debt crisis we can speak of inflating spreads of highly indebted countries.

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ASSESSMENT AND ASSUMPTION FOR THE CURRENT INTEREST MORTGAGE RATE AND BONDS YIELDS

Janáková Hana, Zatrochová Monika

Abstract

Mortgage rate can be very susceptible to economic activity. Comparing the various mortgage interest rates offer use the annual percentage rate to compare it but also the bond rate can directly affect mortgage interest rates. One of the most important aspects to successfully obtaining a mortgage is securing a low interest rate. There are a few different factors that can affect interest mortgage rate and one is also a bond rate. The bond yield can show as a one of indicators whether mortgage rates will rise or fall. The paper offers the assessment and assumptions for the current interest mortgage rate and relationship with bond rate. Analyse is based on the current information and available resources of interest mortgage rate and bond rate and its subsequent synthesis of a selected data. The comparison is focused on current developing interest mortgage rate and bond rate in the closet countries of Slovakia - V4 (Slovakia, Czech, Poland and Hungary). Conclusion of the article is based on the scientific methods to clear the direct relationship between interest mortgage rate and bond rate.

Keywords: Interest rate, Bond rate, Mortgage Bonds, Mortgage-Backed Securities, Yield

JEL Classification: E43, E58

1.INTRODUCTION

Nowadays, to focus on the yield curve as an important idea due to the long-term interest rate that has fallen so low in relation with mortgage backed securities. The level of the long term interest mortgage rates of the country is the one of convergence criteria that is sets out in the Maastricht Treaty and is measured precisely on the basis of long-term bonds denominated in the currencies also of the V4 countries (NBS, 2017).

Mortgage rates are set by the major financial institutions usually a major bank taking the main role. All major financial institutions earn a large part of their income which is the difference between interest mortgage rate charged to borrowers and the bond rate payed to investors for an equivalent term. Bond investors are looking for predictable outcomes but some are possible to take on higher risk. Mortgage default rates increase sharply in the aftermath of the credit expansion. (Amadeo, 2016; Mian & Sufi, 2008).

Investors turn to invest to the bonds as a safe investment when the economic outlook is not good enough. In the case when bonds purchase increase is possible that it is connected with decreasing of yield and therefore with mortgage rate too. But investors are willing to invest when the economy is do well forcing bond prices lower and pushing the yield (and mortgage rates) higher. Mortgages are priced for sale to attract investors who seek fixed income investments. There are many kinds of bonds available, and mortgage rates (yields) rise and fall with those competing investments to a greater or lesser degree.

One of the possibilities to predict the interest mortgage rate is to observe the rate of bond at least for period of 10 years. You can find it on finance websites alongside other stock tickers, or in the newspaper. If it's moving higher, mortgage rates probably are too. If it's dropping, mortgage rates may be improving as well (Robertson, 2015; Jarrow, 1978).

The paper deals with current interest mortgage rate relation with bond rate. This analyse is based on the current information and available resources of interest mortgage rate and bond rate and their direct relations in V4 countries.

2.THEORETICAL BASIS OF PROBLEM STATEMENT

Mortgage-backed securities (MBS) are securities that are backed by the mortgages that banks loan. Rather than hold them for 15 to 30 years, the banks sell the mortgages to Fannie Mae and Freddie Mac. They bundle them together and sell them on the secondary market. That's where they are bought by hedge funds and large banks. The financial crisis showed that many mortgage-backed securities weren't as safe as the investors thought. They contained high and undisclosed levels of subprime mortgages (Amadeo, 2016).
Mortgage backed securities are financial securities that are backed by a pool of underlying mortgages. Mirroring the underlying consumer mortgage, the MBS is a debt security with a declining principal value. Those fact consumers have the option to prepay their mortgages make valuing MBS very difficult. In traditional asset pricing theory, the marginal investor in every asset market is the same broadly diversified representative investor and according to traditional theory a hedge fund liquidating billion of mortgage backed securities finds a large pool of ready buyers. MBS securities rise and fall in value based on the exercise of homeowners' prepayment options. When a homeowner prepays a mortgage, the MBS backed by the mortgage is called back at par. Depending on the interest rate environment, prepayment can either hurt or benefit the investor who owns the MBS. Thus, for an investor who specializes in the MBS market, prepayment risk represents a risk to the value of his portfolio. At the aggregate level, prepayments do not cause changes to aggregate wealth or the aggregate endowment, since for every MBS investor who is short a prepayment option, there is a homeowner who is long the prepayment option. Any observed covariance between aggregates and prepayments is due to some common economic factors driving both aggregates and homeowner prepayments. In the traditional asset pricing theory, the covariance between prepayments and aggregate wealth or consumption explains the price o prepayment risk. (Gabaix, Krishnamurthy & Vigneron, 2004).
Prior research documents that rating agencies play a key role in the traditional corporate bond market. Credit ratings are perhaps more important in the recently developed markets for structured finance products, including MBS securities (He, Qian, & Strahan, 2011; Osborne, 2014).
Banks are trying to gain for mortgages (more specifically mortgage loans that offer) money in the form of mortgage bonds or Mortgage-Backed Securities (MBS) which are debt securities. This is certain type of assets securities that are secured by a mortgage or collection of mortgages. This kind of assets has to be collected in the rating agencies determined by an accredited and also usually pays regular payments. The principle of investing to the mortgage securities is based on lending money for houses. The investor will receive from the bank securities - mortgage bonds and for him is worthwhile due to gain proceeds in the form of so-called payment coupon (a certain proportion of the amount invested). This profit is obviously lower than the interest rate that gives the banks in providing mortgage credit. Mortgage bonds are also backed by real estate so that in case of defaults on mortgage loans to borrowers the bank can sell the property and pay the creditor.
Other possibility even safer for investors is to invest money to the bonds (the safest type as government bonds). However, the case of government bonds are generally a lower yield than would gain investor to invest money in mortgage bonds because government bonds are virtually risk-free (Krishnamurthy & Vissing-Jorgensen, 2011; Predescu, Hull, & White, n.d.).
Bonds are loans made to large organizations. These include corporations, cities, and national governments. The size of these entities requires them to borrow the money from more than one

source. An individual bond is, therefore, a piece of a massive loan. The borrowing organization promises to pay the bond back at an agreed upon date. Until then, the borrower makes agreed-upon interest payments to the bondholder. The real rate occurs even though the volatility of long-term rates rises. Investors would normally require some compensation that is higher yield – for holding a more volatile asset (Turner, 2011).

There is also strong demand among various types of institutional investors. For pension fund managers focusing on the fixed income markets and seeking high returns but constrained by the level of risk, highly rated MBS tranches offer an ideal vehicle (He, Qian, & Strahan, 2011; Jacoby, n.d.). Mortgage-backed securities (MBS) compete directly with bonds in the investment market. The difference from mortgage pools: The investor owns the security, backed by mortgages, instead of the mortgages themselves. For instance a bond with a stipulated earnings rate of six percent will compete with a mortgage backed security of six and one-half percent. If the mortgages backing up the security are sound, the security is a better option.

Instead of being influenced by the prime rate or auto loans, mortgage rates are more heavily influenced by the bond market. When the bond market is strong, with many investors, the mortgage rate tends to decrease. Conversely, when the bond market is weak, mortgage interest rates tend to increase, to make pools or securities more attractive to investors. This influence renders other consumer interest rates are less important to affecting published mortgage rates (Ayanou, 2016).

For variable referred to as long-term bond yield is the average monthly yield on government bonds with a residual maturity of around 10 years since it has been generally assumed that it is the safest types of securities characterized by high liquidity. The average monthly yield is determined as the average of the daily return of that month and both are contained outright actually performed, as well as estimates equal to the value of the last fair of the business transacted at the stock exchange. As interest rates on mortgage loans are considered average monthly interest rate on all new loan agreements to households between the property and the bank. This includes the guaranteed and non-guaranteed loans other than revolving loans and overdrafts, convenience and extended credit card debt. Within the article, the observed time series average interest rates on mortgage loans by the time of fixation of the initial interest rate and up to 1 year, 1-5 years, 5-10 years and over 10 years as % per annum Data are published by the national bank of the country as well as the ECB. (NBS, 2017; ECB, 2017). Consequence of low long-term rates is that interest rate exposures in the private sector have raised. Massive public sector debt financed at ever lower real long-term rates implies an increased stock of private sector assets locked into very low real returns (Turner, 2011).

The presumption of that is decreasing government bond yields will decline and the proceeds of mortgage bonds (due to comparable securities) and will decrease the interest rates on mortgage loans. A reverse is the same, if they grow government bond yields will raise and income from mortgage bonds and this will result in an increase in interest rates on mortgage loans. Real interest rate coefficients in most cases with the expected negative sign and are statistically significant indicating lowering real interest rates that are associated with rising real mortgage interest rate. As with real income, real interest rate elasticities of house prices are much higher in transition economies. (Égert & Mihaljek, 2007).

Based on the theoretical knowledge and assumptions, identification and assessment of the relationship between the return on long-term government bond yields and the interest rate on mortgage loans in the V4 countries with regard to the Slovak and Czech Republic for the selected period is the aim of this paper. The analysis of average monthly interest rate of return to maturity 10 years government bond of the V4 with a primary focus on Czech and Slovak republic. Analysis of the evolution of the average interest rates on housing loans to households V4 and identification and assessment of the association between the variables in the period

because there is a significant linear relationship between the average monthly return on government bonds and the average monthly interest rate on mortgage loans in the V4 countries.

3.METHODS AND OBTAINED DATA

Initial status was examined by using basic scientific methods incorporating a cycle of gathered empirical data, their classification and processing. The research methods enable one to formulate the new recognition, its elucidation and classification into outputs in the form of diagrams and tables. In the indicated output (of the paper) the fundamental experimental method based on the current state of the rate analysis was used. It analyses the financial situation of mortgage rate, outlines basic problems and subsequently processes outputs by a logical deduction, and, of course, it also summarizes conclusions in the given field.

The main aim of the article is identification and evaluation of the relationship between long-term government bond yields and mortgage interest rates. The data are monitored and evaluated monthly basis for the period from January 2003 to November 2016. In the case of undisclosed or missing data is the relevant period (month) omitted.
The main goal is further structured into detailed subgoals which include:
1. Analysis of monthly yields to maturity of the 10-year government bonds within the V4 countries,
2. Trend analysis of average interest rates on housing loans to households within V4 countries with a primary focus on Czech and Slovak Republic,
3. Identification and assessment of the relationship between variables in the selected time period.

According to subgoals defined in previous section, for each country within V4 group, the followed hypothesis is formulated: There is a significant linear relationship between the monthly yields to maturity of the government bonds and the monthly interest rates on mortgage loans to households. It is necessary to examine whether there is linear dependence between the monthly yields to maturity of the government bonds and the monthly interest rates on mortgage loans within the V4 countries, separately by initial rate fixation up to 1 year, over 1 and up to 5 years, over 5 and up to 10 years and over 10 years for the evaluation of hypotheses.

3.1. Data

For variable referred as "long-term bonds yields", the government bonds with a residual maturity of around 10 years are considered, since it is generally assumed that is the safest type of securities characterized also by sufficient liquidity. Monthly yields are calculated as the average daily values of particular month including both the effectively made negotiated trades on the stock exchange and estimated values equal to the data from the latest effectively traded yield.
The second variable described as "mortgage interest rate" or "interest rates on mortgage loans" refer to monthly interest rates on all new loan agreements (new businesses) between households and banks. This includes the guaranteed and non-guaranteed lending for house purchase excluding revolving loans and overdrafts, convenience and extended credit card debt (NBS, 2017a; ECB, 2017). Time series of interest rates on mortgage loans by initial rate fixation up to 1 year, over 1 and up to 5 years, over 5 and up to 10 years and over 10 years in % p.a. are observed and analyzed within the paper. Data are periodically published by national banks of V4 countries as well as the ECB.
Data are monitored and evaluated on a monthly basis for the January 2003 – November 2016 period. In the case of unpublished or missing data, the relevant period (month) is omitted.

3.2. Methods

Statistical methods are used exclusively. Time series analysis is used to assess the development of yields to maturity of the government bonds as well as the development of interest rates on mortgage loans. Pearson correlation coefficient allows expressing the relationship between the analyzed variables. Linear regression merely has an informative value and is used for description of the trend for both the monitored variables.
Comparing evaluated data got by Pearson correlation coefficient with F statistic and p – values as an important part of series analysis. F statistics is a value that is able to compare results of regression analysis to find out if the means between two different factors. The p - value is determined by the F statistic and is the probability of results. The F statistic must be used in combination with the p value when deciding if overall results are significant. The paper shows and compare test data in the conclusion.

4.RESULTS AND DISCUSSION

Identification and assessment of the relationship between variables in the selected time period and defining in previous section for V4 group with the main purpose to show the significant linear relationship between the monthly yields to maturity of the government bonds and the monthly interest rates on mortgage loans to households.
It is necessary to examine whether there is linear dependence between the monthly yields to maturity of the government bonds and the monthly interest rates on mortgage loans within the V4 countries, separately by initial rate fixation up to 1 year, over 1 and up to 5 years, over 5 and up to 10 years and over 10 years for the evaluation of hypotheses.
Development of the monthly government bonds yields and interest rates on mortgage loans was carried out through the time series analysis and subsequently graphically processed. Figure 1 shows the monthly yields to maturity of the 10-year government bonds and monthly interest rates on mortgage loans to households by initial rate fixation for the Czech Republic. Figure 2 represents the same variables for Slovakia.
Figure 1 shows the downward trend of monthly yields to maturity of the 10-year government bonds and the average mortgage interest rates, further categorized by initial rate fixation in the selected period (as evidenced by the negative slope of the line). Except the slightly fluctuations, this decrease begins in the crisis period and continues to the present. Unfavourable economic outlook, scepticism of investors in stock markets and investments rather into "safe" securities were the reasons which pushed the yields down.

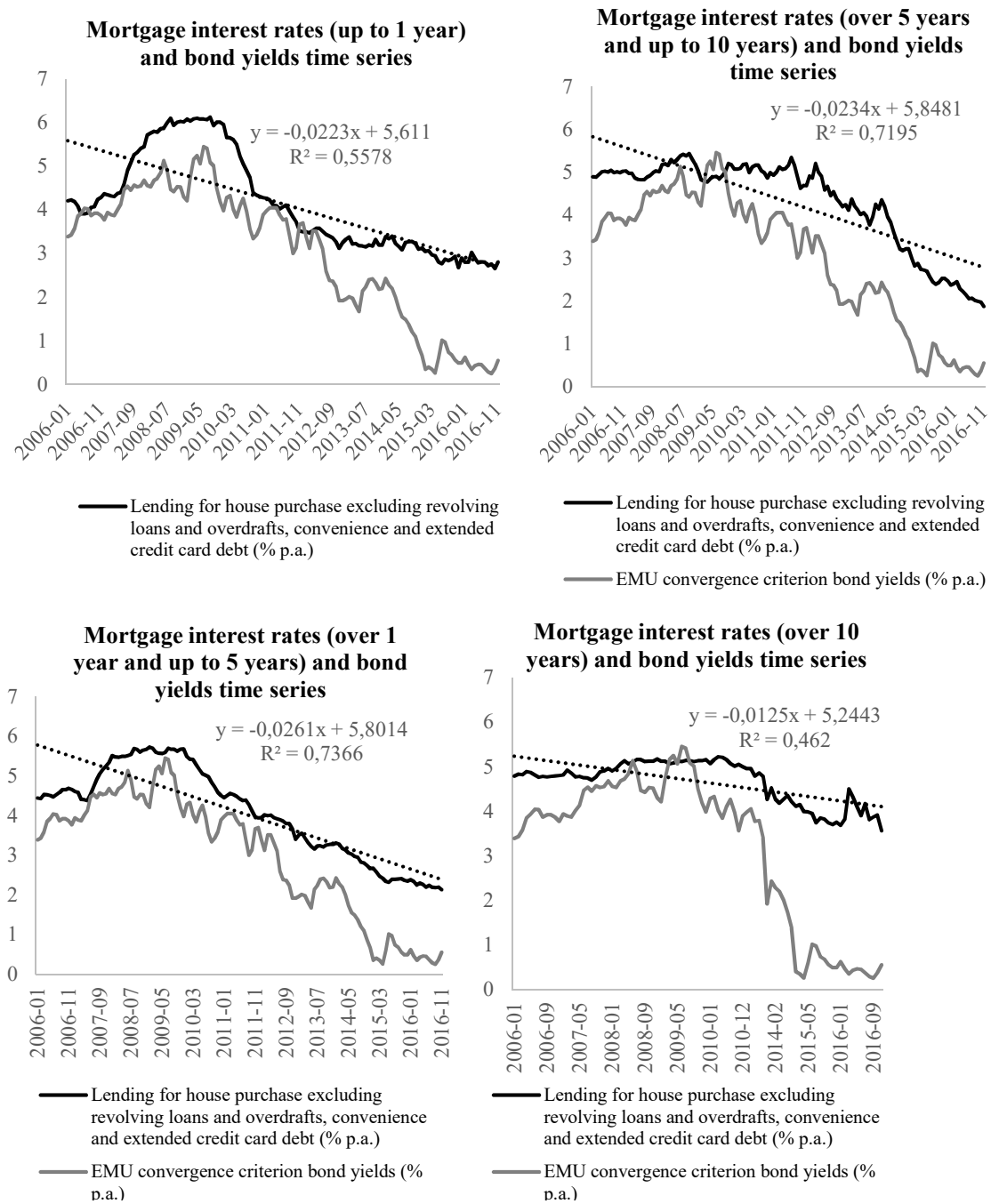


Fig. 2 – Monthly mortgage interest rates by various initial rate fixation and monthly government bonds yields by EMU convergence criterion time series (Czech Republic) Source: own processing based on ECB and EUROSTAT data

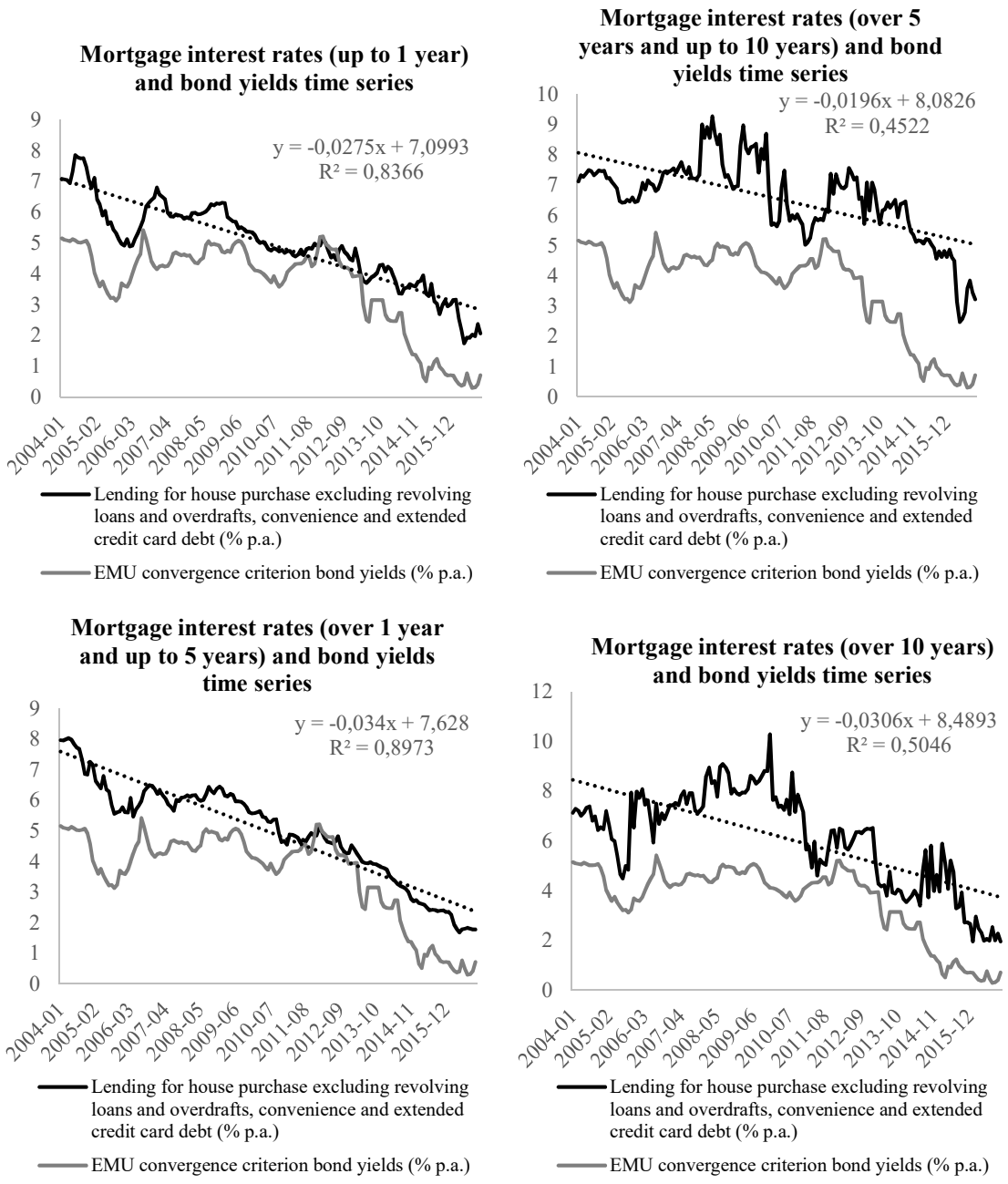


Fig. 3 – Monthly mortgage interest rates by various initial rate fixation and monthly government bonds yields by EMU convergence criterion time series (Slovak Republic) Source: own processing based on ECB and EUROSTAT data

As in the previous case Slovakia is also characterized by the decline of both observed variables, but with significantly non-linear development especially in the case of mortgage interest rates with medium and long term fixation of initial interest rate.
Figure 3 captures the yields to maturity of the 10-year government bonds in Hungary and Poland. Even for these countries the decrease in yields mainly in the post-crisis period was observed.

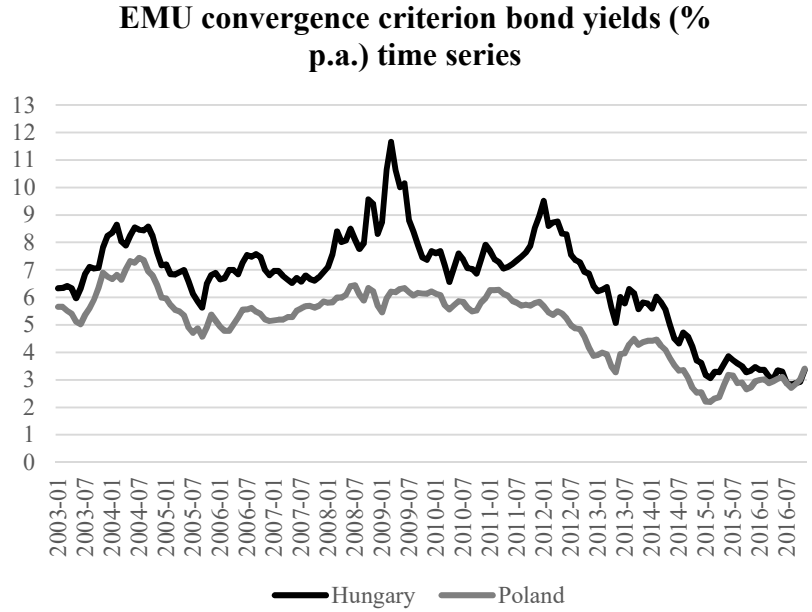


Fig. 4 – EMU convergence criterion bond yields (% p.a.) (Hungary; Poland) Source: own processing based on EUROSTAT data

The results of conducted analysis can be summarized into few points:

1. Downward trend in interest rates as well as yields on the government bonds, particularly since 2008, reflects the impact of the crisis which forced investors to partially restrict investments into much riskier types of securities and rather turned their attention into safe ones. This result into a significant strengthening of "bond market" associated with the decrease in yields and the lowest mortgage interest rates for more than the past decade.

2. Significantly non-linear trend of monthly mortgage interest rates to households of Slovakia and Czech Republic by initial rate fixation over 5 years was observed.

3. Yields on 10-year government bonds are generally held below the level of mortgage interest rates (in % p.a.), suggesting but still does not prove a linear relationship of the two observed variables.

4. Yields on long-term bonds of Czech republic are in average about 1.3 percentage point lower than the mortgage interest rates to households measured in % p.a. and regardless of the initial fixation rate for the selected period; for Slovakia, the monthly yields on government bonds are in average about 2 percentage points lower than the mortgage interest rates and from the data set for Hungary and Poland (EUROSTAT, 2017) the decrease of almost 3 and 1.7 percentage points respectively was observed.

Graphical representation of dependence between yields on government bonds and mortgage interest rates in the Czech and Slovak Republic is depicted in figures 4 and 5.

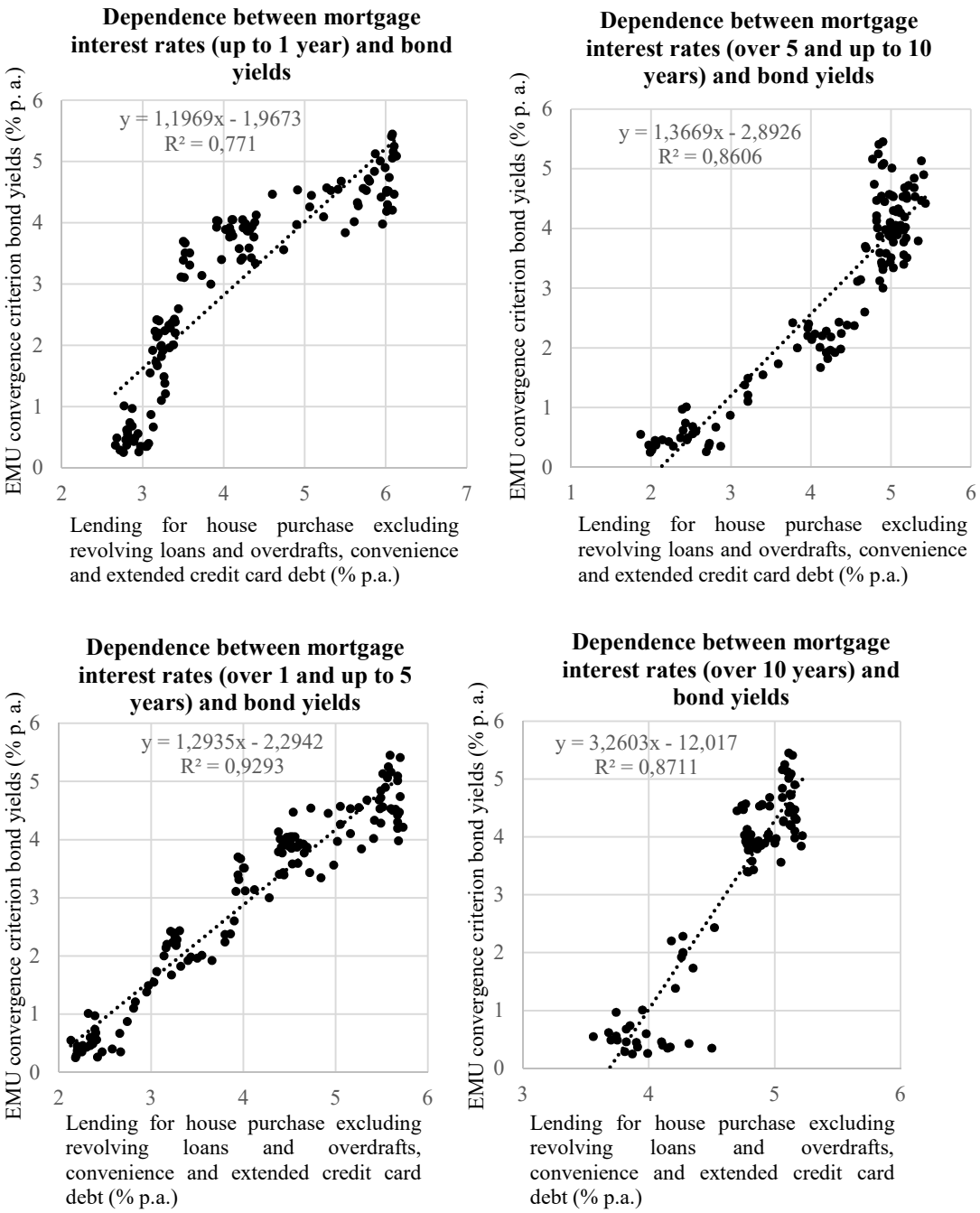


Fig. 5 – Dependence between yields on government bonds and mortgage interest rates with various initial rate fixation (Czech Republic), Source: own processing based on ECB and EUROSTAT data

Figure 4 shows dependence between compared variables could be considered as linear due to calculated coefficient of determination. Results for Slovakia are depicted in figure 5.

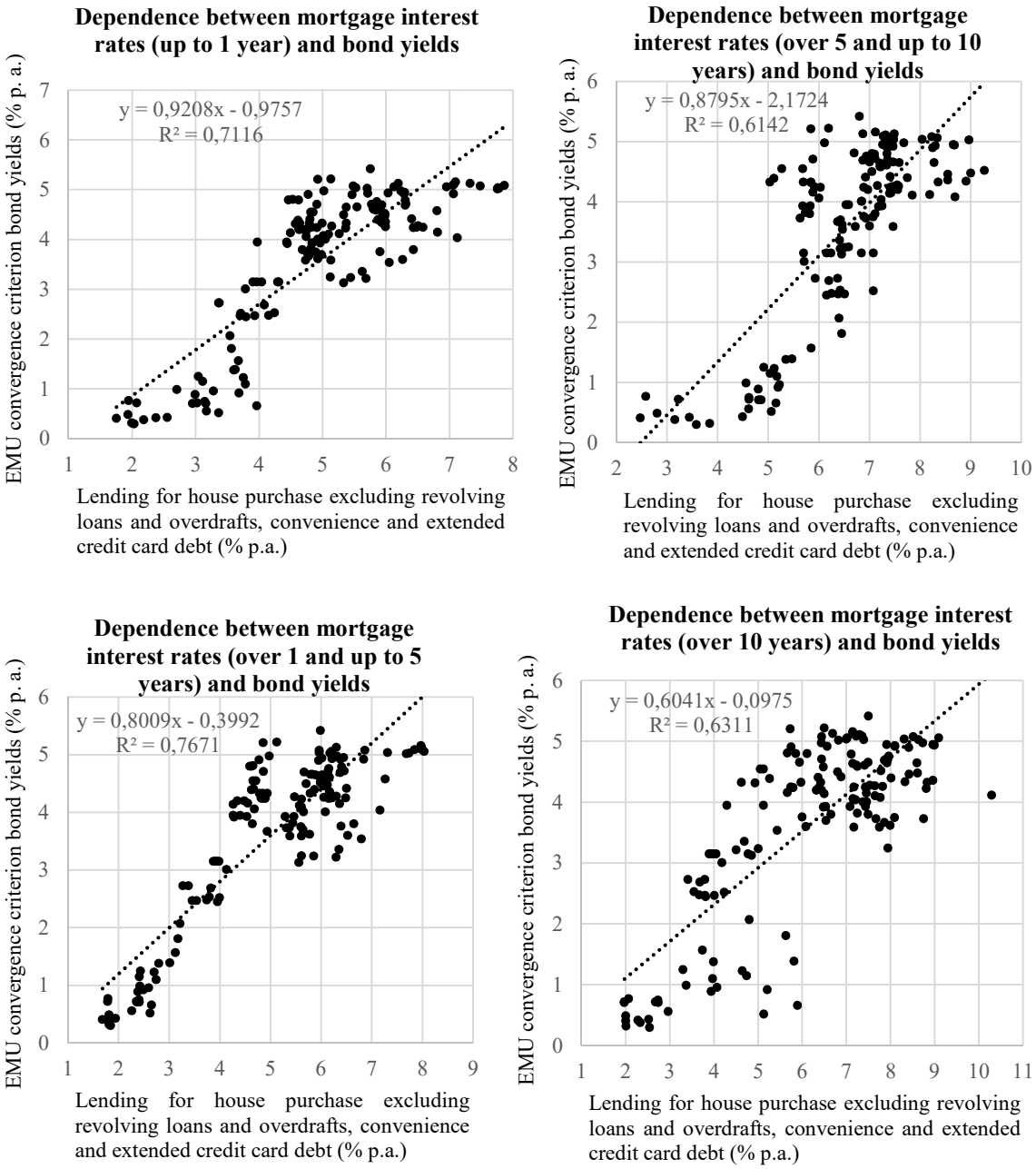


Fig. 6 – Dependence between yields on government bonds and mortgage interest rates with various initial rate fixations (Slovakia) Source: own processing based on ECB and EUROSTAT data

The figure 5 shows the linear trend that has only informative value. Increase or decrease of observed variables (in % per annum) depends significantly on economic conditions. If negative outlook is expected, investors usually start to prefer "safe" types of securities, so their portfolio include more of these, such as government bonds or mortgage-backed securities, which are comparable to government or high-rated corporate bonds and mostly compete on market to each other. This causes an increase in demand for those securities, what subsequently results in lower yields, directly pushing down also mortgage interest rates which height depend mostly on yields of mortgage-backed securities. If a favourable economic outlook is expected, the opposite situation occurs.

It is necessary to calculate the correlation coefficients in individual cases to evaluate hypotheses. Table 1 depicts values of Pearson correlation coefficients expressing the relationship between variables being monitored for all V4 countries.
The column of "*Pearson correlation coefficient*" contains correlation coefficients and means that when is closer to 1 the correlation is stronger and is positive and if the value of correlation is close to -1 is strong negative. If the coefficient is 0 between the variables is not correlation.
F values has been used for p-values calculation as a determinant whether the correlation is significant or not. The obtained results were subsequently compared with $\alpha = 5\%$.. If the calculated p-value is less than the selected "α" the evaluated correlation is significant. If it is not lower the correlation is not significant.
The table 1 shows in that case when is the indication of "significant" and the correlation coefficient is close to 1 there is strong and significant correlation and therefore the hypothesis for this country and evaluated dependence can be accepted. It summarizes important results for each correlation along with necessary statistics.
Tab. 1 – Pearson correlation coefficients

Czech Republic				
Dependence:	**Pearson correlation coefficient**	***F* value**	***p*-value**	**Result**
X (up to 1 year)/Y	0.8780	434.21	4.1306E-43	Significant
X (over 1 and up to 5 years)/Y	0.9640	1 696.89	4.2593E-76	Significant
X (over 5 and up to 10 years)/Y	0.9277	796.66	4.7277E-57	Significant
X (over 10 years)/Y	0.9333	601.23	2.3329E-41	Significant
Slovakia				
Dependence:	**Pearson correlation coefficient**	***F* value**	***p*-value**	**Result**
X (up to 1 year)/Y	0.8436	377.52	3.7225E-43	Significant
X (over 1 and up to 5 years)/Y	0.8759	504.02	2.8181E-50	Significant
X (over 5 and up to 10 years)/Y	0.7837	243.61	1.8481E-33	Significant
X (over 10 years)/Y	0.7944	261.80	5.9121E-35	Significant
Hungary				
Dependence:	**Pearson correlation coefficient**	***F* value**	***p*-value**	**Result**
X (up to 1 year)/Y	0.8534	442.24	1.4997E-48	Significant
X (over 1 and up to 5 years)/Y	0.7726	244.28	2.2586E-34	Significant
X (over 5 and up to 10 years)/Y	0.7431	203.49	1.3542E-30	Significant
X (over 10 years)/Y	0.1469	3.60	0.0597	Insignificant
Poland				
Dependence:	**Pearson correlation coefficient**	***F* value**	***p*-value**	**Result**

X (up to 1 year)/Y	0.8270	305.12	4.3763E-37	Significant
X (over 1 and up to 5 years)/Y	-0.1513	1.15	0.2890	Insignificant
X (over 5 and up to 10 years)/Y	0.3244	6.23	0.0157	Significant
X (over 10 years)/Y	0.3967	9.34	0.0036	Significant
where: X – Lending for house purchase excluding revolving loans and overdrafts, convenience and extended credit card debt Y – EMU convergence criterion bond yields Significance level: $\alpha = 0,05$				

Source: own processing and also own processing based on NBS, MNB, NBP, ECB and EUROSTAT data

Table 1 as well as figures 4 and 5 shows a significant linear dependence between the variables mainly for the Czech Republic and Slovakia. For Hungary is acceptable linear dependence only for initial rate fixation up to 10 years. For Poland, significantly disparate results were obtained and the linear dependence appears only in case of mortgage interest rates with initial rate fixation up to 1 year. This could be caused primarily due to incomplete set of data for mortgage interest rates with initial rate fixation over 1 year.
Using Cohen's rating scale (Rimarčík, 2007; Kuzmišinová & Kuzmišin, 2011) allows transformation of numerical values from table 1 to verbal phrases (Tab. 2).

Tab. 2 – Pearson correlation coefficient using Cohen's rating scale

Dependence:	**Pearson correlation**			
	Czech Republic	Slovakia	Hungary	Poland
X (up to 1 year)/Y	very high	very high	very high	very high
X (over 1 and up to 5 years)/Y	almost perfect	very high	very high	low
X (over 5 and up to 10 years)/Y	almost perfect	very high	very high	medium
X (over 10 years)/Y	almost perfect	very high	low	medium
P – value	extremely significant	extremely significant	significant	significant
where: X – Lending for house purchase excluding revolving loans and overdrafts, convenience and extended credit card debt Y – EMU convergence criterion bond yields				

Source: own processing based on NBS, MNB, NBP, ECB and EUROSTAT data

Table 2 allows evaluating the hypotheses. For each country, the hypothesis can be accepted only if every monitored possibility (X/Y dependence from table 2) is characterized by at least as a "high" correlation (according to Cohen's scale, when correlation coefficient reaches 0.5 or more in absolute value). For the Czech Republic, almost perfect correlation between the observed variables is defined in average, so the hypothesis is accepted. For Slovakia, the level of correlation is very high, also allowing accepting the hypothesis. On the other hand, the same hypothesis is rejected for Hungary and Poland.

4 CONCLUSIONS

The MBS market is also a highly specialized market that requires a great deal of expertise on the part of the investor. In line with theory paper presents the relationship between interest mortgage rates and bond prices has inverse meaning: increasing of the interest mortgage rate, the bond interest rate declines. The bond yield can show as a one of indicators whether mortgage rates will rise or fall. The paper offered one of the way for assessment and assumptions of current interest mortgage rate and relationship with bond rate focused on current developing interest mortgage rate and bond rate in the closet countries of Slovakia - V4 (Slovakia, Czech, Poland and Hungary). Conclusion of the article is based on the scientific methods to clear the direct relationship between interest mortgage rate and bond rate.
The relationship between change in the interest rate and the bond yields can be measured by duration. It reflects a bond's price changes and change of the interest rate. The evaluated correlation and results affirming the relationship between examined variables. The Pearson correlation coefficients mean that when a value is closer to 1 the correlation is stronger and is positive. Evaluated p-value is compared and determines the significant correlation between examined variables. The indication of significance of relationship and the correlation coefficient is strong and therefore the laid out hypothesis for this country and evaluated dependence is able to accept.

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PEER ANALYSES OF THE PROFITABILITY AND LONG TERM SUSTAINABILITY OF SELECTED BANKS

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Abstract

In the last ten years, the concept of low-cost banks has changed the Czech banking system, motivating clients to push the bank to change their pricing and product policy, and won against conservatism in the traditional banking market in the Czech Republic. The aim of this paper is to compare selected banks based on results using peer analysis of financial and other banking sector indicators according to selected statistical methods (the principal components analysis, cluster analysis). The secondary aim is to analyze, whether the low-cost banking segment changes the profitability of "big" banks and the value of other selected indicators (based on 2015 values) during their ten year history and verify if we can still classify them into the low-cost banking segment. These selected indicators are: capital adequacy, balance sheet total, return of equity, return on assets, net interest margin and number of clients. In analyzing of selected banks, the principal components analysis was used for the input of data processing, and subsequently, cluster analysis was used. The basic purpose of using the main components method is to simplify the description of the Group mutually correlated with the absence of the Relations Division on the dependent and independent variable. For the analyses, 10 banks were selected (four "large", two "medium" and five "small" from the low-cost banking segment). The results will be presented as a graphical figure, called a dendogram, providing a highly interpretable complete description of the hierarchical agglomerative clustering. Finally, there the paper will identified the median value of the created variables of clusters' characteristics based on the data from period 2004-2013 and 2015.
The results of the final analyses show that the big and middle banks generate millions in profits and remain in a stable position even with the existence of the low cost banking segment. Low cost bank are attractive to current and potential clients due to their pricing and product policies. Over the long term, this business model could be risky because it makes the low cost banking segment susceptible to bankruptcy.

Keywords: bank, financial indicators, financial market, low-cost bank, peer analysis, profitability

JEL Classification: G21, M31, C38, O16

1.INTRODUCTION

The Czech banking market is one of the most stable, with a high degree of client loyalty in the Central and Eastern European region. It has been ten years since the entry of the first low-cost bank to the banking market in the Czech Republic. The concept of low-cost banks was defined by Lakowski (2012) as a business model mainly focused on young and innovative clients who prefer an internet platform. The first bank with a low-cost policy was mBank, which entered the Czech banking market in 2007. Prior to that, the banking market was controlled by just three "big" banks (ČS, ČSOB and KB) with 70% of the market share and because of the Czech clients´ nature, the volume of deposit per client was significantly higher. The situation was unique because standards in the surrounding markets were different because markets there were originally divided between more major banking houses.

In 2009, the financial world was hit by a global financial crisis and influenced their profits and client behavior. The clients began to think about their loans and assets in greater detail. In general, the crisis meant lower demand for retail and corporate loans, and clients spent more prudently. More massive entry of the low cost banks was from the beginning of 2010, and the new coming banks have changed the market and created the new low-cost banking segment. Since 2010, the old banking concept was challenged by this new business model. Low-cost banks offered low-fee banking based on an innovative internet platform, accompanied by a clear and transparent pricing policy. Later their main innovations were based on attractive interest rates on deposits, the possibility of refinancing all loans and mortgages. Their target group was a young people with a positive attitude to the internet and ability to trust the new low-cost concept. All these facts were in synergy with their marketing campaigns.
The selection of appropriate indicators must be based on the availability of bank data. Analysed banks were segmented according to the Czech National Bank methodology (2016) and the study analysed 3 "large" banks: Česká spořitelna (ČS), Československá obchodní banka (ČSOB), Komerční banka (KB); 2 middle banks: UniCredit Bank Czech Republic and Slovakia (UNI), Raiffeisen bank (RB) and 5 small banks Air Bank (Air), Equa bank (Equa), mBank S. A. (mBank), Fio Bank (Fio) and ZUNO BANK A.G. (Zuno). The required data were obtained from the annual reports, and the analysed database has been chosen with regard to the specifics of selected banking sectors and their disclosure rules. The indicators were classified for period 2004-2013 and 2015, in more detail these indicators were capital adequacy, balance sheet total, return of equity, return on assets, net interest margin and number of clients. In the context of the analysis of selected banks, it used peer analysis. Peer analysis is a term including an analysis of the similarity by selected indicators in the initial analysis methods using the principal components analysis and subsequent cluster analysis. The basic purpose of using the principal components analysis is to simplify the description of the Group mutually correlated with the absence of the Relations Division on the dependent and independent variable. The paper is based on data which had been published before 28. 1. 2017.

2.LITERATURE REVIEW

Guevera, **Chyba! Nenalezen zdroj odkazů.** Maudos and Perez (2007) analyses the level of competition in the European financial markets; De Bandt and David (2000) uses the H indicator suggested by Panzar and Rosse (1987) and their contribution is to provide how the economic changes may affect banks, separately for large and small banks on US and EU banking markets. A lot of international authors´ analysis the relationship between profitability and the bank's economic cycle (scientific studies by Short, 1979; Smirlock, 1985; Bikker and Hu, 2002). Some studies are focused on the relationship between profitability and other external indicators like inflation, gross domestic products or bank taxation (Huizinga, 2000; Bikker and Hu, 2002; Albertazzi and Gambacorta, 2009). Efficiency of selected European banking sectors evaluating Černohorská (2015), who has written that bank efficiency is a relatively complicated analytical problem and that there is no generally accepted concept of efficiency nor is there a uniform system of indicators for measuring bank efficiency. Depending on the combination of selected indicators, the cluster composed of the Czech Republic and Slovakia can be qualified as a cluster with the highest possible efficiency in the banking sector. Hedvičáková, Pozdílková (2015) has analysed that the most beneficial is an account from mBank, for reasons of zero monthly fees and the relatively good availability of ATMs. Closely followed by the products from Fio banka (FIO) and Raiffeisenbank (RB). Conversely, the least favourable is an account from ČSOB, followed by accounts from Česká spořitelna (ČS) and Komerční banka (KB).
For the analysis, it was necessary to choose the appropriate financial indicators. The set of financial indicators and their impact on the firm competitiveness have defined Scholleová,

Čámská (2015). Contributed to the selection of scientific studies, Albertazzi and Gambocorta (2009) and Demirgüç-Kunta and Huizinga (1999), who analyzed the impact indicators ROA on the banking performance. Further scientific study Molyneuxa and Thornton (1992), which dealt with the influence of the interest margin and ROA.

3.OBJECTIVE AND METHODS

The professional objective of this paper is to focus on collection, processing and interpreting of secondary data concerning the position of big banks on the financial market in the Czech Republic in context of the entry of the low-cost banks. The aim is to compare selected banks based on results using peer analysis of financial and other banking sector indicators. The secondary aim is to analyses, whether the low-cost banking segment changes the profitability of "big" banks and the value of other selected indicators (based on 2015 values) during their ten year history and verify if we can still classify them into the low-cost banking segment.
In the article will be used the principal components method. Principal component analysis (PCA) transforms the initial input variables into fewer mutually no-correlation of main components. These principal components method represent almost the whole of the variability of the original variables, and from checking uncorrelated with each other. Each major component is then a linear combination of the original variables, with the first main component describes the largest part of the variability of the original data, the second describes the largest part of the variability in not included in the first, etc. (scientific studies by Field, 2005; Hebák, 2007; Lavine, 2000; Melon, 2005). In the principal components analysis, the data are summarized as a linear combination of an orthonormal set of the vectors. The first principal component accounts for as much of the variability in the data as possible, and each successive component represents as much of the remaining variability as possible. (Zou, 2006) Components accounting for maximal variance are retained while other components accounting for a trivial amount of variance are not retained. These techniques are typically used to analyze groups of correlated variables representing one or more common domains.
The results of the principal components method will be used in cluster analysis - the hierarchical agglomerative clustering. The results of cluster analysis will be present in graphical figure, called a dendogram.
Finally, there the paper will identified the median value of the created variables of clusters' characteristics based on the data from period 2004 - 2013 and year 2015.

3.1.Cluster analysis

Input a prerequisite for performing a cluster analysis is that the data is not affected by the multicollinearity. It is necessary to construct a correlation matrix, subsequently eliminate those criteria in the assessment of relationship between them, and reaching the correlation coefficient higher than 0.7. (Romesburg, 2004) In the case of retention of the criteria, the correlation coefficient is higher 0.7; it must include a justification of its further occurrence for cluster analysis.
Cluster analysis is a collective term covering a wide variety of techniques for delineating natural groups or clusters in data sets. In the article will be used hierarchical agglomerative clustering. Hierarchical agglomerative clustering start at the bottom and at each level recursively merges a selected pair of clusters into single clusters. This produces a grouping at the next higher level with one less cluster. Algorithm of hierarchical agglomerative clustering begins with every observation representing a singleton cluster. At each of the N-1 steps the closest two (least dissimilar) clusters are merged into a single cluster, producing one less cluster at the next higher level. (Hastie, 2013)

In the first stage of clustering calculated mutual distance of objects and write it into the matrix. We get a square symmetric matrix $D = \{d(R,S)\}$, which has a main diagonal zeroes. Used to calculate the metric distance matrix is used by default and is the Euclidean method. Its base is in the geometric model of the data. (Romesburg, 2004)
Objects characterized by p characters are assigned points p-large Euclidean space, then for two points (*R, S*) is defined Euclidean distance (2):

$$d(R,S) = \sqrt{\sum_{i=1}^{p}(x_{ri} - x_{si})^2} \quad . \qquad (2)$$

Method of clustering was used the method of the furthest neighbour. Complete linkage clustering agglomerative (furthest neighbour) takes the intergroup dissimilarity to be that of the furthest (most dissimilar) pairs according to the formula (3):

$$d(R,S) = \max_{\substack{O \in R \\ O \in S}} \{d(O_i, O_j)\} \text{ for } R \neq S \qquad (3)$$

where
R, S … represent two such groups
$d(R,S)$ … represent dissimilarity between R and S in computed from the set of pairwise observation dissimilarities $d(O_i, O_j)$, where one member of the pair O_i is in *R*, and the other O_j is in *S*.

Method of clustering is selected based on the degree of assurance, cophenetic correlation coefficient "CC". The higher the coefficient CC value (a value approaching 1), the greater the credibility and the selection of suitable cloud-based model. (Hastie, 2013; Romesburg, 2004)
The result is graphical figure called a dendogram with provided a highly interpretable complete description of the hierarchical agglomerative clustering.

4.RESULTS AND DISCUSSION

From the 1st of January 1990 there has been two-stage banking system in the Czech Republic. This system has had to transform from the oligopolistic structure sector, where just a few state-owned and still state-controlled banks played an important role, to the modern banking system. This banking system had to overcome insufficient regulation and supervision, very poor product portfolio, lack of technical capacity and skills among the product managers and staff of the banks, create new marketing strategy and pricing policy. We can say that this transformation was problematic and nowadays the banking system can be considered a profitable sector with a high level of competitiveness.

4.1.The position of low-cost banks in the Czech banking sector

The universal banks are basic component of the Czech banking sector. According to the Czech National Bank, we can divide the subjects into five basic groups - large banks (balance sheet above CZK 250 billion), medium-sized banks (balance sheet between CZK 50 - 250 billion) and small banks (balance sheet lower than CZK 50 billion), as well as branches of foreign banks and building societies. Branches of foreign banks can be included in the Czech banking system after the Czech Republic joined the European Union (EU) on the basis of a single banking

license. Currently there are 5 low-cost banks: are Air Bank (Air), Equa bank (Equa), mBank S. A. (mBank), Fio Bank (Fio) and ZUNO BANK A.G. (Zuno). In a lot of press speeches, the spokespersons of these banks agreed that most of their clients had been acquired from three big banks. In the next step, we compare the total assets of the mentioned banks with a number of their clients. We can have a picture of the clients` activities. "In the marketing campaigns in 2010 – 2013, low cost banks determined as their objective to differentiate themselves from standard traditional banks by focusing on creating a spontaneous awareness of their brand and getting onto the "consideration list" of dissatisfied clients who were thinking about changing their bank. In the first step, there was brand communication, followed by a comparison product campaign using the following key comparison criteria: deposit products, loan facilities and services for businesses. The aim of the campaign was to get the clients to think about their old bank and the products they did not need. In the marketing communication, the campaigns emphasized product disadvantages of the traditional banks.", see Hes, Jílková (2015). The entry of new low-cost banks brings to the market a new dynamic from many perspectives, mainly from the point of pricing policy and product innovation.

One of the aims of this contribution is to analyze how the new low-cost bank segment has influenced the banking system and the business in the Czech Republic during last ten years. It will be good to demonstrate the power of three biggest banks on the Concentration Ratio, which is one of the most commonly, used indicators of market shares of the largest banks on the market and it is used by the Czech National Bank. This ratio is expressed by the shares of the three, five and ten largest banks in the total assets, in client receivables and in client deposits. The development during the last 15 years is described in Fig. 1 – Bank Market Concentration. It shows the evolution of the concentration in 2001-2015.



Fig. 1 – Bank Market Concentration. Source: Author according CNB (2016).

The share of big banks (ČS, ČSOB, KB) in the total assets of the banking sector in 2001 - 2015 describes the permanent decisive role of the three largest banks whose share is gradually decreasing in the favor of the other banks from the nearly 60% to the level of 48.8%. It means that the position of the big banks is weaker in favor of smaller or low-cost banks and the market is more competitive. A more significant decrease was seen in client deposits and the reason

could be the decrease in number of big bank´s client. The concrete situation is described in Tab. 1 – Balance Sheet and number of clients (2015).

Tab. 1 – Balance Sheet and number of clients (2015). Source: Author according Banks Annual Reports (2015).

k 31. 12. 2015	BALANCE SHEET TOTAL mld. CZK		NUMBER OF CLIENTS	
BIG BANKS	2807,5		9,248	
ČS	959,6		4,77	
ČSOB	956,3		2,831	
KB	891,6	74%	1,647	76%
MIDDLE BANKS	793,5		0,843	
UNI	547,218		0,343	
RB	246,32503	21%	0,5	7%
LOW-COST BANKS	212,2		2,064	
AIR	81,6		0,424	
EQUA	36,9		0,2	
FIO	57,6		0,59	
Mbank	24,6		0,57	
ZUNO	11,5	6%	0,28	17%
TOTAL BANKS	3813,2	100%	12,155	100%

The balance sheet is a part of financial statements that highlights the financial position of a bank at a current time and reflects the bank's management and earning power. Low-cost banks have acquired nearly 17% of the client portfolio of all banks, but the balance sheet total it not completely consistent with this fact (only 6%). The same data portfolio was analyzed on data from 2012, where low-cost banks acquired 10% of the client portfolio of all banks and the balance sheet result was much worst (only 4%). The reason may be the fact that the low-cost banks haven´t acquired wealthy clients or clients who usually have more bank accounts and they do not use these new banks for their day to day banking needs. But on the other hand, we must further consider that the low-cost banks do not have too many corporate clients and this fact can influence the figures as well.

4.2.Visualize data by using factor analysis

For the graphical visualization, before the cluster analysis, we will use the method of the main components. (Zou, 2006) The first major component depletes approximately 78.50% of the total variability in the data; the second contained approximately 10.64%. The results of the factor analysis are presented in the Tab. 2 - Load of factor. The table shows the significant criteria for further analysis, and analysis of the cluster. The criteria highlighted in bold text were marked as relevant to the process of clustering.

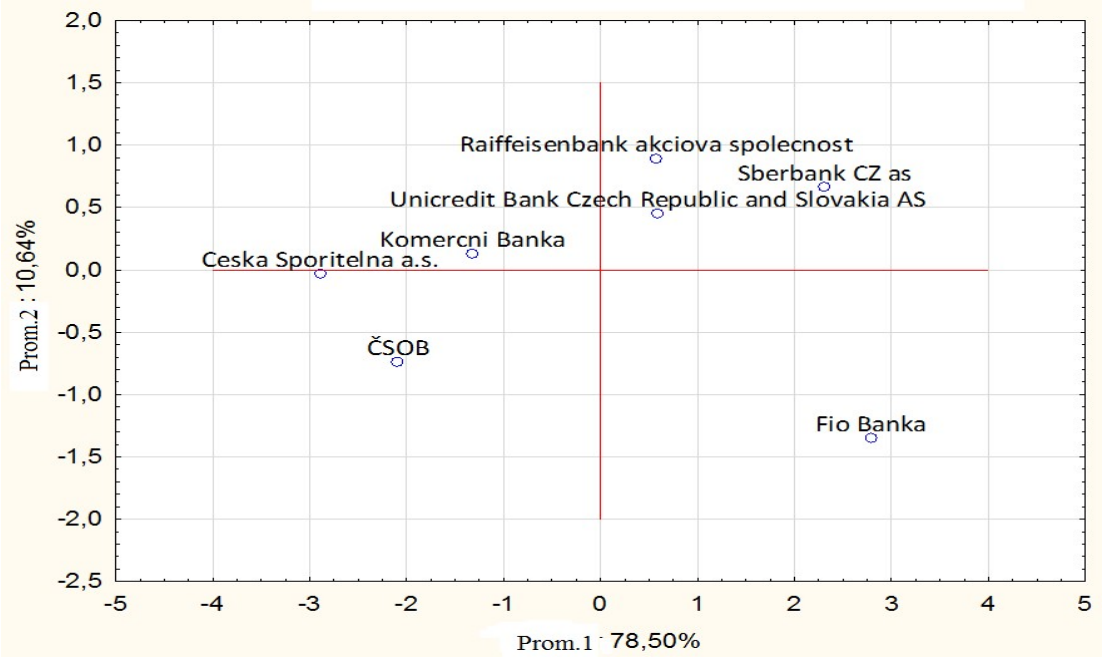


Fig. 2 – Split by the first two principal components (or variables). Source: Author calculation.

Tab. 2 - Load of factor. Source: Author calculation

	Varable 1	**Variable 2**	**Variable 3**
NET INTEREST MARGIN	0.244114	**0.919317**	0.296825
ROA	0.651529	0.356357	0.628316
ROE	**0.880148**	0.144574	0.370396
CAPITAL ADEQUACY	0.332951	0.348909	**0.850993**
BALANCE SHEET TOTAL	**0.776892**	0.274167	0.541889
NUMBER OF CLIENT	**0.869722**	0.331120	0.192843

4.3.Results of cluster analysis

Verification provided will be validated Spearman correlation coefficient. The criteria that are entering the cluster analysis and meet the condition of multicollinearity are:

- Net interest margin;
- ROA;
- ROE;
- Capital adequancy;
- Balance sheet total;
- Number of clients.

This is followed by a selection of cluster treatments, and this clustering method (method of the furthest neighbor, or full join according to statistical Statistica version 12.1) and the method of calculating the distance (Euclidean distance). Method of clustering has been selected on the

basis of coefficient "CC". Coefficient CC chosen on the basis of the achievement of values approaching 1 - method of the complete linkage.
Determination of the relevant number of lot of cloud-based clustering of contour is identified peace a distance of approximately 2. Below this level is established by the relevant number of clusters (see Fig. 3).

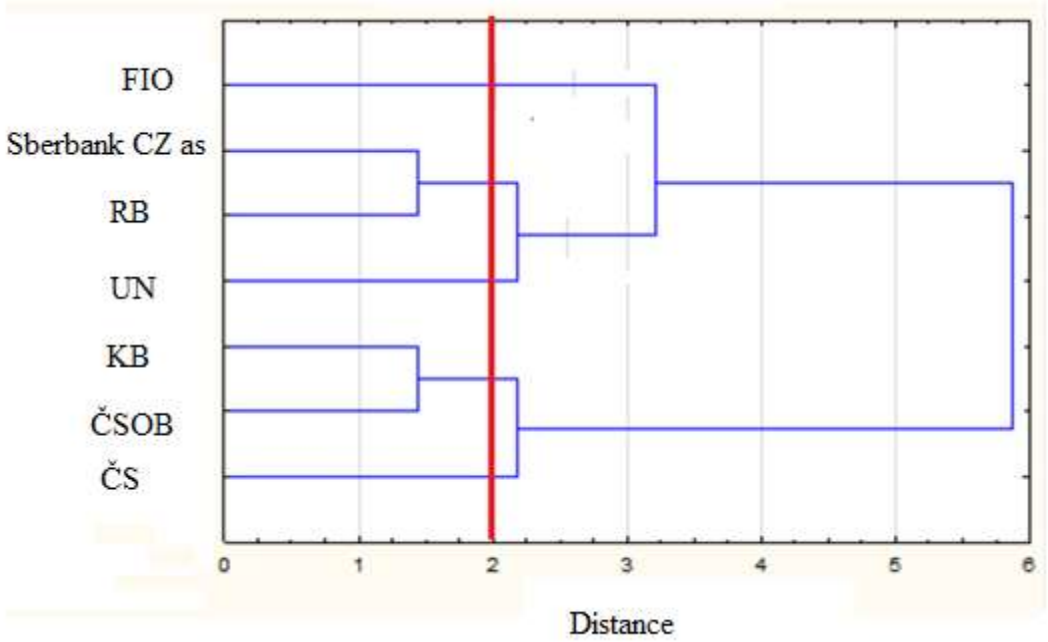


Fig. 3 – Dendogram (Euclidean distance, Complete linkage clustering aglomerative) in period 2004-2013. Source: Author's calculation.

Tab. 3 - Characteristics of clusters according to the of the created variables (median value, period 2004-2013). Source: Author according Annual Reports (2004 - 2013)

	BANK	Net interest margin (%)	ROA (%)	ROE (%)	Capital adequacy	Balance sheet total (mld.)	Number of client (mil.)
1 CLUSTER	**SBERBANK CZ AS , UNICREDIT BANK CZECH REPUBLIC AS, RAIFFEISENBANK AS**	3,1	1.8	9.6	13.5	413.5	0.392
2 CLUSTER	**KOMERCNI BANKA, CESKA SPORITELNA A.S., ČSOB**	3.3	1.8	1,7	15.2	920.4	3.681
3 CLUSTER	**FIO BANKA**	0.9	0.4	9.1	10.4	48.0	0.480

Criteria that are entering the cluster analysis are very important for this Case Study. As we expected, we can distinguish three main clusters (for period 2004-2013). There are three "big" banks with the median value of balance sheet in total CZK 920,4 mld., three "middle- sized"

banks with the median value of balance sheet in total CZK 413,5 mld. and Fio bank which has it´s value of balance sheet in total CZK 48 mld. and the profit CZK 0,4 mil..

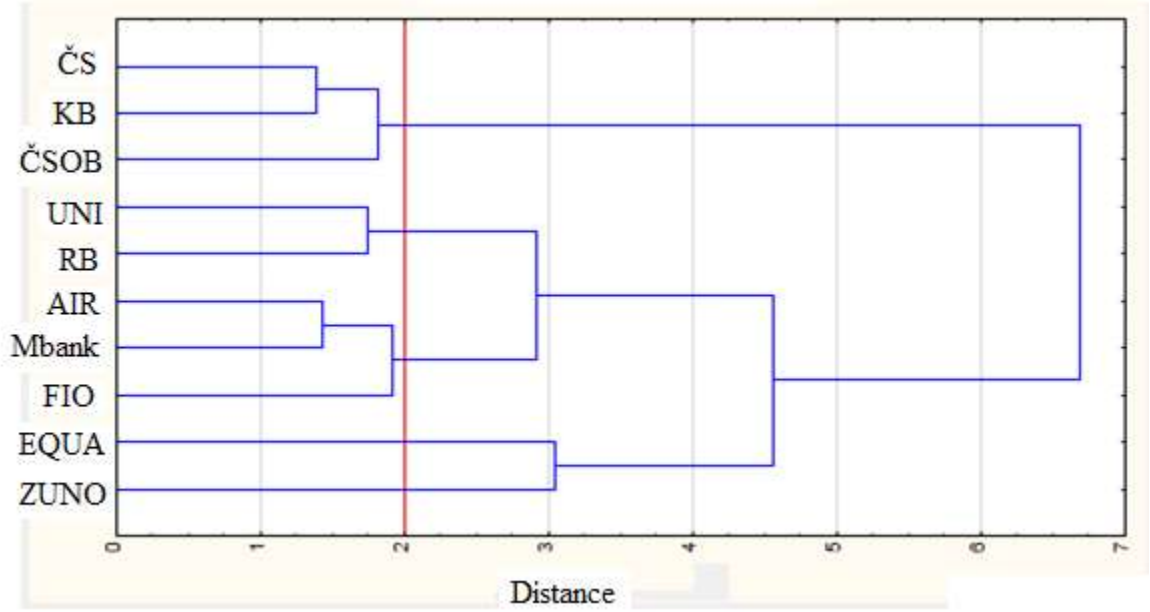


Fig. 4 – Dendogram (Euclidean distance, Complete linkage clustering agglomerative) in 2015. Source: Author's calculation.

Tab. 4 - Characteristics of clusters according to the of the created variables (median value, 2015). Source: Author according Annual Reports (2015)

	Net interest margin (%)	**ROA (%)**	**ROE (%)**	**Capital adequacy**	**Balance sheet total (mld.)**	**Number of client (mil.)**	**Profit/Lost (mld.)**
1 cluster (ČS, ČSOB, KB)	3.0	2.0	13.0	19.0	956.3	3,08	14.00
2 cluster (RB, UNI)	3.0	1.0	11.5	16.5	396.8	0.42	4.10
3 cluster (Air, mBank, Fio)	0.9	1.0	14.0	15.0	81.6	0.57	0.30
ZUNO	x	X	X	X	X	0.28	-0.15
EQUA Bank	x	-1.0	-11.0	15.0	36.9	0.20	-0.04

In 2012-15, there was a decrease in the interest margin of all countries. The profitability of Czech banks is still far from the pre-crisis double-digit level (16-18% in 2007-08). However, the value is above that of Euro area banks, mainly due to their wider net interest margin. The falling market interest rates are directly affecting the income and profitability of banking sector

in the Czech Republic. The analyses shows that the net interest margin as a source of Czech banks´ revenue is on the lower level (3% for cluster 1 and cluster 2) in 2015. The ROE of Czech banks is 13% for the "big" banks in cluster 1, 11,5% for the "middle" banks in cluster 2 and 14% for the banks in cluster 3 in 2015. The Czech banking sector strengthened its capital adequacy and it is sufficiently above the regulatory threshold of 8%. The capital adequacy on the level of 19% for "big" banks and 15% for "small" banks is a condition for investor confidence in the stability of the Czech banking sector as a whole. The results show that the big and middle banks generate millions in profits and remain in a stable position even with the existence of the low cost banking segment. Big banks have lost some of their clients, small banks have opened a large number of branches, and some of them have created their own ATM portfolio. Equa bank generates a lost and by the end of the first half of 2017, online banking unit of Raiffeisenbank Bank (Zuno Bank) announced that it will end operations in the Czech Republic and Slovakia. Zuno's activities will be transferred to Raiffeisenbank in the Czech Republic and Tatra Banka in Slovakia.

4.4.Conclusion

This paper deals with the comparison of three main groups of banks according to the chosen financial and other indicators. On the basis of the results, it can be concluded that the Association of banks in the breakdown by size on the "large", "medium" and "small" banks. The division of the banks into three main clusters with the values of the individual indicators can be seen in Table 3. The paper identified the median value of these created variables of clusters' characteristics based on the data from period 2004-2013 and 2015. The comparison shows that the three big banks have the different characteristics from small banks. It means that the new low-cost banks have not made a significant impact on the financial results and the structure of the financial market in the Czech Republic during the last ten years. However, small low-cost banks have greatly influenced the clients' expectations from their banks. Low cost bank are attractive to current and potential clients due to their pricing and product policies. The analyses shows that the low-cost banks have acquired in 2015 nearly 17% of the client portfolio of all banks, but low-cost banks haven´t acquired wealthy clients or clients who usually have more bank accounts. Some of them have had big troubles generating profits. Equa bank, has been operating at a loss, and Zuno announced that the will leave the market by July 2017. Air Bank announced their entry to the "middle" banking segment and later achieved a profit. On the other hand, according to the analyses done in this paper, this bank still belongs to the smaller banking segment.
Finally, it is needed to mention that the Czech National Bank's spokesman said after a meeting of the bank board on Mach 15 (2017): "The Czech National Bank has decided to continue intervening against the Czech crown to keep the exchange rate at around 27 crowns per euro in the second half of 2017. The bank will also leave interest rates unchanged at all-time lows." (ČNB, 2017) We are not worried that there is any reason for an unexpected change in defined criteria that are entering the cluster analysis during 2017 and we expect the same situation in the banking sector in the Czech Republic in the end of 2017. Interest rates in Europe are at record lows and are likely that they will be on a very low level in 2017-18. There were denominated 88% of client deposits and 81% of client loans mostly in CZK (in 2016).

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INCREASING THE EFECTIVENESS OF CROWDFUNDING CAMPAIGNS

Kameníková Blanka

Abstract

The aim of this paper is to find the key factors increasing performance of crowdfunding campaigns in the Czech Republic as many of them are unsuccessful. The article is based on empirical research. The research is focused on the most successful campaigns in the largest crowdfunding platforms HitHit and Startovač. The study is based on the strategy of qualitative research. 35 projects were analysed according to the following criteria – amount of rewards, value of rewards, amount of information about projects, the content of video, marketing campaign or number of contributors and contributions in time.

Keywords: crowdfunding, funding source, crowdfunding platforms, success rate

JEL Classification: G23, M31

1.INTRODUCTION

Crowdfunding is an alternative way of financing and it is becoming more and more popular. Crowdfunding is also defined as form of money acquisition for specific purpose, project or business plan. Wide community of people provides small amounts in short time on individual projects. It is one of the newest methods, which entrepreneurs and startups worldwide use to acquire necessary capital. Crowdfunding is relatively new method used for financing projects, businesses or campaigns. Founder of these projects receive money from individual investors through crowdfunding portals and then use this money to start his profitable, cultural or social project. In return investors get future ownership of the products or capital participation in project/business.
In the theoretical part, the nature of this financing is explained and a general definition of basic models is mentioned. In the next part, possibilities of crowdfunding in the Czech Republic, especially the ones based on rewards are presented. Two largest platforms were compared – Hithit and Startovač. These portals were examined with the focus on the following - a type of projects they support, the author of the project, an investor and the fee policy.
To find the factors influencing success of a crowdfunding project, 20 successful projects of the platform Startovač and 15 projects of the platform HitHit were analysed. These specific projects were studied according to criteria - amount of rewards, value of rewards, amount of information about projects, the content of video, marketing campaign or number of contributors and contributions in time.

2.THEORETICAL BACKGROUND

Collecting minor financial sums from great number of people exists since forever. In scientific literature we can find several examples. For example public collection for the Statue of Liberty in America, or financing the construction of National theater in Czech Republic (Steinberg, 2012, p. 21).
Historically is crowdfunding connected with USA, from which even nowadays more than 50% of all CROWDFUNDING portals are operated. According to Young (2013, p. 25), in 2001

substantial breakthrough was made when programmer and musician Brian Camelio founded ArtistShare which is considered to be the first specialized crowdfunding platform ever published on the internet.
Crowdfunding portals exists in Europe too, the most successful are for example in Great Britain, Netherlands or Germany. (Maria Staszkiewicz a Milan Zubíček, ©2014)
Crowdfunding is based on crowd sourcing, which is form of utilization potential of other people that participate on acquisition of information or problem solving (Assadi, ©2016).
Crowdfunding is composed from two English words "crowd" and "funding". Meaning of crowdfunding is then crowd financing (Čermák, ©2013). In Belleflamm´s (©2010) opinion is crowdfunding invitation for investors to provide money in form of gift or in return for some reward.
Crowdfunding uses easy availability of social networks as Facebook, Twitter or Linkedin, through which they promote their new ideas and tries to attract investors (Wicks, ©2013). CROWDFUNDING principle is based on idea that people want to help others and their projects. Which are close to them emotionally or geographically (DEBRUYSERE, ©2012, p. 12).
Crowdfunding can be described as one of the newest methods, used for capital acquisition. It represents process of addressing wide public for donations. These donations then serves as registered capital for businesses or projects (Hollas, ©2014).
Lawton states, that the importance does not lie in the amount of individuals that donate, important is the link and transformation of interest groups. (Lawton, 2013, p. 11)
Steinberg (2012, p. 2-4) states in his book definition, which is extended by risk associated with capital. "It is process when public is invited to make financial donations to provide registered capital for new projects and businesses. Entrepreneurs and owners of small businesses can completely avoid risk and instead present their ideas to everyday users of internet, which can provide financial support by using this technique.
Money acquisition through crowdfunding can be divided into several types according to what person who provides funds gets for his donation. CROWDFUNDING projects are created with different intentions and therefore have different specifics.
Majority of authors divides crowdfunding into four basic models, Donation crowdfunding, crowdfunding based on rewards, crowdfunding based on loaning, share crowdfunding (Paul Belleflammea, NessrineOmrani a Martin Peitz, ©2015):

- Donation based crowdfunding
- Equity- based crowdfunding
- Debt-base crowdfunding
- Crowdfunding based on rewards
-

3.RESEARCH OF CFOWDFUNDING

"Crowdfunding" also known as public funding (mostly creative program implemented through the Internet) is not very „well-known" how research from STEM / MARK assumes. This research is created for the Strategy. It was held during February and March of 2016 at the Czech National Panel (CNF) via Internet interviews on a sample of 512 respondents who were between 15-69 years old.
According to the research, less than a tenth of the internet population knows the true meaning of crowdfunding - lead by men or people with university education from Prague or other bigger cities. If the concept is understood, about a quarter of respondents stated that they had met with crowdfunding (heard of it or read about it). Active participation states 6% of respondents.
The financial support is directed mostly to charity, cultural projects, software, internet, computer games, or loans. The general attitude towards crowdfunding is more or less positive

(57%) or neutral (35%). Only a small percentage of people expresses critical opposition (3%). However, when they were asked for any personal involvement in a similar project, 27% of respondents would refused to participate.

The best idea on how to lure people into investing in projects turned out to be rewards as 44% of respondents stated, 29% would be motivated more through ideas. Being part of the project would be the reason for 16% of correspondents and helping others is interesting for 13%.

From the range of projects that were given to respondents, the winner was clear utility - a project interested in creating job positions for disabled. Followed by releasing plates of favorite bands, music festival, release of a travel book or a computer game. The research also showed that women would encourage more in charity and travelogue and men contrarily in a computer games. The idea of crowdfunding is attractive for young people under 30 years, while people over 45 years would be more likely to reject. (STEM/MARK, ©2017)

Massolution engaged in crowdfunding research from the data of 308 specialized crowdfunding platforms around the world. According to their studies it shows that although there has been a crowdfunding throughout the world, the largest parts are mainly the United States and Canada, a slightly less numebr in Europe. The volume of collected funds doubled during the 2012. Growth in 2011 was 64%, in 2012 reached 81%, and this year was funded roughly 2.7 million of US dollars. Massolution expects that crowdfunding will continue to grow and primarily will increase the rate of growth. . (Lauschmann, ©2014)

Crowdfunding in the Czech Republic continues to grow and becomes a main source of private projects of all sorts. In 2016 was collected a total number of 60 million, more than half of this amount was collected by the portal HitHit (39 million), Startovač pgathered 18 million. According to statistics, in 2015 this way of investing in projects at an altitude of about 46 million, a year before this amount was one half lower. (Bartušková, ©2017)

According to statistics, only 1/3 of projects are successful. The remaining 2/3 of the project does not reach its target amount of money, and are not implemented at all. The most interesting projects are in the field of film and video but at the same time, this area belongs in the less successful one concerning the targeted money selection. The most successful projects are in the fields of music, theater, dance and comic books, because in these areas roughly every other project suceeds. On the other hand, the least successful ones are food, science and technology, fashion or journalism. (Bartušková, ©2017)

One of the most successful crowdfunding portal is Kickstarter, which is depended on trust in projects, as well as individual investors and is trying to reach maximum transparency. At the same time it publishes detailed statistics about successful and unsuccessful projects in each category. The most popular project in terms of financial volume is film and video, where from 20,000 of projects were 40% successful. Music has 54% success. Design category takes third place and 35% success rate. But the most successful project of all time is Pebble project (electronic paper watch that communicates with your smartphone). (Kickstarter, ©2017)

On the other hand, there are a lot of projects that are unsuccessful because they let more time to get the necessary investments. According to the statistics, the most projects that received significantly higher investment than originally requested belong to the category of technology, hardware design, software or games.

Another important factor is the direct relationship between the number of facebook friends of the project founders and its success. The rule is, when you have more friends, the greater the initial group to tell about the project is and also has a greater chance of success of the project. Only a quarter of successful projects abide its own deadlines.

As a matter of interest, up to eight months from the date of completed projects, the boundary achieve 75%. If the project gets bigger investment than they originally wanted to, completing it usually does not speed it up, rather the opposite. (Lauschmann, ©2014)

Since 2011, when the Czech Republic started with public financing (or crowdfunding) people have contributed at least 80 million to projects. Trabants expedition to the Pacific, creating a multicultural center, TV show, or maybe unusual footwear production is one of the most successful projects in 2015. According to the project manager of HitHit.com Jana Eckstein any other financial instrument does not deal with such a complex work with the community and openness. The model for all companies dedicated to crowdfunding platform were similar projects abroad under the auspice of Kickstarter. Since its founding, more than 10 million people collected EUR 2.2 billion (roughly 55 billion dollars). (Hithit.com, ©2012-2017)

4.DATA AND METHODOLOGY

In the methodology two largest crowd funding platforms were analyzed in the Czech Republic, specifically, the most successful campaigns in the largest crowdfunding platforms HitHit and Startovač. Success rate were analyzed on both portals in every category of projects. Used data are directly from authors of both portals and are from the period of their establishments until November 2016. Subsequently, the analysis shows number of projects according to the way, how much money they gained and how the number differs from their originally intended goal. Both portals underwent several analyses such as conditions for publishing campaigns, conditions for providing contributions and their charging politics. Based on these facts table charts of both portals were created and compared to each other.
The study is based on the strategy of qualitative research. Also, 35 projects were analysed according to the following criteria – amount of rewards, value of rewards, amount of information about projects, the content of video, marketing campaign or number of contributors and contributions in time.

5.ANALYSIS OF STARTOVAČ AND HITHIT BY THE CATEGORIES

First crowdfunding platform in Czech Republic was established in 2011 and it was called Fondomat. Founders of the company were two British artists living in Prague Joe Wakeford and Conrad Watts.
Crowdfunding services arose later because of distrust of investors, inactivity of authors or inability to set appropriate amount to collect. Since 2011 dozens of projects were realized through crowdfunding in Czech Republic. Since 2012 more crowdfunding platform were established and the most popular was Hithit founded in 2012. Hithit was followed by Startovač, which started in April 2013. Most of the platform work on the exact principal as the foreign ones and the variety of projects is really wide. (Maria Staszkiewicz and Milan Zubíček, ©2014)
Czech crowdfunding portals use several payment methods, for example Hithit Kalyzátor and Everfund use PayU system, so that donated money was never in hands of portal operator. Another method can be credit card payment, bank transfer, PaySec. Startovač uses among other methods the option to pay through PayPal or SMS (Maria Staszkiewicz and Milan Zubíček, ©2014)
Crowdfunding is not protected by any particular legislative act in the Czech Republic. Currently, there are quite a lot crowdfunding websites there. Most of them focus on rewards-based crowdfunding. The platforms specialize specifically in the Czech market, which is why the target group of donors is small; we can derive from that that the disadvantage lies in the fact that there is not the possibility of receiving any staggering sum.
The most popular websites are Hithit, and Startovač. Among other crowdfunding websites are, for example: Penězdroj, Everfund, KreativciSobě, Odstartováno, VisionPartners, Katalyzátor, NakopniMě and Sportstarter. The following analysis focuses on the two most popular sites, Hithit and Startovač.

Both of the most used crowdfunding portals have differently named and differently separated categories. All of the categories of both portals were analysed according to collected amount of money in each category. Orange data are from the portal Hithit, blue ones from the portal Startovač. All the information is directly from authors of both portals and collected from founding period to November 2016.
The analysis revealed that the greatest amount of collected money on portal Hihit has category Science and on the contrary the lowest one has Books and comics.
Portal Startovač has the biggest amount of collected money in a category oriented on Design and technologies and the smallest in Sport.
This analysis clearly pointed out that these two portals are truly different and use distinctive ways of supporting projects in every category and each portal has different successful fields.

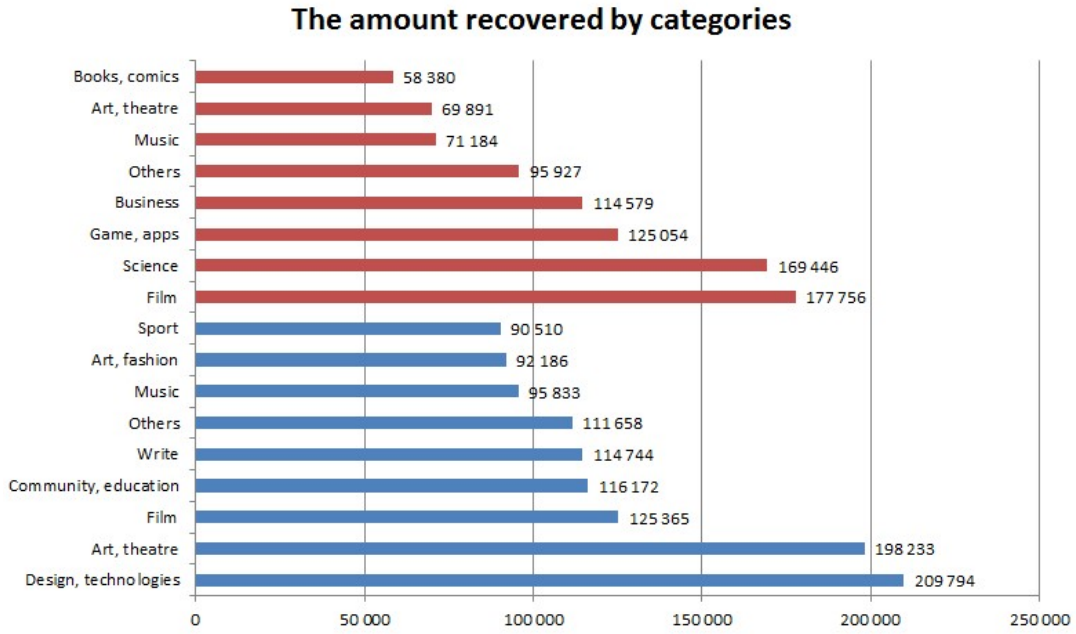


Fig. 1 – The amount recovered by categories. Source: own source inspirated by Startovač, ©2016; Hithit.com, ©2012-2017.

5.1:Analysis of Crowdfunding Websites: Hithit and Startovač

HitHit

The website run by the company called Hithit s.r.o. is based on a reward system and uses the all-or-nothing method. It only aims at creative projects, such as releasing music records, filmmaking, software development, mobile application development, designer product development, etc. It does not support charity projects.

Author

The rules that the author needs to observe are described in the company's terms and conditions. The author can be a natural person or a legal person. After a request to submit a project for posting is sent, it is then evaluated and, once authorized by the website administrator, presented to potential customers via the website. The time span of the campaign is limited to 45 days. The minimal target sum is 50.000 CZK. The description must be written in Czech, though other language versions can be added. All funds are sent to a special bank account kept by ComGate Payments, a.s. company. It is possible to contribute via electronic funds transfer, traditional transfer or electronic payment via debit card. The Hithit team also offers consultation for a given project, provides 24/7 customer support services and tries to help via sharing projects on their social media pages. If a project succeeds, the money is sent to the author's bank account

within two weeks after the end of the campaign. If the target sum is not raised by the end of the campaign, the author of the project is not given any funding (Hithit.com, ©2012-2017).

Contributor
Anyone who wants to contribute has to sign up to the website. The registration requires entering one's name and e-mail address. After donating, you have an option whether you want to be listed among contributors or stay anonymous.

Fees
Fees are specified in terms and conditions. The basic provision for projects up to 200.000 CZK is 9%, VAT from the commission and administration costs of 499 CZK. For a projects of a higher target sum, the commission would be decided on individually per-project basis. Also, bank charges (1.5-2.5%) should be added to the commission; the precise amount is based on type of payment. Commissions are paid after a successful completion of a given project. In case of unsuccessful projects, there are no commissions or fees (Hithit.com, ©2012-2017).

Startovač
Startovač was launched in April 2013, and it focuses mainly on creative projects. Clients have to choose among the following categories: theatre and dance, film, games and apps, music, books and comics, fashion and design, art and science and technology. The goal and the date of completion of the project has to be specified, with a limit of 18 months after receiving the target sum. There is no minimal target sum limit set on this website. It is also based on the all-or-nothing method. At Startovač, not only do they not support business plans or charity, they even reserve the right not to start a campaign. Only citizens over the age of 18 can become clients.
The Startovač team helps clients in composing campaigns and promotion, shares experience with them and provides other support. Thanks to their involvement, the rate of successful campaigns is between 57 and 59%, which is more than the worldwide average (Startovač, ©2016).

Author
The author of the project must be over 18, although younger potential clients can ask for permission to a project. To start a new campaign on Startovač, you only need to sign up and click on "Start the Project." Afterwards, your project is submitted for authorization. While signing up, it is essential to enter the time span for fund-raising. A client has three options: 15, 30, or 60 days. The span of 15 days is suitable for campaigns with a lower target sum (up to 60.000 CZK). The next option is 30 days, which is suitable for most campaigns. The 60-day option is best for clients who are aware that they will not be able to engage in the campaign with much intensity because theirs is a rather long-term project. However, these run the risk of stagnation and potential to spam supporters of a given project (Startovač, ©2016).

Startéři ("The Starters")
Users donating to projects are called Startéři ("Starters"). If a Starter picks a project which s/he wants to fund, s/he sends financial support via transfer to the bank account (kept by Fio banka). If the project is to be funded in euros, the conversion is made in accordance with foreign exchange rates of ČSOB. A contributor can also provide funding via payment card or via PayPal. Another option is a payment via SMS. However, this method carries the most risk, as if the project is unsuccessful, the contribution sent is not returned to the donor, but to nonprofit projects or other projects on Startovač. With other types of payments, if a targeted sum is not collected, funds are sent back to contributors in full (Startovač, ©2016).

Fees
An author who reaches the target fund is obliged to pay the commission from their project based on the target sum and transaction fees. The commission is determined by this template: projects up to 50.000 CZK – 9% of the sum, 50.000-50.000 CZK – 7%, over 500.000 CZK – 5% (Startovač, ©2016).
All fees for payments to be found in the following table.

Payment card fee for a successful project	2% of a donated sum
Transfer payment fee for a successful project	0 CZK/ 0 EUR
PayPal payment fee for a successful project	3,4 % of a donated sum + 10 CZK/0,35 EUR of a donated sum
SMS payment fee via T-Mobile CZ	10.89 % of a donated sum
SMS payment fee via Vodafone CZ	15.25 % of a donated sum
SMS payment fee via Telefónica CZ	15.73 % of a donated sum
SMS payment fee via U:fon	19.36% of a donated sum

Fig. 2 – Transaction fees (or own arrangement). Source: Startovač, ©2016.

5.2.Comparison of the crowdfunding websites

The table summary with additional evaluation was created based on the above-mentioned information concerning crowdfunding tools. The rating scale was from 1 to 5, with 1 as unsuitable, 2 as rather suitable, 3 as normal, 4 as rather suitable, and 5 as suitable.
Ratings are summed up at the bottom of the table, showing which website is the most profitable for its clients, as far as working on web interface is concerned.

Criterion	**Startovač**	**Points**	**HitHit**	**Points**
Transparency	Transparent, assortment of the projects, swiping through necessary	4	Transparent, assortment of the projects, interactive	4
Terms and Conditions difficulty	Brief, simply worded	3	Rather extensive, easily comprehensible	3
Commission from a successful campaign	Based on a target sum (5,7,9 %)	5	Based on a target sum 9 % + VAT, 499 CZK an administration cost of 499 CZK or an individual one	3
Number of social media followers	Facebook, cca 8.700	3	Facebook, cca 10.000	4
Time span of a project in days	15, 30, 60	4	45	3
The most successful projects	2.814.415 CZK (Trabantem napříč Tichomořím)	5	2.421.090 CZK (Nakopni Jatka!)	4
The most succesful project (%, name)	586 % (RE-PLAY staví nové studio)	4	602 % (SKINNERS - botky do k)	5
TOTAL		**28**		**26**

Fig. 3 – Transaction fees (or own arrangement). Source: own source inspirated by Startovač, ©2016; Hithit.com, ©2012-2017.
Startovač received better ratings. Its biggest advantage is the option in choosing the time span for the project and a lower percentage of commission for a successful project required by the operator.

5.3.Statistics of success

The statistics shows number of projects according to the way, how they reached targeted amount of money. In this statistics the projects are not specified according to which one of them were active. Projects are from a range of portals such as Hithit and Startovač.
The most of the projects achieve less than 10% of their targeted sum and that is from overall 32% of projects. On the other hand, in this case no project ended up on a sum 80% or 90% from their targeted amount of money. This can be supposed because of the fact that when project hits such a great border, authors are able to drag it successfully to the end.

% of goal	Number of projects
0%	287
<10%	564
>10%	250
>20%	142
>30%	64
>40%	17
>50%	19
>60%	5
>70%	5
>80%	0
>90%	0
>100%	402

Fig 4 – Analysis of project. Source: own source inspirated by Startovač, ©2016; Hithit.com, ©2012-2017.

The graph shows a success rate of projects on portals Hithit and Startovač compiled in a graphical form for illustration and better understanding.

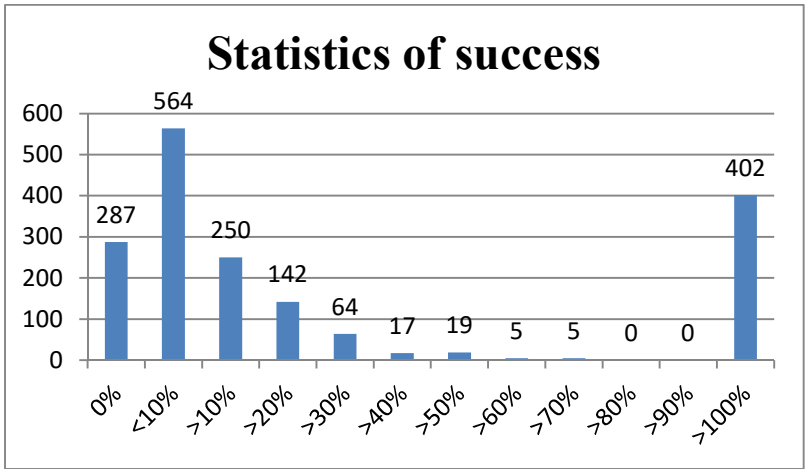


Fig. 5 - Statistic of success. Source: own source inspirated by Startovač, ©2016; Hithit.com, ©2012-2017.

5.4.Analysis of the factors affecting the success rate of crowdfunding projects

After determining the factors affecting the success rate of a project, the 20 most successful projects from Startovač and 15 from Hithit were analyzed.
The following items were analyzed:

Number of rewards
Rewards serve as a motivation for donating. A bigger number of rewards could influence potential contributors as there are more options to invest.

Reward values
Based on a donation amount, a contributor receives a graded reward. Some projects offer rewards starting at very low sums. This makes it possible for donators to support the project even with a low sum. Other projects offer an option to contribute higher sums for more valuable rewards. A bigger reward range will probably lead to smaller difference between reward values.

The amount of information provided
The height of interest in a project can be influenced by the amount of provided information concerning the subject matter and the authors mentioned on the main page of each project.

Promotional video content
In addition to the main page, the promotional video provides information about a given project. By the amount of information given, the authors present themselves to potential contributors. This is able to affect their credibility remarkably.

Marketing campaign
After placing a project on a crowdfunding website, what follows is its presentation to as many people as possible. It is necessary to share links of the project on hobby pages, and to communicate with the fan base of the project constantly. It is essential to react to potential questions quickly.

Number of Contributors and Contributions in Terms of Time
The number of contributors and contributions can and will change over time. Information concerning this was analyzed in the view of the factors that potentially affect the numbers.

Crowdfunding platform
It was analysed also examined various dedicated crowdfunding platform and their conditions.

Title of project	Category	Creator	Goal	Funded	Backers	Success rate
RE-PLAY staví nové studio	Hry a Apps	Vojtěch Novák	200 000 Kč	1 173 650 Kč	1 193	586%
Trabantem napříč Tichomořím	Film	Dan Přibáň	500 000 Kč	2 814 415 Kč	3 860	562%
Vybudování indian studia 2.0	Hry a Apps	Filip Kraucher	20 000 Kč	110 407 Kč	209	552%
Deskofobie (druhá série)	Hry a Apps	Petr Čáslava	10 000 Kč	52 519 Kč	108	525%
Dominika na cestě	Knihy a Komiks	Dominika	60 000 Kč	298 430 Kč	568	497%
První český jachtař na paralympiádě v Riu	Ostatní	Daniel Bína	95 000 Kč	396 500 Kč	522	417%
Motorkářův průvodce lehkovážným cestováním	Knihy a Komiks	Radek Fiala	29 000 Kč	119 109 Kč	369	410%
Knižní vydání historických kuriozit	Knihy a Komiks	Kout historických kuriozit	10 000 Kč	39 615 Kč	147	396%
Zlé peniaze - Karpišov sprievodca krízou	Knihy a Komiks	Juraj Karpiš INESS	2 350 EUR	9 045 EUR	341	384%
Ozvučení hry SIMT	Hry a Apps	wearts	9 800 Kč	36 480 Kč	42	372%
BATTLE OWL	Knihy a Komiks	Battle Owl	20 000 Kč	73 053 Kč	174	365%
DOLLER	Ostatní	DOLLER	175 000 Kč	550 806 Kč	1 060	314%
Chytrý jídlo – BEMACROBIO	Ostatní	BeMacroBio - Zuzana Terešová	50 000 Kč	156 650 Kč	80	313%
Kyselové a přátelé	Ostatní	Kyselové a přátelé	50 000 Kč	156 125 Kč	100	312%
Obchodná 1984-2014 / ĽUBO STACHO	Knihy a Komiks	Ľubo a Monika Stacho	2 000 EUR	6 226 EUR	129	311%
Indigové pohádky	Knihy a Komiks	Mia Svobodová	40 000 Kč	123 383 Kč	311	308%
Velký přelet aneb stádo slonů uchem jehly	Věda a technika	Martin "Marty" Hrabec	400 154 Kč	1 220 811 Kč	1 335	305%
Generátor prchavých okamžiků	Knihy a Komiks	Marek Nawrath	25 000 Kč	72 837 Kč	237	291%
DVTV EXTRA	Film	DVTV	750 000 Kč	2 174 374 Kč	2 413	289%
Pokáč – videoklip k debutovému singlu	Hudba	Pokáč	20 000 Kč	56 750 Kč	97	283%

Fig. 6 - Startovač projects. Source: Startovač, © 2016.

Title of project	Category	Creator	Goal	Funded	Backers	Success rate
SKINNERS - botky do kapsy	Design, Móda	Skinners	90 000 Kč	542 051 Kč	503	602%
Řekněte s Frusackem sbohem plastovým sáčkům	Design, Móda	infiberry, s.r.o.	150 000 Kč	637 520 Kč	1 350	425%
Maraton a jiné pošetilosti	Sport, Literatura	Luboš Brabec	50 000 Kč	135 215 Kč	407	270%
2000 SLOVÍČEK - revoluce v učení slovíček!	Technologie, Vzdělávání	Remembro 2015 s.r.o.	290 000 Kč	782 400 Kč	774	269%
Point / Děravé plány	Umění. Design	Jan Kaláb	55 000 Kč	140 633 Kč	94	255%
Dano Drevo a turnaj Mekyho Žbirku - dokončenie filmu	Film	Peter Popluhár	2 200 EUR	5 284 EUR	363	240%
#prsakoule	Impact Hub, Nadace Vodafone	Loono	157 500 Kč	374 950 Kč	396	238%
Adventní kalendář plný pohádek	Literatura	Petra Janoušková	135 000 Kč	316 080 Kč	684	234%
Mijazaki v Biu Oko	Film	Bio Oko	100 000 Kč	233 710 Kč	822	233%
Vystřel Nefňuku do světa	Hudba, Divadlo	The Tap Tap	500 000 Kč	1 119 728 Kč	705	223%
Probuďme lázně k životu	Umění, Nadace Vodafone	ArtproProstor, z.s.	54 000 Kč	119 800 Kč	216	221%
TAK TROCHU JINÁ ŠKOLA	Vzdělávání	Jakub Freiwald	52 000 Kč	112 026 Kč	171	215%
Certifikát pro Břichopase	Umění	Marie Mrňávková	50 000 Kč	105 250 Kč	196	210%
Lovestory ve výtahu (a dalších 77 povídek z fleku)	Technologie, Literatura	Miloš Čermák	80 000 Kč	168 189 Kč	327	210%
EchoPrime: Pro náročné čtenáře. Nezávislý a bez reklam.	Komunita, Vzdělávání	Dalibor Balšínek	750 000 Kč	1 572 677 Kč	840	209%

Fig. 7 - Hithit project. Source: Hithit.com, ©2012-2017.

6.DISCUSSION

Within the scope of chosen projects, the factors analyzed were those which influenced the success rate of individual crowdfunding projects. Having carried out the analysis, it was found out that the biggest success guarantee is a well-chosen marketing campaign, i.e. an effort to promote and publicize a given project. The authors of the chosen projects of course made use of a crowdfunding website, but also posted their project on various media platforms, such as newspaper or TV. They also used social media to communicate with people, creating a Facebook page or an Instagram account. Via the agency of these tools, they shared the news concerning their project regularly, but also their campaign development regarding the target sum. Mere placement of the project to a crowdfunding website cannot ensure success. A client cannot rely on the website to do all the work: it is important to try to appeal to and attract attention of as many people as possible. Social media seems to be the best way to do so, as they are very popular and interconnected. Molick showed the same outcome, saying that an author of a project with 10 Facebook followers has only a 9% chance for success; it changes to 20% with 100 followers and 40% with 1000.

In addition to social media promotion, the success rate was also increased by answers on questions and news about a project. However, the most frequent posts were concerned about promotion of the projects on social media. After the completion of projects, successful authors continued their activity on social media sites, sharing news regarding the next development of the product. They provided information about what was going on after the end of the project on the crowdfunding website, when the rewards would be delivered or whether manufacturing of the product had already started.

There is analysis of crowdfunding project made by two Czech friends. The project was named Skinners. This project was on Czech crowdfunding platform Hithit as well as on foreign crowdfunding platform Kickstarter. Authors of this project based marketing campaign on the social network Facebook and website. On Facebook page, they reached over 5 000 people who likes Skinners and over 5 000 followers of this page on Facebook. And the reason of this success is fact, that authors of Skinners added periodically photos, information and news and keep their fans posted. Regarding to the website, I think that they spend a lot of time to make Skinners website perfect. It is clear, modern and you can learn everything about their product. And even the project is over on crowdfunding portals, authors still care about fans and update Facebook page and website, still communicate with them.

As already stated, marketing campaign is one of the most important part of successful crowdfunding project. Another very important part is rewards. Now we look closely to rewards of Skinners. To the fans, they gave on Hithit a choice of 11 rewards ranging from 100 Czech crowns to 20,000 Czech crowns. That is average number of rewards. Compared to the Kickstarter, it is equal number of rewards, except that there was ranging in dollars, from 5 to 2 500. The different of rewards on Kickstarter was that some pledge was mentioned more times. For example, pledge of 35 dollars there were 6 times, because there were different time of delivery. This partition was absolutely reasonably, because crowdfunding portals are more familiar to people abroad that in Czech Republic and in general crowdfunding is more known and more closely concept in the world.

A well-adjusted rewards system had a fundamental impact on the success rate of the campaigns. All the authors of successful projects created levels of rewards for contributors of lower sums, as well as for higher sums. When there is a larger spectrum of rewards, the probability that a potential contributor will be interested in donating is higher. The supporters also proved to be rather more fond of material rewards of specified value than of intangible ones. The system of rewards needs to be designed in such a way that a reward of a higher level is more attractive for a supporter than the one of a level below.

7.CONCLUSION

Crowdfunding is a relatively new form of financing entrepreneurial intentions or good ideas. The author of the project receives money from people who want to help with starting a business or who wishes his/her ideas to become real. The money for the project is collected through the crowdfunding portals.

Theoretical knowledge of crowdfunding was used in the practical analysis of two largest crowdfunding platforms in the Czech Republic – Startovač and HitHit. Success rate were analyzed on both portals in every category of projects. The analysis revealed that the greatest amount of collected money on portal Hihit has category Science and on the contrary the lowest one has Books and comics. Portal Startovač has the biggest amount of collected money in a category oriented on Design and technologies and the smallest in Sport. The most of the projects achieve less than 10% of their targeted sum and that is from overall 32% of projects. On the other hand, in this case no project ended up on a sum 80% or 90% from their targeted amount of money.

To find the factors influencing success of a crowdfunding project, 20 successful projects of the platform Startovač and 15 projects of the platform HitHit were analysed. These specific projects were studied according to criteria - amount of rewards, value of rewards, amount of information about projects, the content of video, marketing campaign or number of contributors and contributions in time. The analysis made confirmed that success of a crowdfunding project does not depend on the product only, but there are two significant factors – crowdfunding campaign promoting a product and a correct reward model.
Marketing campaign is a very important part and the author of the project should take some time to make a good campaign. Nowadays, there is a social network, such as Facebook or Instagram, which are powerful. Almost everybody has a profile on some social network; therefore, it is the best way how the people can let each other know about the project.

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ASSESSMENT OF APPROACHES TO MEASURING THE QUALITY OF BUSINESS ENVIRONMENT IN SLOVAKIA

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Abstract

There are many situations and cases occurring in a business when it is necessary to use several qualitative, but mainly quantitative indicators from different areas of business environment, combined into comprehensive evaluation model, so called indexes, for purposes of evaluating the quality of the business environment,. Indexes of assessing the level of business environment published by Business Alliance of Slovakia (PAS) are consisting mainly of qualitative indicators collected by the questionnaire responses of 500 largest enterprises in the Slovak Republic. Indexes of assessing the level of the business environment established by global authorities in a field of economics mainly consists of quantitative indicators. The aim of this paper is to provide analysis of different approaches to the assessment of the business environment in Slovakia published by global and domestic organizations respecting the real development of the business environment in Slovakia. An important part of this paper is an evaluation of key factors influencing the business environment based on the research of authors in solving a scientific project. Results of business environment indexes analysis were compared with the results of the business environment assessment from the recent research. Based on these results, authors tested hypotheses about influence of external factors on the quality of business environment. Main contribution of the paper is a proposal of recommendations for improving assessment of the quality of business environment in Slovakia via Index of Business Environment (IPP) published by the Business Alliance of Slovakia.

Keywords: Business environment, Index, Composite indicator, Assessment, Entrepreneurs

JEL Classification: M21, O11, O12

1.INTRODUCTION

In economic practice, the business environment is measured by various indicators. In general, an assessment of the quality of business environment can be followed by two sets of indicators, of which can be compiled comprehensive assessment model. These groups of factors are:

- Factors of development and business environment.
- Competitiveness innovative factors of the national economy. (Jenčíková, 2006)

For the purpose of assessing the quality of business environment, experts are using various economic and statistical models, or collectively the indicators of the quality of business environment. Almost every complex model brings a number of inaccuracies and pitfalls in its application.

Reasons for assessment using various indicators are mainly economic. By knowing an influence of indicators it is possible to study their progress in time and on that basis to refer about the past and expected development of the system to the future.

The behaviour of socio-economic systems is stochastic – we have ambition to derive future development from the trends in the past. Indexes can be divided from different point of views,

for example by their objectivity, assessed subjects, or by selected parameters evaluated, etc. Indicators and indexes can be reviewed:
• As a simple phenomenon, activity – further irreducible.
• As a complex phenomenon – consisting of a set of indicators.
Indicators and indexes can also be divided into:
• Quantitative (phenomenon can be defined quantitatively)
• Qualitative (phenomenon/process can't be quantified precisely).
Selected index can be unique if the data are received via special survey and monitored by chosen purpose. Index also can be composite derived from several existing surveys and indicators. Objective indexes are considered those which shall be denominated in objective measurable data. Subjective are based on subjective views of respondents in selected file. Construction of index, character of data and data sources are considered three criteria of different approaches to measuring the quality of business environment. (Jenčíková, 2006)
The authors highlight the importance, but also the shortcomings associated with the use of indexes of business environment. The aim of the article is also to analyse the most significant problems of access to measuring the quality of business environment by comparing the composition and characteristics of input data in foreign and domestic composite models to rate the level of the business environment.

2.APPROACHES TO BUSINESS ENVIRONMENT ASSESSMENT

In the economics there is a hierarchy: enterprise – sector – the country's economics – the economics of the transnational alliances, they may correspond to relevant indicators, or indexes. (Klučka, 2015) According to Eurostat, Business activity can be measured at least by three ways:
• **The performance of enterprises** and the business community is influenced by the business environment of the country and a number of economic, social and environmental factors, as well as the attributes of the enterprises and entrepreneurs. These include indicators of "success" of businesses (number of emerging businesses, net increase of businesses, the proportion of businesses that survive the first five years of its existence, etc.).
• **Impact and consequences of enterprise**s in the country's economy can be measured primarily through indicators such as GDP growth, employment and income distribution.
• **Determinants of business environment** include different areas which have a direct and indirect impact on the business environment. Entrepreneurial activity is "self-propelled" at least – which means that, for example, an increase in GDP is reflected by easier access to capital for emerging companies. (Conorto, 2014)

In practice, it is important that indicators in indexes were comparable – not only for given hierarchy, but because of the simplicity of their interpretation. The construction of such a consistent model of indicators enables comparisons between the systems themselves – benchmarking. Its application creates simple concept of learning. There have been published many articles, books and other information sources dedicated to abovementioned issues. There is often a term index replaced by a composite indicator. It constitutes a representative set of indicators, which is calculated after taking into account weighting of individual indicators. To this theory are published e.g.: (Saltelli, 2007), (Nardo, 2005 and (Nicolleti, 2001).

2.1.Global indicators for assessment of business environment

Composite indicators are used in various fields of economy. One of the possible methods of using is an evaluation of the quality of business environment. These aggregated indexes are composed of several pillars containing different indicators of business environment. Collecting

input data is a difficult process. The data that evaluates the level of the business environment may be quantitative, qualitative or combined. Composite indicators of the quality of business environment are periodically published especially by important worldwide economic authorities.

1) World Economic Forum (WEF) measures the quality of business environment through competitiveness of national economies operating in a global environment. WEF annually publishes the Global Competitiveness Index (GCI), which evaluates primarily the level of innovation and competitiveness of the country based on the following pillars: institutions, infrastructure, macroeconomic situation, health and primary education, higher education and training, market efficiency, technological readiness, development of the financial market, market size, business sophistication and innovation.
The pillars of the GCI are divided into 3 groups of 12 variables, of which about two thirds are based on the responses of managers on the questionnaire (soft data) and one third from publicly available sources (raw data). (WEF, 2016)

Tab. 1 Slovak economy assessment in Global Competitiveness Index 2017

Subindex	Pillar	Rank / 138	Score / 7	Key factor
Basic criterion	Institutions	102	3.5	Factor driven economies
	Infrastructure	61	4.2	
	Macroeconomic environment	37	5.3	
	Health and primary education	55	6.0	
Efficiency enhancers	Higher education and training	61	4.5	Efficiency driven economies
	Goods market efficiency	53	4.5	
	Labour market efficiency	93	4.0	
	Financial market development	33	4.6	
	Technological readiness	44	4.8	
	Market size	61	4.0	
Innovation and sophistication	Business sophistication	55	4.1	Innovation driven
	Innovation	68	3.3	

Source: World Economic Forum, 2016

In a closer look at the composition of the indicators in each of the pillars, it is possible to identify variables that have the greatest impact on the competitiveness of the Slovak economy and the quality of business environment in Slovakia. From the ranking of the Slovak economy competitiveness in comparison with other countries, the most problematic seems to be 1st pillar of the GCI - Institutions.
The worst is the Slovak economy evaluated in terms of allocation of public resources, independence of the judiciary, government regulatory action and efficiency of the legislative process in business. The 6th pillar worst score obtained criterion of the tax burden and the costs of the agricultural policy. In the 8th and 12th pillar Slovakia achieved mainly negative assessment in the criterion to maintain a return of talented professionals and the availability of scientific and technical capacity. Answers in the questionnaire arising partly different conclusions than quantitative indicators of GCI suggest.

Tab. 2 – Most critical factors for doing business in Slovakia according Doing Business 2017

Factors	Score
Corruption	19.2
Tax rates	17.2
Inefficient government bureaucracy	14.8
Market regulations	10.8
Restrictive labour regulations	8.9

Source: World Economic Forum, 2016

Slovak entrepreneurs considered the level of corruption, the extent of the tax burden on business and inefficient administrative burdens by state institutions in Slovakia as the most problematic.

2) Doing Business Index (DBI) published by World Bank annually evaluates the development level of the business environment. This includes 10 pillars, as set in table 3. (World Bank, 2017)

Tab. 3 Slovak economy annually comparison in Doing Business Report 2016-2017

Pillar	Rank		Score	
	2016	2017	2016	2017
Starting a Business	64	68	88.54	88.62
Dealing with Construction Permits	102	103	67.81	67.82
Getting Electricity	47	53	80.30	80.31
Registering Property	5	7	90.99	91.00
Getting Credit	42	44	65.00	65.00
Protecting Minority Investors	85	87	53.33	53.33
Paying Taxes	58	56	79.46	80.57
Trading Across Borders	1	1	100	100
Enforcing Contracts	81	82	58.92	58.92
Resolving Insolvency	34	35	70.04	70.53
Total Score / Rank	30	33	75.44	75.61

Source: World Bank, 2017

From annual comparison of the business environment arises that the conditions for doing business in Slovakia slightly improved in terms of score achieved in the rankings. Nevertheless Slovak economy in 2017 compared to 2016 decreased on 3 positions in ranking to 33rd place. It is mainly due to the fact that the countries in competitive position of their economy created favourable conditions for entrepreneurship more effectively than in Slovakia.

3) Corruption Perception Index (CPI) is published by Transparency International (TI) annually. CPI assesses the risk factors of national economies in terms of the impact of corruption on developing business in the assessed country. The Slovak Republic was positioned in last ranking on the basis of input data from eight sources of information assessment. According to world rankings of perceived corruption by TI Slovakia ended in 2016 at the 54th space, and returned to the level of 2014 and obtained last year's score 51 points out of a maximum 100 points. It means decline by four places in a ranking compared to 2015, while the number of rated countries increased from 168 to 176. It is the seventh worst place in the EU, when overtook Croatia, Hungary, Romania, Italy, Greece and Bulgaria. AS Transparency International in the evaluation noted the serious improvement of conditions will be decided mainly by execution of power, not by changing laws. (Transparency International, 2016) Figure 1 highlights the strong interdependence between the level of corruption and the level of social inclusion in developed economies in the world. From the figure, it can be stated, that the high level of corruption causes

an expansion gap between the richest group of population and ordinary citizens, which has indirectly resulted in an increase of poverty in the country.

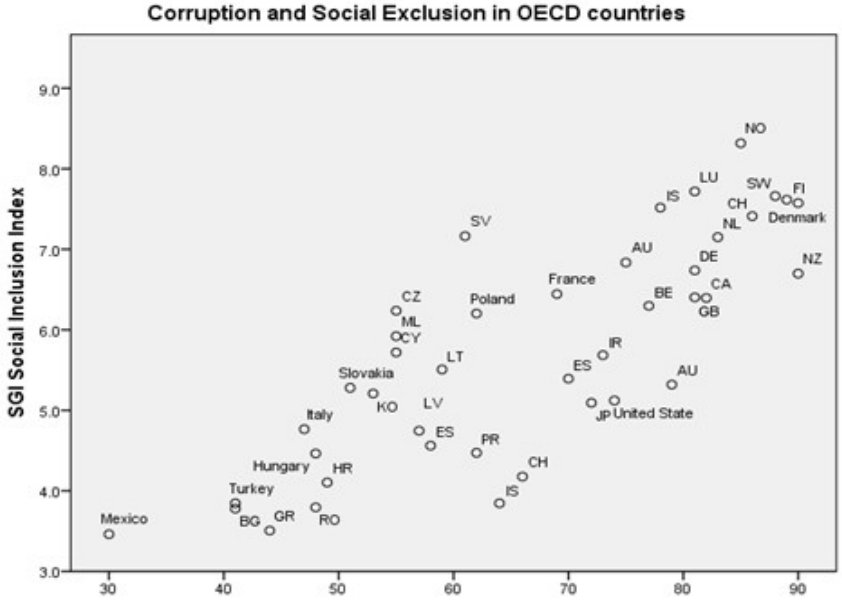


Fig. 1 Countries positioning Corruption Perception Index vs. Social Inclusion Index 2016
Source: Transparency International, 2016

4) F. A. Hayek Heritage Foundation is publishing annually Index of Economic Freedom. This composite indicator evaluates the four pillars of national economies openness in relation to freedom of establishment in the assessed country. Main pillars are rule of law, government size, regulations efficiency and market openness. (F.A. Hayek, 2016)

Tab. 4 – Slovak economy assessment according criteria in Index of Economic Freedom

Pillar	Indicator	Rank 2016	Score 2016	Change 2015/2016
Rule of Law	Property Rights	54	50.0	0.0
	Freedom from Corruption	55	50.0	-3.0
Government Size	Fiscal Freedom	78	80.1	-0.7
	Government Spending	137	49.5	-5.6
Regulatory Efficiency	Business Freedom	74	68.4	-1.2
	Labour Freedom	115	55.0	-1.5
	Monetary Freedom	62	79.5	+4.0
Open Markets	Trade Freedom	10	88.0	0.0
	Investment Freedom	34	75.0	-5.0
	Financial Freedom	19	70.0	0.0
Total	Economic Freedom	56	66.6	-0.6

Source: F.A. Hayek Heritage Foundation, 2016

In the last evaluation of economic freedom in Slovakia, the F. A. Hayek Foundation has identified problems in the first three pillars of the Slovak national economy. In the area of rule of law, we have obtained a score of 50 points out of 100 possible points. Main areas of corruption are in public procurement and the health sector, according to the creators of the index. Many state-owned companies do not provide even basic information. Although the Constitution guarantees the independence of the judiciary, but despite several reforms they have failed to eliminate corruption behaviour in the judiciary. Fiscal freedom includes highest rate

of income tax at 25% for individuals and at 22% for legal entities. Tax collection consists of 29.6% of the total domestic product, but government expenditures increased approximately to 41% of gross domestic product and generating budget deficit, annually. Public debt constitutes more than 55% of the total annual domestic production. The labour market is inflexible in Slovakia as a result of many changes to the Labour Code, according to the creators of the IEF. Also, regulators react slowly to step changes in energy and commodity prices, especially when prices are falling down.

In terms of long-term monitoring of establishment in the Slovak Republic it is important to mention that since 1995 the level of legal protection of property worsened. On the other hand, the level of corruption in the country according to the IEF has not improved at all, for more than 20 years. Long-term comparison also identified worsened labour market flexibility. On the contrary, the trade freedom indicator of the Slovak Republic is among the 10 most developed among all the countries reviewed. This is mostly thanks to EU accession when Slovak Republic became a member of the Schengen area of free trade.

2.2.Slovak indexes for business environment assessment

Based on the responses in the questionnaire BAS publishes quarterly Slovak Index of Business Environment that includes 33 indicators in the following categories – influence of the legal and regulatory framework for business, the Effects of other critical external conditions for business and impact of enterprises on the quality of business environment. Following table shows an analysis of the main pillars of index according to the defined criteria. (Business Alliance of Slovakia, 2016)

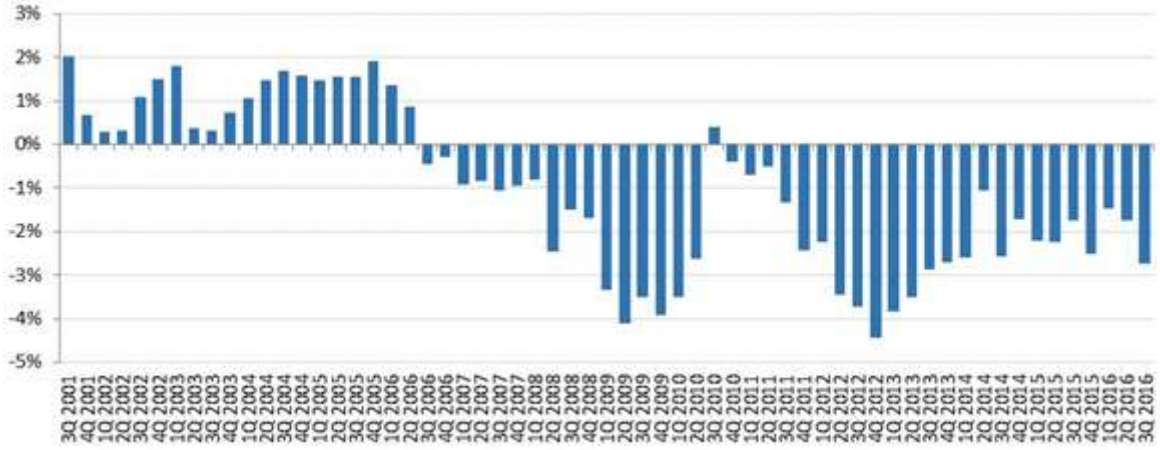


Fig. 2 Quarterly changes of Slovak Index of Business Environment
Source: Business Alliance of Slovakia, 2016

Data are collected via questionnaire survey in which 500 greatest businessmen are answering questions relating to the legal and regulatory framework, external and internal business conditions in terms of national economy.

In contrast to the evaluation of the financial authorities in global indexes of the quality of business environment, there was negative development in Slovak Index of Business Environment for almost past 10 years continuously. The level of the business environment in Slovakia is falling constantly, except of single quarter in 2010.

Tab. 5: Slovak economy business environment according to Slovak Index of Business Environment until 3Q/2016

IPP 3Q/2016	Score	Change
1. Influence of the legal and regulatory framework	22,7	-4,77%
The functionality of the political system in the country	14,2	-5,08%
Legislation on trade relations	55,3	-3,48%
Labour legislation	26,0	-5,39%
Legislation regulating taxes, fees and investments	30,4	-7,97%
Legislation governing contributions	27,8	-8,67%
Market regulations, competition legislation	38,0	-2,77%
Bankruptcy and enforcement legislation	47,3	-1,25%
Clarity, usability, stability of legal norms	10,9	-6,64%
Application of the principles of equality	8,0	-7,38%
Law enforcement, judicial effectiveness	4,0	-6,88%
The functionality of the institutions (cadastres, tax offices, etc.).	73,7	-1,21%
Regulation of cross-border trade (tariffs, licenses, permits)	160,1	-0,39%
2. Effect of other critical external conditions on business	50,8	-2,60%
State economy policy, availability of information	47,5	-2,46%
Bureaucracy, delays in proceedings, reporting	8,9	-6,37%
The level of corruption in offices	11,1	-4,88%
The incidence of economic crime, organized crime	29,8	-4,65%
Efficiency of state economy, access to state aid	8,3	-6,09%
Prices stability	60,0	-0,98%
Stability and predictability of the EUR value	119,3	-0,12%
Access to finance (credit, capital market, and so on.)	225,0	1,17%
Level of infrastructure (transport, telecommunications, etc.)	151,3	-0,66%
The quality and availability of production inputs, labour	85,0	-3,98%
Reliability, financial discipline of business partners	37,3	-2,62%
3. Influence of enterprises on the quality of business environment	292,0	1,10%
Filling the vision	274,5	1,21%
Performance, productivity, profitability of the enterprise	213,1	0,98%
Management system, human resource management	251,6	0,39%
Investments in technology development, quality of production	352,4	1,41%
Liquidity, cash flow, undertaking obligations	270,0	1,05%
Acting towards its business partners, dispute resolution	291,4	1,05%
Employment and remuneration system, social program	216,7	0,55%
Relationship with the environment	483,6	1,99%
Information openness, public appearance, image	534,3	1,48%
Support of local region, charity	311,3	1,68%
Total	52,7	-2,73%

Source: Business Alliance of Slovakia, 2016

A closer look at the pillars of Slovak Index of Business Environment and their benchmarks shows that the decrease of the business environment is mainly due to the influence of the main elements of the legal and regulatory framework and other critical environmental conditions. Entrepreneurs thus a decrease in business conditions accusing the government authorities, and their own effect on the conditions of Slovak market consider highly positive. They complains low efficiency of state institutions, changes in the labour market and business legislation, high tax burden, low level of law enforcement and equality before the law to the government. Among

other external conditions the most problematic are long bureaucracy processes in offices, delays in judicial proceedings, the effectiveness of state management and high level of corruption in the Slovak Republic. Negatively is also valued a weak approach to state aid in business.

2.3.Superindex of Business Environment in Slovakia

6) Business Alliance of Slovakia also annually publishes the Superindex of Business Environment that is based on the data of most prestigious international rankings issued by World Economic Forum, World Bank, F. A. Hayek Heritage Foundation and Transparency International. The composition of Superindex is shown in the following figure: (Business Alliance of Slovakia, 2016, 2.)

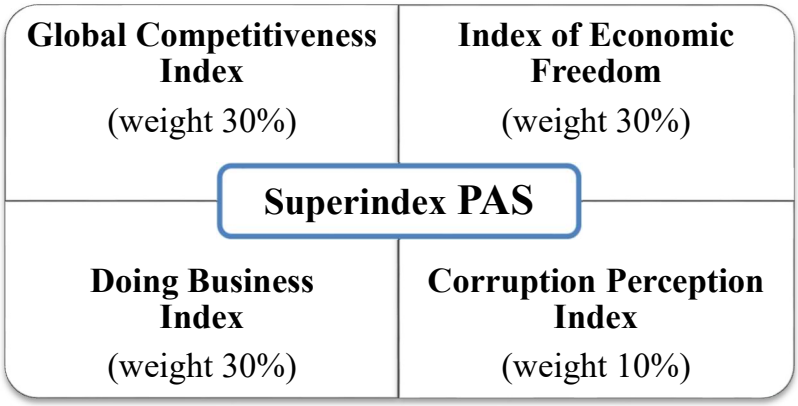


Fig. 3: Composition of Superindex BAS with weights of basic indexes
Source: (Business Alliance of Slovakia, 2016, 2.)

Superindex PAS assesses the improvement of business environment in Slovakia during the previous year, according to getting closer or away from the top 5 countries with the best business environment in the world. Slovakia still lags far behind from countries with the most favourable business environments in the world. In 2016, however, the score rose by 0.46 points to 78.3, mainly contributed to the evaluation of Doing Business 2015 published by World Bank. Slovakia has thus moved to 37th place in the world ahead of Hungary and Bulgaria, which in the previous ranking were located just in front of him.

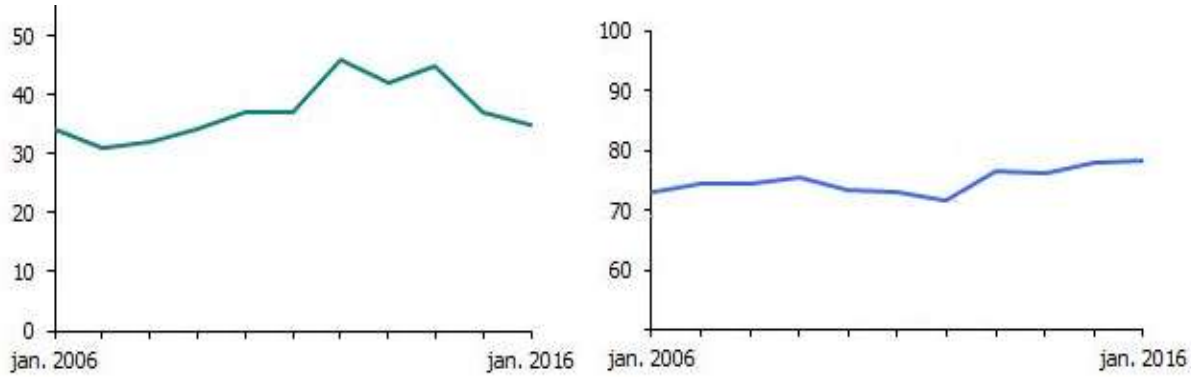


Fig. 4: Positioning of Slovakia in Superindex BAS, according to country ranking and score
Source: (Business Alliance of Slovakia, 2016, 2.)

Business environment in Slovakia, thus based on the results of four renowned institutions, slightly improved a quality and business conditions of country economy. Slovak Republic moved closer to the most successful countries in the world during last years.

3.COMPARISON OF BUSINESS ENVIRONMENT ASSESSMENT APPROACHES

In the previous chapter, authors conducted a detailed analysis of Slovak business environment assessment, in the major global indexes. The following table summarizing Slovak business environment rankings and obtained score in four major global indexes used for describing the quality of business environment.

Tab. 6 – Slovak economy ranking and score development in global indexes of the quality of business environment

Inde	Year	2009	2010	2011	2012	2013	2014	2015	2016	2017
GCI	Rank/Tot	46	47	60	69	71/14	78/14	75/14	67/14	65/13
	Score	4.4	4.3	4.24	4.18	4.14	4.1	4.14	4.22	4.28
DB	Rank/Tot	35/18	40/18	43/18	48/18	46/18	49/18	37/18	29/18	33/19
	Score	-	-	-	-	71.03	71.03	71.83	75.62	75.61
CPI	Rank/Tot	56/18	59/17	66/18	62/17	61/17	54/17	50/16	54/17	N/A
	Score	45	43	40	46	47	50	51	51	N/A
IEF	Rank/Tot	36/17	35/17	37/17	51/17	42/17	57/17	50/17	56/17	N/A
	Score	69.4	69.7	69.5	67.0	68.7	66.4	67.2	66.6	N/A

Sources: (WEF, 2016), (WB, 2017), (TI, 2016), (Hayek Heritage Foundation, 2016)

Considered period was chosen with a view to possible slumps of the quality of business environment due to the global economic crisis at the beginning of the 21st century. It is a medium term of Slovak business environment development, expressed in the Global Competitiveness Index, the Index of Doing Business, the Corruption Perception Index and the Index of Economic Freedom. The following chart shows the position of Slovakia in the global rankings of the business environment assessment during period 2009-2017.

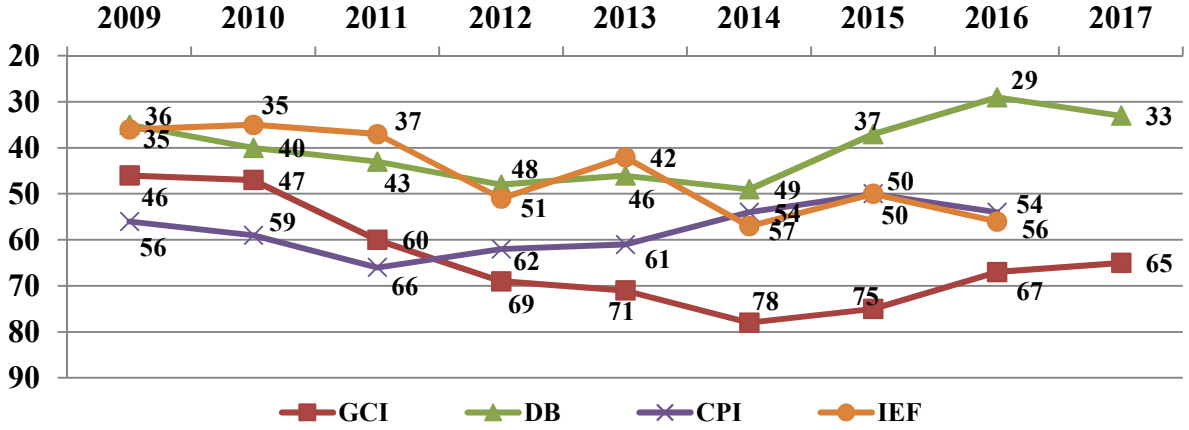


Fig. 5: Slovak economy positioning in global business environment rankings in 2009-2017
Source: (WEF, 2016), (WB, 2017), (TI, 2016), (Hayek Heritage Foundation, 2016)

The business environment in Slovakia in the period in all four World Index has not improved significantly, nor didn't get worse. The sharp decline of Slovakia's position in the Global Competitiveness Index in the period from 2012 to 2015 was mainly caused by significant strengthening the competitiveness of the other assessed economies. On the contrary, the rise can be observed in Slovakia Doing Business position where the position of the Slovak economy since 2014 has moved from 49th place to 29th place in 2016, ranked 33th in 2017. However, it is only a slight improvement of the position, in considered period. For better illustration of the

Slovak economy development in the period 2009-2017, can be used obtained score in four major global indexes to appraise the quality of business environment.

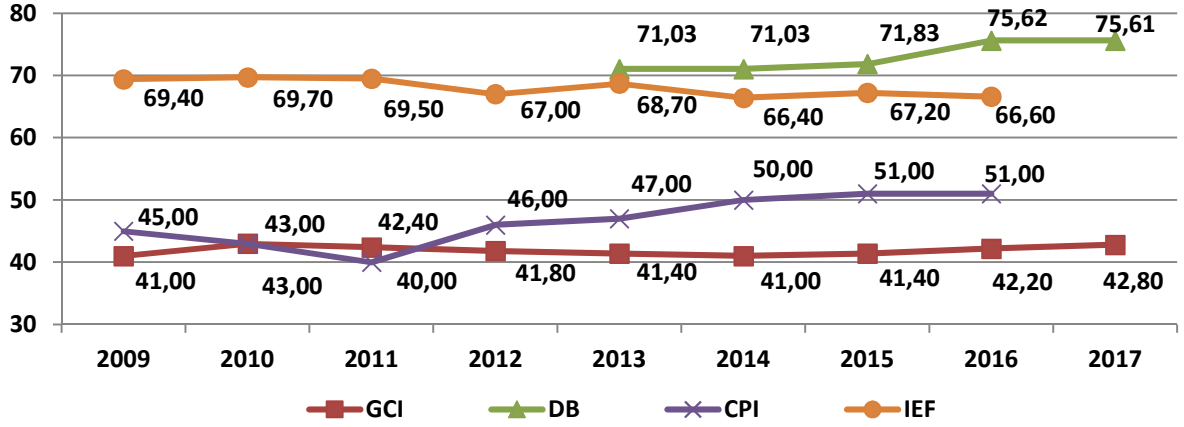


Fig. 6: Slovak economy scoring in global business environment rankings in 2009-2017
Source: (WEF, 2016), (WB, 2017), (TI, 2016), (Hayek Heritage Foundation, 2016)

In the chart above, there can be observed the Slovak economy development according to obtained scores in the four considered global rankings designed to assess development of the business environment. It can be stated, there wasn't recorded any significant changes in the quality of business environment in Slovak Republic. Based on the shown data it can be stated that the quality of the business environment in Slovakia improved in only partial indicators and were stagnating continuously in reviewed period.

3.1.Partial conclusions resulting from comparison of business environment rankings

Stagnating development of the Slovak economy quality of business environment in the global indexes does not correspond with the of the quality of business environment development in the Slovak Index of Business Environment published by Business Alliance of Slovakia, in which Slovak economy continuously decreasing (with the exception of one quarter in 2010) since 2006. Reasons for disproportion in international and Slovak measuring of the quality of business environment can be defined as follows:

- Slovak Index of Business Environment compiled from responses of 500 businesses in the questionnaire is subjective and uncritical view of respondents to the environment in which they carry out their business activities.
- The composition of Slovak Index of Business Environment indicators is more focused on factors of the external environment marginalizing the internal conditions of doing business in Slovakia.
- Entrepreneurs in Slovakia, attach greater importance to some indicators in Slovak Index, as they are weighted in the global indexes of the quality of business environment.

As is clear from the evaluation of entrepreneurs in the Slovak Index of Business Environment, as key obstacles for doing business they consider lack access to the needs of entrepreneurs and the incidence of corruption and indexes in a business. This finding should be subjected to a statistical investigation in order to determine if an identified obstacles influence the quality of business environment in Slovakia. Inputs dataset for testing the hypotheses consists of data collected in the questionnaire survey of entrepreneurs, which was implemented for the purposes of solving the research task.

4.IMPACT OF EXTERNAL FACTORS ON QUALITY OF BUSSINESS ENVIRONMENT

In 2013, it was carried out a statistical survey of business risk for SMEs in Žilina Self-governing Region within the project FaME/2013/MSPRISK: "Current Trends in Business Risks of Small and Medium-sized Enterprises in Selected Regions of the Czech Republic and Slovakia." In Žilina region it was questioned 164 small and medium-sized enterprises, through empirical investigation (questionnaires and interviews with competent persons of SMEs).
Structure of enterprises was as follows: in manufacture production 17%, in trading activities 21%, in construction enterprises 17%, in transportation enterprises 6% in agriculture 1% and the maximum contribution took enterprises that are doing business in other sectors of national economy 38% (advisory, distribution, etc.)
When we are investigation the dependence/independence of the two variables x and y, of which one is numeric it is allowed to use $\chi 2$ –test of independence. For the purposes of our research, we have examined this method to test the hypothesis H0 that speak of independence between variables X and Y, against the hypothesis H1, which involve dependence of the variables.
As examined variables were tested variables X within our research were defined size of the business and length of business,
As variables Y was considered approach of state to the needs of entrepreneurs, incidence of corruption and clientism in business.
Combination of the valuables allows us to examine in particular the following groups of hypotheses:

1. H0 = Government's approach to the needs of the business does not depend on the size of the business.
H1 = Government's approach to the needs of the business depends on the size of the business.
2. H0 = Government's approach to the needs of the business does not depend on the length of the business.
H1 = Government's approach to the needs of the business depends on the length of business.
3. H0 = Corruption and clientism in business does not depend on the size of the business.
H1 = Corruption and clientism in business depends on the size of the business.
4. H0 = Corruption and clientism in business does not depend on the length of the business.
H1 = Corruption and clientism in business depends on the length of the business.
To test these hypotheses, we use the test statistic: (Klučka, 2013)

$$\chi^2 = \sum_{i=1}^{r} \sum_{j=1}^{s} \frac{(n_{ij} - n'_{ij})^2}{n'_{ij}},$$

Where: $\chi 2$ = chi-quadrate, NIJ = empirical frequency (collected data), n'ij = theoretical frequency (calculated) Testing statistics provides that the independence of x and y of about Pearson $\chi 2$ distribution of (A) with the degrees of flexibility = (r-1) (s-1), where r = the number of variations of X and s= number of variations of Y. Assumption is finding and calculate the necessary data into the formula (empirical and theoretical frequency). Hypothesis of independence (H0) of characters X and Y can be refused if:

$$\chi^2 \geq \chi^2_{1-\alpha}(\nu)$$

Where: $\chi^2_{(1-\alpha)}$ = range of critical values,
α = significance level for testing hypotheses; (Klučka, 2013)
For better reliability of the results, was determined the level of $\alpha = 0.05$, which means we can prove the answer to the question (hypothesis) with 95% probability. When

using test of independence were respected conditions as sufficient large scale file n and occupancy within the theoretical frequencies it was $n'_{ij} \geq 5$ and the remaining theoretical frequency $n'_{ij} \geq 1$, as recommended. In a case of proving the existence of dependence it was necessary to assess the intensity of the dependency. For this purpose, it Čuprov contingency coefficient was used:

$$K_2 = \sqrt{\frac{\chi^2}{n \cdot \sqrt{(r-1, s-1)}}}$$ (Klučka, 2013)

Results of examination are scheduled in table 7:
Tab. 7: Assessment of examined valuables dependency based on the hypotheses

Hypotheses		$\chi 2$	$\chi 2_{(1-\alpha)}$	Accepting/ Rejecting	Result	Čuprov Koef.
1.	*H0* = Government's approach to the needs of businesses does not depends on the size of enterprise.	7,63	12,59	Accepting H0	Independent	-
	H1 = Government's approach to the needs of businesses depends on the size of enterprise.					
2.	*H0* = Government's approach to the needs of businesses does not depends on the length of business.	3,53	12,59	Accepting H0	Independent	-
	H1 = Government's approach to the needs of businesses depends on the length of business.					
3.	*H0* = Corruption and clientism occurrence in business does not depends on the size of enterprise.	7,35	5,99	Rejecting H0	Dependent	0,18
	H1 = Corruption and clientism occurrence in business depends on the size of enterprise.					
4.	*H0* = Corruption and clientism occurrence in business does not depends on the length of the business.	1,9	5,99	Accepting H0	Independent	-
	H1 = Corruption and clientism occurrence in business depends on the length of the business.					

5.DISCUSSION ON QUALITY OF BUSINESS ENVIRONMENT MEASURING SHORTCOMINGS

Analysis and subsequent comparison of the six indexes of the quality of business environment issued by global financial authorities and by Business Alliance of Slovakia showed discrepancies in measuring development of the business environment. Ranking of Slovak economy quality of the business environment within global indexes in reviewed period stagnated and has not experienced significant fluctuations in the value of score achieved as well as in the global ranking of country's national economies. On the contrary evaluation of entrepreneurs, within Slovak Index of Business Environment published Business Alliance of

Slovakia quarterly, shows a continuous decreasing trend, which assessed the business environment in Slovakia growing only in the third quarter of 2010, in past 10 years.
Based on composition of indicators in different pillars of Slovak Index, there have been identified a state approach to the needs of entrepreneurs and the incidence of corruption and clientism in business, as the most serious problems. These indicators were subjected statistical investigation of their dependency on enterprise size and length of business. From the results of applied statistics, there can be identified the shortcomings in measuring the quality of business environment in the Slovak Republic:
Indicators and critical factors in Slovak Index of Business Environment are unbalanced, when more than two thirds of indicators are devoted to external market conditions, and less than third of all indicators can described as internal conditions. Such assessment model composition doesn't cover all business activities and processes. Subjectivity of Slovak Index of Business Environment lies in the assessment of the business environment of its direct participants - entrepreneurs. They perceive external conditions too critical and tend their own business activity assessed very positively, which degrades measurement of Slovak business environment through mentioned index. Quality of the business environment dependence examination promoted showed that entrepreneurs perceive corruption and lack of transparency in business put stronger weight than ordinary citizens in community life.

6.CONCLUSION

Based on an analysis and subsequent comparison of four major global indexes and two Slovak indexes assessing the quality of business environment has been detected disproportion between results of Slovak and global indexes. Closer analysis of Slovak Index of Business Environment determined problem areas in the process of measuring the development of business environment, as set out in the discussion on results. Identified problem areas were subjected an examination of their dependency measure on size of enterprise and length of business. Based on the results it can be established the following recommendations to improve the measurement of the quality of business environment in Slovakia provided by Slovak Business Alliance:
a) The structure of the Slovak Index of Business Environment should be redesigned basically, so it complied with all levels of the business environment and ensure a balance in terms of the assessment of external and internal business conditions. If we want to evaluate complex business environment, the model should consist of a combination of quantitative (objective) economic indicators and qualitative (subjective) data collected from entrepreneurs through questionnaire. b) It is necessary to eliminate a time lag in annual global measuring of the business environment and Slovak Index of Business Environment, which is published quarterly. Calendar year is a reasonable period during which there may be significant changes in the business environment only exceptionally. c) Weights of Corruption Perceptions Index in Superindex published by Business Alliance of Slovakia should be amended to take into account of the results of statistical investigation of dependence corruption and clientism occurrence in business perceived by entrepreneurs on the quality of business environment in the Slovak Republic. Therefore, authors recommends to raise a weight Corruption Perception Index within the model of SuperIndex (BAS) from 10% up to 18%, based on results of statistical assessment, published in this article.

Acknowledgement
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MACROECONOMIC BACKGROUND OF PUBLIC LISTING IN CZECHIA AND HUNGARY

Kiss Gábor Dávid, Vychytilová Jana

Abstract

The principal objective of this paper is to analyze the common and country-specific aspects in the macroeconomic and political background of the poor public listing in Czechia and Hungary. Vector Autoregressions were tested on country level and a fixed effect panel regression analyzed the cross-country phenomena. As a key result, we cannot support the idea that privatization policies, funded pension pillar, economic crisis or stock market ownership could be useful variable which describes the solution of current situation. Believing that economic growth or the increasing number of companies can solve this problem proved to be also a false hope. Deeper and finer political and market incentives are necessary to highlight the added value of public listing for the targeted sector.

Keywords: public listing, stock exchange, macro variables, Czechia, Hungary

JEL Classification: E44, P12, G18, G20

1.INTRODUCTION

The number of public listed companies decreased significantly since the middle of the nineties not only on developed markets Doidge et al. (2015), but both in Czechia and Hungary as well – presenting a negative attitude towards direct funding channels. The scope of the paper is to decide, which macroeconomic conditions affected public listing in the selected sample countries. A number of policy decisions mitigated constraints or enhanced the potential of equity capital market financing for companies in the region. Privatization trough IPOs increased the number of companies on stock markets in the early nineties; however sample governments had no clear commitment towards this privatization channel. Funded pension pillars provide a stable demand both for bonds and shares with long term investment horizon. Stock markets started to join to conglomerates, providing a more standardized way of listing and services. However, stock markets suffered from crises as well both from financial and institutional point of view (for example the reporting frauds before the dot-com crisis).

Present paper focuses on the Czech and Hungarian markets (due to their common historical background and similar stock market size) between 1996 and 2015, studying the impact of macro-variables and policy-related dummies on the number of public listed enterprises. Can we blame the development pathways of these countries or the exchange rate (for example: the former popular FX based corporate lending), the crises, the privatization or the ownership structure of the stock market for the declining trend of public listing in both countries? Or completely different paths are followed by these countries and we are not able to compare them?

The structure of the paper is the following: theoretical background section summarizes the importance of public listing and the story behind the policy-related dummies. Methods contain the description of Vector Autoregression Models (VAR) to summarize country-specific aspects of public listing developments and a fixed effect panel regression model, where individual effect test can show the poolability of sample countries. Results and data section summarizes the key findings of the individual analysis of the countries and their common points.

2.THEORETICAL BACKGROUND

Companies are able to use equity and debt sources to maintain the asset side of their balance sheet. Financial markets provide an alternative channel to raise capital by collecting shareholders' equity and bond issuance – meanwhile listing can be interpreted as a sign of transparency and reliability (Meluzin and Zinecker, 2014, 2015). Markets have an important benchmark function as well to give a picture about asset valuation, volatility and interest rates. However, poor tendencies are questioning the added value of public listing from corporate point of view. Unfortunately, there is a strong demand for equities on the investor side, with a capital export as a consequence of this unsatisfied demand (Fungacova and Hanousek, 2011).

Central East European countries have a mixed capitalism model according to Farkas (2011) and Nyvltova (2008), where companies prefer indirect lending channels and mostly neglecting the direct ways of fund raising (Shellock 2016). Governments tried to motivate economic actors via taxation (discounted dividend taxes on public listed enterprises), by privatisation trough IPOs or with the establishment of the funded pension pillars – however this commitment was not consistent and many accommodating decisions were cancelled later or followed with an even hostile policy (like Hungarian transaction taxes).

Central banks can also expand their transmission channels by replacing private financial activity (Lenza et al. 2010, Bagus and Schiml 2009): purchasing corporate bonds directly on primary and secondary markets as it happens since 2010 in the Euro Area or in Japan . Japanese Quantitative and Qualitative Monetary Easing represented a whole new level, when purchases of Exchange Traded Funds debuted in 2013.

The relative weight of public listing can be represented by listing count per capita, following Doidge et al. (2015). Macroeconomic development can be captured by the changes of log GDP/capita in market prices (source: national statistical offices) and the number of firms per capita. Currency market developments are characterized by real effective exchange rate changes. However, there are some region-specific factors which can affect public listing, namely privatization, mandatory funded pension pillars, stock exchange conglomerates and crises as the next section summarizes.

2.1.Policy-related dummies

There was a listing peak in the early nineties due to mass privatization processes in transitional Central European countries (Bornstein 1997). Voucher-privatization in Czechia resulted more than thousand listed companies on Prague Stock exchange until 1997 (Svejnar 2013) with a constant consolidation until 2002-2015 period when this number became two digit (Fungacova and Hanousek 2011). Hungarian governments preferred the non-public channels of privatization, a small number of companies were introduced on the market after an IPO and some of them was even delisted later. According to OECD (2006) Economic Survey, both countries have a very small venture capital market, moreover one of the lowest levels of venture capital investment in international comparison, when measured relative to GDP. This fact contraindicates with the access to financing, which is one of the key constraints for innovative SMEs – and without venture capital exits, the potential IPO number will be lower as well (Meluzin 2009).

Pension system theoretically can be divided on four pillars: zero pillar provides social aid for old aged people from tax incomes, while first pillar covers the pay-as-you-go systems, where pension payments are provided from pension contribution – with a support from the public budget if it is necessary. Funded pillars can be mandatory (second) or volunteer (third) or can be based on individual savings without any kind of institutional background (fourth). The quality of these pillars depends on contributions in the past, income accruing from the

investment in the future, and managerial costs and fees during the accumulation period – besides demographic and labor market conditions (Simonovits 2002).
The first systemic pension reform in Central and Eastern Europe was approved in Hungary in 1997 with the introduction of a privately-managed mandatory pension funds (MPF) as second pillar. MPF assets had increased to 9,7 percent of GDP in 2006, while third pillar (operating since 1993) was able to accumulate 2.6 percent of GDP. Returns of mandatory funded pillar followed the MNB base rate – partially due to the conservative bond-oriented investment strategies and high transactional costs (PSZÁF 2008, Czajlik and Szalay 2006).The modification of the government edict 282/2001 with the introduction of eligible portfolios in 2006 increased the weight of equities to 40% and holding of venture fund units were allowed with 3% or 5% share. After these regulatory changes, government bonds remained as a dominant component in the portfolio (51%), while shares and investment funds had an increasing role (33%) at the end of 2007 (Gaál 2007, Impavido and Rocha 2006). However, the entire second pillar was nationalized and used up to finance public budget in 2010. Czechia has a short liaison with second pillar between 2012 and 2015 only, and the second pension pillar was officially cancelled as of 1 January 2016 by the Act 376/2015, which came from the results of the Professional Committee for Pension System Reform. (CSSZ, 2016).
Czech and Hungarian stock markets were owned by local financial institutions until the first half of 2000s, when they were acquired by the Wiener Börse to form the CEESE Group (CEESEG).
Trust in financial markets can be eroded under crises: willingness of IPOs decreases due to poor funding environment, while investors can reallocate their capital after corporate scandals. Sample markets were affected by the Russian crisis in 1998 (some blue chips like Richter had a significant market share in Russia), dot-com bubble between 2000-2002, sub-prime crisis in 2007 and 2008. These periods were defined as crisis periods in the Euro-zone[1], to define external funding and market conditions.

3.METHODS

Czech and Hungarian data was tested individually with a VAR model, then together via panel regression to see their common characteristics.
Vector autoregressive (VAR) processes can describe the data generation process of a small set of time series variables, where all of them are treated as being a priori endogenous, and allowance is made for rich dynamics. This procedure captures the dynamic interactions for a set of *K* time series variables $y_t = (y_{1t}, \dots, y_{Kt})'$. The basic model of order *p* VAR has the form of (1) (Lütkepohl and Kratzig, 2004).

$$y_t = A_1 y_{t-1} + \cdots + A_p y_{t-p} + u_t \qquad (1)$$

Where the A_i's are *(KxK)* coefficient matrices and $u_t = (u_{1t}, \dots, u_{Kt})'$ is an unobservable error term, assumed to be a zero-mean independent white noise process with a time-invariant, positive definite covariance matrix: $u_t \sim (0, E(u_t, u_t'))$. The lack of autocorrelation in the residuals was tested with Ljung-Box test.
Panel regression requires consistent, balanced and fixed database to group (individual-specific) effects, time effects, to manage heterogeneity that can or cannot be observed (Park 2011). Our paper uses Panel Data Toolbox[2], following Álvarez, Barbero and Zofio (2015). Panel data (2)

[1] http://cepr.org/content/euro-area-business-cycle-dating-committee
[2] http://www.paneldatatoolbox.com

contains data matrices (with *i* columns and *t* rows) that were observed over a long period of time with *y* dependent and *X* independent variables with the following representation:

$$y_{it} = \alpha + \beta X_{it} + \mu_i + v_{it}, \text{ i=1,…, n, t=1,…, } T_i. \quad (2)$$

where μ_i represents the i-th invariant time individual effect (or unobserved component, latent variable, and unobserved heterogeneity) and $v_{it} \sim i.i.d(0, \theta_v^2)$ refers to the disturbance. In panel data models μ_i is called as a ''random effect'' when it is assumed as a random variable and a ''fixed effect'' when it is treated as a parameter to be estimated for each cross section observation *i*. It means that fixed effect approach allows arbitrary correlation between the unobserved effect μ_i and the observed explanatory variables X_{it}. Fixed effects analysis is more robust than random effects analysis, but time-constant factors cannot be included as X_{it} – this approach is for time-varying explanatory variables (Wooldridge 2010).
The Im and Pesaran (2003) panel unit root test (3) assumes the cross-sectional independence, with individual effects and no time trend:

$$\Delta y_{i,t} = \alpha_i + \rho_i y_{i,t-1} + \sum_{z=1}^{p_i} \beta_{i,z} \Delta y_{i,t-z} + \varepsilon_{i,t} \quad (3)$$

Null hypothesis: ρ_i=0 for all i=1,…,N and alternative hypothesis is ρ_i<0 for i=1,…,N_1 and ρ_i =0 for i=N_1+1,…,N, with 0<N_1 ≤N alternative hypothesis allows for some (but not all) of the individual series to have unit roots. This test uses separate unit root tests for each cross-section units based on the (augmented) Dickey-Fuller statistics averaged across groups. (Hurlin – Valérie 2007).

Serial correlation in the error term biases the standard errors and causes loss of efficiency. Wooldridge's test (4) has a null hypothesis of no serial correlation in the error term of a fixed effects model, time demeaned errors of a within regression are negative serially correlated: $\rho = -1/(T-1)$. This test regresses within $\hat{v}_{it}$ estimation residuals over their lag, $\hat{v}_{i,t-l}$ using a Wald test with clustered standard errors:

$$\hat{v}_{it} = \alpha + \rho \hat{v}_{it} + \epsilon_{it} \quad (4)$$

Random effects models can be tested by Baltagi and Li's Lagrange multiplier test for first-order serially correlated errors with the joint null hypothesis of serial correlated and random individual effects. The LM test is based on the OLS residuals and it is asymptotically distributed as a X_2^2.

4.RESULTS AND DATA

This section summarizes the key information about the dataset, then the two countries are analyzed separately to identify country-specific aspects. Later the common points are highlighted by a panel regression.
Czech company number per capita ratio was lower during the entire sample as Fig. 1 presents, but both of them presented a continuous increase – while listed per capita ratio suffered from continuous decrease. Hungarian listing remained stable, compared the monotone decrease in the Czech case. First years were characterized with privatization only, while crises were defined for the following intervals: 1998, 2000-2002, 2008-2009, 2011-2013 (as they appeared in the Euro-zone as the main export market of both countries).

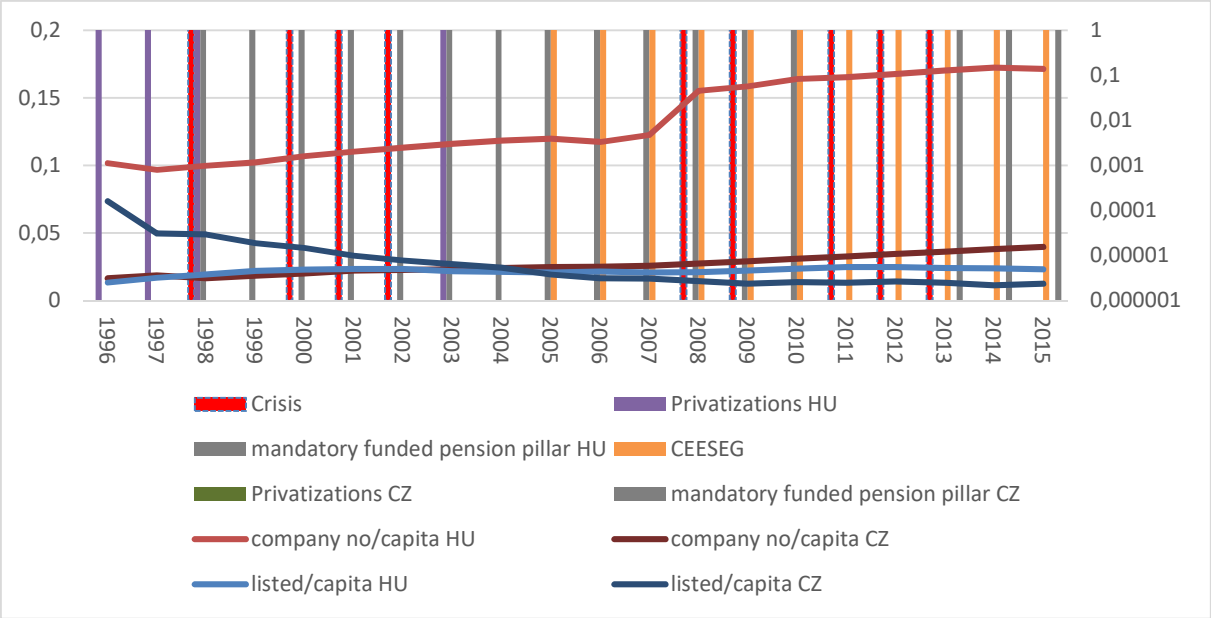


Fig. 1 – Listing, company number and dummies. Source: own edition, stock markets, Hungarian and Czech statistical offices

Hungarian listing has a declining behavior (Tab.1), represented by the negative coefficient of the 2 year lagged data. Funding of new companies can have a minor positive impact on the listing. Previous real effective exchange rate changes can have significant negative impact (it can be interpreted as the result of the popularity of FX based corporate lending), however their coefficient was close to zero. Crisis in the Euro-zone, privatization and funded second pillar had significant impact on listing, while the ownership-structure had no significance.

Tab. 1 – Vector Autoregressive Model on Hungarian yearly data (1996-2015) with 2 lag. Source: own edition, JPL Toolbox for Matlab

Dependent Variable = listed/capita
R-squared = 0.9970
Rbar-squared = 0.9879
sige = 0.0000
Q-statistic = 3.0603
Nobs, Nvars = 17, 13
****

Variable		Coefficient	t-statistic	t-probability
listed/capita	lag1	0.291447	1.868912	0.135001
listed/capita	lag2	-0.278103	-2.561490	0.062539*
lgdp/capita	lag1	-0.000000	-0.206781	0.846280
lgdp/capita	lag2	-0.000000	-0.197827	0.852827
company no/capita	lag1	0.000002	0.661917	0.544212
company no/capita	lag2	0.000029	5.753354	0.004526***
dREER	lag1	-0.000000	-0.927630	0.406105
dREER	lag2	-0.000000	-4.768462	0.008850*
Crisis d		0.000000	2.995355	0.040125**
Privatisation d		-0.000000	-2.657131	0.056559*
2nd pillar d		-0.000001	-7.961110	0.001349***
CEESEG d		-0.000000	-0.371413	0.729167

constant	0.000011	3.918019	0.017277**

Notes: ***: significant at 99%, **: significant at 95%, *: significant at 90%
Ljung-Box test on residuals (lag 2): p(1)=0.24, p(2)=0.26

Variable set was not significant for the Czech market, only the 2 year memory was present in listing per capita (Tab. 2). This result suggests that poor listing has different macro background in both countries.

Tab. 2 – Vector Autoregressive Model on Czech yearly data (1996-2015) with 2 lag. Source: own edition, JPL Toolbox for Matlab

Dependent Variable = listed/capita
R-squared = 0.9986
Rbar-squared = 0.9954
sige = 0.0000
Q-statistic = 2.2924
Nobs, Nvars = 17, 12
****

Variable		Coefficient	t-statistic	t-probability
listed/capita	lag1	-0.093857	-0.347920	0.742069
listed/capita	lag2	0.562524	2.796539	0.038149**
logGDP/capita	lag1	-0.000008	-1.438245	0.209884
logGDP/capita	lag2	0.000008	1.228310	0.273990
company no/capita	lag1	-0.000745	-1.814031	0.129399
company no/capita	lag2	0.000007	0.043852	0.966720
dREER	lag1	0.000000	1.591701	0.172328
dREER	lag2	-0.000000	-0.623466	0.560313
Crisis dummy		0.000000	0.687657	0.522261
2nd pillar dummy		0.000000	0.486530	0.647167
CEESEG dummy		0.000001	1.069217	0.333850
constant		0.000013	0.426582	0.687427

Notes: ***: significant at 99%, **: significant at 95%, *: significant at 90%
Ljung-Box test on residuals (lag 2): p(1)=0.28, p(2)=0.30

To test the common points between Czechia and Hungary, a fixed effects panel regression was fitted on the data. It indicated that log GDP per capita and privatization were significant variables, with negative coefficients (so there is no reason to say that poor listing can be grown out, or privatization can be a sole solution). Both countries were significant at the test of individual effects, making the sample structure reasonable, while the input table had no unit root and the panel provided non autocorrelated residuals (Tab. 3).

Tab. 3 – Panel: Fixed effects (within) (FE) on Czech and Hungarian data. Source: own edition, Panel Data Toolbox for Matlab

Dependent Variable = listed/capita
N = 40 n = 2 T = 20 (Balanced panel)
R-squared = 0.31250 Adj R-squared = 0.13508
Wald F(7, 31) = 2.013014 p-value = 0.0852
RSS = 0.000000 ESS = 0.000000 TSS = 0.000000

variable	Coefficient	Std. Error	t-stat	p-value
logGDP/capita |	-0.000072	0.000022	-3.2093	0.003 ***
company no/capita |	0.000581	0.000399	1.4535	0.156
dREER |	0.000001	0.000001	1.4288	0.163
Crisis dummy |	-0.000010	0.000008	-1.3317	0.193
Privatisation dummy |	-0.000038	0.000018	-2.1520	0.039 **
2nd pillar dummy |	0.000004	0.000011	0.4171	0.679
CEESEG dummy |	0.000006	0.000013	0.4927	0.626

Individual Effects

id |	ieffect	Std. Error	t-stat	p-value
Czechia |	0.000905	0.000274	3.3013	0.002 ***
Hungary |	0.000974	0.000295	3.3050	0.002 ***

Wooldridge's test for serial correlation p-value = 0.3133
Im and Pesaran (2003) Panel Unit Root Test
P-value of the W_bar statistic = 0.0318**
P-value of the Z_bar statistic = 0.0326**
P-value of the Z_bar_DF statistic = 0.0000***
Notes: ***: significant at 99%, **: significant at 95%, *: significant at 90%

5.CONCLUSION

There are different myths and ideas about the poor level of public listing in Czechia and Hungary. Current paper tested the possible macroeconomic and political determinants to check, how privatisation, pension system, crisis and stock market ownership background affected corporate attendance on local equity markets. Economic development was involved via the inclusion of GDP and general corporate number. There were significant differences between Czechia and Hungary as individual VAR models suggested, however none of the variables were identified as a super weapon candidate which can be used to change the tide. Our results are suggesting that the decreasing number of public listing is not an issue what can be outgrow, or not even a problem what can be sustainably managed through future privatisations. Despite the different development paths since the transition, the individual effects in the panel regressions supported the idea to involve both countries in the sample.
Poor venture capital involvement remained an unsettled issue in our dataset, because of the small and mixed portfolio of such companies. Listing costs were non transparent, while private sector profitability would be biased by many factors so they were excluded from our research.
The main theoretical implication of this study is that we cannot interpret poor public listing with macro or political variables only, this agenda requires a more sophisticated and structural approach to find those key factors which can highlight the added value of stock markets for companies.

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UNSETTLED RECEIVABLES IN ACCOUNTING AND TAXES: CZECH CASE

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Abstract

This paper briefly outlines the actual situation of unsettled receivables in Czech enterprises. The aim of the article is to present the results of research in the area of the adjustments to receivables with an impact on the tax base. The first part of the paper analyses the background of debt management from various aspects. From the research, it was found that in recent years' overdue receivables have still been recorded in the accounts, and the creation of adjustments for non-lapsed receivables is increasing. A discussion then follows in which special attention is paid to area of application of statutory adjustments in tax expenses, where very strong dependency was statistically confirmed.

Keywords: receivables, adjustment to receivables, management of receivables, unsettled receivables

JEL Classification: M21, M41

1.INTRODUCTION

Receivables, an important part of working capital, are associated with high risk of non-payment. The area of the management of receivables is an important part of a company's management system, one on which the company's success depends and whose importance increases in difficult conditions due to reduced demand for products and services, lack of available funds and other phenomena accompanying recession (Kubickova and Soucek, 2013). The focus of this article is to present an analysis of the importance of adjustments to receivables for the financial management of enterprises and the tax base under the conditions in the Czech Republic. This article presents the results of research in 2013 and 2016. Following parts deal with a theoretical background and further develop scientific questions. The next part presents the methodology used in the article. Last part concludes by discussion about achieved results.

2.THEORETICAL BACKROUND

In the literature, the issue of receivables management is studied from many aspects and in many different contexts and levels: as part of company management, performance management, financial and cash management, risk management and marketing and business policy (Kubickova and Soucek, 2013). Customer audit also helps to improve customer-supplier relationships (Bris and Klimek, 2015).
According to Daniels (2004), the performance management is a broad concept. In 1970, performance was described mainly as a technology to control the behaviour and results, for which there were two key elements of what is known as performance and performance could be defined as the ability to assess investments made in business the best possible way. Therefore, from these definitions is clear that unsettled receivables reduce such performance. According to Kontus (2012) accounts receivables management directly impacts the profitability of a company, her study aims to prove correlation between individual receivables and ROA. The increase of the company's performance is listed in management top-priority list. Accounts

receivable management includes establishing a credit and collections policy. Credit policy consists of four variables: credit period, discounts given for early payment, credit standards and collection policy. The three primary issues in accounts receivables management are to whom credit should be extended, the terms of the credit and the procedure that should be used to collect the money. In every business engagement, a situation can arise where one of the partners finds themselves in primary or secondary insolvency (Paseková et al. 2011). The topics are addressed in publications by many authors such as Checherita-Westphal (2016), Belás, J. et al. (2014), Bilan, Y. (2013), Chovancova, B., and Hudcovsky, J., (2016), Micuelac and Monea (2012), Kalibayev (2015) and Shi (2015). Taylor, E. B. (2016) discusses about the inability of consumers to meet one's liabilities and see possible social and psychological effects of the problem.

Receivables as part of current assets are also a significant item of working capital. To ensure solvency in the short term, permanent working capital management is essential so that liquid assets are always available in the amount required by liabilities payable. This places high demands on the structure management of current assets. Receivables are a transition of the cycle of current assets and their management is to ensure company's liquidity and cash flow. To improve cash flow, the firm offers its customers a reduced price and increased purchasing up to the firm's capacity in exchange for shortened receivable collection times (Czopek and TrzaskuŚ-Zak, 2013).

Kim and Kang (2016) deals with debt collection through customer call centers and states that implementation of this collection method helps to improve the financial situation of companies. Thomasa et al. (2016) in some case study describes the procedures for repayment of unsecured debts. Their article these procedures consider for crucial in debts collection by creditors, the first approach solves string of consecutive payments or non-payments and the second approach is an estimate that the defaulter pays a debt in that month or not. Based on these approaches, the creditor may establish a portfolio of receivables and reveal bad debts.

The management of receivables is a set of rules and practices that minimize the risk of unsettled receivables. The purpose of the management of receivables does not involve a situation when a company has no receivables, but a situation when the costs associated with the management of receivables process are as low as possible. The management of receivables is carried out in three phases: preparation, to maturity, and past due. Some study deals with provisioning for doubtful debts of Slovak enterprises in taxation and accounting. It is analyzed and studied the importance of provisions, difficulty in provisioning for loans and their impact on the economic performance of selected companies (Suhanyiova et al. 2015). In Czech Republic a new solution to bankruptcy law had taken place; the possibilities of legal solutions include mediation proceedings, arbitration, litigation, and insolvency proceedings. Pasekova et al. (2015) give an analysis of real data from the five-year period during which the Insolvency Act was in force revealed that individual creditors received satisfaction amounting to approximately 50 % of established receivables.

3.RESEARCH METHODOLOGY

The main goal of this paper is to discuss problems related to receivables, and the high risk of unsettled receivables. As research from 2012 has shown, interest in dealing with bad debts is growing, which is why subsequent research has dealt with non-lapsed receivables and bad debts (Kolarova and Otrusinova, 2012). The aim of this research was to determine whether the increased the enforcement of outstanding receivables. This assumption was tested on the basis of the questionnaire survey results. The first survey was carried out in 2013, and the following research was performed in 2016 by the research work students. The impetus for the continuation

of the research was the amendment to the Reserves Act of 2014, which governs overdue receivables.

This section describes research methodology - data collection, the process of designing and implementing a questionnaire survey. Furthermore, it specifies the scientific methods used to answer the research questions. In the years 2013 and 2016 a survey using questionnaires (as based method) was carried out at the Faculty of Management and Economics at the Tomas Bata University in Zlin (Czech Republic). The structure of the questionnaire was focused on the same objectives as in 2013. 194 questionnaires have been gathered and analyzed in 2016 and 206 questionnaires had been evaluated in 2013. Every valid questionnaire was statistically analyzed and synthesized. The statistical methods as the regression analysis were used. Hypotheses were defined to be tested by basic hypothesis testing for variance.

The respondents were from the entire spectrum of companies (manufacturing, business and service enterprises) as well as non-profit and public sectors (see the fig. 1). The structure of the questionnaire focused on the same objectives in both years. Businesses of various sizes were surveyed in the individual questionnaires. 300 respondents were initially contacted in year of the survey, but some respondents did not reply, or their answers were incomplete. For statistical evaluation, the factor of company size was not taken into consideration, as every company has problems with receivables.

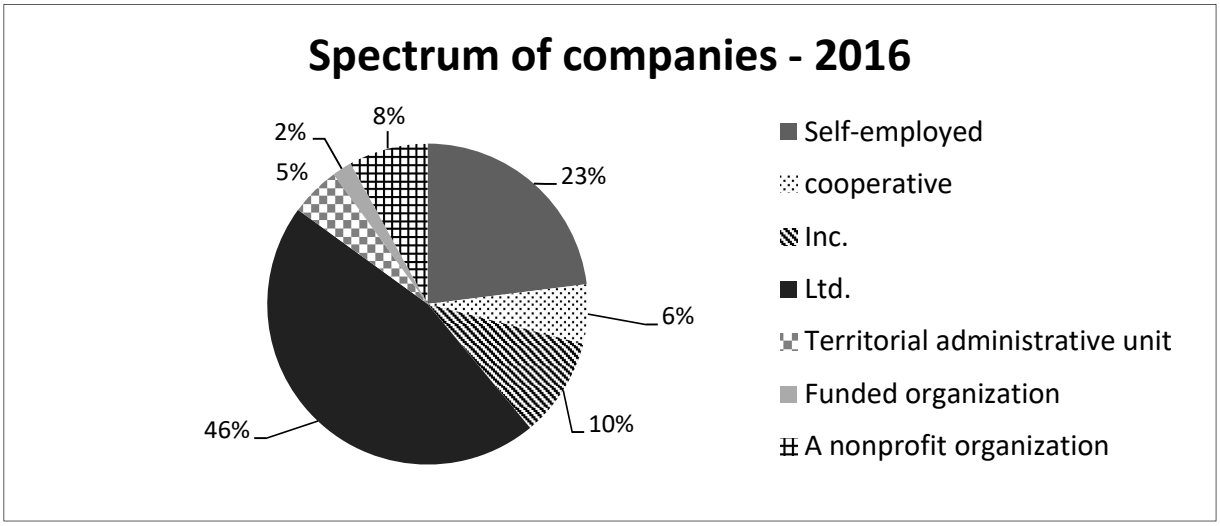


Fig. 1 – Spectrum of companies. Source: own

The questions were compiled according to the legal regulations in the surveyed years. The respondents who were contacted were mainly from corporate management and the economic sector.

Questions which were evaluated:

1. How many non-lapsed receivables payable within 31 to 90 days do you have?
2. What percent of the value of your overdue non-lapsed receivables has been paid?
3. What percent of the value of your non-lapsed receivables registered in insolvency proceedings has been paid?
4. Have you applied the statutory adjustment to receivables in your tax declaration?

Formulations of hypothesis were as follows:

H_1 - There is a correlation between the formation of provisions and their application in tax expenses

4.RESULTS AND DISCUSSION

The main results of the research are introduced and discussed in this part of paper.
The results of the 2013 research compared to the year 2016, is displayed in Table 1:
Tab. 1 – Comparison of the results of questionnaire surveys for the years 2016 and 2013 Source: own

Question no.	Response year 2013	Response year 2016	Comparison of 2016 to 2013
1	13.8%	12.6%	1.2
2	9.5%	10.6%	-1.1
3	2.3%	1.5%	0.8
4	68.9%	72.7%	-3.8

In the discussion, we evaluate the available surveys to answer the first question: *"Has purchasers' payment discipline improved?"*

1. In 2013, 13.8% of companies had receivables with due payment dates of between 31 and 90 days, while in 2016 there was a reduction to 12.6%.
2. The 2013 questionnaire showed that overdue non-lapsed receivables were paid in 9.5% of cases. Some receivables were paid only in part, or not paid at all. Overdue receivables lose their value, and the likelihood of their collection decreases as the time elapsed after their due payment date increases. In accounting terms, according to the principles of fair presentation combined with the principle of prudence, it is necessary to react to the reduction in the value of the receivable. In its accounts, the company can use two instruments: reduction of the receivable (which has a temporary character) or permanent reduction. The revenue is included in the tax base and is subject to taxation, and an obligation to pay VAT arises. The tax base can be reduced by creating statutory adjustments with a fiscally effective one-time depreciation of receivables. In 2016, overdue non-lapsed receivables were paid in 10.6% of cases.
3. In the first survey, non-lapsed receivables registered in insolvency proceedings were paid in 2.3% of cases. These receivables are registered in the insolvency proceedings so that the company can create statutory adjustments and reduce its tax base. In the insolvency proceedings, certain groups of creditors have an advantageous position, according to the type of debt. In the year 2016, there was a reduction in value to 1.5%.
4. Regarding the receivables set forth in § 24 paragraph 2 section y) of the Income Tax Act, the depreciation of a receivable is a tax expense. According to the quoted provision, the nominal value of a receivable or acquisition price of a receivable acquired by transfer, deposit or during a company transformation is a tax expense under the presumption that the receivable was accounted for among revenue at the time of its creation. Thus, the taxable income was not tax exempt, yet at the same time it is not a receivable acquired without payment or a receivable arising between connected parties. Statutory adjustments are created primarily for application in the company's expenses. In the year 2013, companies applied these items at a value of 68.9%. Adjustments to non-lapsed receivables are created as per the Reserves Act, in order to

determine the income tax base as per §8. In 2016, companies are applying these items at a value of 72.9%.

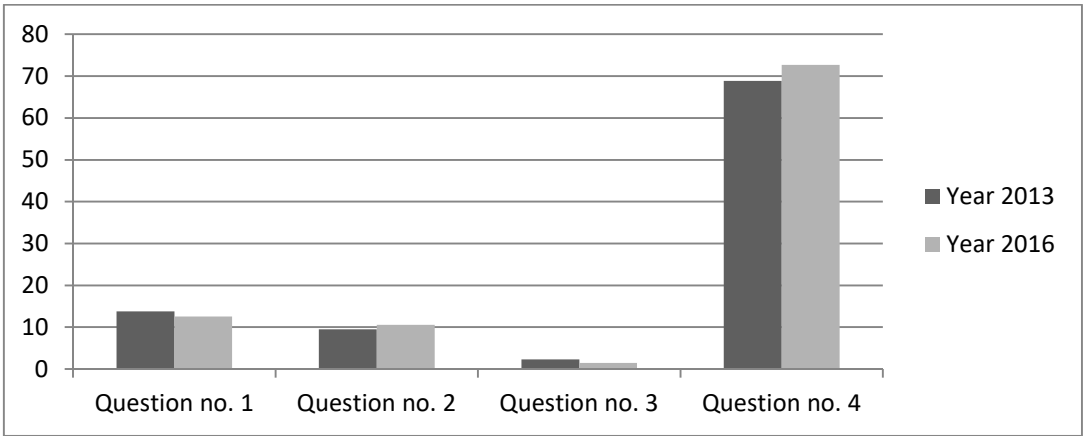


Fig. 2 – Comparison of the results of questionnaire surveys for the years 2016 and 2013. Source: own

Statistical evaluation

The next aim of the article was to present the results of research in the area of the creation of adjustments to receivables with an impact on the tax base. From this perspective, questions 4 were then subjected to a statistical evaluation, where the dependency of the creation of statutory adjustments on application in tax expenses was examined. The basic assumption was that the investigated file has a normal distribution. Hypotheses were defined to be tested by basic hypothesis testing for variance. A normal distribution of data was found and we can confirm that the occurrence of more than 80% of primary data is greater than 5 and the independence of values can be tested.

Tab. 2 – Creation of adjustments to receivables with an impact on the tax base for the years 2016 and 2013. Source: own

Question	Response year 2013	Response year 2016
Have you created the adjustments to receivables?	59.6%	68.3%
Have you applied the statutory adjustment to receivables in your tax declaration?	68.9%	72.9%

Using the regression coefficient (1) slope of a straight line was calculated, which indicates the average change in the dependent variable y for unit change in the independent variable x, where n represents the number of questions.

(1) $$b_{xy} = \frac{n\sum_{i=1}^{n} x_i y_i - \sum_{i=1}^{n} x_i \sum_{i=1}^{n} y_i}{n\sum_{i=1}^{n} y_i^2 - \left(\sum_{i=1}^{n} y_i\right)^2}$$

n – Number of questions
x – Independent variable
y – Dependent variable

The regression coefficient value was 0.50187, and the regression line equation was Y = 0.5019 x+ 4.0677. The equation determines linear regression, where “x” is the independent variable, is

the creation of statutory adjustments, and "y" is the dependent variable, the application of tax expenses. The correlation coefficient was calculated from the comparison pair x and y. The correlation coefficient was calculated as r = 0.923762. The result points to a very strong dependency between the creation of adjustments and application in tax expenses.

5.CONCLUSIONS

The main goal of this paper was to discuss problems related to receivables, and the high risk of unsettled receivables. The special focus of this paper was to analyse the previously performed research survey in this field, and to present the importance of adjustments to receivables under conditions in the Czech Republic. The study has demonstrated that businesses are still dealing with unsettled receivables that is able to apply in the tax base. The production of efficient tax adjustments increases of 8.7% compared to 2013. About 3.8% of respondents more applied statutory provision in tax return in the 2016 survey. Based on the correlation analysis, we can conclude that the result shows a very strong correlation between provisioning and application in tax expanses. The tested hypothesis has been confirmed. By the replies on the question concerning the submission of receivables in bankruptcy proceedings, the results were surprising because compared to 2013 it decreased by 0.8%.

This paper also strove to demonstrate the dependency of adjustments on the tax base. Accounts receivable management is still a core function of every business and, as with any other aspect of business, it must be managed effectively to produce the best results while avoiding costly mistakes. In the first part of this paper, the authors discuss the main purpose of the survey on this topic. Based on the critical literature review, the research questions were specified. The chapter then summarizes the main findings from the questionnaire survey. The findings presented in the paper are derived mainly from research carried out as part of the students' and authors' work. The role of this article, as well as further research at the Tomas Bata University in Zlín, is to provide an empirical study which will discuss the options for dealing with unpaid receivables. The research has demonstrated that in the Czech Republic, the situation in the area of insolvency is still unfavourable. A strong dependency between the creation of adjustments and their application in tax expenses was also confirmed.

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THE ECONOMIC INTERPRETATION OF THE CONCEPT OF PROFIT LOSS: THE CASE OF THE CZECH REPUBLIC

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Abstract

The notion of lost profits is often interpreted incorrectly. Based on the author's experience, even expert opinions in the field of economics derive lost profits directly from the accounting profit or loss as shown in the profit and loss account. Such an approach is insufficient. In this paper, we show that the economic importance of the notion of lost profits should be seen primarily as a decline in the value of the company and to show the methodical procedure to correct the calculation of lost profits approach to economic and legislative conditions in the Czech Republic.

Keywords: lost profit, economic damage, expert opinion

JEL Classification: G39

1.INTRODUCTION

Lost profit (loss of earnings) is one of two forms of material damage. Material damage is understood as a damage that had occurred in the victim's property which is objectively expressible in generally accepted measurement equivalent, i.e. in money (Hendrych, 2009). The actual damage can then be another possible sign of material damage or, in other words, the value of the property asset was directly reduced. Both of these forms of property damage can be considered equivalent, and the existence of one of them does not affect the creation and relevance of a second. In the case of the Czech Republic, the obligation of the subject responsible for the damage to pay actual damages and the lost profits is enshrined in § 2952 of the Act no. 89/2012 Coll. Civil Code. For completeness, it is worth noting that in addition to property damage also non-material or intangible damage may occur, which cannot be expressed clearly in monetary terms and in a specific form. The examples may include injury, damage to reputation, or emotional distress and other violations of personal rights.

Determining the amount of economic damages should normally not be a problem for an expert witness, which is completely in contrast to the quantification of lost profits - even though it might seem just the opposite from the terminology perspective. Indeed, the like do not come from the company's balance sheet or even from the accounting profit and loss account and we need to do a professional valuation using the appropriate valuation methods as we will argue in this paper further.

Unlike actual damages a profit loss does not constitute reduction of the current economical state, as is the case with actual damage. Assets of the party suffering the damage did not diminish nor increase. Loss of earnings is thus the difference of wealth between the state what the party suffering the damage achieved and what it would achieve if the damage did not occur. It is therefore a foregone gain of property which was prevented by the harmful event (Bejček, 2005). In terms of the economic interpretation the fundamental definition of lost profits should be interpreted as a loss in wealth increase. In other words, it can be seen as loss of profits which with respect to the regular course of things ought to have happened, but did not happen due to a loss event (see also the opinion of the Supreme Court of Czechoslovakia Cpj 87/70, published in the collection judicial decisions under the number RC 55/1971, pp. 339-340).

Some authors (e.g. Nedbálek, 2015) divided loss of profits on real (factual) and hypothetical. The real loss of earnings will occur in a situation where the amount of lost profits is determined according to the value already agreed, or at least predictably achievable by the subject suffering the damage on the basis of information relating directly to this party. There must therefore be a direct and undeniable link between the conduct and the damage. On the contrary, the hypothetical loss of earnings can be established only with difficulty, since it will be a gain, which is the relevant course of business under conditions similar to those breached the contract in a fair trade usually achieved. While it is relatively easy to demonstrate the actual loss of earnings, the hypothetical loss of profit is based on the prediction and assessment of future developments. On the other hand, it must be recognized that any loss of profit is more or less hypothetical, and that this classification is in certain respects only academic.

Hamplová (2016) on the issue of lost profits quantification states: "*[In] legislations of different countries, even in an environment of international courts the concept of "lost profits" is commonly used as a result of the infringement impeding economic activity of a particular subject. From the practice of quantifying these "lost profits" valuers and experts, possibly by replacing those profits in cash, however imply, that they are denominated at the actual cash flows.*" From the above quotation it shows that the realization of profit does not necessarily mean (and usually it does not) the realization of cash flow at the same rate, whereas the loss of profit means that just real money flows (the difference between cash inflows and cash outflows), not only the difference between revenues and expenses reported in the financial statements. In other words, corporate accounting and economic theory perceive a profit in another way than in the case of profit, which "escaped" any entity resulting from certain disruption of its economic activity.

Hamplová (2016) states that the compensation of damage is calculated based on lost profits. Lost profits are the result of an infringement while impeding economic activity of a certain subject, while the practice of quantifying these lost profits valuators and experts, possibly by way of replacing those profits, which are conducted in cash, that are denominated at the actual cash flows. Quantification of economic damages is therefore according to Hamplova (ibid) based on the unrealized value of expected cash flows that would occur in the ordinary course of things.

Cited the opinion of the Supreme Court of Czechoslovakia, namely that the loss of profit represents the unrealized increase (multiplication) of property of the subject suffering the damage, is consistent with the economic interpretation of expected cash flows that were not realized due to such damage. In the event that the subject suffering the damage is the owner of a particular business enterprise in which the results of unlawful conduct impeding economic activity negatively affected cash flows, the potential increase in the property value can economically be quantified as the difference between the original investment (Contributions from owners - see following Table 1, marked in gray field) and the value of equity after taking into account all cash flows (see Table 1, black-marked field). Multiplication of the owner's property which hypothetically could be a "perfect condition of things" is actually a residual value of a business project after paying all necessary expenses related to financing (i.e. payment of principal debt and accrued interest). The amount of this residual value is dependent on the profitability of the business project (what operating income is generated from invested capital) and the cost of debt.

Tab. 1 – Value creation of a business project for the owner. Source: Authors

Financing of the business project	plus Financial cash flow	
		plus Debt capital (loans)
		plus Equity (Owner's equity)
Profitability of the business project	minus Investment cash flow	
		minus Investments into fixed assets
		minus Investments into working capital
	plus/minus Operating cash flow	
		plus Inflows from sales
		minus Operating expenses
		minus Corporate income tax
	plus Investment cash flow	
		plus Cash inflow from sales of fixed assets
		plus Cash inflow from sales of working capital
Redistribution of cash flow from the business project	minus Financial cash flow	
		minus Debt capital (loans)
		minus Interest
		minus Cost of equity
		Residual value of the business project for the owner (increase in owner's wealth)

The actual loss of revenue for the owner of a business project can then be interpreted (as shown in the following Table 2) as the difference between the amount of wealth that the owner could realize if he was running things as usual and the wealth that the owner had actually taken place in the situation which has been negatively affected by any infringement caused by the subject responsible for the damage.

Tab. 2 – Loss of profit of the owner of the business project as a decrease in proliferation of its assets. Source: Authors

Residual value of the business project for the owner in the case of "perfect condition", i.e. in the situation of "normal course of things"	Loss of profit of the owner of the business project
	Residual value of the business project for the owner in the state affected by the event causing the damage

The procedure for calculating the residual value of the business project presented in the table above (Table 1) is a simplified representation of economic reality, as the financial, investment and operating cash flows generally do not occur in the same time period and there is a delay between the expending of financial resources, the realization of business investment, implementation of operating cash flow and actual redistribution of cash flows. Cash flows realized in different time periods cannot simply be added but it is necessary to take into account the time value of money by discounting. When choosing the discount rate for purposes of comparison of the present value of cash flows for the perfect condition of things, and the present value of cash flows realized for the state affected by an incident, it is necessary to take into account the nature of the event causing the damage and its consequences, a phase in which there is a dispute between the by the damage affected business project and the subject causing the damage and also the fact that the consequences of an event are ongoing or not (in details, among other authors see Hamplová, 2016, the issue of the discount rate already exceeds the scope of this article). The definition of an expert (analytical) task from the perspective of time is also significant, i.e. whether the quantification is done *ex post* or *ex ante*. In this regard, the role of

particular importance plays the choice of the date of valuation on which the damage quantification in terms of present value of lost profits would apply. Also, it is necessary to determine whether to the time of the analysis the damage still occurs, or whether such behavior has already been prevented.

2.VALUE BASIS OF THE BUSINESS ENTERPRISE IN QUANTIFYING THE LOSS OF PROFIT OF THE OWNER OF THE BUSINESS PROJECT AND THE CHOICE OF METHODOLOGICAL APPROACH TO VALUATION

For the purposes of quantifying the loss of profit is first necessary to specify the appropriate basis of value, as its choice clearly sets the conditions defining the interpretability of analyzes and calculations. The basis of values can be in the global standardization of valuation found directly in the International Valuation Standards (IVS) issued by the IVSC in London.
In the case of unlisted companies operating in emerging markets (even in the case of companies based in the Czech Republic), it can certainly be assumed that there is no market of sufficient quality, from which it would be possible to derive market value of the business project under the IVS, or possibly the "usual price" within the meaning of the Act no. 151/1997 Coll., on property valuation, as amended. For the purposes of quantifying the loss of profit it is thus appropriate that the basis of fair value in accordance with its definition contained in IVS as amended is calculated. The basis of fair value makes it possible to take into consideration the specific needs of a particular case. In terms of value basis introduced under the IVS therefore, there is a category of fair value (the category of fair value on the principle of going concern) derived on the basis of the model (i.e. this is called the third level of quality estimation for assets for which there is no active price-setting market of sufficient quality). For assets for which there are markets of sufficient operating quality the market value basis can apply.
Choosing a valuation approach that will be used to quantify the fair value of the business project, assumes that two basic assumptions are met:

- The assumption of the highest and best use of the asset being valued. Under this condition the assumption that the market works in an economic sense effectively, so that the competitive process leads to maximum utilization of limited scarce resources is hidden.

- The assumption of permanent continuation of the business enterprise (going concern), under whose fulfillment can be expected that the business enterprise will exist indefinitely.

Further operation of the business enterprise from the owner's perspective makes economic sense only if the value of equity derived by applying the income based valuation methods of future economic performance of the continuously operating business is higher than the income of a hypothetical liquidation of the business enterprise. Otherwise, the continued operation of the business enterprise (and therefore income based valuation) lacked meaning and value of the business enterprise would have to be established at liquidation value - in details see Mařík et al. (2011).
In the case of fulfillment of assumptions of *highest and best use* and *going concern* it is relevant to determine the value of the business enterprise as functional operating unit by using one of the income based valuation methods. Typically, the method of discounted cash flow (DCF), will be applied. This method uses the concept of free cash flows for lenders and owners. The free cash flow is the value driver of fundamental importance for the quantification of lost profits and therefore DCF method is more appropriate than the economic value added, or capitalized earnings method.

Value of a business project for all its investors in the case discounted cash flow method can be seen at the present value of removable free cash flows called FCFF (free cash flow to firm). Calculation of the present value of FCFF is determined by estimating the value of the entire business enterprise, including debt - see Mařík et al. (2011).
If the terms of the solution the actual owner's wealth suffering the damage is crucial, or in other words if it is necessary to determine the value of a business enterprise for its owner, it is necessary to quantify the value of equity in the company running this business enterprise. This can be done either by the income based value of the business enterprise subtracting the value of interest-bearing debt at the valuation date, or it can come directly from a present value of future free cash flows to owners called FCFE (free cash flow to equity). Removable free cash flow at the FCFF level in this case, after adjustment for all cash flows that do not belong to the owner, a particular interest and loan repayments (if we add the newly received loans). FCFE calculation scheme is as follows:

	The adjusted operating profit after adjusted taxes *)
+	Depreciation
+	Other expenses that are not expenses in a given period (eg. Change cost reserves)
–	Investments in operating working capital
–	Investments in fixed assets
=	Free cash flow to the firm (FCFF)
–	Interest from debt capital, net of tax shield, i.e. Interest * (1 - tax rate)
–	Repayments of interest-bearing debt capital
+	Adoption of a new interest-bearing debt capital
=	Free cash flow to equity (FCFE)

**) Note: Adjusted operating profit is profit generated by net operating assets. A detailed interpretation of this issue can be found in Mařík a kol. (2011)*

3.METHODOLOGY FOR QUANTIFYING LOST PROFITS IN THE EVENT THAT AS A RESULT OF A LOSS EVENT ONLY INCREASE OPERATING COSTS OCCURS

The subject of this paper is to provide hints on the methodology of quantification the loss of profit due to a damage. For example the damage may be caused by a delay in shipment of production equipment. The emergence of lost profits occurs than because of the increase in production costs, for a period of one year (1 January 2016 to 31 December 2016) as the production has to be outsourced. The valuation date for quantifying the amount of lost profits is determined by several months after the consequences of the incident. Hence, the solution lies in the *ex post* quantification of the reduction in cash flow at the FCFF or FCFE level (depending on the specification of the valuation subject). The amount of lost earnings at the entity level in this case can be identified by the following relationship:

$$\text{Lost profit}_{1.2016-31.12.2016} = FCFF_{2016,O} - FCFF_{2016,D} \quad (1)$$

where $FCFF_{2016,O}$ the free cash flow at the entity level, which would hypothetically have been achieved in 2016 the ordinary course of things
$FCFF_{2016,D}$ the actual free cash flow at the entity level for 2016 affected by the consequences of an event causing the damage

Assuming that a change in production costs is the only consequence of an damage event, it is possible to use free cash flow at the entity level containing the calculation of loss compared to a hypothetical scenario without the occurrence of the damage event being quantified as follows:

$$FCFF_{2016,O} = (T_{2016} - Od_{2016,O} - N_{2016,prod,O} - N_{2016,adm}) * (1-t) + Od_{2016,O} - I_{brutto,2016} \quad (2)$$

$$FCFF_{2016,D} = (T_{2016} - Od_{2016,O} - \Delta Od_{2016,D} - N_{2016,prod,O} - \Delta N_{2016,prod,D} - N_{2016,adm}) * * (1-t) + Od_{2016,D} - I_{brutto,2016} \quad (3)$$

$$\Delta Od_{2016,D} = Od_{2016,D} - Od_{2016,O} \quad (4)$$

$$\Delta N_{2016,prod,D} = N_{2016,prod,D} - N_{2016,prod,O} \quad (5)$$

where

T_{2016} sales in 2016

$Od_{2016,O}$ depreciation in 2016 under normal course of things

$Od_{2016,D}$ depreciation in 2016 affected by the consequences of the damage

$\Delta Od_{2016,D}$ change (increase) of depreciation 2016 as a consequence of the damage

$N_{2016,prod,O}$ production cost without depreciation in 2016 under normal course of things

$N_{2016,prod,D}$ production cost without depreciation in 2016 affected by the consequences of the damage

$\Delta N_{2016,prod,D}$ change (increase) of production cost as consequences of the damage

$N_{2016,adm}$ administrative costs in 2016 (all non-production operating costs)

$I_{brutto,2016}$ re operationally necessary gross investments in fixed assets and working capital in 2016

t the effective income tax rate

The calculation assumes that as a result of operating costs (administrative and production costs including depreciation) a tax shield arises. Thus a saving on income tax in the amount of total product cost and effective income tax rate is generated. Calculation also assumes that in the case of claims and normal damage free course of things gross investments in the amount of depreciation are made which can be different in the case without the occurrence of the damage, thus:

$$\text{Lost profit}_{1.1.2016 - 31.12.2016} = (\Delta Od_{2016,D} + \Delta N_{2016,prod,D}) * (1-t) \quad (6)$$

4.CONCLUSION

Profit or loss recognized in the income statement in the corporate financial accounting cannot be considered an indicator of the success of a business project from the perspective of its owner. As the difference between revenues and expenses recorded for a certain period accounting profit does not reflect the actual cash flows generated by the business project, but only and only the difference between the realized income and incurred costs, which accounting perceives as consumption of factors of production for a certain period and records it the basis of accrual principle. Thus, crucial is in no way a true moment of cash flows, but only and only accruals of income and expenses. Profit of any business project is an indicator to price setting (on an aggregated, enterprise level) and serves as a baseline for determining the income tax base. In no case it does represent a material benefit, which the owner for a certain period achieved (or could achieve, if not prevented him from doing by any hypothetical loss event), because inter alia:

- To quantify the accounting profit, the collected revenues and expenditures are not of the primary importance, but realized revenues and expenses are (i.e. not as real collection of revenue from sales generated by the production, but only realized revenues, whose collection in the event of insolvency or protracted default of the customer, in fact, never ever may not occur),

- Does not consider time value of money, because it only works with a nominal value of individual accounting items,
- Realized profit may not be paid out to the owner in the form of profit-sharing or any other form of cash flows and the owner, therefore, may never achieve pecuniary gains out of the profit.
- Ignores the opportunity costs that arise as the owner's opportunity costs due to inability to invest in capital embedded in another business project. These opportunity costs of equity, although economically existent, are not recorded in financial accounting because they are not actually paid in the form of dividends, and constitute neither a decline in the value of assets nor increases in liabilities (which is how costs are defined in financial accounting).

Proposed methodological approach in this paper is based on the measurement of the reduction in cash flow at the FCFF or FCFE level. The main advantage of our methodology is therefore the direct linkage of the parameters affected by the consequences of an event causing the damage. In addition to the above mentioned advantages of our approach, there are also limitations inherent to the framework. The approach is based on ex post quantification of the reduction of cash flow. The question is however, how the estimate the level of cash flow, which would hypothetically have been achieved in the ordinary course of things. Lost profits cannot be demonstrated with reasonable certainty for a "new and unproven enterprise" as it is largely speculative or uncertain.

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MODELLING AND OPTIMIZATION CASH PROCESSING COSTS IN THE CZECH REPUBLIC

Král Martin, Hájek Ladislav

Abstract

All bank processes connected with cash processing are currently more important because of rising volume of cash in Europe. Despite the popularity of non-cash payments, the volume of cash in circulation is growing not only in the European Monetary Union but also in the Czech Republic. That is why the all cash processing institutions, banks including, should analyse these processes in order to reducing operating costs.
The aim of this paper is to describe processes in the banking industry connected with the cash processing in the Czech Republic and to analyse costs of these processes. The paper describes the results of measures which have the potential to increase efficiency of the current system while maintaining the decentralized manner of cash processing and in the final section, possibilities of the centralization of cash processing are discussed and a solution proposed. In addition to the evaluation of the efficiency of processes on the basis of the objective function, the efficiency of the use of working hours of employees of the bank is also dealt with.

Keywords: Efficiency, Cash Processing, Simulation, Costs, Centralization

JEL Classification: E47, G20

1.INTRODUCTION

At present, a total of 481 financial or credit institutions operate in the Czech Republic. Of that number, 46 institutions are banks and branches of foreign banks (CNB, 2017a). With respect to clients, banks are primarily institutions that accept deposits and provide loans; i.e. ensure payments among individual entities on the financial market (Revenda, 2012). Payments may be either cash or non-cash. Non-cash payments include for example one-time or standing payment orders or payment card transactions. A survey of one of the biggest payment card companies, MasterCard, shows that popularity of modern payment technologies in the Czech Republic continues to grow and regular debit cards are used with increasing frequency (MasterCard, 2016a). Consumers will have the possibility in addition to the standard payment authentication by PIN to replace this authentication method in the case of electronic purchases by a biometric method (e.g. fingerprint, facial recognition – selfie) (MasterCard, 2016b). Despite the popularity of non-cash payments cash in circulation globally has been still increasing and the worldwide cost of handling cash exceeds $ 300 billion per year (Delloite, 2016). The volume of cash in the European Monetary Union increased by almost 30 % from 15,687M pieces of euro banknotes in 2012 to 20,220M pieces in 2016 (ECB, 2017). The situation in the Czech Republic is very similar - the volume of Czech crowns in circulation increased by 35 % in the last five years (CNB, 2017b).
Banks currently pay 80% of the bill to provide cash. As their cash costs continue to rise, banks are under increasing pressure to manage their cash operations more effectively. There are three successive waves of cost reduction that banks around the world are taking to reduce their cash costs. The first wave is optimization of internal bank operations. Through more sophisticated cash planning, intelligent monitoring of ATM incidents, and rationalization of the ATM footprint, banks can cut their total cost of managing cash by as much as 10 to 15%. The second

wave is outsourcing where transferring cash operations to third-party providers can lower costs, as outsourced providers typically achieve greater economies of scale. Contracts of this nature often give banks savings in the range of 15 to 20%. The third wave of cost reduction is the establishment of multi-bank cash utilities. By collaborating on cash processing, distribution, and machine management, banks can cut costs, manage outsourcing risks, and gain greater buying power with third-party providers. This approach has proved highly successful in Australia, Austria, and Finland, with reductions of 20 to 30% in the cost of cash operations (Booz & Company, 2011).

The main objective of banks (minimisation of costs related to cash processing and the maximisation of efficiency of the necessary processes), should not be achieved for example by the reduction of services provided at selected branches of a bank because such diversification carries additional costs (Goetz et al, 2013).

Therefore, banks should maintain the same standard of services for clients now when the volume of cash in circulation continues to increase because otherwise they put themselves at risk of losing clients. The way to reduce cash processing costs is to invest in modern processing equipment or to review completely the cash processing system and centralize it.

Firstly, the existing cash processes of a decentralized cash processing system of selected banking institution are described and an objective function created to measure the efficiency of these processes in terms of costs. Further, on the basis of simulations in the created multi-agent model, the level of current costs connected with the processing of cash of the banking institution is determined and new centralized solution is proposed in order to improve the efficiency of this processes.

2.BANKING SYSTEM IN THE CZECH REPUBLIC

2.1.The Czech National Bank

The Czech Republic has a two-tier banking system. The Czech National Bank (CNB) has the function of the central bank. The CNB is an autonomous body acting as the bank of the state, established directly under the Constitution of the Czech Republic.

In addition to its main objectives (to maintain price stability and to support economic policies of the government – sustainable economic growth), the CNB supervises the financial market and the banking system and carries out monetary policy. It ensures that there are no uncontrolled or big changes in the currency value (inflation or deflation) that could destabilise the economy for example by the change in the value of obligations of debtors to creditors, the deformation of the tax system of the state, frequent fluctuations of interest rates and the related capital inflow and outflow (and the related fluctuations of the currency exchange rate), and so on (CNB, 2017c). Functions of the Czech National Bank may be divided into two interrelated areas, microeconomic (regulation and supervision of the financial and banking markets, the payment system, representation of the bank of the state in the monetary area) and macroeconomic (monetary policy, foreign currency operations, currency issuance). Therefore, the CNB acts as the bank of banks, the bank of the state and the issuer of non-cash and cash money (Revenda, 2011). The CNB is the only institution having the right to issue cash into circulation (Polouček, 2006). In addition to the issuance of cash (banknote printing, coin minting), the CNB also provides for processes connected with cash processing, i.e. checks whether cash is fit for further circulation, preparation of cash for further circulation and withdrawal and destruction of damaged cash (Polouček, 2009). At present, the CNB has a total of seven branches in the Czech Republic (Prague, Brno, Ostrava, Hradec Králové, Plzeň, České Budějovice, Ústí nad Labem) (CNB, 2017d), of which the first four discharge the functions in full extent (CNB, 2017e).

2.2.Commercial banks

Commercial banks (credit institutions) are business entities having three main functions. The first function is financial intermediation (transformation of funds) for the purpose of achieving profit (Revenda, 2012). The second function is money creation, but solely in a non-cash form, and the third consists in carrying out payment and clearing operations, which also include cash operations (deposits, withdrawals, checking the authenticity, deposits of surplus cash with the Czech National Bank and in the case of insufficient cash reserves its withdrawal from the Czech National Bank) (Půlpánová, 2007).
Processes connected with cash processing in one of the most important banking institution in the Czech Republic are illustrated in Fig. 1.

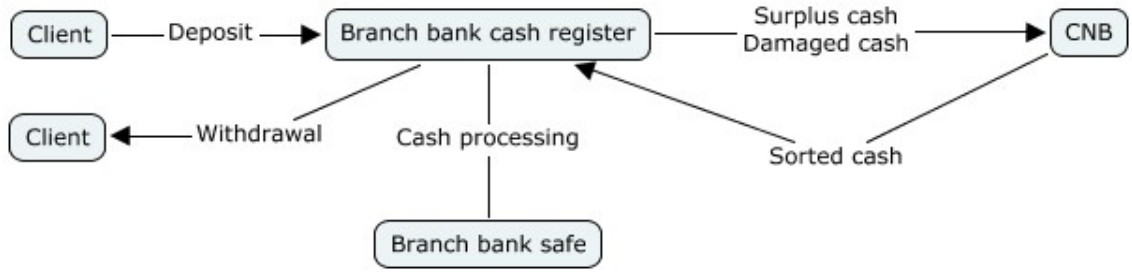


Fig. 1 – Operations involved in cash processing – decentralized. Source: Own processing.

The bank currently has branches in 259 towns and cities; average distance between branches is approximately 17.8 km (see its illustration in Fig. 2).

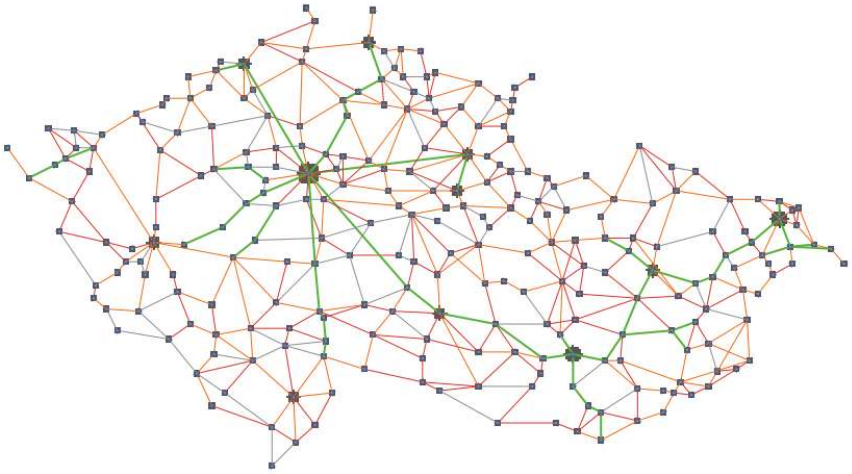


Fig. 2 – Bank´s branches in the Czech Republic. Source: Own processing.

The main objective of commercial banks is to be efficient in providing services to clients at a high standard and to ensure clients' satisfaction and loyalty so that the banks' profits (the difference between income and costs) and market share increase. These services are called banking products. They are of a non-material character and they are characterised, among other things, by the impossibility to be patented. Therefore, it should be in the interest of every banking institution that payments, and cash payments in particular, to be carried out as effectively as possible. This means that costs related to cash processing should be as low as possible while the same service standard is maintained (Jablonský & Lauber, 1997). In the case of commercial banks, this includes for example the maximum allowed cash withdrawal at the cash desk without a prior notice or the speed of crediting a cash deposit.

3.METHODS

To evaluate the efficiency of the cash processing system of the bank, the quantitative approach is selected (Zonková, 2005), based on the result of the objective (cost) function (1), which encompasses the most important cost items related to cash processing. The sum of daily costs of cash processing for each branch of the bank is as follows:

$$z_{ij} = \beta_1 x_1 + \beta_2 x_2 + w\beta_3\beta_4(x_3 + x_4) + \beta_5 x_5 + x_6 + x_7 + p_i \cdot (FC + VC \cdot d_j) \quad (1)$$

where
β_1 – the deposit and immediate withdrawal of sorted banknotes,
x_1 – the number of sorted banknotes issued by the CNB,
β_2 – the deposit and immediate withdrawal of sorted coins,
x_2 – the number of such coins,
β_3 – the coefficient of the calculation of gross wage per month to salary per minute;
β_4 – the proportion of time needed to process cash before the client and the total time needed to secure all processes connected with cash processing (printout of receipt, handling cash to the vault, preparation of cash for depositing with the CNB etc.);
x_3 – the cash dispensation time expenditure,
x_4 – the time expenditure related to the processing of received cash,
β_5 - current 2T repo rate,
x_5 – the amount of cash maintained at the branch,
x_6 – daily insurance costs;
x_7 – daily costs of safe custody services, disposable coin bags and banknote bands,
w – gross wage of a teller,
p_i – the current frequency of surplus cash transportation between bank branches and the nearest Czech National Bank branch,
d_j – the minimum distance between a particular bank branch and the nearest Czech National Bank branch (km),
FC – flat costs of cash transport from a bank's branch (CZK),
VC – variable costs of cash transport from a bank's branch (CZK/km).

The amount of total costs of cash processing is the sum of all individual cost functions (2):

$$z_j = \sum_{i=1}^{n} z_{ij} \quad (2)$$

The total efficiency of the use of working hours of the bank's employees – tellers – is selected as the second indicator of efficiency (3):

$$e = 100 \frac{\sum_{i=1}^{n} y_{1i} + \sum_{i=1}^{n} y_{2i}}{\sum_{i=1}^{n} FTE_i} \ (\%) \quad (3)$$

where
y_1 – the time necessary for processing cash deposits at the bank's branch,
y_2 – the time necessary for processing cash withdrawals at the bank's branch,
FTE – the number of employees (tellers at the bank's branch) in full-time equivalents.

To determine the real level of costs of cash processing, the simulation method is used. This method yields useful information related for example to the utilisation of production capacities and sources, the identification of critical areas of a project (the minimum, medium and

maximum terms) or costs and the classification of costs based on various aspects (Dlouhý, 2007).
The model simulating processes related to cash processing is prepared using the NetLogo interface. This simulation software is used to a large extent in research and science and, overall, it is regarded as one of the most popular (Kravari & Bassiliades, 2015). It was selected not only for its user-friendly interface (well-arranged and easy to operate) but also because of an automated random element in the sense of the generation of random numbers (the size of cash deposits and withdrawals) and its quite accurate application of the calculation of the shortest path in graph (4) (Jablonský, 2007). The shortest path in graph is used to calculate variable costs of cash transport from a branch of a commercial bank to the nearest branch of the Czech National Bank.

$$t_k = min_j\,(t_i + y_{ij}) \qquad (4)$$

where
y_{ij} – rating of link between nodes (municipalities, towns) u_i and u_j,
t_i – known node rating,
t_j – unknown node rating

If $t_i = t_1$ is the rating of the initial node, then $t_1 = 0$ and simultaneously:
$$t_j - t_i = y_{ij} \qquad i, j = \{1; 2; 3; \ldots ; n\}. \qquad (5)$$

4.RESULTS

4.1.Initial decentralized solution

For the purpose of determining the current average level of daily costs of cash processing, simulations with the following model parameters (Král, 2017) were carried out:
β_1 = CZK 0.035;
β_2 = CZK 0.085;
β_3 = 0.000093056;
β_4 = 0.1;
x_3 – 43 pcs/min;
x_4 – 100 pcs/min;
β_5 – 0.05 % p. a.;
x_6 – 234.54*ln*(*cash amount*) – 47.59;
x_7 – 541.84*ln*(*cash amount*) – 237.45;
w – CZK 18,000;
FC – CZK 245;
VC – CZK 20;
p_i – see Tab. 1;
Cash withdrawal limit (without notice) – CZK 100,000;
Cash withdrawal – normal distribution $N(\mu; \sigma^2)$ from μ = 10,904 and σ^2 = 2,866 in Vyšší Brod up to μ = 53,975 and σ^2 = 84 601, in Prague;
Cash deposit – normal distribution $N(\mu; \sigma^2)$ from μ = 9,740 and σ^2 = 2,704 in Sobotka up to μ = 64,873 and σ^2 = 195,230 in Prague;
Working hours – 8 hours.

Tab. 1 – Number of cash trips made to CNB. Source: Own processing

Cash amount		p_i
Lower limit	Upper limit	(per 5 days)
0	800,000	1
800,001	1,600,000	2
1,600,001	2,600,000	3
2,600,001	3,000,000	4
3,000,001+		5

The results of a total of 1,000 simulations are illustrated in Tab. 2.

Tab. 2 – Daily cash processing costs. Source: Own processing

	Full-Time	Part-Time
Number of simulations	1000	1000
Time	8:00:00	8:00:00
Median	1,442,636	1,411,031
Minimum	1,227,099	1,200,216
Maximum	1,752,781	1,714,382
First quartile	1,384,839	1,351,500
Third quartile	1,511,151	1,478,045
Interquartile Range	126,312	123,545
Efficiency of tellers	0.906865	0.947167

The current daily costs of cash processing as shown in the simulation results on the assumption of full-time employment range from about CZK 1.23M to over CZK 1.75M. In the case of part-time employment, total costs are lower by about CZK 40 thousand on average (the effect of reduced wage costs). The efficiency of the use of working hours is at 90.7% on the assumption of full-time employment, i.e. "idle time" constitutes more than 9% of working hours of employees. In the case of part-time employment, the proportion of ineffectively used tellers' working hours decreases to 5.3%.

The biggest portion of costs (over three fourths) are costs of employees while the CNB's fees for deposits and withdrawals of sorted cash account for over 11% of costs (CZK 169 thousand). By contrast, interest costs represent a negligible amount (less than CZK 107) (Tab. 3).

Tab. 3 – The structure of daily costs of cash processing Source: Own processing

	Full-Time		Part-Time	
Cost item	CZK	Percentage (%)	CZK	Percentage (%)
Wages	1,123,485.48	77.63	1,083,395.33	76.78
CNB fees	169,023.87	11.68	171,999.34	12.19
Transportation	87,876.54	6.07	88,092.29	6.24
Insurance and safe custody	66,727.26	4.61	67,440.57	4.78
Interests	106.75	0.01	104.10	0.01
Total	1,447,219.90	100.00	1,411,031.63	100.00

4.2.Making the decentralized solution more effective

The possibilities to make the decentralized solution more effective are very limited in this case if the same service standard is to be maintained. Therefore, cash services at branches that display low efficiency cannot be reduced or altogether cancelled. Since the commercial bank cannot influence directly the CNB's fees, costs of transport (given the oligopoly of cash-in-transit security companies), costs of insurance or interest rates, the only option is to improve further the work efficiency of employees – tellers. This target could be achieved by the purchase of new processing equipment that enables faster cash processing or possibly also cash sorting to save costs of the CNB's fees. For example, the Glory USF-50/51 banknote sorter achieves up to 10% faster banknote counting than GFS 100 banknote sorters. (Albacon, 2017).
The following simulation is performed on the assumption of identical parameters as in the simulation in the previous chapter, with the exception of variables x_3 and x_4, which are increased. However, their increase will not correspond to the declared 10% due to the constant speed of coin counting (the sorting of coins in the banknote sorter is not possible):
x_3 – 46 pcs/min,
x_4 – 106 pcs/min,
However, this increase applies only to branches where the working hours of tellers are used effectively ($e > 0.98$). In the case of small branches with an ineffective use of working hours, there would be no saving; on the contrary, the share of idle time would rise further.
The simulation results (costs structure) are provided in Tab. 4.

Tab. 4 – The change of structure of daily costs of cash processing – new equipment. Source: Own processing

	New cash process. techn. (mean)		Full-Time empl. (mean)		Part-Time empl. (mean)	
Cost item	CZK	Percentage (%)	Difference (CZK)	Difference (%)	Difference (CZK)	Difference (%)
Wages	1,013,729.5	85,5	-109,756.0	-9.8	-69,665.8	-6.4
CNB fees	17,563.8	1,5	-151,460.0	-89.6	-154,435.5	-89.8
Transportation	87,940.1	7,4	63.6	0.0	-152.2	-0.2
Insurance and safe custody	66,872.6	5,6	145.3	0.2	-568.0	-0.8
Interests	105.6	0,0	-1.1	-1.1	+1.5	+1.5
Total	1,186,211.6	100,0	-261,008.3	-18.0	-224,820.0	-15.9

The simulation results show that investment in new equipment would reduce daily costs of cash processing by CZK 261 thousand on average compared to the situation on the assumption of full-time employment or by CZK 225 thousand compared to the situation on the assumption of part-time employment. Most of this decrease is due to savings on the CNB's fees (CZK 151 thousand and CZK 154 thousand, respectively) and, further, the reduction of costs of tellers' wages (CZK 110 thousand and CZK 70 thousand, respectively).
The efficiency of the use of employees' working hours e is at around 94.81%.

4.3.Proposal of a centralized solution

In this case, a centralized cash processing solution consists in the creation of a so-called cash centre. It is a place where cash would be fully processed, sorted and accounted for. In addition, surplus cash would be transported from such cash centres to the Czech National Bank. Under this model, only cash handover to a client would be carried out at standard branches. The centralized model of cash processing is illustrated in Fig. 3.

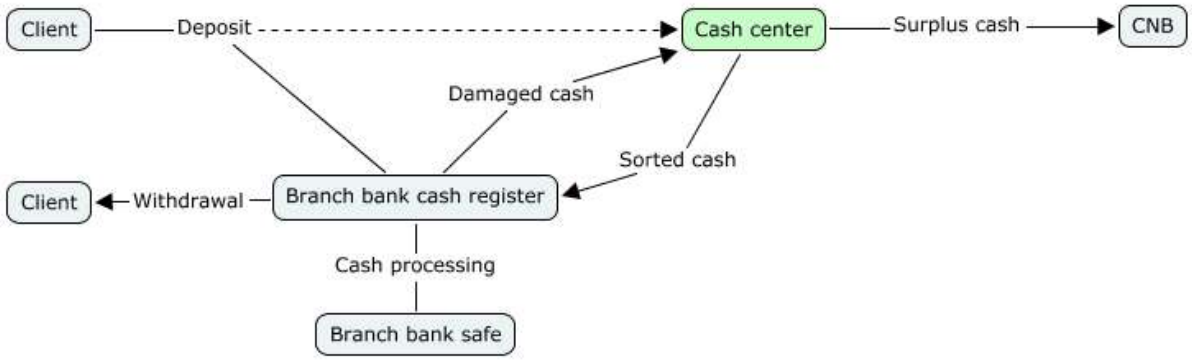


Fig. 3 – Operations involved in cash processing (centralized). Source: Own processing.

For optimal location of these cash centres (cash centre – CC), it is necessary to minimize costs of cash transport, i.e. to minimize part of the objective function $(FC + VC \cdot d_j)$, where d_j denotes the distance in km of the cash processing centre from the nearest branch of the Czech National Bank. If $d_j \geq 0$, then $d_j = 0$ is the global minimum, i.e. the same town (if distances within the town are disregarded as they usually constitute only a minimum portion of total costs). Cash centres would be located in Prague, Brno, Ostrava, Plzeň, Ústí nad Labem, Hradec Králové and České Budějovice.

The simulation parameters stay identical to those used in making the decentralized solution more effective. Cash centres are added gradually in the above-given order to be able to determine whether the contribution of another cash centre is sufficient.
The results of a total of 1,000 simulations for each specific number of cash centres are illustrated in Tab. 5, Fig. 3 and Tab. 6.

Tab. 5 – The total daily costs of cash processing – centralized. Source: Own processing

	Number of Cash Centres						
	1	2	3	4	5	6	7
Number of simulations	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Mean	1,213,725	1,159,020	1,146,174	1,132,883	1,126,345	1,112,955	1,106,213
Variance	3.924568E+10	1.945891E+10	1.533476E+10	1.207727E+10	1.532011E+10	1.269233E+10	1.092131E+10
Standard deviation	198,105.21	139,495.21	123,833.59	109,896.63	123,774.42	112,660.25	104,505.1
Conf. int. Lower (α = 0,95)	1,157,423	1,119,376	1,110,981	1,101,650	1,091,169	1,080,938	1,076,513

Conf. int. Upper (α = 0,95)	1,270,025	1,198,664	1,181,367	1,164,115	1,161,522	1,144,974	1,135,913
First quartile	1,075,079	1,069,149	1,054,336	1,062,794	1,041,408	1,028,330	1,018,779
Third quartile	1,238,949	1,209,652	1,182,991	1,180,204	1,164,322	1,187,594	1,206,732
Interquartile Range	163,869.7	140,502.3	128,655.5	117,410.6	122,913.3	159,263.9	187,953.7

In the case of creation of only one cash centre in Prague, daily costs of cash processing are higher by about CZK 30 thousand than in the decentralized solution. After the creation of a second cash centre in Brno, daily costs decline by almost CZK 55 thousand to CZK 1.159M in total. The centralized cash processing solution therefore becomes more cost-effective at that moment. With each additional cash centre, costs of cash processing decline further; this trend can be described by the power function (6):

$$y = 154355x^{-0,416} \quad (6)$$

where x – the number of cash centres.

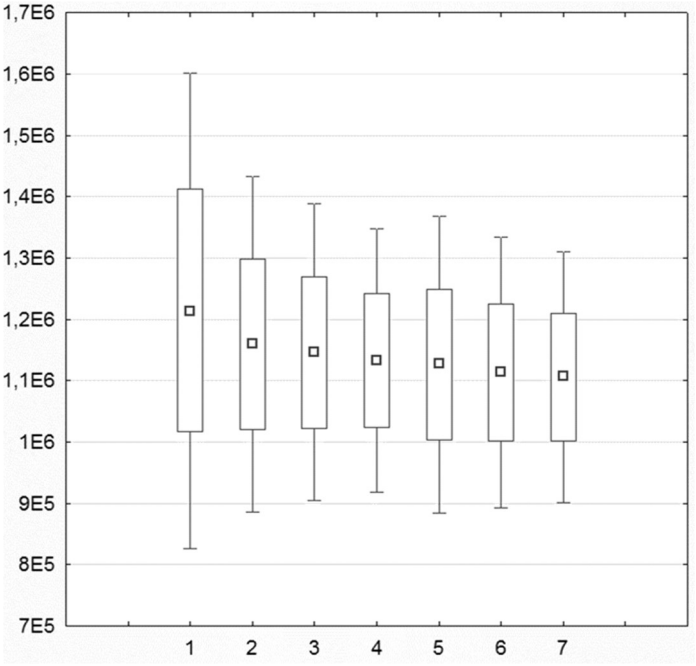


Fig. 4 – The total daily costs of cash processing – centralized. Source: Own processing.

Tab. 6 – The structure of daily costs of cash processing – centralized. Source: Own processing

	Number of cash centres						
Cost item	1	2	3	4	5	6	7
Wages	1,018,140	1,014,012	1,012,075	1,010,511	1,007,785	1,005,001	1,002,150
CNB fees	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transportation	159,230.8	108,839.2	97,458.6	87,409.5	82,714.1	72,315.2	68,069.9
Insurance and safe custody	36,245.36	36,061.70	36,528.52	34,857.82	35,735.78	35,529.00	35,881.62
Interests	108.08	107.44	111.78	104.26	110.36	108.84	111.26
Total	1,213,724	1,159,020	1,146,174	1,132,883	1,126,345	1,112,955	1,106,212

The efficiency of the use of working hours *e* stays at 94.99% with any number of cash centres (see Fig. 5), i.e. at a level comparable to that in the more effective decentralized manner of cash processing. The slight increase is caused by smooth cash processing flow in cash centres. On the basis of these results, the centralized manner of cash processing can be considered more effective.

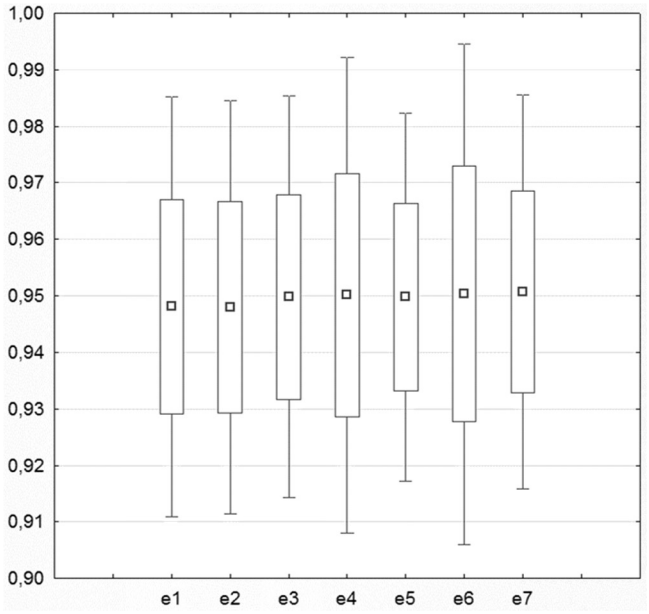


Fig. 5 – The total daily costs of cash processing – centralized. Source: Own processing.

If management of the bank wanted to change decentralized model of cash processing processes to centralized model, it would be necessary to change the organizational structure simultaneously because this centralization does not mean shifting cash processes completely from cashiers in branches to cash centres. For example, it would be established new organizational part – "Payment or Cash services". This arrangement along with initial investments to space improvement for cash centres and acquisition of new cash processing machines would not be negligible. The total amount of the costs and return of the investments

as well would mainly depend on a current state of banks space and its ability to change its function for example from standard offices to cash processing floor.

5.DISCUSSION

The cash circulating through society is supported by an elaborate and costly infrastructure, involving money processing and distribution operations as well as an intricate cash delivery network – automated teller machines (ATMs), seal bag deposit systems, coin dispensers, tellers, lockboxes, etc. The total European cost of providing this cash system is estimated to be € 84 billion (US $115 billion) per year. These expenses are expected to grow in coming years, due to rising prices and increasing safety standards. The growing popularity of new forms of non-cash payment only serves to amplify concerns over the cost of managing cash. As approximately 20% of the total cash costs are variable cost (transaction-driven) and 80% fixed cost (not transaction-driven), the cost per transaction will increase when cash volumes start declining (Booz & Company, 2011).
Management of commercial banks, generally in all Europe, currently have to increase the efficiency of operating processes cost, including cash processes, because of low spreads between loan rates and deposit rates (Agapova & McNulty, 2016). Banks apply new strategies in order to reduce excess inventory, lower handling and processing costs, improve operating efficiency and optimize their network of ATMs.
The tested cases display a trend of the reduction of total costs only when there is a change of the system of cash processing from decentralized to centralized and not of the input parameters; i.e. this can be considered partial optimisation. To achieve full optimisation (minimisation of the cost function), input parameters would have to be adjusted. For example, to minimize wage costs, it is apparent that the number of employees (x_3 and x_4) would be zero, etc. However, from the practical point of view, such result is not real. Likewise, the reduction of an employee's wage to CZK 0 is not feasible because under the law (the Civil Code) every employee in the Czech Republic working with is currently entitled to be paid the minimum wage of CZK 80.50/hour or CZK 13,400/month assuming a 40-hour working week (Government Decree No. 336/2016 Sb., amending Decree No. 567/2006 Sb. ("on minimum wage"). Furthermore, due to the existence of frequent collective bargaining agreements, any insufficiently justified wage reduction would be problematic. Likewise, it is not possible to change unilaterally prices of cash transport or even to ignore the distance between branches or to stop paying fees to the Czech National Bank, etc.
Another possibility to eliminate part of costs would be to limit cash services by the lowering of the maximum amount of cash withdrawal without prior notice. This measure would reduce the sum of money held at individual branches to secure the declared service standard and thus also reduce safekeeping and insurance fees. Next way, how to reduce operational costs connected with cash processing is to eliminate cash services inefficient branches and substitute it for deposit ATMs. For example, reducing of operational hours of inefficient bank branches could result to an average total energy savings of about 5% (Spyropoulos & Balaras, 2011). The installation of deposit ATMs near branches or at frequented places would be a modern technical solution that could be to a great extent the means of a further decrease of operating (wage) costs. This measure can reduce operational costs by more than 35 % (Ray, 2016). Such investments would be aimed at reducing the number of cash transactions at cash desks and thus reducing the "scheduled" working hours. Besides the bank, the use of deposit ATMs would be also beneficial to the client, who would not have to present a personal identification document in the course of cash deposit or withdrawal or queue and subsequently wait while being attended to.

To ensure frequent use of ATMs, the bank could apply, in addition to the presentation of general advantages, benefits of a financial character such as different fee levels, various rewards for the active use of payment cards etc. As a result, a decline in income from fees for cash services could be much lower than a decline in operating costs.

6.CONCLUSION

The objective of this paper was to model costs related to cash processing of a selected banking institution in the Czech Republic. At present, cash is processed on a decentralized basis, i.e. at cash desks of all branches. The only savings concern wage costs, which had originally amounted to CZK 1,123,485.48 per day before being reduced by about CZK 40 thousand to CZK 1,083,395.33 per day on average with the introduction of part-time employment contracts. Other costs of cash transfer, insurance, consumables, the CNB's fees and interest remained unchanged, however.

Investment in new equipment that enables cash sorting would significantly accelerate the time of cash processing. As a result, not only would wage costs decrease but costs of the CNB's fees for deposits and withdrawals of sorted cash would decrease by a total of CZK 224,820 per day. The payback period of the investment would be slightly less than two years.

Centralized cash processing was another option tested. It would be carried out in the so-called cash processing centres, which would be established in the same towns where the Czech National Bank has its branches in order to minimise cash transport costs. The establishment of these centres could completely eliminate costs of the CNB's fees and, moreover, wage costs savings would be achieved too. Costs of cash transport would be lower as compared with the previously mentioned solution (investments in new equipment) only after four cash centres have been put into operation. In the case of establishment of all seven cash centres, the bank would save approximately CZK 300,000 per day and the efficiency of the use of tellers' working hours would increase by 0.2% from 94.7% to 94.9%.

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SELECTED CHARACTERISTICS IN THE BRAND PORTFOLIO MANAGEMENT

Kral Pavol, Bartosova Viera

Abstract
The objective of this contribution is to point out the seriousness of application of the complex brand portfolio within the current market environment and define (propose) selected characteristics and approaches that may serve for analyzing, efficient management and adoption of suitable strategic executive decisions regarding the brand portfolio. Also, there is space dedicated to explanation of a model used for quantification of the expected (average) brand portfolio return on investment and determination of the overall portfolio risk. The contribution also deals with a proposal for the multidimensional model for brand portfolio evaluation based on knowledge of hard metrics, determines the existing types of linkages between brands in portfolio and describes approach for evaluation of such linkages, defines key criteria for brand portfolio risk diversification and presents a proposal of quantification model for the brand life cycle costs.

Keywords: brand portfolio, branding strategy, brand value, returns on brand investment, risk diversification, life cycle costs

JEL Classification: M31, G31, C61

1 Introduction

Within the current marketing practice, it is quite common to see a company concurrently implementing strategy of various brands, meaning the brands consume available resources of various kinds. Even the biggest companies with great capital available are limited when it comes to funds, production capacities, personnel and material resources, time, etc. It is necessary to plan and manage the existing brands, not just as individual units but also provide their complex management by using advanced management methods and approaches. We are talking about a brand portfolio integrating all brands implemented by a company regardless their success and current life cycle stage.

It is not possible to think about the brand portfolio as a complex set of company brands only, it must be perceived as a set of brands with different priority level, mutual dependency, interaction and possibility of synergy effect generating revenues and supporting enforcement of company's strategic goals. Such characteristics bring a lot of issues and tasks into the brand portfolio management related to different approach for searching the right solutions and decisions, which may be classified between the most important strategic-related decisions for each company applying the branding strategy. Companies that fail to pay sufficient attention to monitoring and evaluation of indicators regarding the state of enforced brands often fail to utilize their limited resources effectively and the management makes incorrect decisions.

Up to the present day, the brand portfolio management and branding strategies represent open issues with possibility to define new opinions and frameworks towards brand portfolio optimization. The brand portfolio management and branding strategy issues are subject to many, mainly foreign publications as well as studies. The literature in Slovak language provides only partial knowledge without complex solving of the issue. The importance of multiple brands is widely described, but less is known about the composition of the brand portfolio and the

positioning strategies to use. The presented approaches and opinions of authors regarding the issue vary in some areas, therefore, we present some of them.

Most large firms operating in consumer markets own and market more than one brand; they have a brand portfolio (Morgan & Rego, 2009; Dacin & Smith 1994). Muzellec and Lambkin (2009) identified two types of branding strategies: integration (ascending brand extension) and separation (descending brand extension). They proposed three types of corporate branding strategy within the brand architecture: trade name, business brand and holistic corporate brand. According to Laforet and Saunders (1999) branding strategy refers to the ways in which companies combine their brand name on their products. The literature often suggests that larger brand portfolios are inefficient because they lower manufacturing and distribution economies (Hill, Ettinson & Tyson 2005).

A brand's perceived quality is determined by comparing the quality to alternative brands. The brand could be considered having higher, equal or lower quality than competitive brands and could be seen as the best brand, one of the best brands, one of the worst brands or the worst brand on the market (Aaker, 1996).

To secure success in the long-run, companies must operate an appropriate set of successful brands and brands with prospects for future success. Furthermore, as cases of brand portfolio elimination show - the overall success does not always correlate positively with the number of managed brands (Haas, 2010)

For example brand management in the Slovak Republic is characterized by a number of specifics (long-term absence of branding in marketing management of domestic brands due to the effects of the principles of a centrally planned economy, which turns out in the lack of experience with branding ofdomestic managers and the lack of literature dedicated to the specificities of branding in Slovak Republic, reckless acceptance of foreign branding concepts without taking into account socio-cultural and psychographic characteristics of target segment in the Slovak Republic, as well as lax approach to measuring brand value, without knowing which it is impossible to maximize the efficiency of the process of branding etc.), (Majerova & Krizanova, 2015).

Central to any brand strategy is the brand portfolio management - the ability to organize all the firm's brands into a coherent brand portfolio and manage the complex interrelationships in these portfolios. Companies managing brand portfolios must address two primary tasks: 1. optimizing the structure of the portfolio, 2. adapting the portfolio to changes in the market or strategic directions of the firm (Kuzmina, 2009; Aaker, 2004).

There are also several disadvantages in owning multiple brands. The main disadvantage in using multiple brands is that the brands within the portfolio might limit each other in several ways because they compete with each other. As a result, no one of the brands will be very profitable (Kotler et al., 2003) and consumers might switch between brands within the portfolio (Kotler & Keller, 2012). A larger brand portfolio could also decrease the value of the brands within the portfolio and could increase price competition (Morgan & Rego, 2009). Broader portfolios are also inefficient because they lower manufacturing and distribution economies and dilute marketing expenditure (Morgan & Rego, 2009). As suggested by Kuzmina (2009), using multiple brands would only be strategically viable if each brand is linked to a specific target segment and has a unique market position. In general, most firms begin with a single product or brand and become multi-product firms over time (Rao, Agarwal, Dahlhoff, 2004).

Generally, one brand does not allow complex coverage of the whole market, mainly in cases of significantly differentiated market. If the company's desire is to increase the market share, it is

necessary to select multi-brand strategy, i.e. building own portfolio. The company growth is generally accompanied by creation of new brands, if the company's desire is to reach new segments or apply new distribution channels.

2 Methods

In theory, it is possible to talk about the least complicated brand portfolio management if such portfolio comprises of a single brand. By adding further brands into the portfolio, there is a progressive increase of complexity of the whole system, by impact of higher number of brands as well as influence of mutual ties, dependencies and interactions. Such ties may arise for brands additionally, which is probable to influence structure of the future portfolio. Even in case of independent brand having no close ties with other brands in the portfolio, the situation may get complicated with time and it may have negative influence to even previously relatively independent brands. Therefore, it is not possible to underestimate what may seem as a low interconnection and bonds of brands as with time, they may evolve into a close bond transferring negative impacts to a part or the whole brand portfolio.

Within the brand portfolio management, we may come across a situation when a passive attitude to solving a certain problem may be the best suitable solution. Harsh reactions to any change within the external or internal environment may cause destabilization of the whole brand portfolio.

The higher the level of market differentiation and geographical scope of company's activities, the higher the number of brands utilized by the company. It is not necessary for expansion of portfolio by new brands to be related to creation of a new brand, it may result from mergers or acquisitions. At certain level of development, the company exercising a single-brand policy reaches a point when it is necessary to make a strategic decision - selection between a single-brand portfolio policy or multi-brand portfolio policy when the brand management becomes more challenging and more complex.

Successful brands reflect customer's imagination, personal features with symbolic meaning or emotional values that may create permanent customer's preference with dominant position in relation to product's functional features. Therefore, the brand positioning requires identification of unique characteristics from other characteristics being the same for all other brands in the same industry. Within the current market conditions, there is a general rule that a brand is one of the most significant elements for customer loyalty. Brand loyalty brings significant marketing advantages including reduction of marketing costs, increase of commercial range value, low rate of acceptance of competitive brands by customers, increase of profit, etc. Successful establishment of a brand at the market does not necessarily guarantee its success in future. They are influenced by change of number of market factors such as change of demand, customer preferences, technological advancement, competition, etc. Therefore, it is necessary to provide continuous brand monitoring in terms of its customer influence, demand stimulating, and seasonal effect and evaluate its further existence.

With regard to the brand portfolio management analogy to management of other systems comprising of set of individual or interconnected elements in joint interaction, for proposal of characteristics for brand portfolio specified in this contribution below, we used knowledge and several years of experience of relative, mainly economic disciplines. Our assumptions were based mainly on project portfolio management, financial management, graph theory tools and methods as well as statistics.

It is not possible to execute brand management efficiently without knowing the number of characteristics and indicators (return on investment, risk, customer loyalty customer satisfaction rate, brand interaction, competition, etc.), which represent base for strategic decisions regarding the brand.

3 Results and Discussion

Regular evaluation of brand positioning provides competitive advantage over other brands. Efficient brand monitoring systems enables companies to understand its effect to value perceived by customer, its position in relation to competitive brands, etc. One of the most utilized approaches for brand performance monitoring is the so-called 5As' model:

1. Perceptional Metrics
   - **Awareness** (sentient, responsive, top of the mind, indifferent).
   - **Acquaintance** (brand preference, relevance, commitment, perception).
2. Performance Metrics
   - **Association** (brand posture, price determinants, customer acquisition, customer retention).
   - **Allegiance** (brand benefits, customer value, brand referral).
3. Financial Metrics
   - **Appraisal** (brand value, returns on brand investment, brand response to market share, cost of brand building, net revenue over brand, sunk cost on brands).

It is a simple and efficient brand performance measurement tool based on set of qualitative as well as quantitative characteristics evaluation. It is important for the company to understand relations between the aforesaid characteristics and evaluate each of its brands in a complex way.

We can conclude that the brand is an integral intellectual part of the product that finds expression relating only to this product whether in name or in design and has a stable and strong communication with the customer. All elements of the brand can be divided into two main groups (Majerova & Kliestik, 2015):

- *rational elements* – these are focused on the content of brand communication, its proposals and promises, explain to the consumer what this brand can do for him/her and also, they are perceived by logical reasoning.
- *emotional elements* - this is, so to speak, a "feeling" of the brand, which is its expression directed to satisfy the spiritual needs of the customer without affecting the scope of rational reasoning.

For brand portfolio creation, it is necessary to make decision regarding number of brands as well as type of brands, to contribute to achievement of business goals. Inclusion (support) of strong brands with strong customer awareness and possessing high value is necessary prerequisite to achieve the objectives. Successful application of multi-brand strategy involves building of a solid position in minds of customers at target markets for brands included in the portfolio. Portfolio should not comprise of independent brands, however, it should reflect the global market dominance.

When creating the portfolio, we recommend applying mainly the following key principles:

1. Synchronize brands in the portfolio with specific customer requirements and ideas,
2. Synchronize brand positioning strategy with generic competitive strategy, product category and market position,

3. Characteristics emphasized in the brand positioning should correspond to each other to create a reliable and trustful brand,
4. One property could be applied to more than one brand within the portfolio - some properties are appealing for each brand and could be applied to more brands in the portfolio,
5. Make strategic decisions related to the portfolio upon results of the continuous monitoring of environment and brand diagnostics only.

3.1 Returns on investment (ROI) and portfolio risk

It is possible to classify information regarding returns of brand investment and risk rate as key determinants being decisive for the brand portfolio ultimate structure and management approach. It is possible to define total returns on investment of each brand by a set of expected ROIs and assigning probability of their occurrence (frequency function - all possible ROIs with probability of occurrence of each of them). The frequency function may be also substituted by a couple of indicators, being: Average returns on brand investment indicator and divergence indicator.

The Average (expected) returns on brand investment $\overline{RB}_i$ is therefore calculated according to the formula (1) upon same probability of all returns on brand investments:

$$\overline{RB}_i = \sum_{j=1}^{N} \frac{RB_{ij}}{N} \tag{1}$$

In case the expected returns on brand investment shall not have the same occurrence probability, then the average value is determined in the following way:

$$\overline{RB}_i = \sum_{j=1}^{N} P_{ij} \cdot R_{ij} \tag{2}$$

where:

RB_{ij} - j-th ROI of i-th brand
P_{ij} - Probability of achieving the j-th ROI for i-th brand
N - Number of values of expected ROI

We will perceive the brand risk rate in relation to returns as uncertainty, possible variability of its expected returns. To be able to evaluate the risk in relation to the brand returns, it is necessary to know the following:

1. Probability of the brand achieving the expected returns,
2. Probability of the achieved returns being different than the expected returns.

Due to various values of the brand ROI, it is necessary to formulate also scatter of ROI values in relation to the average ROI:

$$\sigma_i^2 = \sum_{j=1}^{N} \frac{(RB_{ij} - \overline{RB}_i)^2}{N} \tag{3}$$

In case the expected ROI shall not possess the same level of probability, then the ROI divergence of i-th brand is calculated as follows:

$$\sigma_i^2 = \sum_{j=1}^{N} \left[P_{ij} \cdot (RB_{ij} - \overline{RB}_i)^2 \right] \tag{4}$$

Formulas (1) to (4) define the quantification of ROI and risk of individual brands. The brand portfolio comprises of combination of several brands with various risk rate and returns

potential, which determines different risk value of brand combination from simple risk average of individual brands. It is a great mistake to evaluate the risk of individual brands individually. It is necessary to evaluate the risk within the whole portfolio of brands. The divergence value of brand combination within the portfolio may be lower than the individual divergence of a single brand. The ROI and portfolio risk of brands may significantly vary from ROI and risk of individual brands. Brand portfolio risk is not expressed as a sum or average or standard variance of individual brands being included in the portfolio.

If RP_j is *j*-th portfolio ROI, X_i is part of the whole amount of invested funds invested into *i*-th brand and *N* is number of brands included in the portfolio, then the following shall apply:

$$RP_j = \sum_{i=1}^{N} (X_i \cdot RB_{ij}) \tag{5}$$

The average portfolio ROI is determined as a weighted arithmetic mean of ROIs of individual brands where shares of invested resources into individual brands shall be used as weights:

$$\overline{RP}_j = \frac{\sum_{i=1}^{N} (X_i \cdot RB_{ij})}{\sum_{i=1}^{n} X_i} \tag{6}$$

The expected ROI of brand portfolio shall be then defined as a weighted arithmetic mean of expected ROIs of individual brands:

$$\overline{RP} = E(RP) = E.\left(\sum_{i=1}^{N} X_i \cdot RB_{ij} \right) \tag{7}$$

The expected value of sum of two ROIs shall equal to the sum of expected values of each of such ROI: $E(RP_{1j} + RP_{2j}) = \overline{RP}_1 + \overline{RP}_2$. At the same time, the expected value of "C" constant multiplied by ROI shall be the constant times expected ROI: $E\left[C \cdot (RP_{1j})\right] = C \cdot \overline{RP}_2$

The expected value of sums of various ROIs is the sum of expected values:

$$\overline{RP} = \sum_{i=1}^{N} E \cdot \left(X_i \cdot RB_{ij} \right) \tag{8}$$

at the same time:

$$\overline{RP} = \sum_{i=1}^{N} \left(X_i \cdot \overline{RB}_i \right) \tag{9}$$

Divergence σ_p^2 of the brand portfolio equals to the expected value of portfolio ROI variance squares from average ROI:

$$\sigma_p^2 = E\left(RP - \overline{RP} \right)^2 \tag{10}$$

3.2 Brand Evaluation Model

For brand evaluation of the existing portfolio, we propose to apply the model based on examination of 3 dimensions falling into the hard data category:

1. *Returns on brand investment* - it represents brand's ability to generate profit
2. *Brand market share* - it indicates brand's position in relation to competitive brands within the same industry
3. *Share of risk at the overall risk relative to the whole portfolio of brands* - it represents share of the total risk rate necessary to accept for application of all portfolio brands.

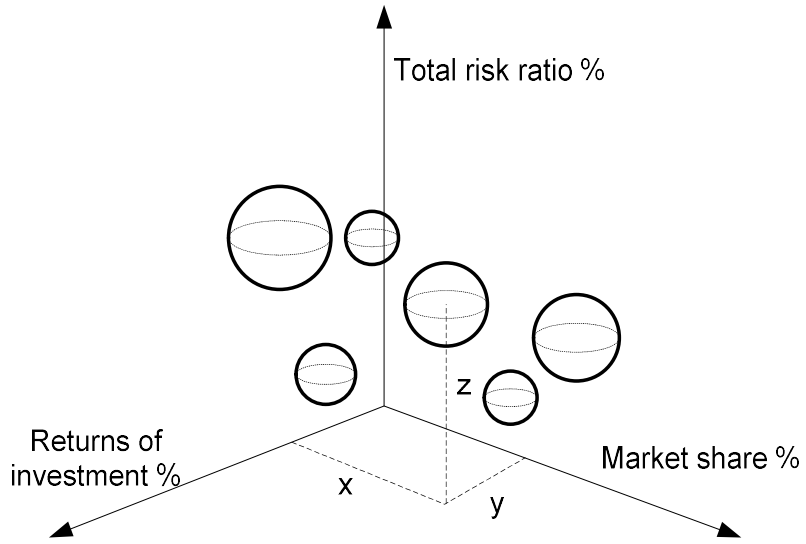


Fig. 1. Brand evaluation dimensions. Source: Own work.

By demarcation of such dimensions, there is a 3-D space created for evaluation for portfolio brands. Individual 3-D balls in the space represent brands included in the portfolio. The ball radius is directly proportional to share of brand at the attained incomes for the whole portfolio. It is possible to add further data not included in Figure 1 into the model. The data could include mutual interrelations (interactions) between brands, we address the matter below. By applying this attitude we get the complex view of the existing brand portfolio. The evaluating entity may set limiting values for monitored dimensions determining area of the undesirable brand position. such portfolio evaluation model is considered as a simple tool with high testimonial value for brand portfolio management. However, it is necessary to emphasize that further important aspects of successful brand are not taken into account, such as customer brand loyalty, customer's attitude and opinions regarding the brand, brand image, etc. being subject of other analytic approaches.

3.3 Interrelations between brands in portfolio

We defined three basic relations between brands included in the portfolio that will be clarified by mutual interrelation between two model brands - A, B. The brand interrelation may have significant influence to total success of portfolio and influence the total risk rate. If we consider brands A and B, their relation may take the following forms:

1. Brands A and B are mutually *independent* - there is no determinant connecting such brands together, each brand is able of independent existence.
2. Brands A and B are in the state of mutual *support* - their relation takes a positive value of synergy, whereby it is possible to have a unilateral or bilateral support of brands.
3. Brands A and B are in the state of *competing against each other* - their relation takes a negative synergy value, positive development of one brand may determine worsening of development of the other brand.

It is possible to represent such ties in a graphic form (Figure 2).

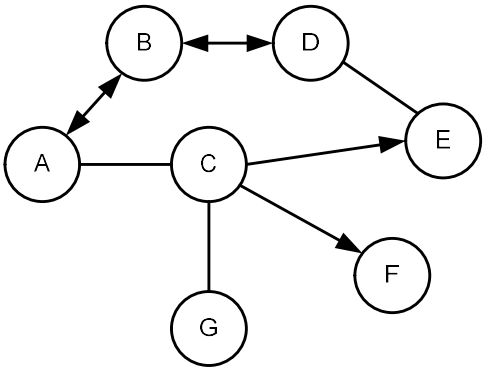


Fig. 2: Types of ties between brands. Source: Own work.

Figure 2 shows portfolio comprising of 7 brands with determination of types of ties between them. For example, there is a direct competition between brands A and B. To the contrary, brands A and C provide support to each other. The tie between brands C and E is in the form of a one-sided supporting tie.

For determination of a tie (relation) between two brands, it is possible to apply the so-called adjacency matrix with dimensions *n x n*:

$$A_{ij} = (a_{ij}) \qquad i, j = 1,2, ..., n \tag{11}$$

Matrix element:

$a_{ij} = 1$, if $h_{ij} \in H$, i.e. if there is a mutually supporting relationship between brands

$a_{ij} = -1$, if $h_{ij} \in H$, i.e. if there is a relationship of competition between brands

$a_{ij} = 0$, if $h_{ij} \notin H$, i.e. if there is no relationship between brands, they are independent

Each element of matrix $a_{ii} = 0$ for each $i \in \{1,2,..., m\}$, meaning there are zeroes on the main diagonal. Elements in the *i-th* line of the matrix show impact of the *i-th* brand to the other brands in the same portfolio. Number of elements $a_{ij} \neq 0$ represents number and type of ties to other brands. Elements in *j-th* column represent number and type of ties determined by other brands to the *j*-th brand. By using such matrix, we can compare brands in the portfolio when it comes to ties to other brands. If matrix A_{ij} contains prevalent number of $a_{ij} = 0$ elements, then the portfolio comprises of brands that can be considered as independent with no significant or mutual interaction. In such case, loss of favourable position of one brand will have no influence to position of other brands of the portfolio.

It is necessary to realize that brand portfolio creates ties between the brands but also influences other functional areas of the company. For example, the brand value is closely linked to the company pricing strategy. It is very difficult to find a brand having dominant position within a particular industry and covering products for relatively low prices.

3.4 Diversification

Risk diversification should be one of the key tasks of brand portfolio development. In case of company's sources and efforts concentrated to a smaller number of brands, failure of one brand may have a disastrous impact to the whole portfolio. Higher number of brands represents more favourable risk diversification. Success in reaching the company's strategic goals is greatly dependent on the brand portfolio diversification level, which may be executed according to the presented criteria reflecting conditions of the external as well as internal company environment:

- *Ties between brands* - the closer and more interconnected relations between brands included in the portfolio, the greater the danger of transferring failure from one brand to other brands. The principle applies in case of favourable development as well. Apart from the existing ties, it is also necessary to make provision for brand value, being in a mutual relation. Mutual interconnection (dependency) of valuable brands constitutes situation with the highest risk.
- *Synergistic effect* - if certain brands create synergy effect, it is necessary to make strategic decisions in consideration to the synergy effect existence. Such effect may become evident in a negative fashion, therefore, when making decisions, it is favourable to make provision for the net synergistic effect being the difference between positive and negative synergy value.
- *Portfolio consistence from the point of brand nature and type* - enormously non-homogenous brand portfolio cumulating segment-unrelated brands, causing difficulties in resource management, increasing marketing costs, suppressing generation of positive synergetic effect and disabling concentration of company efforts into one area with permanent improvement.
- *Costingness* - combination of brands financed from own and external sources. Ratio between own and external portfolio sources should be deduced from the source structure of the whole company. Experience shows that share of external sources on the overall volume of company sources should not exceed the empiric value of 70%.
- *Risk rate* - balancing of the portfolio with brands with various risk levels. High-risk brands carry substantial problems related to their realization, however, they are able to produce a significant value in comparison with the total portfolio value. We also have to think about balancing the portfolio by lower risk rate brands where we expect production of planned income value with high rate of probability.

Correctly-balanced portfolio, making provision for the aforesaid diversification criteria, is not only directed to achieve company's strategic goals, at the same time, it is a basic prerequisite for risk elimination, efficient utilization of company's sources, prevention against additional costs as well as a prerequisite of achieving success in other areas of portfolio management.

3.5 Brand Life Cycle Costs

In relation to brand life cycle, it is possible to determine the following cost categories, related to individual life cycle stages:

1. Brand establishment and building costs *(C_B)*
2. Brand introduction costs *(C_I)*
3. Brand development (expansion) costs *(C_D)*
4. Brand position strengthening (maintenance) costs *(C_M)*
5. Brand elimination (liquidation) costs *(C_E)*

Brand life cycle costs (BLCC) are a sum of the aforesaid costs:

$$BLCC = C_B + C_I + C_D + C_M + C_E \tag{12}$$

Considering the cost time value, then the following applies for $BLCC_d$:

$$BLCC_d = \sum_{t=1}^{n} \frac{C_{B_t}}{(1+i)^t} + \sum_{t=1}^{n} \frac{C_{I_t}}{(1+i)^t} + \sum_{t=1}^{n} \frac{C_{D_t}}{(1+i)^t} + \sum_{t=1}^{n} \frac{C_{M_t}}{(1+i)^t} + \frac{C_E}{(1+i)^n} \tag{13}$$

Where:

i - Discount rate [%]
n - Brand life cycle [years].

Generally, brands have long life cycle n, which may cause significant distortion during BLCC quantification, therefore, it is suitable to transform the quantification model and respect the time factor (13).

4 Conclusion

Our objective was to propose an open set of selected characteristics, mainly of a quantitative nature, providing managers responsible for brand portfolio information regarding the actual portfolio state and provide efficient application of managing approaches and functions. However, such characteristics do not provide information for operating management, they are more understood as brand portfolio strategic management tools with significant impact to its further development and success. Still, they may not be considered as an instrument capable of revealing all deficiencies and reserves in brand portfolio even despite the fact that when proposing them, we respected the complexity principle. Application of the proposed characteristics is not limited by company's industry specification or its size. Input data, problematic to obtain in some cases, have a significant impact to quality of results. Yet again, it is necessary to emphasize the necessity to respect further, mainly qualitative brand characteristics, which are irreplaceable in the brand portfolio management. Due to extensity of the issue, the qualitative characteristics were not subject to our examination.

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ANALYSIS OF SELECTED ASPECTS OF INSOLVENCY IN THE CONTEXT OF VAT OUTPUT TAX CORRECTION

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Abstract

The volume of receivables of business entities recorded an increase, especially in times of economic crisis. The government of the Czech Republic, similar to legislators in other selected European Union Member States, used the opportunity of the Concil Directive on the common system of value added tax and implemented a provision into their legislation that allows creditors to get at least the value added tax, which they had to pay during the supply of goods or services for receivables from debtors in insolvency proceedings, respectively in the bankruptcy. The aim of this paper is to analyze the interdependencies between selected indicators of insolvency and corrections of the amount of value added tax in case of receivables from debtors in insolvency proceedings using methods of correlation analysis. The result of the analysis indicates downward trend of number of submitted insolvency proceedings, both for companies and for natural persons. The analysis confirmed the existence of a high degree of dependence between the number of submitted insolvency proceedings and the number of bankruptcies among companies. The high degree of dependence exists in conditions of the Czech Republic also among the number of bankruptcies among companies and the number of bankruptcies among self-employed persons. In relation to VAT there were found mostly negative dependencies on different degrees, the highest number is in the case of VAT returns with non-zero row enabling the correction of the VAT and the number of insolvency proceedings.

Keywords: bankruptcy, insolvency, correlation analysis, economic crisis, reverse charge system, tax policy, value added tax

JEL Classification: C50, G33, H20

1.INTRODUCTION

Insolvency, its causes and solutions is currently a very current topic mainly because of the growing number of business entities and citizens confronted with debts. (Chamber of Deputies Parliament of the Czech Republic, 2017). For more on this subject see e.g. (Carter, & Auken, 2006) or (Mikušová, 2013).
The basic ways of resolving the insolvency are according to Article 4 of the Act no. 182/2009 Coll., on Bankruptcy and its Resolution (Insolvency Act), as amended, are bankruptcy, reorganization and a debt relief. In case of the bankruptcy are the creditors are satisfied proportionally from the yeild of the realization of assets, unmet debts do not cease to exist and creditors are thus entitled to their further enforcement. The reorganization is used mainly by the debtor - an entrepreneur who carries out the recovery of the enterprise while keeping the operation in the entity (Maršíková, 2009). The aspects of insolvency law reforms in Italy with a a focus on the companies in reorganization are dealt with by e.g. (Accettella, 2016). The purpose of debt relief is exemption of the debtor from debts, either in the form of a five-year rescheduling plan (at least 30% coverage), or one-time monetization of assets (Maršíková, 2009).

The predictability and clarity of insolvency proceedings affects the behavior of companies, banks and consumers. The yield of registered and accepted claims into the insolvency proceedings in the Czech Republic are, according to statistics of the World Bank, one of the lowest in Europe. The World Bank sources from 2014 show that the average length of insolvency proceedings in the Czech Republic is 2.1 years. The Czech Republic in comparison with other neighboring transforming economies (Slovakia, Poland) achieved since 2009 a significant reduction of time of insolvency proceedings from the average duration of 6.5 years to the current 2.1 years whereas in neighboring countries, the average length of proceedings since 2009 has not reduced. The trend of shortening the length of proceedings simplies that a legislative change in the Czech Republic in 2006 brought a significant shortening of the procedure. (Chamber of Deputies Parliament of the Czech Republic, 2017a).
The substantial change that will enter into the force after the approval of the amendment to the Insolvency Act provisionally since July 2017 is significant limitations of so called “bullying proposals”. This amendment was approved by and was presented to the President for signature on 31 January 2017. In practice, the judge will have possibility to decide not to publish submission for the insolvency in the insolvency register. Then he will have the possibility to reject the abusive submission. The alleged debtor is now under the publicity, here we could note the example of 2016, when such totally unfounded bankruptcy proceeding was submited and handwritten by the citizen at Kooperativa, Inc., Vienna Insurance Group. (Chamber of Deputies of Parliament of the Czech Republic, 2017a).
The above mentioned also relates to the problem called “insolvency tourism” or "forum shopping", which is already responsed to within the revision of the regulation on insolvency proceedings (i.e. the proposal for a regulation of the European Parliament and of the Council amending Council Regulation (EC) no. 1346/2000 on insolvency proceedings). In the Czech Republic as well, there has been observed many cases where the debtor's seat has changed just prior to the insolvency proceedings with the obvious purpose of such changes, unrelated to the economic realities of the debtor's business, to make it more difficult to exercise the rights of creditors, respectively, even to achieve a more favorable assessment of the case by the newly competent court. (Chamber of Deputies Parliament of the Czech Republic, 2017a)
Concerning this approved amendment it is not the last expected legislative change in the field of insolvency. For expansion of the possibilities of using the institute of debt relief for natural persons, non-entrepreneurs, there was submitted another government bill to amend the Insovency Act on 8 February 2017 to the Chamber of Deputies Parliament of the Czech Republic. More information can be found in the relevant Parliamentary print no. 1030 (Chamber of Deputies Parliament of the Czech Republic, 2017c).
The comparison of main differences between corporate insolvency proceedings in the countries of Visegrad four were dealt with e.g. (Crhová, Fišerová & Paseková, 2016).
To alleviate the negative effects of insolvency on the creditors the government also uses other tools e.g. those of a fiscal nature.

2.THEORETICAL BACKGROUND

VAT belongs among to the indirect taxes, it is a part of the price of goods or supplied services (James & Nobes, 2016). Unlike excise duties or energy taxes that are levied only on the selected commodities, VAT belongs to the universal or general taxes (Schenk, Thuronyi & Cui, 2015). The ad valorem tax, among which VAT is ranked, are determined usually by a percentage of the price from the tax base that is expressed in monetary units (Široký, 2015).
Tax measures of the government may have a stabilizing function in times of crisis (Kubátová et al, 2016) and (Oats & Miller, 2016). In the field of VAT, one of the tools besides application of VAT rates are also special provisions and regimes concerning the very application of this

tax. More about the application of tax rates in times of crisis e.g. (Široký & Maková, 2014). During the crisis, according to Kubatova et al. (2016) it is necessary to carry out the expansionary fiscal policy. However, like James & Nobes (2016), they draw attention to a time delay in the response of tax revenues to the implementation of these measures. Vráblíková (2016) states that an economic growth in the long term is affected by indirect taxes positively, especially in the case of excise duties, which also follows from the results of other studies, e.g. Alm & El-Ganainy (2013).

Influence of potential legislative changes in the field of value added tax on the budgetary and fiscal policy, entrepreneurs and final consumers, including the aspects of tax evasion are also dealt with by e.g. Bieliková, Buno & Hrašková (2015), Bye, Strom & Avitsland (2012) or Buettner & Wamser (2009).

As an anti-crisis measures with effect from 1 April 2011 in the Czech Republic it was approved the Article 44 of the VAT Act. In accordance with this provision, the creditor had a possibility to correct the amount of output tax in case of receivables in insolvency proceedings arising no later than six months before the court decision on insolvency. This provision has been implemented into domestic legislation in accordance with Articles 90 and 185 of the Council Directive 2006/112/EC of 28 November 2006 on the common system of the value added tax (hereinafter referred to as the VAT Directive). According to the explanatory memorandum (Chamber of Deputies Parliament of the Czech Republic, 2011) the regime was applied in various forms in at least twelve other European Union Member States, namely Belgium, Denmark, France, Italy, Ireland, Latvia, Luxembourg, Germany, Portugal, Austria, Greece and the United Kingdom.

With effect from 1 January 2013 the creditor is allowed in accordance with Article 44 paragraph 1 point a) of the VAT Act to carry out the correction only if the debtor is in insolvency proceedings and insolvency court decided on the bankruptcy on the debtor's assets. This change means that it is no longer possible to make output tax corrections in respect of claims against debtors whose insolvency is solved by reorganization.

However, this measure is controversial from the beginning, one of the problems is based on the interpretation of the term of rise of claims before the court decision on insolvency. The Supreme Administrative Court in its judgment file No. 9 Afs 170/2014-42 decided that in accordance with Article 44 of the VAT Act it is possible to make a correction of output tax in receivables in insolvency in case of receivables that arose in less than 6 months before the date of the decision on bankruptcy. However, in practice of GFD it is still possible to make corrections in respect of claims arising in the period longer than 6 months, which was the intention of the Ministry of Finance of the Czech Republic to prevent speculations. The Supreme Administrative Court (2014). Clarification was not achieved even by the adaption of wording in Article 44 of the VAT Act in an amendment with effect from 29 July 2016.

As part of the amendments of the Parliamentary press No. 873 of the Act amending the tax legislation, there has been introduced an amendment in order to enable output tax corrections in accordance with Article 44 of the VAT Act also in the case of solution of insolvency by reorganization. This amendment, however, was not approved and existing law is still valid (Chamber of Deputies Parliament of the Czech Republic, 2017b).

The problem remains highly topical for many reasons, partly due to above mentioned conflict of The Supreme Court and General Financial Directorate, partly for the reason that the largest coal producer in the country, the company OKD has been in insolvency proceedings.

Since there is an assumption in case of receivables for OKD that they are subject to a standard tax rate, which is in the Czech Republic currently at 21% level it would appear as a more favourable for the creditor to have a possibility of correction of the amount of output tax for debtors in insolvency proceedings if the insolvency court decided to declare bankruptcy on the debtor's assets, respectively if the provision would be extended to the solution of insolvency by

reorganization. This change of legislation would mean that creditors obtain 21 % of their receivables in a relatively short time horizon in the form of inclusion of this correction into the regular VAT returns at the date when it was on his a corrective tax document from the creditor´s side was delivered to the debtor, in practice, therefore, to the insolvency administrator. Furthermore, there still remains the possibility that during the insolvency proceedings the creditor obtains another part of the receivable from the debtor. In case that in the future there is at least a partial satisfaction of the debt, the creditor in accordance with the current legislation of Article 44 paragraph 6 of the VAT Act has to pay the tax liability from the accepted payment. This possibility has a significant impact on cash flow of creditors. Since there is an assumption that transactions with OKD were made in larger volumes and for the majority of creditors the company is a key customer. Which also has a secondary effect on employment and the continued viability of these creditors.

On the other hand, the debtor is according to the Article § 44 paragraph 5 of VAT Act obliged to reduce his input tax by the amount of tax corrected by the creditor. For the debtor, this fact means an increase in his final tax liability for VAT. In these cases, debtors often do not have sufficient funds for the payment of this tax, which has a negative impact on VAT revenue and hence on the the state budget.

Due to the topicality of the problem we may observe increased activity on the part of persons representing the interests of creditors. The Coordination Committee together with the Chamber of Tax Advisors regularly discusses problems of interpretation of tax legislation. At the beginning of this year there have been discussion on the contribution under number 486/14.12 with title Output tax correction of value added tax in case of reorganization of the debtor, with the aim of clarifying of the impacts on the tax base of VAT in the supplies which were not fully paid due to the approval of the reorganization by the recipient.

The promoters of this contribution reasoned that in case of the reorganization there is an extinction of the part of the debt. In accordance with Article 90 paragraph 1 of the VAT Directive and Article 42 paragraph 1 point b) of VAT Act there is reduction of the tax base after the chargeable event. The creditor is obliged to correct the tax base and the amount of tax, which represents a reduction in tax liability. On the other hand, in accordance with Article 74 of the VAT Act the debtor is obliged to make a correction of the deduction that is to reduce the originally claimed entitlement to deduct tax on the respective received taxable supply, which ultimately means an increase of his tax liability. If the tax is declared by the debtor and actually paid, it will have a neutral impact on VAT collection. This contribution, however, was concluded by GFD with contradiction, more information can be found in the minutes from the 25 January 2017 (Financial Administration of the Czech Republic, 2017).

Otherwise the favourable opinion of the GFD could have an important influence on the state budget, especially to the possible decrease of VAT revenue in Moravian Silesian region with consideration to the mentioned company OKD and also and also some of the companies from the Vítkovice Machinery Group.

Even more significant negative effect on the state budget has the fact that due to the possibility and benefits of applying of Article 44 of the VAT Act, the creditors support the way of solving the insolvency of a debtor - the VAT payer by a form of bankruptcy. A possible solution would be repealing of this provision of Article 44 of the VAT Act which was introduced into Czech legislation during the ongoing economic crisis, while the introducing the general reverse charge system (Council of the European Union, 2016), the proposal of which was approved on 27 January 2017 approved by the ECOFIN (Council of the European Union, 2017). The principle of this mechanism is to apply the output tax by the a customer, not a supplier while retaining the right to deduct on the part of the customer in accordance with the relevant provisions of Article 72 and subsequent of the VAT Act.

As indicated by Sobotovičová (2015), according to a statistical survey carried out among companies in the Czech Republic, 14 % of the respondents had receivables from debtors in the insolvency proceedings, and only 2 % of respondents met the rules for the application of the Article 44 of the VAT Act.

3.OBJECTIVES AND METHODOLOGY

The aim of this paper is to assess the mutual dependence between selected indicators from the field of insolvency and the application of value added tax in the context of relevant legislation. To achieve the objective of the article the authors used the standard positivism economic methodology which also included the scientific methods as description, deduction, comparison, furthermore study of legislative sources and synthesis methods at the end. The methods of correlation analysis were used for specific analysis of dependence among examined factors, since, as Barrow (1988) states, these techniques may be applied to cross-sectional data.
The strengths of the interrelationship of selected variables is determined by correlation analysis. The linearity of the relationship is analyzed by the Pearson's correlation coefficient *r* specified by (1)

$$r = \frac{N\ \sum_{i=1}^{n} x_i y_i - \sum_{i=1}^{n} x_i \sum_{i=1}^{n} y_i}{\sqrt{n\sum_{i=1}^{n} x_i^2 - \left(\sum_{i=1}^{n} x_i\right)^2}.\sqrt{n\sum_{i=1}^{n} y_i^2 - \left(\sum_{i=1}^{n} y_i\right)^2}}, \quad (1)$$

where *x* and *y* are analyzed variables, *n* is the number of pairs of values. We talk about strong positive dependences, if, according to Buglear (2012) or Newbold, Carlson & Thorne (2013). the value *r* takes at least 0.9. The values close to 0, on the contrary, express the independence between the observed characters. More about the interpretation of values of the character is stated by Morris (2012).

To examine the dependence between the order of the values the Spearman correlation coefficient r_s, (2) is used

$$r_s = 1 - \frac{6\ \sum_{i=1}^{n}(i_x - i_y)^2}{n.(n^2-1)}, \quad (2)$$

where i_x and i_y are differences in the order of value x_i a y_i.

4.ANALYSIS

Tab. 1 shows the number of insolvency petitions in the years from 2011 to 2016. According to the data, the number of insolvency petitions in the Czech Republic is different each year, both for legal entities and for natural persons (including self-employed persons).

Tab. 1 – Number of insolvency petitions in the Czech Republic. Source: Federation of Creditreform Associations (2017).

Year	Companies	Natural persons including self-employed persons
2011	6 753	17 600
2012	8 398	23 830
2013	6 021	30 888
2014	3 563	31 577
2015	3 004	29 349
2016	2 438	27 067

Using the equation (1) there will be modeled relationship - functional dependence of the total number of insolvency petitions in relation to the petitions submitted by legal entities and natural persons. The objective is to assess on the significiant level 0.01 level whether there exists a dependence between the number of petitions submited by both of the groups.

Tab. 2 – Correlation analysis. Source: own calculation using software SPSS.

Correlations

		Companies	Natural Persons
Companies	Pearson Correlation	1	-0.552
	Sig. (2-tailed)		0.256
	N	6	6
Natural Persons	Pearson Correlation	-0.552	1
	Sig. (2-tailed)	0.256	
	N	6	6

The results of correlation analysis in Tab. 2 confirms the medium-high negative degree of dependence between both observed variables. Although the input data in the Tab. 2 shows a decreasing trend of number of submitted petitions, this number is decreasing in both of the groups.

The data in Tab. 3 show the number of insolvency proceedings in the particular regions of the Czech Republic and the average number of insolvency proceedings in the region per 1.000 registered companies. The data are arranged according to the number of insolvency proceedings per 1.000 registered companies. For both years 2015 and 2016 this value is the highest in the capital city of Prague. On the contrary the minimum number of insolvency petitions submited is in the Central Bohemia and the Pilsen region.

Tab. 3 Insolvency proceedings – division according to the regions. Source: Federation of Creditreform Associations (2017).

Region	Number of companies in the insolvency proceedings		Number of insolvency proceedings per 1.000	
	2015	2016	2015	2016
City of Prague	755	649	1.33	1.11
Southern Moravia	302	317	1.00	1.03
Moravian-Silesian	233	199	0.93	0.79
Karlovary Vary	58	52	0.76	0.69
The Olomouc	122	94	0.88	0.67
The Pardubice	104	78	0.89	0.66
South Bohemia	132	107	0.82	0.66
The Zlín	102	85	0.73	0.60
The Ústí	134	103	0.77	0.59
The Liberec	91	68	0.79	0.58

Vysočina	62	60	0.56	0.54
Hradec Králové	94	73	0.69	0.53
The Pilsen	96	72	0.67	0.50
Central Bohemia	283	160	0.88	0.49

The testing of dependence of the number of insolvency proceedings per 1.000 companies in the years 2015 and 2016 is documented in Tab. 4. The value of the Spearman coefficient is close to 0.7. Among the number of insolvency proceedings in the particular regions of the Czech Republic in the years 2015 and 2016 there exists a moderately high level of dependence.

Tab. 4 Spearman correlation coefficient. Source: own calculation.
Correlations

			Number of insolvency proceedings per 1 000 companies in 2015	Number of insolvency proceedings per 1 000 companies in 2016
Spearman correlation coefficient	Number of insolvency proceedings per 1 000 companies in 2015	Correlation Coefficient	1.000	0.698**
		Sig. (2-tailed)	.	0.005
		N	14	14
	Number of insolvency proceedings per 1 000 companies in 2016	Correlation Coefficient	0.698**	1.000
		Sig. (2-tailed)	0.005	.
		N	14	14

The most common method of terminating insolvency petitions is a declaration of insolvency, its solution is possible to reach either via reorganization or bankruptcy in case of companies or self-employed persons. The amendment to the Insolvency Act aims to strengthen the rights of creditors and accelerate resolving insolvency (Smrčka, Arltová & Schonfeld, 2013), (Chamber of Deputies Parliament of the Czech Republic, 2017a). Developments in the number of bankruptcies in 2014-2016 in the particular calendar years is described in Tab. 5.

Tab. 5 - Bankruptcies of companies and self-employed persons. Source: Federation of Creditreform Associations (2017).

Year	Insolvency petitions	Bankruptcies-companies	Bankrupticies – self-employed persons
2011	24 353	1 778	495
2012	32 228	1 899	555
2013	36 909	2 224	849
2014	35 140	2 403	1 110
2015	32 353	2 191	1 158
2016	29 349	1 982	1 076

By the Pearson correlation coefficient there will be examined in Tab. 6 the dependence of number of insolvency petitions of companies and bankruptcies (for companies and a self-employed persons) in the analyzed period in the years from 2011 to 2016.

Tab. 6 – Dependence of number of insolvency petitions and bankruptcies. Source: own calculation.

Correlations

		Insolvency petitions	Bankruptcies companies	Bankruptcies self-employed persons
Insolvency petitions	Pearson Correlation	1	0.827*	0.464
	Sig. (2-tailed)		0.042	0.354
	N	6	6	6
Bankruptcies companies	Pearson Correlation	0.827*	1	0.758
	Sig. (2-tailed)	0.042		0.081
	N	6	6	6
Bankruptcies self-employed persons	Pearson Correlation	0.464	0.758	1
	Sig. (2-tailed)	0.354	0.081	
	N	6	6	6

*. Correlation is significant at the 0.05 level (2-tailed).

As the number of submission of insolvency petitions since 2014 is decreasing (more details about the development e.g. Svobodová, 2013), the number of bankruptcies in the companies segment is decreasing as well, therefore it holds that there exists a high degree of direct dependence between the observed values according to the value r = 0.758. This trend, however, is not entirely true when assessing relationships for self-employed persons (r = 0.464). The number of self-employed persons in bankruptcy in this segment has been decreasing only since 2016 and this trend is the same for companies already since the year 2015. At the end of 2016 the bakruptcies of self-employed persons represent the higher proportion of the total number of bankruptcies. The highest value of coefficient *r* based upon analysis of the relationship of insolvency petitions and bankruptcies of companies is in the amount of r = 0.827.

As it has been previously mentioned, since 2011 the VAT Act includes the provision enabling correction of output tax in case of receivables from debtors in insolvency proceedings. The development of the amounts of output tax corrections in this case can be found in Tab. 7. The data were obtained from the General Financial Directorate (GFD).

Tab. 7 – Correction of output tax in receivables from debtors in the insolvency proceedings in CZK. Source: GFD (2016)

Year	Rown No. 33 of VAT return – creditors
2011	150 949 338
2012	185 351 830
2013	113 211 596
2014	131 775 113
2015	96 831 754

The Pearson correlation coefficient values in Tab. 8 analyze the dependence between the number of insolvency petitions and corrections of output tax in receivables from debtors in insolvency proceedings made by the creditor (row No. 33 in the VAT return of the creditors).

Tab. 8 Correlation – insolvency petitions and output tax correction. Source: own calculation according to the data from GFD.

		Number of Insolvency Petitions	Correction of output tax - creditors	Non-zero row no. 33 of VAT returns
Number of Insolvency Petitions	Pearson Correlation	1	-0.364	-0.731
	Sig. (2-tailed)		0.547	0.161
	N	5	5	5
Output tax correction - creditor	Pearson Correlation	-0.364	1	0.860
	Sig. (2-tailed)	0.547		0.061
	N	5	5	5
Non-zero row no. 33 of VAT return	Pearson Correlation	-0.731	0.860	1
	Sig. (2-tailed)	0.161	0.061	
	N	5	5	5

Between the number of insolvency petitions and the amount of VAT output tax corrections made by the creditor there is a slight negative dependence, since the value of r = - 0.364. In case of assessment of dependence between the number of filed VAT returns, the row no. 33 of which has a non-zero character, there is a high degree of correlation (r = - 0.731). The conclusion of the analysis indicates a proportional relationship of the number of VAT returns with non-zero row no. 33 and the amount of output tax correction made by the creditor (r = 0.860).

5.DISCUSSION AND CONCLUSION

The aim of this paper was to analyze the dependencies between selected indicators of insolvency and corrections of the amount of value added tax in case of receivables from debtors in insolvency proceedings using methods of correlation analysis.

The results of the analysis shows dependences among selected analyzed indicators. Moderately high negative level of dependence was found between the number of insolvency petitions submitted in the segment of companies and in the segment of natural persons including the self-employed persons. In recent years there has been a declining trend in the number of these petitions as a result of a stable and growing economy development. According to the opinions of the authors, in the future, in the next longer period of time, there may be again a situation where the annual number of submitted petitions will increase. This development could be influenced by the overly optimistic expectations of people who are currently going into the debts, so that they will not be able to cover all their liabilities in the future. When evaluating the development of number of insolvency proceedings it is important to take into account the international interconnection of markets and competitive environments, which in more detail analyzes e.g. Tošenovský (2014). The changes of macroeconomic indicators such as unemployment, inflation or transition to a different phase of the economic cycle may also have a significant influence on the change in trend of development.

The high degree of direct dependence (in case of segment of companies) betwen the number of insolvency petitions and the number of bankruptcies is caused by the fact that bankruptcy is one of the ways to terminate the insolvency petition. In the future, this dependence could be mainly influenced by changes of legal environment or speed of the procedure. The moderate degree of dependence exists according to the data that are available to the authors of the research for the segment of natural persons. Natural person has a possibility to solve the bankruptcy also

by the debt relief (a legal entity can use this way only when it is, according to the law, not considered as an entrepreneur).
The insolvency proceeding also has an important impact on field of value added tax when it is possible to use the institute of output tax correction in case of debtors in insolvency proceedings. Here logically, is a high dependence between the amount of the submitted tax returns with the non-zero row no. 33 filed by creditors who uses the institut, and the amount of output tax correction.
The frequent changes in legislation and changes of interpretation of already approved regulations distort the business environment of each country. They have negative secondary effects e.g. on the collection of taxes, the state budget, employment, investment rate or GDP. According to the authors' opinion, the simplifying of legislation by removing the controversial exceptions in case if insolvency and taxes would contribut to improvement of the status and economic security of both creditors and debtors in the Czech Republic.
One of the possibilities is a re-expansion of Article 44 of VAT Act to include a circle of debtors in such a way that there can be supported decision when choosing the form of insolvency resolution for a reorganization, which should result in continuation of the business entity in operation, maintainance of jobs in the debtor´s business and then with his business partners.
Preferable option in authors´opinion is the complete abolition of this provision while introducing the reverse charge system, proposal of which was supported by the Council ECOFIN. According to the authors of this paper it is very appropriate to consider whether the financial limit (treshold) for the application of this regime should not be reduced or even abolished, and whether there should be easing of conditions enabling the application of this regime in the EU Member States. In authors' opinion, it would be appropriate to apply this regime without any limit for a transaction to prevent artificial shattering of particular transactions. VAT on the output would be applied only by a supplier of goods or services only in the case of the supply to the final consumer. This would result in significant prevention of tax evasion, especially carousel frauds, which according to the Council of the European Union (2016) constitute 25% loss of VAT revenues.

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LEARNING IN THE ORGANISATION AS A TOOL OF KNOWLEDGE MANAGEMENT: A STUDY OF KNOWLEDGE BASED INDUSTRIES

Kuruppuge Ravindra Hewa, Gregar Aleš

Abstract

This paper focuses on reviewing the learning behaviour of individual employee in the firm over other influencing factors in knowledge based industries in Sri Lanka. Using a stratified random sampling technique, a sample of 143 employees from jobs in Database Administration & Development, Systems & Network Administration, Web Development & Programming and Software Engineering was selected as respondents for the survey from 13 knowledge based industrial firms in Sri Lanka. After descriptive analysis of the characteristics of respondents, the causal relationships among predictor and outcome variables were tested using partial least squares regression. The results indicated that the use of digital methods, digital tools, organizational identification and knowledge sharing are positively influenced by employee's learning in the firm. Yet, employee's turnover intention has negatively influenced employee learning.

Keywords: information technology, knowledge management, organisational identification, organisational learning, knowledge based industries, Sri Lanka.

JEL Classification: M1, M1

1.INTRODUCTION

Knowledge is considered to be the most powerful resource in the present day business world as knowledge consists of characteristics of the inability of imitating and copying (Montequin et al. 2006). As a result, almost all types of firms are now keeping trust on knowledge based resources to gain the competitive advantages over similar firms. Gaining competitive advantages through knowledge resources has become a compulsory activity of effective knowledge management (KM) in present day businesses as an effective KM always opens access to knowledge by the right person at the right time (Akhavan et al. 2009). Knowledge creation, storing and dissemination would probably comprise the term 'knowledge management'. However, there is no universally accepted definition for KM. Mostly, content and context of knowledge direct the definition of KM (Koenig and Srikantaiah, 2004). O'Leary et al. (2001) reviews KM as a system which supports to generate, access and reuse of knowledge in order to preserve and share it among working teams and individuals in the firm. This definition further emphasizes KM as a concept which can be studied only as a system which connects together organizational, individual and cultural factors. Generally, it is believed that the individual behaviour of employees is different to the team behaviour of individual members of a team (Van and Sleebos, 2006). Therefore, concepts relevant to a team and an individual member of a team such as learning in the organization have been identified as one of the most vital factors for KM.

Learning in the organization has become a key term in employee adaptation and knowledge processes, innovation and organizational development studies in individual and collective levels of employees in a firm. One of the common findings of these studies is that managers are

responsible to make the organizational environment as a learning organization, enabling employees to search for new knowledge, knowledge sharing, storing and utilization to develop the firm. Such behaviour of employees would help to establish the sustainability and longevity of the firm as well. In one way, creating a learning culture is dependent on individual and organizational factors of the internal business environment of the firm (O'Leary et al., 2001). In another way, the success of learning by employees is dependent upon the effectiveness of the mode of learning. As the learning is done by the employees themselves, it is no doubt that the business environment is also having a role to play. Previous studies have conceptualized adequately about learning in the organization as a function of organizational factors. But, a few research studies have been conducted on relevant factors of individual employees' learning behaviour in the firm. Specifically, very few studies have been conducted to detail organisational learning in developing countries like Sri Lanka, where many industries are in a transitional period. Information technology industry in this regard is very specific.

In Sri Lanka, the Information Technology sector can be considered as one of the major revenue generating sources. At the same time, over the past decades, knowledge based industries (KBIs) in Sri Lanka has been developing at a rapid space (CBSL Annual Report, 2014). While the nature of the industry has been always dynamic and the environment ever changing. Especially, the software industry thrives on knowledge workers who learn relevant things fast and it is a focal point for the development of the IT industry (Herath and Ranasinghe, 2011). However, limited studies have focused on employee's learning in the firm which is very vital for the smooth functioning of a firm in the IT sector in Sri Lanka. Contemporary managers in the IT sector also have identified that changing the human behaviour and creating a learning culture as a learning organisation is a challenge (Herath and Ranasinghe, 2011). Hence, it is worthwhile to develop this study addressing employees' learning issue with other influencing factors in KBIs in Sri Lanka. Accordingly, the main objective of this study is reviewing the influencing factors of employees' learning in KBIs in Sri Lanka. Identifying most prone dimensions of employees' learning and the nature of relationships (positive/negative) between predictors and employees' learning in KBIs in Sri Lanka would serve as the sub-objectives of this study. Theoretically, this study assists in enhancing the knowledge about employees' learning behaviour which is an important aspect of KM in the IT industry in general. Specifically, contextual knowledge about employee learning behaviour in transitional economies like Sri Lanka would be helpful for other researchers to design their studies as well. However, this paper is organized into five parts, namely introduction, literature review, methodology, data analysis and conclusion.

2. LITERATURE REVIEW

The literature review of this article is basically divided into three parts. The first part is about knowledge management. The second part reserves for organizational identification and related dimensions and final part is about learning in the organization. The main argument which the researcher focuses on is to build in the literature review that employees' learning behaviour would be a result of other relevant individual and organizational activities. In the event of building the argument, all sub sections of the literature review provide evidence to support the main argument of the literature review.

2.1 Knowledge Management

KM is not a single process. It is a collaboration of human resources, enterprise organizational culture, information technology, methods and tools that support the organization to run their

functions smoothly. Furthermore O'Leary et al. (2001) describes a KM system that facilitates the creation, access and reuse of knowledge, and its main goals are to promote knowledge growth, communication, preservation and sharing. According to Montequin et al. (2006), making a transition of a firm that manages efficiently in all aspects of knowledge is not a trivial step. Further, knowledge and KM are nowadays vital areas for most organizations, especially those that are driven by knowledge (Montequin et al. 2006). According to Yu-Chung et al. (2005) employee behaviour is one of key determinant of effective KM. Employees learning in the firm and knowledge sharing behaviours are directly connected with the operation of a firm. These kinds of positive behaviours would stimulate the development and implementation of knowledge. Implementing KM means something more than implementing a set of IT tools: it involves changes in the organizational structure, process and culture. The first step to change from a traditional company into a KM is to be aware of the knowledge of the organization. In addition to that, Yu-Chung et al. (2005) explains that knowledge is not easily measured or audited, so organizations must manage knowledge effectively in order to take full advantage of the skills and experience inherent in their systems and structures as well as the tacit knowledge belonging to the employees of the firm. KM can more effectively integrate and administer a firm's information technology base and assist in the development of a systematized information model.

2.2 Organizational identification, use of digital methods and tools, knowledge sharing and turnover intention of employees

Organizational identification (OID) is identified as a concept which can be explained, predicted and understood by the behaviour of employees in an organization. Employees generally identify the organization with their beliefs, values and principles referring to the prevailing system in the firm (Van Knippenberg and Sleebos, 2006). When employees have the perception of belonging to the firm to which they are attached is identified as OID. Further, OID has been reviewed by Hogg and Terry (2000), as a concept of self-categorization by an employee about his/herself in line with an overall overview of the firm. The importance of OID has considerably grown during the recent years in studies because of its implications to organizations (Kreiner & Ashforth, 2004). In a comprehensive study by Van Knippenberg (2000) revealed that OID is positively related with performance and organizational citizenship behaviour of employees and negatively related with turnover intention of employees. Further, employee's positive attitudes towards the job, psychological attachment to the organization of fostering the feeling of retaining would also be enhanced by OID (Kreiner & Ashforth, 2004). However, as far as research findings of OID are concerned, it is clear that it has been a predictor for employees' behaviour in many cases.

New generation that developed with technological artefacts like different models of mobile phones, computers, video games and visual and sensible items in information technology is identified as 'Digital Natives' (Palfrey & Gasser, 2008; Prensky, 2001). Generally, digital learning is defined as a system of radical reworking of pedagogy (Prensky, 2001) connecting to different aspects of learning. Learning in digital mode is a broader concept and it is not recognised as gaining or sharing the knowledge in a one particular place. Accessing information through a network of peers is one of the main features of learning through the digital mode (Ito et al., 2009). As far as employees in firms are concerned, their learning process is mostly combined with digital artefacts. The mode of learning also matters (Jenkins, 2007). Currently, it is rare to find an organization which does not use digital equipment in the operation process. Therefore, the learning process of employees is connected with digital artefacts and mode.

Knowledge sharing is defined as an activity of sharing information, expertise, skills and attitudes among friends, communities, organisations and individuals (Eid & Nuhu, 2011). Employees in present day organisations have been immensely influenced by social networking sites which have influenced to their learning behaviour. Similarly, accessibility of information and knowledge by others are also making it easy for others to learn (Eid & Nuhu, 2011). Both, accessibility and affordability of knowledge within an organisation has shown to be an influence on employee learning behaviour.

Turnover intention of employees is defined as mental readiness of employees to leave the firm. Employee turnover is reported as the main human resource issue in the IT industry in Sri Lanka and most of the other developing countries in the world. Losing skilful, competent employees who have shown better performance in the firm creates problem in teamwork and incur extra cost for replacing the team. However, the turnover intention is identified as part of the turnover behaviour of employees (Tett & Meyer, 1993). All the behavioural movement can be seen by employees once they have set the goal to leave the firm. Therefore, the turnover intention of employees becomes an influencing factor on the employees' learning behaviour.

2.3 Learning in the Organisation

Peter Senge in his book titled The Fifth Discipline: The Art and the Practice of the Learning Organization (1990), firstly mentions about organisational learning or learning organisations. In this book, he identified organisational learning or learning organisations as firms in facilitating their employees to learn from the organisation and make the required transformation to perform better. The book proposed five characteristics of organisational learning, namely system thinking, personal mastery, mental model, shared vision and team learning. Personal mastery which is the employee's ability to grow and develop is identified as one of the important characteristics at personal level. Employee learning which is also recognised as a part of personal mastery concentrates on different individual learning aspects in the firm. This concept has deepened the understanding of employee's personal vision, efforts, professional skills, knowledge and capabilities (Senge et al., 1994) discusses about learning in the vocation. Further, Senge et al (1994) mentions that managers of firms should not only invest money in wealth creation, but to develop the values, skills and abilities related to the performance of employees as employees experience based on performance that would in turn have great influence on overall firm performance. Specifically, learning tacit knowledge by employees would enhance the individual performance as well.

3. METHODOLOGY

This study focused on explaining the influencing factors on employees' leaning in the firm in KBIs in Sri Lanka. According to Sri Lanka Information Communication Technology Association (SLICTA), the current total workforce involved in the IT sector is around 60,000 of which 29,000 workers are directly involved in jobs in Sri Lanka. In addition, according to IT work force categories can be mainly divided into several job categories. The sample of this survey design was based on the above information. The survey of this purpose was conducted in 2016. The primary data was collected from 13 randomly selected KBIs which were selected using the simple random sampling technique from the list of IT related companies given by the SLICTA. Only four main job categories, Database Administration & Development, Systems & Network Administration, Web Development & Programming and Software Engineering were considered as important jobs for the study as most of KBIs are dominant with these jobs. A

questionnaire was developed adapting measurements validated by other researchers on variables of this study. Most of the questions other than basic information were in five-point Likert scale (1 = strongly disagree, 2 = slightly disagree, 3 = uncertain, 4 = slightly agree, 5 = strongly agree). Measurements related to dimensions such as personal learning (Gardiner and Whiting, 1997), digital methods & mode (Lee and Law, 2012), Organizational identification (Mael and Ashforth, 1992), knowledge sharing (Bock and Kim, 2002) and Three items from Wayne et al. (1997) were used to measure turnover intention of employees. Finally, 141 respondents attended the survey. Respondents for the survey were selected according to stratified random sampling. The questionnaire was self-administered in nature and the respondents answered the questionnaire in premises of KBIs. The fieldwork included analysis of secondary documentary sources in each organization to analyse and conclude the study. Partial least squares regression ($X = TP^T + E$), ($Y = UQ^T + F$) was performed to analyse the data. Employees' learning in the firm served as dependent variable and organisational identification, use digital methods, use of digital mode, knowledge sharing of employees and turnover intention of employees served as dependent variables in this model. In addition, descriptive analysis of the sample was also executed.

4. DATA ANALYSIS AND RESULTS

Some interesting conclusions could be drawn according to the descriptive analysis of the respondents in this survey. A 22 percentage of all responses have been received from the job of Database Administration & Development. Systems & Network Administration Officers have given 30 percent. The contribution from Web Development & Programming and Software Engineering officer is respectively 20 and 28 percentages. Female percentage of the sample is reported as 18 percent. Respondent's ages range from 19 to 43 years. The majority of respondents (65 percent) is reported in the age group of 18 - 27 years. At the same time, around 40 percent of respondents have reached minimum five years of work experience in their jobs. Some of respondents have served more than twenty years in the same company. But a majority (around 68 percent) had changed their company during the last five years.

Data analysis process began with descriptive analysis of responses. Table 1 elaborates the nature of data collected by the survey. In the model, employees' learning in the firm served as the outcome variable and organisational identification, use digital methods, use of digital mode, knowledge sharing of employees and turnover intention of employees represented independent variables.

Table 1, Descriptive Analysis of Responses, Source: Sample Survey, 2016

Variable	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
Employees' Learning in the Firm	143	3.000	5.000	4.685	0.574
Organizational Identification	143	4.000	5.000	4.804	0.398
Use of Digital Methods	143	3.000	5.000	4.657	0.583
Use of Digital Tools	143	3.000	5.000	4.629	0.565
Knowledge Sharing	143	3.000	5.000	4.615	0.568

Turnover Intention	143	2.000	5.000	3.734	0.847

According to the correlation matrix of the model, four variables, namely organisational identification, use of digital methods, use of digital tools and knowledge sharing among employees have positively correlated with employees learning in the firm. The highest (0.749) correlation to employee's learning in the firm is reported from the use of digital methods in employees' learning process. The least value (0.553) is given as knowledge sharing among employees in the firm. Employees' turnover intentions have negatively correlated (-0.043) to employee's learning in the firm. Almost all other variables are also correlated negatively with the turnover intention of employees. However, the minimum negative correlation of turnover intention is associated with employee's learning in the firm.

Table 2, Correlation Matrix, Source: Sample Survey, 2016

Variables	1	2	3	4	5	6
1.Organizational Identification	1.000					
2.Use of Digital Methods	0.589	1.000				
3.Use of Digital Tools	0.489	0.574	1.000			
4.Knowledge Sharing	0.381	0.322	0.299	1.000		
5.Turnover Intention	-0.134	-0.015	-0.148	-0.068	1.000	
6.Employees' Learning in the Firm	0.622	0.749	0.745	0.533	-0.043	1.000

Partial least squares (PLS) regression model results showed the quality of the model as Q^2 cum = 0.820, R^2Y cum = 0.826 and R^2X cum = 0.497. R^2 of the model is 0.761 (SD=0.281). However, PLS model has calculated the coefficients of each variable as shown in table 03. Accordingly, the intercept is reported as -1.120 and turnover intention of employees negative value. All other values are reported as positive coefficients.

Table 3, Coefficients (Variable Employees' Learning in the Firm), Source: Sample Survey, 2016

Variable	Coefficient	Std. deviation	Lower bound (95%)	Upper bound (95%)
Intercept	-1.120	0.297	-1.706	-0.533
Organizational Identification	0.382	0.034	0.315	0.449
Use of Digital Methods	0.314	0.030	0.255	0.374
Use of Digital Tools	0.322	0.033	0.257	0.388
Knowledge Sharing	0.229	0.044	0.142	0.317
Turnover intention	-0.012	0.023	-0.058	0.034

When all independent variables are prioritised based on the influencing ability to employees' learning in the firm, the model has concluded by providing the results as given in figure 1. Accordingly, the most influencing factor is identified as use of digital methods (1.252) and least influencing factor is reported as turnover intention (0.072). The second least important factor is depicted as knowledge sharing (0.891).

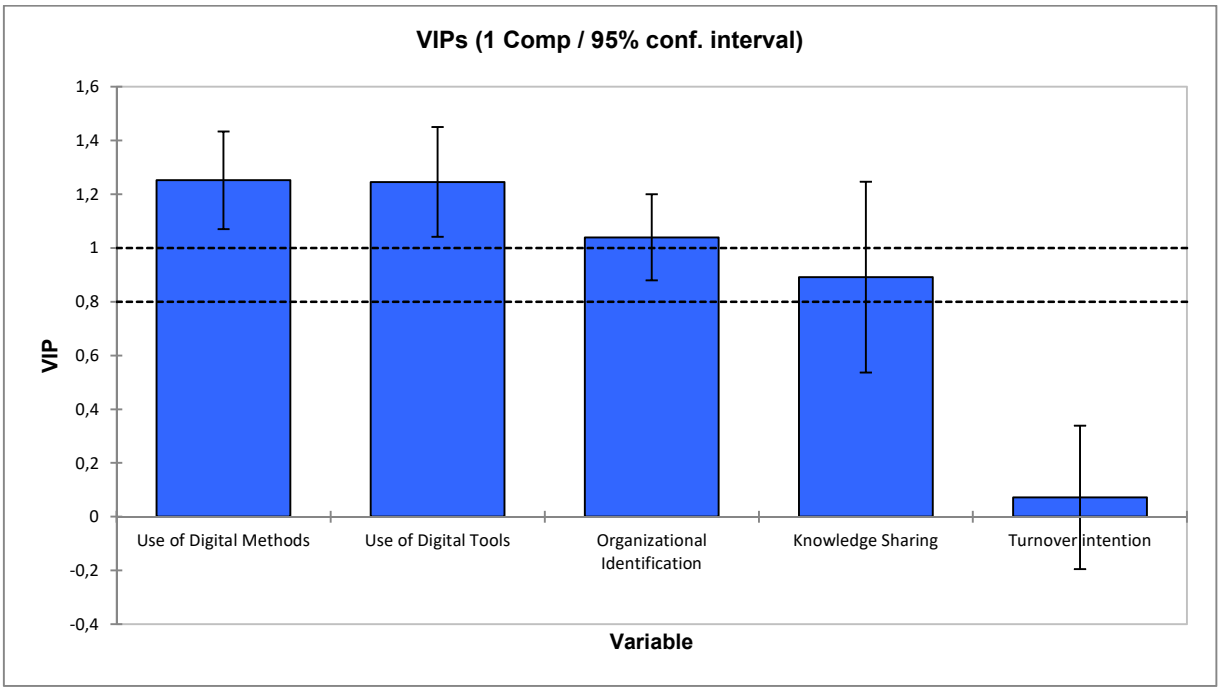


Figure 01, Variables Important in the Projection, Source: Sample Survey, 2016

At the same time, the results indicate the standardised coefficient in case of employees' learning in the firm as shown in figure 02. Accordingly, a minus coefficient is reported for the turnover intention of employees.

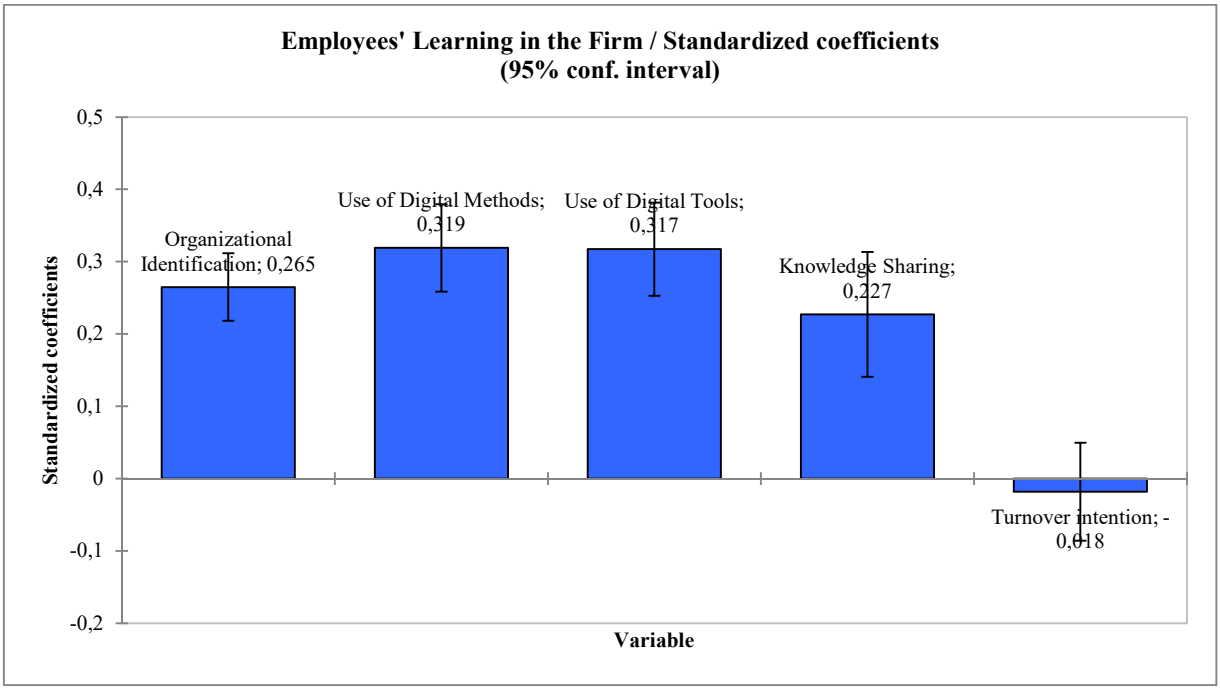


Figure 02, Variables Important in the Projection, Source: Sample Survey, 2016

This analysis indicated several findings. Firstly, it was recognised that employees' learning is positively correlated with organisational identification, use of digital methods, use of digital

tools and knowledge sharing among employees. However, turnover intention has negatively correlated to employees' learning in the firm. Secondly, the higher influence is made respectively by the use of digital methods and the use of the digital tool in the learning process. A minimum influence is reported by turnover intention of employees in their learning process in the firm.

5. CONCLUSION

According to the analysis, employee identification, use of digital methods of learning, use of digital tools in learning and knowledge sharing among employees have shown a positive correlation to employees' learning in the firm. The digital mode of learning and use of digital artefacts have shown a strong correlation to employees' learning, concluding the current trend in the IT sector. Once the employees in the IT sector get used to work with technology, they experience everlasting changes in equipment, technology and methods. As a result, the continuous learning process has become compulsory for employees. However, a positive effect is seen when learning takes place through digital methods and tools. Provision and establishment of new methods, equipment and technologies through digital methods and tools in KBIs would probably make it easier to develop the firm as learning organisation.

This study also was carried out under limitations. The sample size itself and selecting respondents only from four job categories are limitations of this study. KBIs itself have had differences as IT industry is highly diversified. Accordingly, the selection of the sample from a wider perspective covering more KBIs, job categories and respondents would make these kinds of studies more solid and stable. The use of the model (PLS) had some limitations in interpreting relationships among variables as the data that appeared on Likert Scale. Extending PLS to Structural Equation Modelling (SEM) would eliminate that issue of advancing the analysis more thorough. However, eradicating of one of these limitations would direct the future researcher to analyse the same research in detail.

Research findings of this study implicate a few important aspects to practice. Most firms in the IT sector are trying to convert their firms as learning organisations to gain competitive advantages and innovations. KBIs in present day competition can't survive in the long term without having an energetic, motivated, knowledgeable and dedicated workforce who can make the organisation changed as per requirement of society at large. Knowing the learning behaviour of workforce and employee's learning related factors in the firm is a primary step in the conversion process of a firm as a learning organisation. Therefore, this study would fulfil that requirement of managers, owners, governors and policy makers who are considering making their firms learning organisations in the IT sector in general.

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USING PREDICTIVE MODELS TO IDENTIFY FACTORS INFLUENCING MARKET RESEARCH

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Abstract

In this article we focused on analysis of market research in companies in the Slovak Republic. The main goal was to determine relevant factors affecting the market research in Slovak companies and to quantify their influences. Analysed data was obtained from 373 Slovak companies in 2014. Logistic regression model and classification trees model using the SAS Enterprise Guide and SAS Enterprise Miner statistical software were used as the main tools for the statistical analysis. The data was used to find out how market research in companies in the Slovak Republic (market research: yes (1), no (0)) is linked to their available characteristics (legal status, number of employees, annual turnover, sector, marketing department and ownership). The impact of relevant factors selected by the stepwise elimination method was quantified through regression coefficients and p-value Chi-Square statistics decision trees algorithm.

Keywords: marketing indicators, market research, decision trees, logistic regression

JEL Classification: C10, M31, O10

1.INTRODUCTION

Multinomial logistic regression and classification trees are types of probabilistic statistical classification models. Classification and regression trees, also known as recursive partitioning, segmentation trees or decision trees, are nowadays widely used either as prediction tools or simply as exploratory tools (Berry & Linoff, 2004). Their interest lies mainly in their capacity to detect and account for non linear effects predictors on the response variable. Classification trees are constructed by repeatedly splitting the data, defined by a simple rule based on a single explanatory variable. At each split, the data is partitioned into mutually exclusive groups, each of which is as homogeneous as possible. The splitting procedure is then applied to each group separately. The objective is to partition the response into homogeneous groups. The tree is represented graphically, and this aids exploration and understanding (De'ath, & Fabricius, 2000; Dietterich, 1990).

Multinomial logistic regression is used for predicting the outcome of a categorical dependent variable based on one or more features (independent variables). Logistic regression can be used to control explanatory variables when assessing relationships between a dependent variable and several independent variables and predicting outcomes of a dependent variable using a linear combination of explanatory (independent) variables (Hosmer & Lemeshow, 2000).

In this paper we focused on analysis of market research in companies in the Slovak Republic. The main goal of our research was to determine relevant factors affecting the market research in Slovak companies and to quantify their influences. We analysed data obtained from 373 Slovak companies in 2014. Simple random sampling, using companies as sampling units, was used. Logistic regression model and classification trees model using the SAS Enterprise Guide (SAS EG) and SAS Enterprise Miner (SAS EM) statistical software were used as the main tools for the statistical analysis.

In relation to the main aim of the research we formulated two hypotheses:
H_1: We assume that the number of employees has a positive impact on the market research of the company,
H_2: We assume that the annual turnover of the business has a positive impact on the market research of the company.

2:LITERATURE REVIEW

Defining the market is an important issue because it allows to better identify market changes and adequately respond to them. Division of the market into different subgroups of buyers, which require different products and to different marketing programs is called market segmentation. Market segment consists of consumers who have a similar response to the specific marketing mix. Kotler (Kotler & Keller, 2007) defines the market from the marketing point of view as „the set of actual and potential buyers of the product." Přibová (Přibová end al., 1996) understands the market „as a specific group of customers in a specific geographic area". According to Bennett (Bennett & Lamm, 1988), market research refers to „the systematic collection, recording and analysis of data with regard to the specific market where a market is considered to be a specific group of customers in a specific geographic area."
„Marketing research refers to the collection, recording and analyzing the data relating to the marketing of certain goods or services (Majaro & Jurnečka, 1996). Marketing research is the systematic identification, collection, analysis, evaluation of information and conclusions that correspond to a particular marketing situation, in front of which stands firm."
By Bennett (1989), marketing research is seen as „a function that links the consumer, customer and public to the marketing-workers through exchange of information - information used to identify and define marketing actions, monitor marketing efforts and to improve understanding of marketing as a process."
Market research is understood by Foret & Stávková (2003) as a single project, single action, within which to establish the current situation on the market generally uses one chosen research technique. The term market research indicates particularly short survey and market situation forecast. Differences between different types of surveys are given: the nature of the questions, commodity, target group, the nature of the problem studied, the availability of the underlying data (Boučková end al., 2003).
The marketing literature has emphasized the importance of marketing orientation for achieving organizational objectives like competitive advantage and performance improvement. Nedelová (2015) stated that the importance of marketing orientation is affecting businesses. There are several studies which investigate marketing orientation in the context of different business fields and business size. Parasuraman (1983) and Avlonitis & Gounaris (1997) were primarily focused on examining of differences between marketing orientation of industrial and consumer businesses. Liu (1995) and Appiah-Adu (1997) investigated differences between the levels of marketing orientation in relation to the performance of different-sized businesses. Liu (1995) examined the adoption of market orientation in UK businesses of different sizes which were divided into three groups - medium-sized, large and extra-large businesses. Majority of them confirm the positive relationship between market orientation and business performance (Avlonitis & Gounaris, 1997; Cervera, Mollá & Sanchéz, 2001; Jaworski & Kohli, 1993). Rojas-Méndez & Rod (2012) partly confirmed positive impact of marketing orientation on business performance.

3:SELECTION OF RELEVANT FACTORS

Based on the results of the questionnaire survey that was focused on reviewing of the importance and degree of selected areas of marketing activities used in company, we analyzed the impact of the following attributes on market research (*market research* (MR)*:* yes (1), no (0)):
Legal status (LS): a. s. (joint stock company) (1), s. r. o. (limited liability company) (5), komanditná spoločnosť (limited partnership) (4), fyzická osoba/živnostník (individual/self-employed person, proprietorship) (3), družstvo (cooperative) (2),
Number of employees (NE): proprietorship (1), 1 – 9 employees (2), 10 – 49 employees (3), 50 – 249 employees (4), 250 and more employees (5);
Annual turnover (TO): to 2 000 000 Euros (1), 2 000 001 – 10 000 000 Euros (2), 10 000 001 Euros – 50 000 000 Euros (3), over 50 000 000 Euros (4);
Sector (SEC): industry (section ISIC rev. 4: C), building industry (PS) (section ISIC rev. 4: F), trade (section ISIC rev. 4: G, H, I), services (section ISIC rev. 4: G, H, I) (OS), energy industry (section ISIC rev. 4: B, C, D, E), transportation (section ISIC rev. 4: G, H, I), post and telecommunication (section ISIC rev. 4: J) (EDT), agricultural industry (section ISIC rev. 4: A), tourism (section ISIC rev. 4: G, H, I) (PCR), other (section ISIC rev. 4: R, S, T, U) (I).
Marketing department (MD): the company has marketing department (1), the company has not marketing department (0),
Ownership (OWN): foreign capital, (LZ), domestic capital (LD), dominance of the foreign capital (PZ), dominance of the domestic capital (PD).
We found that 52.55 % of 373 companies covered in the survey regularly performed market research in various areas (Tab. 1).

Tab. 1 – Companies classified according to the *market research* (MR). Source: own elaboration, SAS EG.

MR (market research)	Frequency	Percent
0	177	47.45
1	196	52.55

Table 2 shows the number of companies that participated in the survey and their division into companies that do perform and those that do not perform *market research* (MR) depending on the *number of employees* (NE).
In the category of companies with 250 and more employees, 79 % of companies performed market research. In the category of companies with 1 – 9 employees, 34 % of companies performed market research in 2014.

Tab. 2 – Companies classified according to the *market research* (MR) and *number of employees* (NE). Source: own elaboration, SAS EG.

Table of NE by MR			
Frequency / Row Pct	0	1	Total
1*	23 / 85.19	4 / 14.81	27
2	69 / 65.71	36 / 34.29	105
3	44 / 54.32	37 / 45.68	81
4	24 / 30.38	55 / 69.62	79
5	17 / 20.99	64 / 79.01	81
Total	177	196	373

*Note: proprietorship (1), 1 – 9 employees (2), 10 – 49 employees (3), 50 – 249 employees (4), 250 and more employees (5).

The amount of an annual turnover is considered to be an important factor affecting market research. Companies classified according to the amount of their annual turnover and performing market research are presented in the Tab. 3. The data indicate a correlation between the use of market research and the level of turnover.

Tab. 3 – Companies classified according to the *market research* (MR) and *annual turnover* (TO**).** Source: own elaboration, SAS EG.

Table of TO by MR			
Frequency / Row Pct	0	1	Total
1*	115 / 64.97	62 / 35.03	177
2	28 / 38.89	44 / 61.11	72
3	18 / 31.58	39 / 68.42	57
4	16 / 23.88	51 / 76.12	67
Total	177	196	373

*Note: to 2 000 000 Euros (1), 2 000 001 – 10 000 000 Euros (2), 10 000 001 Euros – 50 000 000 Euros (3), over 50 000 000 Euros (4).

The survey shows that only 35 % of companies with an annual turnover up to 2 million Euros did market research. In the category of companies with an annual turnover between 10.000.001 Euros and 50 million Euros 68 % of companies did market research.

In the next part we analysed the relationship between the variables that describe attributes of the companies and the variable *market research* (MR). To statistically verify the dependency of the variable *market research* on each factor, we first used Chi-Square Test. The influence of considered variables on the variable *market research* (MR) was evaluated using the logistic regression model and decision trees model.

4.RESEARCH METHODS AND METHODOLOGY

4.1.Logistic regression model

Logistic regression is a method for modelling in situations for which there is a binary response variable. The predictor variables can be numerical or categorical.

Letting Y be the binary response variable, it is assumed that $P(Y=1)$ is possibly dependent on $\boldsymbol{x}$, a vector of predictor values $E(Y)=E(Y|\boldsymbol{x})=\pi$. The goal is to model $p(\boldsymbol{x})=P(Y=1|\boldsymbol{x})$. Y is binary, modelling $p(\boldsymbol{x})$ is really modelling $E(Y|\boldsymbol{x})$. If we model $p(\boldsymbol{x})$ as a linear function of predictor variables $\eta=\beta_0+\sum_{j=1}^{k}\beta_j x_j$, then the fitted model can result in estimated probabilities which are outside of [0,1]

$$\pi=P(Y=1|\boldsymbol{x})=\frac{exp(\eta)}{1+exp(\eta)}=\frac{exp\left(\beta_0+\sum_{j=1}^{k}\beta_j x_j\right)}{1+exp\left(\beta_0+\sum_{j=1}^{k}\beta_j x_j\right)}=\frac{1}{1+exp\left(-\beta_0-\sum_{j=1}^{k}\beta_j x_j\right)} \quad (1)$$

where $\boldsymbol{x}=(x_0, x_1,...x_k)$ may be the original set of explanatory variables.

It can be noted that

$$ln\frac{\pi}{1-\pi}=\eta=\beta_0+\sum_{j=1}^{k}\beta_j x_j=\sum_{j=0}^{k}\beta_j x_j \quad (2)$$

is called the *logit*. The model for the logit is linear in the predictors.
When interpreting estimated parameters of the model logistic regression is used odds ratio, abbr. *OR*

$$OR_{X_1,X_0} = \frac{chance\ for\ the\ group\ X_{j1}}{chance\ for\ the\ group\ X_{j0}}, \qquad (3)$$

where X_{j1}, X_{j0} represent two categories of objects that differ from each other in values of the variable X_j while values of other explanatory variables – predictors are the same in these two sets (Hosmer & Lemeshow, 2007; Agresti, 1990).
In logistic regression the odds ratio is defined as follows: $OR_{X_{j1},X_{j0}} = e^{\beta_j}$ that results from the logit pattern of the logistic regression model.

4.2.Classification trees

Classification and regression trees are suited for the analysis of complex data. Decision tree models can be effectively used to determine the most important attributes in a dataset (Breiman, 2001).
A decision tree is a structure that can be used to divide up a large collection of records into successively smaller sets of records by applying a sequence of simple decision rules. A decision tree model consists of a set of rules for dividing a large heterogeneous population into smaller, more homogeneous groups with respect to a particular target variable (Berry & Linoff, 2004; Dietterich, 1990).
The goal of decision tree modelling is to build a tree that will allow to identity various target groups based on the values from a set of input variables. Decision tree modelling is based on performing a series of if-then decision rules that forms a series of partitions that sequentially divide the target values into a small number of homogenous groups that formulate a tree-like structure. (Matignon, 2007; Mingers, 1989).
In data mining, a decision tree is a predictive model which can be used to represent classifiers and regression models. When a decision tree is used for classification tasks (the target is categorical), it is more appropriately referred to as a classification tree. When it is used for regression tasks (the target is continuous), it is called regression tree (De'ath & Fabricius, 2000).
Decision trees offer many benefits: self-explanatory and easy to follow, flexibility in handling a variety of input data: nominal, numeric and textual, adaptability in processing datasets that may have errors or missing values, high predictive performance for a relatively small computational effort, available in many data mining packages over a variety of platforms, useful for large datasets (Breiman et. al., 1984).
An empirical tree represents a segmentation of the data that is created by applying a series of simple rules. Each rule assigns an observation to a segment based on the value of one input. One rule is applied after another, resulting in a hierarchy of segments within segments. The hierarchy is called a tree, and each segment is called a node. The initial segment, containing the entire data set, is the root node of the decision tree. A node with all its successors forms a branch of the node that created it. The final nodes are called leaves. For each leaf, a decision is made and applied to all observations in the leaf (De'ath & Fabricius, 2000).
The criterion for evaluating a splitting rule may be based on either a statistical significance test, namely an F test or a Chi-Square test, or on the reduction in the target variance, that is, entropy, or Gini impurity measure. At each step, after the best set of split is determined, then the split criterion is used to determine the best split.
Entropy is defined as the quantitative measure of disorder or randomness in a system (Entropy - Definition, Calculation, and Misconceptions).

Given an arbitrary categorization C into categories c_j ($j = 1,2,... m$), and a set of examples S, for which the proportion of examples in c_j is p_j, then the entropy $H(S)$ of a set of examples **S** is

$$H(S) = -\sum_{j=1}^{m} \left(p_j \log_2 p_j \right) \qquad (4)$$

(Note that 0ln(0) is taken to be zero by convention.)
Information Gain is the difference between the entropies before and after splitting (Quinlan, 1987). It is the expected reduction in entropy caused by partitioning the examples according to a given attribute *A*.

$$Gain(S, A) = Entropy(S) - \sum_{i=1}^{n} \frac{|S_i|}{|S|} Entropy(S_i) \qquad (5)$$

with: $\{S_1,...,S_i,...S_n\}$ – partition of S according to value of attribute A, *n* – number of attribute *A*, $|S_i|$ – number of cases in the partition S_i and $|S|$ – total number of cases in S.

A variety of decision tree algorithms are proposed in the literature like ID3 – Iterative Dichotomiser 3 (Quinlan, 1986), C4.5 – successor of ID3 (Quinlan, 1993), CART – Classification and Regression tree. We used ID3 algorithm. It constructs tree in a top down manner without backtracking. It classifies the dataset by using entropy and information gain to select root node for classification. Limitation of ID3 is for small sample, data may be over-fitted or over-classified. It tests only one attribute at a time. Entropy is used to calculate homogeneity of the dataset.

5.RESEARCH RESULTS AND DISCUSSION

In the analysis there are 373 companies, seven nominal input (explanatory) variables (*number of employees* (NE), *annual turnover* (TO), *marketing department* (MD), *ownership* (OWN), *legal status* (LS), *sector* (SEC), *market* (MA*)* and *market research* (MR) (dependent variable). To statistically verify the dependency of input variables on dependent variable *market research*, we used Chi-Square Test (Agresti, 1990). An impact of particular categorical variables on the variable *market research* we quantified with Cramer's contingency coefficient (Cramer´s V) (Agresti, 1990).
Significant relationship was proven between the variable *market research* (MR) and five nominal variables (all except the variables *sector* (SEC) and *market* (MA)) (Fig 1).

Data Role=TRAIN Target=MR

Input	Chi-Square	Df	Prob
NE	62.9785	4	<.0001
TO	44.5939	3	<.0001
MD	42.6804	1	<.0001
OWN	41.4895	3	<.0001
LS	29.5477	4	<.0001
SEC	19.8186	10	0.0310
MA	1.6726	1	0.1959

Fig. 1 – Chi-Square Test for Independence. Source: own elaboration, SAS EG.
The most intensive relationship measured by Cramer's contingency coefficient (Fig. 2, Tab. 4) was discovered between *market research* (MR) and *number of employees* (NE), *annual turnover* (TO), and *marketing department* (MD).

Tab. 4 – Cramer's contingency coefficient for input variables. Source: own elaboration, SAS EG.

Number of employees	Turnover	Marketing department	Ownership	Legal status	Sector	Market
0,411	0,346	0,338	0,334	0,282	0,231	0,067

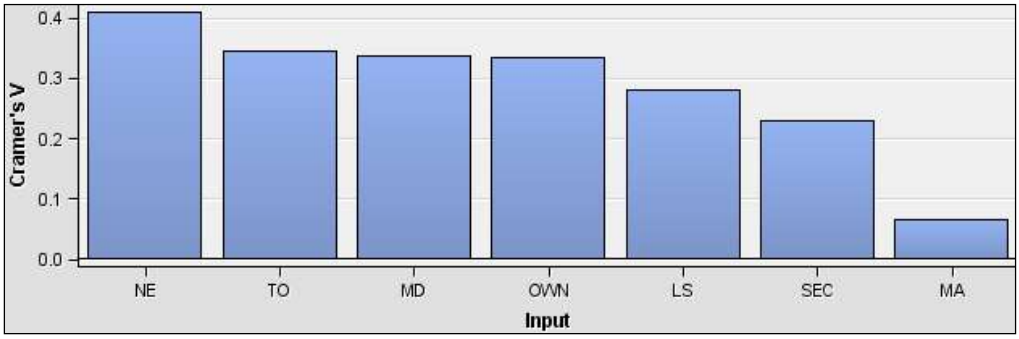


Fig. 2 – Cramer's contingency coefficient for input variables. Source: own elaboration, SAS EM

The influence of considered variables on the binary variable *market research* (MR) was evaluated using the logistic regression model and classification trees model. Logistic regression model allows us to predict the probability of a randomly selected company doing market research. Stepwise regression was used to select factors that have a relevant influence on market research of the companies. The following variables were selected for this model: *ownership* (OWN), *number of employees* (NE) and *marketing department* (MD). Statistical significance of the model with these variables is confirmed in Tab. 5.
Tab. 5 Testing the significance of the logistic regression model. Source: own elaboration, SAS EG

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	83.0915	8	<.0001
Score	77.0301	8	<.0001
Wald	65.3134	8	<.0001

Wald test displayed in Tab. 6 shows that at 0.05 level of significance, all the selected variables significantly influence a change of *market research* variable.

Tab. 6 Wald test of significance of variables contribution. Source: own elaboration, SAS EG.

Type 3 Analysis of Effects			
Effect	DF	Wald Chi-Square	Pr > ChiSq
OWN	3	9.1833	0.0270
NE	4	17.4568	0.0016
MD	1	6.0069	0.0142

Point estimates of parameters of the model of logistic regression and tests of the model parameters significance are displayed in Tab. 7.

Tab. **7** – Test of significance of the logistic regression model parameters. Source: own elaboration, SAS EG.

Analysis of Maximum Likelihood Estimates						
Parameter		DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept		1	1.9844	0.3967	25.0263	<.0001
OWN	LD	1	-0.9415	0.3796	6.1531	0.0131
OWN	LZ	1	-0.3857	0.4608	0.7005	0.4026
OWN	PD	1	-1.2207	0.4851	6.3324	0.0119
NE	1	1	-2.0938	0.6680	9.8252	0.0017
NE	2	1	-1.2035	0.4077	8.7133	0.0032
NE	3	1	-1.1349	0.3799	8.9243	0.0028
NE	4	1	-0.2849	0.3832	0.5527	0.4572
MD	0	1	-0.6790	0.2770	6.0069	0.0142

When interpreting estimated parameters of the logistic regression model, odds ratio (*OR*) is used (Tab. 8).

Tab. 8 – Point and interval estimates of odds ratios. *Source: own elaboration, SAS EG.*

Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
OWN LD vs PZ	0.390	0.185	0.821
OWN LZ vs PZ	0.680	0.276	1.678
OWN PD vs PZ	0.295	0.114	0.763
NE 1 vs 5	0.123	0.033	0.456
NE 2 vs 5	0.300	0.135	0.667
NE 3 vs 5	0.321	0.153	0.677
NE 4 vs 5	0.752	0.355	1.594
MD 0 vs 1	0.507	0.295	0.873

At the 0.05 level of significance, only two regression coefficients were non-significant: regression coefficient for dummy variable OWN_LD, OWN_LZ and regression coefficient for dummy variable NE_4.
Under the condition of constancy of other explanatory variables values, it can be estimated that:
A chance of the company doing market research if the company has more than 250 employees is 1/0.300=3.33 times higher than if the company has 1 to 9 employees and is 1/0.752 times higher if the company has 50 to 249 employees.
A chance of the company doing market research if the company has marketing department is 1/0.507=1.97 times higher than if the company has no marketing department.
A chance of the company doing market research if the company has foreign capital dominance is 1/0.295=3.39 times higher than if the company has domestic capital dominance.
We verified the significance of the influence of the explanatory variables on the variable *market research* (MR) using the decision tree model too.
The diagram (Fig. 3) displays the decision tree used to predict the value *yes* (1), of the target variable *market research* (MR). The Tree Diagram provides the most detailed picture of nodes, decisions and branches.

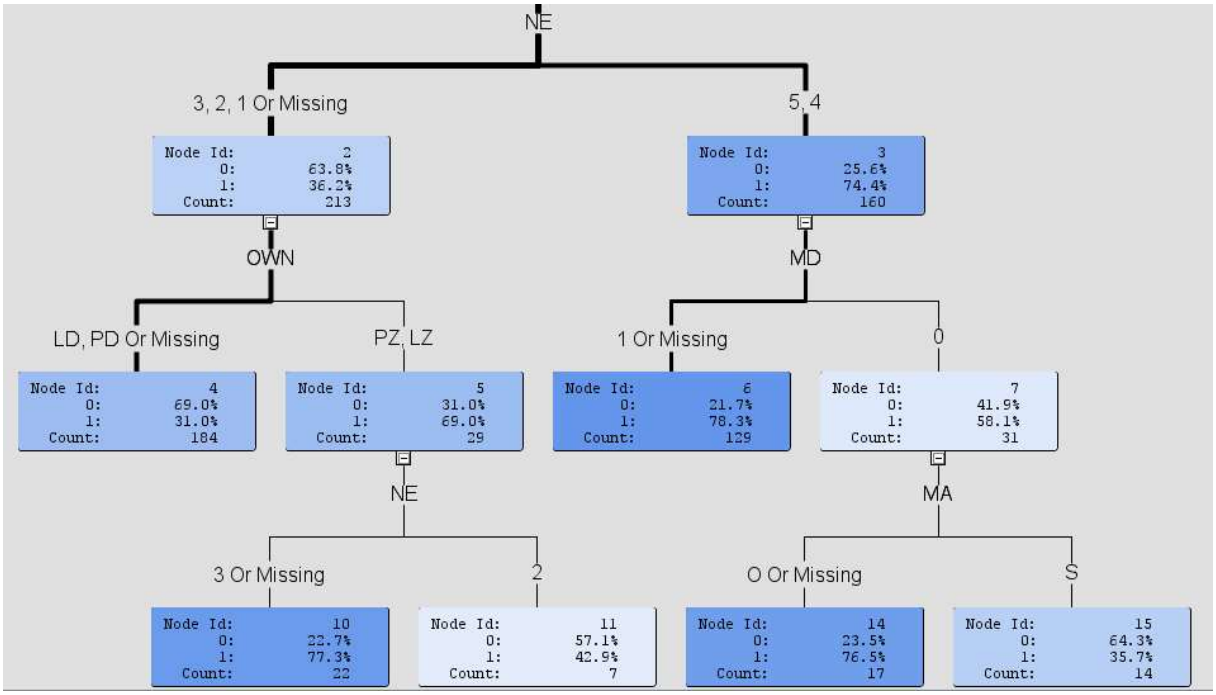


Fig. 3 – Decision tree. Source: own elaboration, SAS EM

As shown in figure 3, *number of employees* (NE) attribute has the highest information gain and was selected as a decision attribute in the root node. This variable has the strongest influence on the target variable *market research* (MR). *Marketing department* (MD) has strong influence on the dependent variable too. *Legal status* (LS) has the weakest influence on the modeled variable.
When using the Chi-Square splitting criterion, the best splits are selected by the largest Chi-Square statistic. In other words, the best splits in grouping the data are determined by the smallest *p*-values. The logworth statistic is computed as follows: LOGWORTH=-log (*p*-value). The attribute *number of employees* (NE) has the smallest *p*-value (the highest LOGWORTH) (Fig. 4).

Split Node 1

Target Variable: MR

Variable	Variable Description	Worth
NE	NE	0.1069
MD	MD	0.0841
TO	TO	0.0817
OWN	OWN	0.0797
LS	LS	0.0378

Fig. 4 – Logworth. Source: own elaboration, SAS EM.

6.CONCLUSION

The main goal of this article was to determine relevant factors affecting the market research in Slovak companies and to quantify their influences. In relation to the main aim of the research we formulated two hypotheses:
H_1: We assume that the number of employees has a positive impact on the market research of the company,

H_2: We assume that the annual turnover of the business has a positive impact on the market research of the company.

The influence of considered explanatory variables (*number of employees*, *annual turnover*, *marketing department*, *ownership*, *legal status*, *sector*, *market* on the binary variable *market research* was evaluated using the multinomial logistic regression model and classification trees model. The analyses were created using the SAS Enterprise Guide and SAS Enterprise Miner statistical software. Multinomial Logistic regression model allows us to predict the probability of a randomly selected company doing market research. On the basis of data sample using the stepwise elimination method we discovered that the market research of companies in the Slovak Republic in 2014 was significantly dependent on ownership (with categories: foreign capital, domestic capital, dominance of the foreign capital, dominance of the domestic capital), number of employees (with categories: proprietorship, 1 – 9 employees, 10 – 49 employees, 50 – 249 employees, 250 and more employees) and marketing department (with categories the company has marketing department, the company has not marketing department). Using the regression model we observed that variable *number of employees* (NE) has the strongest influence on the dependent variable *market research* (MR) (Wald Chi-Square=17.4568, *p*-value = 0.0016). A chance of the company doing market research if the company has more than 250 employees is 1/0.300=3.33 times higher than if the company has 1 to 9 employees, is 1/0.321=3.12 times higher if the company has 100 to 49 employees and is 1/0.752=1.33 times higher if the company has 50 to 249 employees.

The variable *number of employees* (NE) was selected as the most influencing using the decision tree model too.

Figure 3 and Figure 4 reveal that the *number of employees* is the most significantly linked with the *market research* (MR) and hence the most discriminating factor. We selected it for generating the first split.

Based on the results of both models, we can conclude that the H1 hypothesis is valid.

The amount of an annual turnover is considered to be an important factor affecting market research. We classify companies according to the amount of their annual turnover and performing market research. The data indicate a correlation between the use of market research and the level of turnover. The survey shows that only 35 % of companies with an annual turnover up to 2 million Euros did market research. In the category of companies with an annual turnover between 10,000,001 Euros and 50 million Euros 68 % of companies did market research.

The result of the Chi-Square test showed that the variable *annual turnover* has significant influence on the dependent variable *market research* (MR) (Chi-Square = 44.3939, *p*-value = 0.0001). Using the stepwise elimination method, this variable was not selected to the multinomial logistic regression model (Wald Chi-Square = 0.7253, *p*-value = 0.8672). This result was confirmed by the decision tree model too. The variable *annual turnover* was not used to generate the decision tree. The variables *marketing department* and *ownership* have more influence in the multinomial model.

Hypothesis H_2 was partially confirmed.

We compared this results with the other researches focused on investigation of marketing orientation of different-sized businesses. Our results correspond with the results of Liu (1995) who have found the significant difference between marketing orientation of businesses of various size. Liu (1995) defined businesses of different sizes according to their volume of annual sales. We consider our results as positive, because the enterprises recognize the importance of market research as a competitive advantage. Improving the use of market research as a key area, which can help businesses focus on customer needs, to changing requirements and speedily adapt to them.

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THE EFFICIENT MARKET AND FINANCIAL BUBBLES: EVIDENCE FROM VIETNAMESE STOCK MARKET

Le Bao Thy, Huynh Nguyen Minh Tam, Pham Ngoc Ai Nhi

Abstract

Stock market efficiency has attracted the attention from researchers for some decades. For a market to become efficient, investors must perceive that the market is inefficient and possible to beat. But a raising question comes when some events happened such as US stock market crash of 1987, dot-com bubble of 2000, the examples of successful investors who have beaten the market repeatedly. The occurrence of market anomalies, and the emerging of financial behaviorists, increased interest in market efficiency theory. Vietnamese stock market is emerging market which faces the problem of volatility and inefficiency. This paper primarily examines the weak form efficiency in both HOSE and HNX stock exchanges. The study also seeks to detect the existence of rational speculative bubbles in the stock markets as one of the evidence of market inefficiency by using duration dependence test with log logistic hazard model. We conclude that there were rational speculative bubbles in the Vietnamese stock market, which were partially responsible for pushing up the stock prices. These results not contribute to the literature of EMH and financial bubbles for further academic researchers but also provide evidence about Vietnamese market inefficiency so that the policy maker can consider about how to control and improve the performance of stock market.

Key words: bubbles, market efficiency, stock returns, log logistic hazard model, duration dependence test.

JEL Classification Codes: G11, G14, G19

1. INTRODUCTION

The classic statements of the Efficient Markets Hypothesis (EMH) found in (Fama, 1970) have become the subject of discussion by many scholars in the field of finance. The market is considered to be effective when all of relevant information is incorporated into the stock price. Provided that the market is efficient, investors will not expect to achieve abnormal returns of their investments. The term market efficiency is used to explain the relationship between information and share prices in the capital market. Fama proposed that there are three types of market efficiency: weak, semi-strong and strong. The weak form states that prices of tradable assets already reflect all past publicly available information. The semi-strong form of the EMH claims both that prices reflect all publicly available information and that prices instantly change to reflect new public information. The strong form of the EMH additionally claims that prices instantly reflect even hidden "insider" information. Overall, the main implication of the hypothesis is that in an efficient market an investor, individual, financial or non-financial institution cannot systematically obtain positive excess profit by trading securities. In other words, no investor should ever be able to beat the market, or the average annual returns that all investors and funds are able to achieve using their best efforts.

Since (Fama, 1970), a vast number of studies have been completed and many books have been written in this subject. There are large amounts of empirical evidence supporting or against the EMH which can be divided into two parts: (i) evidence supporting the random walk behavior of prices; (ii) Investors and researchers have disputed the efficient-market hypothesis both

empirically and theoretically. Behavioral economists attribute the imperfections in financial markets to a combination of cognitive biases such as overconfidence, overreaction, representative bias, information bias, calendar anomalies and various other predictable human errors in reasoning and information processing. Some of these anomalies are broadly known as financial bubbles.

A financial bubble is defined as deviations in the stocks' price from the corresponding asset's intrinsic value. It could also be described as a situation in which asset prices appear to be based on implausible or inconsistent views about the future. Stock price bubbles are the result of long run up in prices. During the period of bubbles, the probability that the price will revert is very low. Theoretically, the longer the duration of price increases, the lower the probability that price will decrease in the subsequent period, thus inconsistent with the mean reversion process. Because it is often difficult to observe intrinsic values in real-life markets, bubbles are often conclusively identified only in retrospect, once a sudden drop in prices has occurred. Such a significant decrease is known as a buble crash. Both the boom and the burst phases of the bubble are examples of a positive feedback mechanism, in contrast to the negative feedback mechanism that determines the equilibrium price under normal market circumstances. Prices in a financial bubble can fluctuate abnormaly and unpredictably from supply and demand alone.

It will be helpful to establish whether empirical research supports or rejects EMH in stock markets of various countries. However, since there are so many differences between the various stock markets, it would be difficult to examine them as a whole and come to a conclusion. Although the results from empirical researches has been complex, they have generally not supported strong forms of the efficient-market hypothesis. In emerging stock markets, most of studies mainly focus on weak form efficiency.

The Vietnamese stock market was established in 2000 with two main representative stock exchanges called as Ho Chi Minh City Stock Exchange (HOSE) and Hanoi Stock Exchange (HNX). Over a short period of time, there is a significant increase in the quantity of the companies listed, market capitalization and trade volume. As can be seen in Figure 1, the period of time from 2006-2008, VNIndex has reached highest historical peak over 1100 points of VNIndex in March 2007 but then declined. After this point of time, there was a rapid decline in the investors' trust in the Vietnamese stock market.

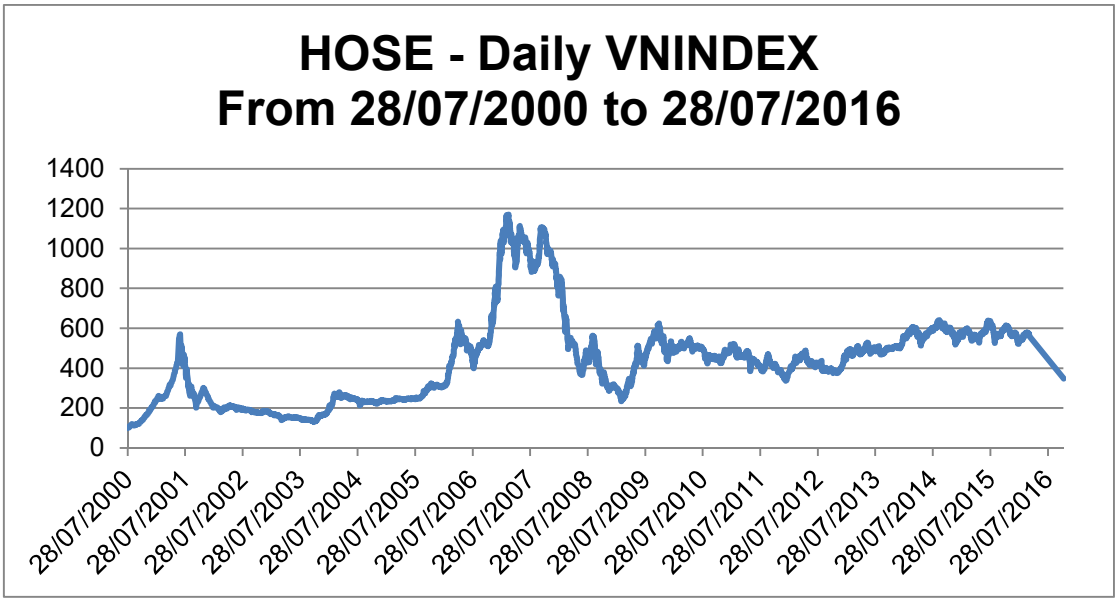


Figure 1: Daily VNIndex over the period 28 July 2000 to 28 July 2013

The Vietnamese stock market like other emerging markets, also faces problems of volatility and inefficiency. By this context, a raising question is whether the Vietnamese stock market (both HOSE and HNX) is weak-form efficient or not. Moreover, this study seeks to detect the presence of rational speculative bubbles in the stock markets. We examine if there are rational speculative bubbles in the Vietnamese stock market, which are partially responsible for pushing up the stock prices. Since rational bubbles have been found with the empirical evidence in this study, it is against the implications of efficient market hypothesis. Therefore, it is evident that the Vietnam's stock market is in weak form and its relevant information is inefficient.
The structure of this paper is organized as follows. Section 2 briefly reviews the literature about efficient market hypothesis and financial bubbles. Section 3 describes the data set and discusses our methodologies. Section 4 compares the empirical results of this study with other previous research while a brief summary of findings is presented in Section 5. Section 5 also explores the economic significance of this study and concludes the paper in brief.

2. LITERATURE REVIEW

This section reviews the findings from empirical studies on evidence supporting the random walk behavior of prices and financial bubbles in both developed and emerging stock market so that we can have an overview about market efficiency and financial bubbles phenomenon of different countries and different markets all over the world.

2.1 Stock Market Efficiency

Many researches for EMH were investigated in emerging markets with an effort to examine the effectiveness of this hypothesis in these markets.
Huang (1995) conducted the experiment of random walk hypothesis in nine countries and territories in Asia including Korea, Singapore, Hong Kong, Indonesia, Japan, Malaysia, Philippines, Taiwan, and Thailand with data collected from 1988 to 1992. The results showed that stock markets in Hong Kong, Korea, Malaysia, Philippines, Singapore, and Thailand themselves show various levels of positive serial correlations hence market efficiency is rejected in such markets.
In India, (Padhan, 2009) studied 33 companies from different categories of Bombay stock exchange. In this study, they used daily data from April 1990 to February 2007. The results showed that stock prices support random walk hypothesis in the long run was found, although during short periods they might not. It is also stated that stock prices follow random walk process mainly due to firm specific factors, apart from economic and financial factors.
In China, many articles were examined for the weak-form efficiency, which however gave complex results. Shanghai and Shenzen are the two main stock exchanges and each of these exchanges trades two types of shares, type "A" shares which are available to domestic investors and type "B" shares which are available to foreign investors. (Long, Payne, & Feng, 1999) employed weekly stock returns and they found that both "A" and "B" shares on the Shanghai exchange follow the random walk hypothesis. (Laurence, Cai, & Qian, 1997) used daily data which covered the period from 1993 to 1996. The results indicate the existence of weak-form efficiency in the market for "A" shares, but not for "B" shares. (Araújo Lima & Tabak, 2004) used daily returns from 1992 to 2000 and found similar results.
(Abeysekera, 2001) examined Sri Lanka and tested the behavior of stock returns on the Colombo Stock Exchange, with a view to determine its consistency with the weak form of the Efficient Markets Hypothesis. Data tested include daily, weekly and monthly returns of stock index for the period of 1991 to 1996. The results of his study showed that the stocks traded in CSE do not behave in a manner consistent with the weak form of the Efficient Market

Hypothesis. (Füss, 2005) investigated seven Asian countries, India, Indonesia, Korea, Malaysia, the Philippines, Taiwan and Thailand. He concluded that none of them followed random walk hypothesis in the pre-liberalization period, while in the post liberalization period the weak-form efficiency hypothesis is adopted for all, except for the smaller stock markets of Indonesia and Thailand.
(Hoque, Kim, & Pyun, 2007) tested in eight Asian stock markets i.e. Hong Kong, Indonesia, Malaysia, the Philippines, Singapore, Thailand, Taiwan and Korea from 1990 to 2004. They found that the stock markets of these countries rejected the random walk hypothesis except Taiwan and Korea. (Tas & Dursunoglu, 2005) run a series of tests to examine the weak form of market efficiency. According to their results, which was conducted with data of thirty stocks included in the ISE30 index for the period of January 1, 1995 through January 1, 2004, they rejected the weak form of efficient market hypothesis. (Al-Khazali, Ding, & Pyun, 2007) studied the behavior of the indices of eight equity markets in MENA region from the countries of Bahrain, Jordan, Kuwait, Morocco, Oman, Saudi Arabia, Tunisia and Egypt. They used weekly data from 1994 to 2003 and they found that no one of them supported random walk hypothesis. (J. H. Kim & Shamsuddin, 2008) examined a similar group of 9 Asian stock market returns for the period of 1990 to 2005. They found that that market efficiency differs with the level of equity market development. In general, the developed or advanced emerging markets such as Hong Kong, Japan, Korea, Singapore, Taiwan showed weak-form efficiency, while Indonesia, Malaysia, Philippines are found to be inefficient. They have also found evidence that Singaporean and Thai markets have become efficient after the Asian crisis in 1997.

In general, findings from researches studying whether or not the emerging stock markets support or reject the market efficient hypothesis are quite contradictory. Not all emerging stock markets, however, most of them are inefficient since some experimental studies have found evidence supporting weak-form efficiency in some stock markets in developing countries.

2.2 Financial Bubbles

A financial bubble is defined as deviations in the stocks' price from the fundamental value. Stock price bubbles are the result of long run up in prices. During the period of bubbles, the probability that the price will revert is very low. Theoretically, the longer the duration of price increases, the lower the probability that price will drop in the subsequent period, thus inconsistent with the mean reversion process.
If markets were efficient, they should never have financial bubbles. Efficient markets can exist only if every investor is also efficient in how they think and act. According to behavioral economics, the emotional investor dominates the market, which is why short-term prices are erratic, why bubbles occur and why trends last longer than they should and then correct more than they should. The point here is that speculative bubbles come because of inefficiency of the market. Several researches have tested for the presence of speculative bubbles in the various stock market with different testing approaches and techniques, but their findings are complex.
(Flood & Garber, 1980) stated that "the bubble can arise when the actual market price depends on its own expected rate of change, hence in arbitrary, the self-fulfilling expectation of price changes may drive actual price independently of market fundamentals". (Blanchard & Watson, 1982) explain that the high expectations for the asset price are a partial consequence of the bubble. (Tirole, 1985) used the dynamic model to examine the existence of bubble, and found that there is no existence of financial bubble for any return on the stocks that is larger than the growing rate of the economy, and if that return is less, a steady-state bubble may be positive. He summarized three necessary criteria to exist the financial bubble: durability, scarcity and common belief. (Hardouvelis, 1988) showed that there was an excess between actual receive (discount factor) and the sum of risk premium with bubble premium in Japan and the United

States. He concluded that bubbles existed in those two countries, in contrast to Great Britain, where evidence of the presence of bubble is weak.
In Asia, several researches have tested for the presence of speculative bubbles that also improve the truth about the volatility and inefficiency of the emerging markets. (Mokhtar, 2006) and (Jirasakuldech, Campbell, & Knight, 2006) also tested for existence of rational bubbles in the Malaysian and Thai stock market. (Lehkonen, 2010) reported mixed results in Chinese stock markets and China-related share indices in Hong Kong. The author's result shows the presence of rational bubbles in weekly data for both of the Mainland Chinese stock exchange share classes, but fail to investigate bubbles using monthly data.

3. DATA AND METHODOLOGY

3.1 Data

Ho Chi Minh Stock Exchange (HOSE) and Hanoi Stock Exchange (HNX) are the main stock exchanges in Vietnam. There is VNIndex which is a capitalization-weighted index comprising all equity listings in the HOSE. And there is HNXIndex, which is the market value weighted stock indexes computed from all stocks trading in HNX. The historically data is gathered and used in this study. For VNIndex, the paper collected data in HOSE from July 28th, 2000 to March 31st, 2016. For HNXIndex, the paper gathered data in HNX from January 4th 2006 to March 31st 2016. In order to check the robustness of the model, the paper divided full sample into two subperiod. In the sub-period 1, the data was from July 28th, 2000 to the point before the economic crisis of 2008 and in the sub-period 2, the data was collected from the point after the economic crisis in 2008 to March 31st, 2016.
The returns are computed as following:

$$R_t = Log\left(\frac{P_t}{P_{t-1}}\right)$$

Where, R_t is the index returns in the period t, P_t is price in the period t, P_{t-1} is price in the previous of the period t.

	HOSE	HNX
Full Sample	28th July, 2000 – 31st March, 2016	14th July, 2005 – 31st March, 2016
(1) Pre – crisis period	28th July, 2000 – 31st December, 2007	14th July, 2005 – 31st December, 2007
(2) Post – crisis period	1st January, 2008 – 31st March, 2016	1st January, 2008 – 31st March, 2016

Table 1: Descriptive statistics

	VNINDEX	HNXINDEX
Observations	3737	2577
Mean	0.000462	-0.000091
Median	0.000196	-0.000503
Std. Deviation	0.015966	0.021405
Maximum	0.077407	0.201593
Minimum	-0.076562	-0.128853
Skewness	-0.215082	0.317999
Kurtosis	5.720134	9.132739
Jarque-Bera	1180.918	4081.858

Notes. VNIndex series starting in July 28th, 2000. HNXIndex series starting in July 14th, 2006.
The comparison between VNIndex and HNXIndex statistics in table 1 illustrates that HOSE has 3737 sample (mean = 0.000462, maximum = 0.077407 and minimum = -0.076562). Respecting HNX has 2577 sample (mean = -0.000091, maximum = 0.201593 and minimum = -0.128853).

3.2 Methodology

3.2.1 Statistical Tests for Market Efficiency

To test market efficiency, we can look at the pattern of short-term movements of the daily returns and identify the process generating those returns. If the market is efficient, the model would fail to identify any pattern and it can be concluded that the daily returns follow a random walk process. If the results show any pattern in daily returns, then historical market data can be used to forecast future market prices, and the market is regarded as not efficient. There are several techniques available to determine patterns in time series data. In this study, we use four statistical methods: Augmented Dickey-Fuller unit root test, serial correlation test, runs test, variance ratio test to examine market efficiency of Vietnamese stock market.

Serial correlation test

A serial correlation test is the most commonly use as the first methods for randomness. Serial correlation test measures the correlation coefficient between a series of current returns and its value in the previous period, whether the correlation coefficients are significantly different from zero. The research hypothesis of Auto-correlation tests is defined as:

H_0: Returns index contains Auto-correlation

H_1: Returns index do not contain Auto-correlation

Autocorrelation can be calculated as:

$$\rho_k = \frac{\sum_{t=1}^{T-k}(r_t - \bar{r})\,(r_{t-k} - \bar{r})}{\sum_{t=1}^{T}(r_t - \bar{r})^2}$$

Where ρ_k is the serial correlation coefficient of lag k, T is the sample size, k is the lag length, rt is the stock return at time t, and $\bar{r}$ is the sample mean of the stock returns.

Run test

The runs test (Bradley, 1968) is a non-parametric test that is tested to examine examine statistical independencies. The test is based on the premise that if a series of data is random, the observed number of runs in the series should be close to the expected number of the runs. The null hypothesis of randomness is tested by observing the number of runs or the sequence of successive price changes with the same sign, positive, zero or negative. Therefore, price changes of stocks can be categorized into three kinds of runs: an upward run (prices go up), a downward run (prices go down) and a flat run (prices do not change).

The runs test is defined as:

H_0: Return of price stock follows random walk test

H_1: Return of price stock dose not follow random walk test

$$Z = \frac{R - \bar{R}}{s_R}$$

Where, R is the observed number of runs, $\bar{R}$ is the expected number of runs and S_r is the standard deviation of the number of runs. The values $\bar{R}$ and S_r are computed as follows:

$$\bar{R} = \frac{2n_1n_2}{n_1 + n_2} + 1$$

$$S^2{}_R = \frac{2n_1n_2(2n_1n_2 - n_1 - n_2)}{(n_1 + n_2)^2(n_1 + n_2 - 1)}$$

Where, n_1 and n_2 are number of positive and negative values in the return.

The result of Run test will be rejected H_0:

$$|Z| > Z_{1-\alpha/2}$$

Variance ratio test

After autocorrelation and run test for serial independence in the series have been done, we use the variance ratio test proposed by (Lo & MacKinlay, 1988) to examine whether the increments of all three random walk hypotheses are linear function of the time interval. The variance ratio test is used to test for a random walk in returns, i.e., that returns are independently and identically distributed with a constant mean and finite variance that is a linear function of the holding period. This bases on the hypothesis that the changes of price in a random walk is linear in the sampling interval, which means if a return series follows a random walk, the variance of its q differences would be q times the variance of its first differences. With a sample size of nq+1 observations ($p_0, p_1,...,p_{nq}$), the equation of the variance ratio is defined as:

$$VR_{(q)} = \frac{Var(\rho_t - \rho_{t-q})}{Var(\rho_t - \rho_{t-1})} = \frac{{\sigma_b}^2(q)}{{\sigma_a}^2}$$

with

$${\sigma_b}^2(q) = \frac{1}{m}\sum_{t=q}^{nq}(\rho_t - \rho_{t-q} - q_\mu)^2$$

$${\sigma_a}^2(q) = \frac{1}{np-1}\sum_{t=1}^{nq}(\rho_t - \rho_{t-q} - \mu)^2$$

Where

$$m = q(nq - q + 1)\left(1 - \frac{q}{nq}\right) \quad ; \quad \mu = \frac{1}{nq}(\rho_{nq} - \rho_0)$$

VR(q) is the variance ratio of q-difference, $\sigma b^2(q)$ is the scaled variance of the q-difference, σa^2 is the variance of the first difference, and p is the closing price.

Standard statistical tests used to test null hypothesis of random walk test with uniform covariance hypothesis Z(q) as formular:

$$Z(q) = \frac{[VR(q) - 1]}{\sqrt{\theta(q)}} \sim N(0,1)$$

Where:

$$\theta(q) = \frac{2(2q-1)(q-1)}{3q(nq)}$$

Standard statistical tests use for variance heterogeneity Z(q) as formular:

$$Z^*(q) = \frac{[VR(q) - 1]}{\sqrt{\theta^*(q)}} \sim N(0,1)$$

Where

$$\theta^* = \sum_{j=1}^{q-1}\left[\frac{2(q-j)}{q}\right]^2 \hat{\delta}(j)$$

And:

$$\hat{\delta}(j) = \frac{\sum_{t=j+1}^{nq}(X_t - X_{t-1} - \hat{\mu})^2\left(X_{t-j} - X_{t-j-1} - \hat{\mu}\right)^2}{\left[\sum_{t=1}^{nq}(X_t - X_{t-1} - \hat{\mu})\right]^2}$$

where δ(j) is the heteroscedasticity consistent estimator, and μ is the average return. The value of the variance ratio is 1 under the null hypothesis. But if the heteroscedastic random walk is rejected, there is evidence of autocorrelation in return series (Worthington & Higgs, 2004).

Following (Lo & MacKinlay, 1988), we set up a statistical test for a random walk, in which P_t denotes the log price process.
H_0: VR(q) = 1 The return series follow a random walk
H_1: VR(q) ≠ 1 The return series do not follow a random walk
VR(q) > 1 positive serial correlations, VR(q) < 1 negative serial correlations.

Unit Root Test
The fourth approach was developed by (Dickey & Fuller, 1981) is used to examine the stationarity of the time series data. A series with unit root is said to be non-stationary indicating non-random walk. The most common test to examine the existence of a unit root is the Dickey-Fuller test. This unit root test provides evidence on whether the stock prices in Vietnamese stock market follow a random walk. Therefore, it is also a test of the weak-form market efficiency.
Thus, the hypotheses to be tested are:
H_0: series contains a unit root
H_1: series is stationary

3.2.2 Financial bubbles

Duration dependence Test
This study performs test for the duration dependence on abnormal continuously daily returns. Abnormal returns are transformed into a series of run lengths of two data sets, which are positive and negative abnormal returns for daily data respectively. A run can be defined as a sequence of abnormal returns of similar signs. Formally, the data consists of a set ST of T observations on the random run length. The number of positive and negative runs of particular length i are counted.
Test of duration dependence is implemented by analyzing the hazard rate (h_i) for runs of positive and negative returns. The hazard rate is defined as the probability of obtaining a negative innovation given a sequence of i prior positive innovation, h_i = prob ($\varepsilon_t < 0 | \varepsilon_{t-1} > 0, \varepsilon_{t-2} < 0, \dots, \varepsilon_{t-i} > 0, \varepsilon_{t-i-1} < 0$).
If bubble exists, we expect hazard rate to be decreasing in *i*, and if bubble exist in runs of positive returns, for all i. Since rational expectation bubbles cannot be negative, for run of negative returns, this condition does not hold. The hazard rate should be constant in negative runs. In general, if there is a negative relationship between the probability of a run of positive returns ending, and the length of the run, or in other words, the presence of bubbles suggests that the negative duration dependence and a decreasing hazard rate in positive abnormal returns, but not in negative abnormal returns.
Following McQueen and Thorley (1994), the log likelihood function for a sequence of N runs is expressed as follows:

$$L(\theta | S_T) = \sum_{i=1}^{\infty} N_i \ln h_i + M_i \ln(1 - h_i) + Q_i \ln(1 - h_i)$$

Where θ is a vector of parameters. S_T is the set of the data (*T* is the number of daily observations on the random run length). N_i is the completed runs of length *i* in the sample. Mi is the number of runs with a length greater than *i*, h_i the sample hazard rate, is the conditional probability of run ending at *i*, given that it lasts at least until *i*.

Log logistic hazard model

To operate test of duration dependence, a functional form must be chosen from the hazard function. The study uses the Log Logistic Hazard Model as a hazard function which is defined as:

$$h_t = \frac{1}{1 + e^{(\alpha + \beta \ln i)}}$$

Where β is the estimated coefficient of run length. The log logistic function transforms the unbounded range $(\alpha + \beta \ln i)$ into the bounded (0.1) space of h_i, the conditional probabilities of ending a run.

The dependent variable is 1, if the run ends; or 0, if the run does not end in the next period. The independent variable is the log of the current length of the run. Log-logistic test is an estimation of sample hazard rates and β. According to (Harman & Zuehlke, 2004), an estimate of β that is negative and significantly different than zero for positive runs, in conjunction with an insignificant estimate of β for negative runs, is considered evidence of financial bubbles.

4. EMPIRICAL RESULTS

4.1 Random walk Test

After applying four statistic test to examine Vietnamese market efficiency, we represent the results below:

Results of Unit Root Test

Since a unit root is a necessary condition for a random walk, the Augmented Dickey-Fuller test is used to test the stationary time series for both of HOSE and HNX. ADF unit root test was performed including intercept, intercept and time trend, or without intercept and time trend for the whole sample period 2000 - 2016. The results of Augmented Dickey-Fuller for a unit root for Vietnamese stock price indexes give that all of the period time in two of Vietnam stock exchanges are stationary (not reported).

Results of Autocorrelation Test

To investigate the weak-form of EMH for VNIndex and HNXIndex, firstly, we perform the auto-correlation test on daily returns of two main stock exchanges in Viet Nam is HOSE (VNIndex) and HNX (HNXIndex). The result is shown below in table 2:

Table 2: Results of autocorrelation tests for the observed daily return data

Lag	Full sample				Pre – crisis (2000 – 2008)				Post - crisis (2008 – 2016)			
	HOSE		HNX		HOSE		HNX		HOSE		HNX	
	Chi^2	P-value	Chi^2	P-value	Chi^2	P-value	Chi^2	P-value	Chi^2	P-value	Chi^2	P-value
1	99.210	0.0000	15.629	0.0001	32.393	0.0000	2.163	0.1414	67.368	0.0000	14.381	0.0001
2	106.927	0.0000	18.858	0.0001	46.281	0.0000	6.649	0.0360	67.379	0.0000	14.463	0.0007
3	153.797	0.0000	61.501	0.0000	67.937	0.0000	27.111	0.0000	94.087	0.0000	35.168	0.0000
4	163.506	0.0000	61.503	0.0000	89.308	0.0000	27.855	0.0000	94.267	0.0000	35.315	0.0000
5	167.752	0.0000	62.365	0.0000	94.690	0.0000	28.821	0.0000	94.583	0.0000	35.365	0.0000
6	174.870	0.0000	68.795	0.0000	96.459	0.0000	28.823	0.0001	101.170	0.0000	45.608	0.0000
7	176.807	0.0000	74.854	0.0000	101.201	0.0000	36.691	0.0000	101.387	0.0000	46.025	0.0000
8	177.302	0.0000	75.017	0.0000	101.374	0.0000	37.710	0.0000	101.663	0.0000	46.205	0.0000

9	177.446	0.0000	75.035	0.0000	101.543	0.0000	39.844	0.0000	101.754	0.0000	47.040	0.0000
10	178.621	0.0000	76.655	0.0000	110.025	0.0000	41.486	0.0000	102.625	0.0000	48.181	0.0000

Source: Calculation of reseachers

Estimated results indicate that all the autocorrelation coefficients are significant at 1% level, which rejects the absence of auto-correlation in stock returns for full sample of VNIndex and HNXIndex in both HOSE and HNX. For VNIndex, we reject the null hypothesis that all autocorrelation coefficients from lag one to lag ten for the series of observed returns of sub period 1 (Pre-crisis) and sub period 2 (Post- crisis) at the significance level of 1%. For HNXIndex, we can reject the null hypothesis that all autocorrelation coefficients from lag two to lag ten for the series of observed returns of pre-crisis and post-crisis period at the significance level of 1% except lag 1 of pre-crisis period.

Results of Run Test

In this paper, we use run test to examine a random walk process for VNIndex and HNXIndex. This is a non-parametric test, it is a better measure for all kinds of sample as suggested by Jarque-bera. Table 3 illustrates the result of runs test.

Table 3: Result of run test for daily return of the VNIndex and HNXIndex

Statistic	Daily return of the VNIndex			Daily return of the HNXIndex		
	Full Sample	Pre – crisis (2000 – 2008)	After crisis (2009 – 2016)	Full sample	Pre – crisis (2000 – 2008)	After crisis (2009 – 2016)
Observations	3737	1690	2047	2577	526	2051
Number of run	1516	615	901	1207	210	997
Z-statistic	-11.57	-11.24	-5.45	-3.01	-4.59	-1.1
p-value of Z	0.000**	0.000**	0.000**	0.000**	0.000**	0.27

*Notes: **, * Indicates the 1% significant level, 5% significant level.*
Source: Calculation of researchers

For VNIndex, Z-statistic is -11.57, -11.24, -5.45 for the full sample and two sub-period respectively. This result and p-value of Z indicates that the runs test reject the existence of random walk test in full sample and two sub-period at the significance level of 1%.

For HNXIndex, Z-statistic is -3.01, -4.59, -1.1 for the full sample and two sub-period respectively. These results show that the runs test reject the existence of random walk test in full sample and pre-crisis period (2000 – 2008) at the significance level of 1%. After crisis with p-value of Z is 0.27, the runs test cannot reject the existence of random walk test at the significance level at 10%.

Results of Variance ratio tests

The results of the variance ratio tests for Vietnamese stock markets for the full sample period and the two sub-periods are reported in Table 4 and 5. VR(q) represents the variance ratio of the returns, and Z(q) and Z*(q) represent the statistics of the variance ratio under the assumption of homoscedasticity and heteroscedasticity, respectively. The variance ratio test is conducted for various lags of q (i.e., 2, 4, 8, 12 and 16 days) for each index.

Table 4: Result of variance ratio test for daily return of the VNIndex

Statistic	Number of nxq of base observations	Number of q of base observations aggregated to form variance ratio			
		2	4	8	16
2000 – 2016	3736				
VR(q)		0.6721	0.3221	0.1718	0.0856
Standard deviation		0.0288	0.0519	0.0803	0.1181
Z-statistic		-11.3781	-13.0504	-10.3062	-7.7403
p-value		0.0000	0.0000	0.0000	0.0000
2000 – 2008	1689				
VR(q)		0.7279	0.3359	0.1825	0.0855
Standard deviation		0.0494	0.0889	0.1389	0.2073
Z-statistic		-5.5745	-7.4655	-5.8873	-4.412
p-value		0.0000	0.0000	0.0000	0.0000
2009 – 2016	2046				
VR(q)		0.6272	0.3109	0.1633	0.0861
Standard deviation		0.0327	0.0589	0.0897	0.1282
Z-statistic		-11.4076	-11.6921	-9.3224	-7.1289
p-value		0.0000	0.0000	0.0000	0.0000

*Notes: **, * Indicates the 1% significant level, 5% significant level.*
Source: Calculation of researchers

The result presented in the table 4 shown that VR(q) < 1, indicating negative auto-correlation for daily return of VNIndex for full sample and two sub-periods. Moreover, this also rejects the null hypothesis at the significance level of 1%, so that the VNIndex rejects the random walk hypothesis.

Table 5: Result of variance ratio test for daily return of HNXIndex

Statistic	Number of nxq of base observations	Number of q of base observations aggregated to form variance ratio			
		2	4	8	16
2005 – 2016	2576				
VR(q)		0.5734	0.2720	0.1417	0.0735
Standard deviation		0.0411	0.0679	0.0930	0.1252
Z-statistic		-10.3646	-10.7072	-9.2284	-7.3988
p-value		0.0000	0.0000	0.0000	0.0000
2005 – 2007	525				
VR(q)		0.5762	0.2720	0.1336	0.0738
Standard deviation		0.0944	0.1504	0.1935	0.2467
Z-statistic		-4.4881	-4.8384	-4.4760	-3.7543
p-value		0.0000	0.0000	0.0000	0.0002
2008 – 2016	2050				
VR(q)		0.5724	0.2729	0.1478	0.0747
Standard deviation		0.0354	0.0631	0.0953	0.1370
Z-statistic		-12.0506	-11.5048	-8.9413	-6.7524
p-value		0.0000	0.0000	0.0000	0.0000

*Notes: **, * Indicates the 1% significant level, 5% significant level.*

Source: Calculation of researchers

As the results of table 4, the results in table 5 show that VR(q) < 1 in all period, indicating negative auto-correlation for daily return of HNXIndex for full sample and two sub-periods. It also rejects the null hypothesis at significant level of 1%, so the HNXIndex does not folow the random walk hypothesis.

Duration Dependence Test with Log-logistic model

The log logistic test results for the full sample and two sub-periods namely pre-crisis and post-crisis in HOSE are reported in Table 6, 7 and 8 respectively.

For the full sample period in HOSE, this study documents a total of 1521 runs including 758 for positive and 763 for negative abnormal returns. Meanwhile, for the pre-crisis period, there are 308 runs of positive abnormal returns and 312 runs of negative abnormal returns which make up a total of 620 runs. During post-crisis period, table 8 shows a total of 899 runs with 499 runs of positive abnormal returns and 450 runs of negative abnormal returns. The longest positive runs last 26 days and occurring in full sample and pre-crisis period. Relative to the positive runs of abnormal returns, the negative runs tend to have shorter lives with the longest run lasting for only 13 days. For full sample of VNIndex, the hazard rate of daily return increase the first three days. The probability of positive return in one day and reverse negative return the next day is 17.57%, and probability of positive return in two-day and three-day is 25.36%, 30.30% respectively. Moreover, the longest positive return is in 13 days, the probability is 41.5%. In addition to that, Table 6, 7 and 8 show the maximum likelihood estimates of the log logistic function parameters α and β for full sample as well as two sub-periods.

As shown in Table 6, positive runs of abnormal returns exhibit a significant negative β coefficient is -1.8938. The likelihood ratio test (LRT) of the null hypothesis of no duration dependence test or constant hazard rate is rejected at the 1% significant level with the LRT of 54.19. For negative runs, it also rejects the null hypothesis at the 1% significant level with the LRT of 52.35 and slope $\beta = -1.9016$. As a result, we can conclude that there is the existence of the financial bubbles in HOSE from 2000 to 2016 period.

Table 6: Duration dependence test with log-logistic model for runs of daily excess value-weighted portfolio returns for the full sample period in HOSE

Run length	Positive		Negative	
	Number of runs	Sample hazard rate	Number of runs	Sample hazard rate
1	329	0.1757	311	0.1722
2	184	0.2563	210	0.2917
3	110	0.3030	116	0.3429
4	44	0.2277	50	0.2999
5	36	0.3114	32	0.3306
6	23	0.2930	19	0.3508
7	8	0.2007	5	0.1667
8	6	0.1745	8	0.2936
9	3	0.1378	2	0.1169
10	4	0.2367	3	0.2703
11	2	0.1215	3	0.4074
12	1	0.1121	0	0.0000
13	3	0.4105	1	0.1781
14	0	0.0000	0	0.0000
15	0	0.0000	0	0.0000

16	1	0.1481	0	0.0000
17	0	0.0000	1	0.2833
18	0	0.0000	1	0.4186
19	1	0.2065	0	0.0000
20	0	0.0000	0	0.0000
21	1	0.2877	0	0.0000
22	0	0.0000	0	0.0000
23	0	0.0000	0	0.0000
24	0	0.0000	0	0.0000
25	0	0.0000	1	1.0000
26	2	1.0000	0	0.000
Total	758		763	
α β LRT of $H_0: \beta = 0$ p-value		-0.1683 -1.8938 54.19 0.0000**		-0.1656 -1.9016 52.35 0.0000**

*Notes: **, * Indicates the 1% significant level, 5% significant level.*
Source: Calculation of researchers

For pre-crisis (2000 – 2007) of VNIndex, the hazard rate of daily return increase the first three days. The probability of positive return in one day and reverse negative return the next day is 15.11%, and probability of positive return in two days and three days is 25.67%, 28.95% respectively. Moreover, the longest positive return is in seven days, the probability is 29.66%. As shown in Table 7, positive runs of abnormal returns exhibit a significant negative β coefficient is -1.8938. The likelihood ratio test (LRT) of the null hypothesis of no duration dependence test or constant hazard rate is rejected at the 1% significant level with the LRT of 54.19. For negative runs, it also rejects the null hypothesis at the 1% significant level with the LRT of 39.32 and slope $\beta = -1.9016$. As a result, we can conclude that there is the existence of the financial bubbles in HOSE in pre-crisis period.

Table 7: Duration dependence test with log-logistic model for runs of daily excess value-weighted portfolio returns for the pre-crisis period in HOSE

Run length	Positive		Negative	
	Number of runs	Sample hazard rate	Number of runs	Sample hazard rate
1	126	0.1511	116	0.1423
2	77	0.2655	82	0.2451
3	44	0.2895	50	0.3000
4	19	0.2368	22	0.2514
5	14	0.2756	19	0.3405
6	11	0.2568	8	0.2595
7	5	0.2966	2	0.1029
8	3	0.1739	4	0.2286
9	0	0.0000	2	0.1667
10	2	0.2020	2	0.2222
11	1	0.0982	2	0.3143
12	1	0.1765	0	0.0000
13	0	0.0000	1	0.2708
14	0	0.0000	0	0.0000

15	0	0.0000	0	0.0000
16	1	0.1481	0	0.0000
17	0	0.0000	1	0.4857
18	0	0.0000	1	1.0000
19	1	0.2065		
20	0	0.0000		
21	1	0.2877		
22	0	0.0000		
23	0	0.0000		
24	0	0.0000		
25	0	0.0000		
26	2	1.0000		
Total	308		312	
α β LRT of H_0: $\beta = 0$ p-value		-0.1683 -1.8938 54.19 0.0000**		-0.1656 -1.9016 39.32 0.0000**

*Notes: **, * Indicates the 1% significant level, 5% significant level.*
Source: Calculation of researchers

For post-crisis (2007 – 2016) of VNIndex, the hazard rate of daily return increase the first three days. The probability of positive return in one day and reverse negative return the next day is 20.87%, and probability of positive return in two-day and three-day is 27.23%, 33.96% respectively. Moreover, the longest positive return is in seven days, the probability is 33.96%. Table 8 presents results log logistic hazard model for the post-crisis, positive runs of abnormal returns exhibit a significant negative β coefficient is -2.0709. The likelihood ratio test (LRT) of the null hypothesis of no duration dependence test or constant hazard rate is rejected at the 1% significant level with the LRT of 29.88. For negative runs, it also rejects the null hypothesis at the 1% significant level with the LRT of 26.06.32 and slope $\beta = -2.1293$. Results of sample hazard rates for post-crisis period demonstrates pattern that is consistent with financial bubbles.

Table 8: Duration dependence test with log-logistic model for runs of daily excess value-weighted portfolio returns for the post-crisis period in HOSE

Run length	Positive		Negative	
	Number of runs	Sample hazard rate	Number of runs	Sample hazard rate
1	202	0.2087	195	0.2019
2	107	0.2723	128	0.3364
3	66	0.3396	66	0.3929
4	25	0.2597	28	0.3533
5	22	0.3395	13	0.3171
6	12	0.3364	11	0.4714
7	3	0.1479	3	0.2838
8	3	0.1983	4	0.6038
9	3	0.2784	0	0.0000
10	2	0.2857	1	0.4762
11	1	0.2200	1	1.0000
12	0	0.0000	0	0.0000
13	3	1.0000	0	0.0000
Total	449		450	

α		-0.1177		-0.1053
β		-2.0709		-2.1293
LRT of H_0: $\beta = 0$		29.88		26.06
p-value		0.0000**		0.0000**

*Notes: **, * Indicates the 1% significant level, 5% significant level.*
Source: Calculation of researchers

For full sample of HNXIndex, the hazard rate of daily return increase the first two days. The probability of positive return in one day and reverse negative return the next day is 26.98%, and probability of positive return in two-day is 32.87%. Moreover, the longest positive return is in ten days, the probability is 55.56%.

Table 9 presents results log logistic hazard model for full sample, positive runs of abnormal returns exhibit a significant negative β coefficient is -2.0081. The likelihood ratio test (LRT) of the null hypothesis of no duration dependence test or constant hazard rate is rejected at the 1% significant level with the LRT of 35.59. For negative runs, it also rejects the null hypothesis at the 1% significant level with the LRT of 27.97 and slope $\beta = -2.0979$. Results of sample hazard rates for full sample demonstrates pattern that is consistent with financial bubbles.

Table 9: Duration dependence test with log-logistic model for runs of daily excess value-weighted portfolio returns for the full sample period in HNX

Run length	Positive		Negative	
	Number of runs	Sample hazard rate	Number of runs	Sample hazard rate
1	323	0.2698	273	0.2115
2	141	0.3287	155	0.3131
3	63	0.3281	72	0.3176
4	35	0.3618	52	0.4483
5	22	0.4453	23	0.4492
6	6	0.2628	6	0.2553
7	2	0.1197	5	0.3333
8	5	0.3883	1	0.1143
9	3	0.4286	1	0.1452
10	2	0.5556	3	0.5660
11	0	0.0000	1	0.4783
12	0	0.0000	1	1.0000
13	0	0.0000	0	0.0000
14	0	0.0000	0	0.0000
15	0	0.0000	0	0.0000
16	1	1.0000	0	0.0000
Total	603		593	
α		-0.1332		-0.1112
β		-2.0081		-2.0979
LRT of H_0: $\beta = 0$		35.59		27.97
p-value		0.0000**		0.0000**

*Notes: **, * Indicates the 1% significant level, 5% significant level.*
Source: Calculation of researchers

For pre-crisis period of HNXIndex, the hazard rate of daily return increase the first three days. The probability of positive return in one day and reverse negative return the next day is 21.16%,

and probability of positive return in two-day and three-day is 30.77%, 48.98% respectively. Moreover, the latest positive return is in nine days, the probability is 64.29%.
Table 10 presents results log logistic hazard model for the pre-crisis sample, positive runs of abnormal returns exhibit a significant negative β coefficient is -2.1661. The likelihood ratio test (LRT) of the null hypothesis of no duration dependence test or constant hazard rate is rejected at the 1% significant level with the LRT of 24.13. For negative runs, it also rejects the null hypothesis at the 1% significant level with the LRT of 27.97 and slope $\beta = -2.0979$. Results of sample hazard rates for full sample demonstrates pattern that is consistent with financial bubbles. From this statement, we can conclude that the existence of the financial bubble in HNX for pre-crisis period.

Table 10: Duration dependence test with log-logistic model for runs of daily excess value-weighted portfolio returns for the pre-crisis period in HNX

Run length	Positive		Negative	
	Number of runs	Sample hazard rate	Number of runs	Sample hazard rate
1	51	0.2116	46	0.172285
2	24	0.3077	28	0.264151
3	16	0.4898	15	0.290323
4	4	0.2353	11	0.40367
5	2	0.1613	4	0.263158
6	4	0.4615	2	0.214286
7	0	0.0000	2	0.318182
8	0	0.0000	0	0
9	2	0.6429	1	0.3
10	1	1.0000	1	0.47619
11	0	0.0000	1	1
Total	105		111	
α β LRT of H_0: $\beta = 0$ p-value		-0.0983 -2.1661 24.13 0.0000**		-0.1118 -2.0979 27.97 0.0000**

*Notes: **, * Indicates the 1% significant level, 5% significant level.*
Source: Calculation of researchers
Meanwhile, the results of post-crisis convey the similar information to full sample and pre-crisis period. Tables 11 show that this study has evidence to reject the null hypothesis of no bubbles during post-crisis era. The β coefficient during post-crisis period is negative ($\beta = -2.1661$) and LRT of 24.13 is significant at 1% level. For the negative runs, the null hypothesis of no bubbles is rejected at 1% significant level. This pattern is therefore consistent with financial bubbles.

Table 11: Duration dependence test with log-logistic model for runs of daily excess value-weighted portfolio returns for the post-crisis period in HNX

Run length	Positive		Negative	
	Number of runs	Sample hazard rate	Number of runs	Sample hazard rate
1	273	0.2873	226	0.2246
2	118	0.3491	128	0.3422
3	47	0.3133	60	0.3435

4	31	0.4012	41	0.4939
5	20	0.5405	19	0.5277
6	2	0.1411	4	0.2823
7	2	0.1917	3	0.3442
8	5	0.6779	1	0.2000
9	1	0.4736	0	0.0000
10	1	1.0000	2	0.625
11	0	0.0000	0	0.0000
12	0	0.0000	1	1.0000
Total	500		485	
α β LRT of H_0: $\beta = 0$ p-value		-0.0983 -2.1661 24.13 0.0000**		-0.1118 -2.0979 27.97 0.0000**

*Notes: **, * Indicates the 1% significant level, 5% significant level.*
Source: Calculation of researchers

For negative return result from table 6 to table 10, the null hypothesis is rejected at 1% significant level. Since speculate bubbles cannot be negative, the significant result in the runs of negative returns implies that the VNIndex and HNXIndex must be control by the foreigner trading, strong internal investors, or speculators leading to herd mentality. It makes the stock prices fell down quickly, some investors bargain stock away. The information is very important to stock market, if it has negative indicate, it would have been bailing out. These activities make price decrease, speculators will buy it with lower price than real price and lead the stock market following the upward trend.

5. CONCLUSION

Stock market efficiency is always an important topic that attracts a lot of attention from academicians and practitioners. Vietnamese stock market is emerging markets that gets an immense focus by policymakers, investors, academicians. This study provides the present studies review some contributions to the existing literature in context of the Vietnamese stock market. In the above analysis, we investigate the Random Walk Hypothesis in order to examine about the weak form efficiency of Vietnamese Stock Exchange. This study uses various tests both parametric as well as non-parametric to arrive at the objective of the study employing return series of VNIndex and HNXIndex from the period of time from 2000 to 2016. The conclusion in the study is that the indices of Vietnamese Stock Exchange are not followed Random Walk Hypothesis and therefore the market is weak form inefficient. These results are consistent with (Dong Loc, Lanjouw, & Lensink, 2010). All the statistical and econometric tools such as normality tests, autocorrelation test, unit root tests, runs test, and variance ratio test used for the study clearly reveal that the Vietnamese Stock Exchange is inefficient in weak form.

The results of the duration dependence tests showed the evidence to support the existence of rational speculative bubbles in the Vietnamese stock market. To check the robustness, we divided data into 3 period namely full sample, pre-crisis and post-crisis period, we found the similar results for 3 sample about the presence of financial bubbles for both HOSE and HNX. This result is consistent with (Haa), but the author just examine the presence of financial bubbles only in HOSE. This evidence could contribute as a reference for further academic research in the stock market and help investors when making their trading decisions. The Vietnamese stock market is an emerging market, where imperfection and speculation are unavoidable. These results about weak form market efficiency and financial bubbles can help

the government change or improve policy in order to control and help maintain investor confidence in the Vietnamese economy. It also supports the evidence so that the government can make the stock market more transparent and enact strict regulations to control illegal trading, "inside trading", anomalies ... There are several issues that the policy makers should address. (Mokhtar, 2006) suggest that to reduce share price bubbles, interest rates should be raised when asset prices rise and reduced when asset prices fall. (Kroszner, 2003) argue that enhancing the transparency of the equity market would make the information easily accessible to investors that are able to reduce information asymmetry to prevent bubbles. Moreover, developing financial infrastructure such as the payment systems and constructing derivative products based on price jumps may help hedge the political risk (H. Y. Kim & Mei, 2001).

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FACTORS AFFECTING LABOR PRODUCTIVITY: EVIDENCE IN LISTED COMPANIES IN VIETNAM

Le Thanh Tung, Lam Thanh Hieu, Hoang Thi Trang

Abstract

This study aims to analysis the impact of some factors on labor productivity with the sample of 244 companies which listed on the Vietnam Stock Exchange in 2011-2013. Labor productivity determined in two ways: (i) the divide of revenue and the number of labor, (ii) the divide of profit after tax and the number of labor. Results showed that wage and company age have a positive relationship (helpful impact) to increase the labor productivity. The results also indicated that the number of employees has a negative relationship (harmful impact) to decrease the labor productivity of the companies during the period.

Keywords: labor productivity, wage, company age, employees, stock market, in Vietnam.

JEL Classification: D20, D24

1. INTRODUCTION

According to the report from Vietnam General Statistics Office (GSO) the labor productivity of Vietnam had continuously increased 6.4% in 2015 and the average growth of labor productivity was approximately 4.34% per year in the period of 2011-2015. Meanwhile, the statistics were published by the International Labour Organization (ILO) in 2015 showed that the labor productivity of Vietnam is still lower than other countries in the Association of Southeast Asian Nations (ASEAN). Specifically, Vietnam's labor productivity is only by 2/5 compared with Thailand, 1/5 Malaysia or even 1/15 to Singapore. The International Labour Organization (ILO) forecasts that Vietnam's labor productivity will be able to catch up with the Philippines in 2038 and Thailand in 2069.

Vietnam has a golden age in labor force with the young structure of the population. In the year of 2015, Vietnamese labor force aged 15 and above was 54.61 million persons (Vietnamese population approximately among 90.7 million), up 185 thousand persons compared to 2014's similar period; labor force within working age was 48.19 million persons, rose 506.1 thousand persons. Laborers aged 15 and above working in all economic activities in 2015 reached an estimate of 52.9 million persons, rose 142 thousand persons from 2014, of which the sector of agriculture, forestry and fishery accounted for 44.3%; the sector of industry and construction represented 22.9%; the sector of services took 32.8%. The rate of trained labor within working age in 2015 was estimated to reach 21.9%, higher than the previous year's rate of 19.6%. Because of the young population structure, the labor productivity must be speeded up to make more and more working place for young workers who continuously join the labor force (GSO, 2016).

The director of ILO Vietnam, Sziraczki (2015) explained the role of labor productivity on development including four reasons: (i) First, labor productivity drivers economic growth, a highly productive economy means it produces more goods or services with the same amount of resource; (ii) Second, labour productivity affects everyone, the businesses brings higher profit, the workers can reach to higher wages and better working conditions, the government increases tax revenues; (iii) Third, the current state of labour productivity is important to catch up with

many high-level countries (iv) Fourth, ageing population and economic integration also need to be taken into consideration.

However, labor productivity is really one of the weaknesses reduced the competitiveness of Vietnamese companies. Therefore, the research focus on the fact of labor productivity and the solutions to improve labor productivity is urgent topics to enhance the competitiveness of Vietnam's economy in the progress of international integration. Some theories of macroeconomics have confirmed increased labor productivity will increase not only the size of the gross domestic product (GDP) but also national income, thereby allowing increased savings and investment in order promote economic growth. Besides, the national labor productivity is determined by the productivity of companies in the country.

There are some economist's opinions which focus on the solutions taken to increase labor productivity and improving competitiveness in Vietnam. The Government needs to boost labor productivity to maintain its rapid economic growth. Some recent reports suggested a conclusion that the Vietnamese enterprises must be improved their labor productivity. Although labor productivity has increased in Vietnam, the growth is still lower than its potential. Therefore, labor productivity is a research topic is very urgent in Vietnam's economy at this time. However, the quantitative research in this field in Vietnam is quite low. This paper uses three methods simultaneously with panel data estimation including the Pooled, FEM (Fixed Effects Model) and REM (Random Effects Model) to analysis the relationship between some factors and labor productivity in Vietnam through the dataset from a sample of 244 listed companies on the Ho Chi Minh City and Hanoi stock exchange in the period of 2011-2013.

The structure of the paper includes 5 sections. Besides the introduction, section 2 presents an overview of the theoretical analysis and section 3 shows the research model and the dataset. The next one focus on the results and discussion. Conclusion and some governance implications presented in the last section of the article.

2. LITERATURE REVIEW

Labor productivity has a very important role supporting the economics growth. So it is one of the main topics about driver the development of countries. However, there are some different views about the labor productivity concept. The first concept of productivity was mentioned around 1766 in the Quesnay's study. In the early of the 20th century, there were some definitions of productivity as the relationship between the outputs and the inputs used to produce them. By 1950, the Organization for European Economic Co-operation (OEEC) gave a formal definition of productivity "Productivity is the quotient obtained by dividing the output by one of the factors in production progress" (Jarkas , 2010). So the simplest way to define productivity as the ratio of the outputs of an activity to the inputs consumed to make those outputs. More specifically, Isinika (1995) definition of productivity is the ratio of output (goods and services produced) per unit of input (labor, capital, materials). In other words, the "yield" shows the relationship between output and input.

The International Labour Organization (ILO) defines productivity as the ratio between "output of work" and "input of resources" used in the progress of creating wealth. This definition applies to an enterprise, an industry or an economy as a whole. In different industries, the output and input are also different. Productivity is simply the ratio between the amount product and amount of resources used in the course of production. The resources can be (unit of resource is in parentheses) land, material, plant and machinery, people and capital (Singh, 2014)

However, many administrators often misunderstand between productivity and labor productivity. In fact, productivity is more overall than labor productivity. According to some studies, the productivity is calculated not only divide output by the input but also add the efficiency or performance (Han & Leong, 1996). Drewin (1982) defined labor productivity as

"amount of goods and services produced by a production factor (labor) in a unit time". Borcherding & Liou (1986) implied that the labor productivity is the relationship between the number of products manufactured and labor costs. Kapp & Sanchez (2012) suggested that the labor productivity is the added value of enterprises compared to the total of employees (full-time workers).

Labor productivity depends on the ratio of inputs and output quantity obtained from productive labor process. Inputs are the resources used to produce goods and services, inputs are often used including a number of labor hours, a number of employees, wages. Outputs are goods produced or services provided, often including the number of goods and services, value-added sales, revenue, profit after tax. Some researchers suggested that labor productivity calculated by divided the amount of output by the number of employees (Wimmer, 2000; Mankiw, 2010). Siebert et al (2006) showed that the labor productivity can be calculated as revenue per labor hour (Riley & Bondibene (2013) also made a similar calculation). Basker (2011) measured the labor productivity as the ratio of the revenue to a number of employees.

Considering the overall perspective, the national labor productivity depends on the productivity of country's industries, namely labor productivity of the business community, labor productivity of provinces or national. However the question "What enhance the labor productivity?" is very difficult to clearly answer. This is always a difficult issue since labor productivity affected by different factors. There were some empirical researches which had done on labor productivity in several countries, the developed or the developing group. Ingene's study (1982) showed that the labor productivity was affected by a number of specific factors to such style or scale of investment, the acreage of the store. The research of Thurik & Kleiweg (1986) pointed out some specific factors of the companies as the acreage of shops, store formats or locations that affect labor productivity of enterprises. Findings of Rama (2001) demonstrated increasing productivity helped companies offset "wage shock" when the cost increase, thereby not occur layoff or decrease profit from increased wage offers. Specifically, it points to the incentive for managers to pay their employees more than the market-clearing wage in order to increase their productivity or efficiency, or reduce costs associated with turnover, in industries where the costs of replacing labor are high. This increased labor productivity and/or decreased costs pay for the higher wages.

Park (2008) showed that labor productivity of enterprises depends not only on wages but also the amount of employees, competitions, union organizations. Mayneris et al (2014) indicated that labor productivity depends on wages, a number of employees and the age of the company. Lee and Yuen (2015) studied the labor productivity in a sample of small and medium-sized enterprises (SMEs) in Malaysia, showed that wages and labor scale, the technological level has an impact on labor productivity.

3. THE RESEARCH MODEL AND DATA

Based on the theoretical frameworks about labor productivity as well as some empirical studies focus on the factors affecting labor productivity, our paper assumes three main factors affecting labor productivity in Vietnam including (i) wage level, (ii) the number of employees, and (iii) the age of the company.

The research model is presented in the following equation:

$$LP = \beta_0 + \beta_1 LW_{it} + \beta_2 LE_{it} + \beta_3 A_{it} \qquad (1)$$

Which: LP_{it} (Ln Labor productivity) is the natural logarithm base of labor productivity; There are two equation kinds that use in this paper to calculated the labor productivity. First, labor productivity is the revenue divided by the number of employees (denoted LP1) and second, labor productivity is defined as profits after tax divided by the number of employees (denoted LP2). LW_{it} (Ln company's wage) is the natural logarithm base of wage costs in the companies;

LE_{it} (Ln company's employees) is the natural logarithm basing on the amount of employees in companies; A_{it} (Company age) is the age of the companies (age-level is the number of years operated since it was established).
The database used for the study is the quarterly data with time-series style. This data was collected from the accounting balance sheets and annual financial reports of a sample including 244 companies listed on the stock market in Vietnam period 2011- 2013. As such, total sample had 730 quarterly observers. The descriptive statistics of research sample is presented in the table below:

Tab. 1 - The descriptive statistics of the collected data. Source: Calculated from the research data

Description	Variable				
	LE	LW	A	LP(1)	LP(2)
Mean	6,168	16,277	9,957	20,722	17,766
Median	6,095	16,425	7,000	20,655	17,830
Maximum	10,81	20,050	56,000	24,190	22,300
Minimum	3,000	10,330	1,000	18,160	10,100
Observers	730	730	730	730	730

4. FINDINGS

Research methods using panel data regression (panel data) are applied simultaneously evaluates both three ways including the Pooled data model (PM), the Fixed effects model (FEM) and the Random effect model (REM). In which labor productivity was calculated based on two calculations of data are the total revenue and the total profit after tax of companies.

Tab. 2 - Results using data regression variables LP1. Source: Calculated from the research data

Dependent variable: LP1			
Variable	PM	FEM	REM
C	-75,6789*** (-13,8189)	-100,06*** (-4,6796)	-101,196*** (-4,7412)
LW	0,2957*** (147,8744)	0,0764*** (4,0066)	0,1252*** (7,0285)
LE	-0,2328*** (-132,4458)	-0,7292*** (-16,936)	-0,4993*** (-15,7487)
A	0,0462*** (16,9774)	0,0616*** (5,7885)	0,0611*** (5,7486)
Observations R^2	730 0,2188	730 0,9685	730 0,3674
Likelihood test ($\chi 2$) Hausman test ($\chi 2$)	2344,876 0.000 71,051 0.0000.		

Notes: LP1 is the natural logarithm base on labor productivity which defined by revenue divided by company's employees. LW is the natural logarithm based on wage; LE is the natural logarithm based on the number of employees; A is the age of the company.
In Table 2, the results of regression which labor productivity using total revenue divided by the number of employees in the same period. The regression results in Table 2 were calculated by 3 methods: Pooled, FEM and REM. The Likelihood and Hausman test results confirmed the

results of FEM model is the most qualitative that present the impact of some factors on labor productivity in the companies. The study results showed that wage has a positive impact on labor productivity with the significance of 1%, meanwhile, if the wage increases 1%, the labor productivity will increase 0.0764%. Next, the amount of employees has a negative impact on labor productivity with 1% of significance, particularly if the number of employees increases 1%, labor productivity decreases 0.7292%. Finally, the age of companies has a positive impact on labor productivity at the significance of 1%, in that if the age of company increase 1 year, the labor productivity also increased 0.0616%.
Results have shown that companies should focus on increase the wage, cut back the number of employees. In addition, study results also imply if the business has greater seniority in the market, labor productivity is also improved.

Tab. 3 - Results using data regression variables LP2. Source: Calculated from the research data

Dependent variable: LP2			
Variable	PM	FEM	REM
C	722,2389*** (89,6618)	668,788*** (9,4431)	693,1181*** (9,8543)
LW	0,4443*** (151,0421)	0,1918*** (3,0345)	0,3071*** (6,3991)
LE	-0,3693*** (-142,8393)	-0,3739*** (-2,6223)	-0,3761*** (-6,5257)
A	0,3527*** (8,0280)	0.3241*** (9,1846)	0,3071*** (6,3991)
Observations R^2	730 0,2485	730 0,8465	730 0,1956
Likelihood test ($\chi 2$) Hausman test ($\chi 2$)	1159,835 0,000. 10,0674 0,0180.		

Notes: LP2 is the natural logarithm base on labor productivity which defined by profit after tax divided by company's employees. LW is the natural logarithm based on wage; LE is the natural logarithm based on the number of employees; A is the age of the company.

In the following, the results in Table 3 presents the factors affecting labor productivity. Particularly, labor productivity was based on the total profit after the tax divided by the employees in the same period. Likelihood and Hausman test results continue to assert the estimation of FEM method is the most suited to the research data. In particular, the research results continue to confirm the wage increase has the effect of promoting labor productivity. Specifically, if the wage increases 1%, the labor productivity will increase by 0.4105% at 1% statistical significance. Conversely, if the number of employees (E) increase 1%, the labor productivity will be fell 0.3669% at 1% statistical significance. Finally, when the age of company increases 1 year, the labor productivity will increase by 0.3241% at the significance of 1%.
Results also showed that R2 = 22.53% meaning that the independent variables included in the regression model on the likely explanation approximated 22.53% of the variation in the average of the dependent variable. Once again, the results present that labor productivity increase if managers will increase the wage as well as reduced the number of employees. Besides, when the age of firms increase that lead to labor productivity also increases.

5. CONCLUSIONS AND RECOMMENDATIONS

In this study, the data collected from 240 companies (with 730 observations) listed on the Stock Exchange in Vietnam from 2011 to 2013 is applied to clarify the relationship between labor productivity and a number of factors such as wages, a number of employees and the age of the company.

Research's results have shown a positive relationship between wages and labor productivity in the business. In general, labor productivity increases help firms offset the "shock wage increase" when cost increases, so do not occur layoffs or declining profits from the rising cost of wages bring. From there to increase employee productivity, enterprises require the continuous policy of wage increases, increase the form of bonuses. Wages are one of the most important economic instruments in the management of labor, this is a useful tool to help promote work motivation of workers since labor productivity will increase.

In addition, the amount of labor negatived relationship with labor productivity of firms during the study. In essence, Vietnam enterprises have not paid attention to labor. The cause could be Vietnam has cheap manpower so enterprises can not attach importance to the effective use of labor. Moreover, the trend of firms that recruit the labor shortage without considering the restructuring work should result in wasted labor. So rising labor costs lead to reduced productivity. Currently, the size of the enterprise labor Vietnam increased rapidly, but in fact, the use is now only about 40% of the capacity of human resources that they own. Therefore, this is an illustration of warning to firms if continue hired labor without regard to the quality will lead to reduced labor productivity or worse can now bear the losses because the cost labor increased but not associated with increased output respectively.

Finally, the results of the study confirmed the age of firms related to labor productivity. Thus, the results showed that firms seem increasingly senior business on the market, the bigger the high labor productivity. The results imply that the senior enterprises often apply a lot of management solutions, methods of production and new technologies from which to promote increased labor productivity.

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THE IMPACT OF SOCIAL MEDIA MARKETING ON BRAND LOYALTY: THE CASE OF DIGITAL PRODUCTS IN VIETNAM

Le Thanh Tung, Nguyen Thanh Dung, Nguyen Hong Thai

Abstract

This study aims at researching and analyzing the effects of social media marketing on brand loyalty of customers. The data were collected through surveys of 230 customers of digital products in Ho Chi Minh City, Vietnam. The research results show 05 elements of social media marketing have a positive impact on customer's brand loyalty. Five factors include: (1) offers advantageous campaigns of digital brands; (2) offers relevant content to consumer's concern; (3) brand contents are frequently updated; (4) offers popular contents shared between friends and (5) appears on various devices and offers applications on social media. Based on research results, this study also proposes a number of implications for management at enterprises.

Keywords: social media marketing; brand loyalty; brand; digital products, Vietnam market.

JEL Classification: M10, M31

1.INTRODUCTION

Following the theories of business management, the building and maintaining brand loyalty is one of the important topics which the researchers done in a very long time (Oliver, 1997; Chaudhuri & Halbrook, 2001; Bennett & Rundle-Thiele, 2002). Nowadays, marketers have used a lot of different marketing tools to maintain the brand loyalty of the customer. They used the elements of the brand, the classic marketing strategy, as well as new methods of marketing such as events, sponsorships, marketing communications or internet marketing tools which are social media marketing (Keller, 2008; Kotler & Keller, 2007).

The context of this study is chosen in the digital products market in Vietnam. By the end of 2015, the number of internet users in Vietnam reached about 45.2% of the population (the Vietnam's population is 90.7 million) and there are about 30 million people using social media. In Vietnam's mobile market there were 128 million smartphones are activated (approximately 1.41 times the population), 26 million of which use social media on the smartphone. Also in 2015, the growth rate of Internet users in Vietnam was 13%, significant high in Asia; also for social media users, the growth rate is 50%, therein who use social networks on the phone is 53% (Nielsen, 2014; We are Social, 2015). This report shows that Vietnamese tend to use mobile phones to access the social network.

Therefore, in recent years, social media marketing is becoming an effective tool to enhance the effectiveness of marketing activities for the company as well as it promotes commercial activities on Vietnam market. Many enterprises have been strongly investing for the advertising campaign on Facebook, YouTube or Zalo,.... However, the real impact of social media marketing to brand loyalty, as well as sales and customer service is still a matter of debate in Vietnam. So this study identifies elements of the marketing social media impacting to brand loyalty of consumers is necessary, this also helps the managers know how to invest in elements social media marketing. Finally, the research results conclude some recommendations in order to enhance the loyalty of consumers to brands through social media marketing.

2.LITERATURE REVIEW

Social media

Social media platforms are online portals driven by technology and enhance the use, streaming and sharing of multimedia content (data, voice, and video). These platforms have become the fast growing 'virtual communities' in the emerging global village (Nielsen, 2014). The easy accessibility to anyone anywhere across the world with internet access makes it a potential marketplace where brands also come to promote their products and engage the target audience. Increased communication on social media platforms for organizations fosters brand awareness and often, improved customer service. Social media is comprised of a variety of platforms in which information is created and exchanged by individuals online (Mangold & Faulds, 2009).
Social media platforms popular now (6 group) in Vietnam. Some examples of these include - (i) Blogs: WordPress, Blogger/Blog Spot,… (ii) Social Networks: Facebook, Google Plus, MySpace, LinkedIn,… (iii) Group news/Forum: Vozforums, 5giay,… (iv) Community share multimedia content: Youtube, Itunes,… (v) Community share personal information: Twitter, Friendfeed,… (vi) Community share a message via Skype, Whatsapp, Google chat, Facebook Messengers, Viber, Zalo,... (We are Social, 2015).

Social media marketing

Building brand loyalty by social media marketing is defined as the process of empowering individuals to maintain and develop the site, the products and services of enterprises through social channel online; thereby exploiting the larger community on the internet that is not available through traditional channels marketing (Weinberg, 2009).
Social media marketing is more different than traditional marketing methods. Therefore, it requires special attention and strategy building to achieve brand image and loyalty. Social media marketing always directly impacts to the consumer; thus enterprises need to inculcate the brand image and loyalty to its each customer. Social media marketing tool is the best tool to create connections with customers (Gordhamer, 2009).
Social media marketing helps brand represent more sincerity in communicating with consumers; trying to show what the brand is rather than trying to control its image. Nowadays, customers have more influence in decisions to buy products and busy. Therefore, enterprises should be reachable and available on every social media communication channel such as Facebook, youtube, Blogs, Forums at any time (Gordhamer, 2009).
Today, enterprises in Vietnam tend to focus on social media marketing. Marketers are very steep to achieve, tomorrow they may become meaningless. Day by day, the new algorithm, new tool are changed or created. Google changes search algorithm priority on the mobile device, which has made many companies's website in Vietnam are relegated in search results. Facebook has the video feed automatically turned on the users, growth rate video views on Facebook which in a short time increasing to 50%, it's a fertile ground for social media marketing. The mobile device will become the main trend on future, Google is leading this playground; websites will be relegated if it unfriendly with mobile devices in past year, and focus on developing programs for equipment mobile led to a series of companies's website in Vietnam relegated in searching term.

Brand loyalty

Brand loyalty can be conceptualized as the final dimension of consumer brand resonance symbolizing the consumer's ultimate relationship and level of identification with a brand (Keller, 2008). As brands gain exclusive, positive, and prominent meaning in mind of a large number of consumers. Brand having loyal customers will increase its sales, market share, profits

for enterprises and helps enterprises grow or at least maintain its position in the market (Keller, 2008; Aaker, 1991; Kapferer, 1997).

Brand awareness, brand recognition and brand loyalty are through marketing social media. It can be said that enterprises have used social media marketing to generate brand loyalty by voice, text, images, videos posted on social media (Coon, 2010). Attracting the loyalty of customers and maintaining brand loyalty are considered as a challenge in business. Due to increasing internet penetration rate in the world and the general use of these tools, especially among the new generation, as well as social network growth in cyberspace with regard to its functions and individuals impressibility from the same group in this space, the necessity of noticing social media marketing and planning for it is undeniable. Many marketing researchers, such as marketing performers, have emphasized on the main role of interpersonal relationships effect on creating a positive attitude toward desired brand and strong connection between customers and brand (Brexendorf et al, 2009).

In trendy of the world economy, Vietnamese enterprises have been recognizing the importance of brand, they have been focusing on the development of brand rather than their less interesting last year. Currently, social media marketing is very important in Vietnam, where the competition is so fierce. The era of online advertising and marketing to serve purely increase brand awareness and increase site visits without regard to efficiency to achieve the real goal (potential customer list, sales) was over. Now, enterprises need to anticipate and implement marketing strategy in an effective way for their brand, and to save costs; social media marketing ensures it.

The relationship between social media marketing and brand loyalty

Irem and Mesut (2012) has conducted research in Turkey, they have studied how is the impact of social media marketing on brand loyalty. The results of the study showed that brand loyalty of customers are positively affected by social media marketing (1) offers advantageous campaigns, (2) offers relevant content, (3) offers popular contents, (4) appears on various platforms and offers applications on social media.

Research by Michel et al (2012) in Canada showed that brand loyalty is measured through the trust of customers. Taking the perspective of the brand community building plus the brand trust and loyalty literatures, research's goal is to show how brand communities based on social media influence elements of the customer-centric model (i.e., the relationships among focal customer and brand, product, company, and other customers) and brand loyalty by McAlexander (2002). The results of structural equation modeling show that brand communities established on social media have positive effects on customer-product, customer-brand, customer-company and customer-other customer relationships, which in turn have positive effects on brand trust, and trust has positive effects on brand loyalty. They find that brand trust has a fully mediating role in converting the effects of enhanced relationships in brand community to brand loyalty. Their model and results show that with creating and enhancing brand communities based on social media, and by facilitating feelings of community, usefulness, information sharing, and strengthening the social bonds among members and other elements of the brand, marketers can increase brand trust and loyalty.

Elissar et al (2012) has an overview of the theory in the study of loyalty online (e-loyalty). They found that: the growing number of academic studies about online customer loyalty shows that diversity, if not divergence, exists regarding the measurement and conceptualization of online loyalty. Considering this theoretical and conceptual diversity. The goal is to realize a descriptive meta-analysis of the empirical literature focusing on the conceptualization, measurement, antecedents, and consequences of e-loyalty, and to provide an integrative model for these antecedents and consequences. The study proposes an integrative framework to better understand existing studies and explore research omitted in this field. Future research will be

able to use the suggested model in this article as a foundation to explore the factors affecting online customer loyalty as well as its consequences. Finally, with the growth of social media, forums, virtual communities, and P2P exchange, researchers of online customer loyalty should adopt a new perspective and try to understand loyalty not only by achieving customer satisfaction but also through the creation of strong ties, sense of commitment and a sense of belonging to a community. Research should study online customer loyalty from the perspective of a community of loyalty where the customer integrates socially into a village, with ties that envelop and direct his choices in a convincing way.

Research model

The research model is based on the theoretical framework and the scale of Irem and Mesut (2012). The hypothesis H1 to H5 are the independent variables impact to the dependent variable the brand loyalty of customers on social media.

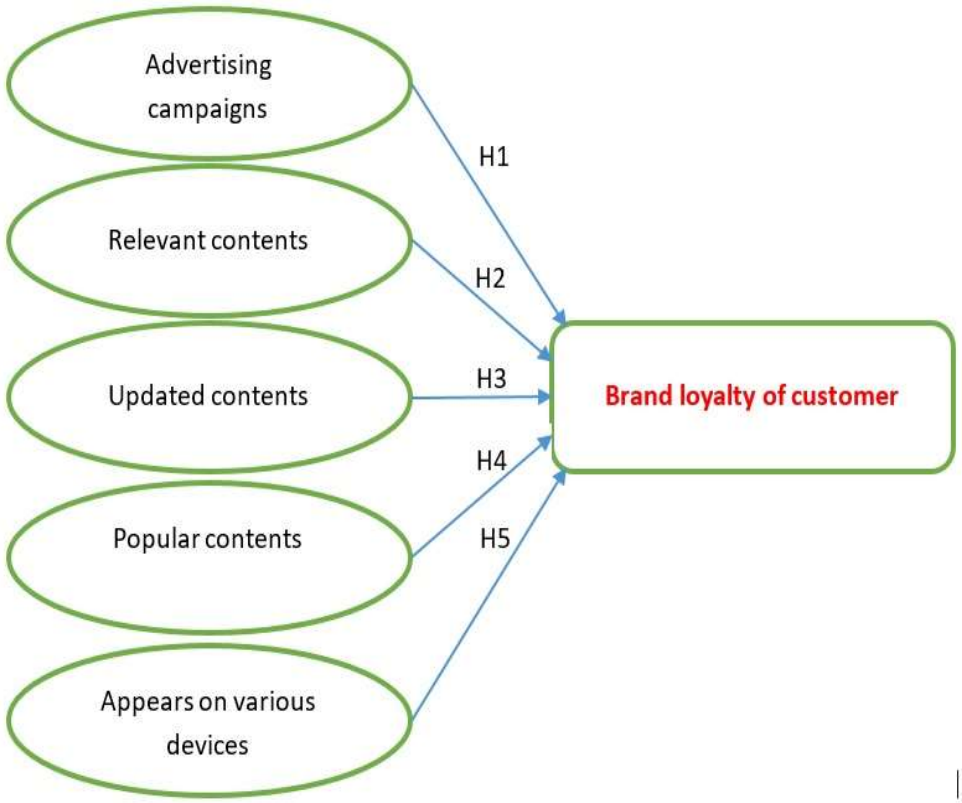


Fig. 1 – Theoretical model. Source: Research results by authors

The hypothesis of the research model is presented as follows:

Hypothesis H1: Brand loyalty of customers is positively affected when the brand offers advertising campaigns on social media.

Hypothesis H2: Brand loyalty of customers is positively affected when the brands offers relevant contents on social media.

Hypothesis H3: Brand loyalty of customers is positively affected when the brand offers updated contents on social media.

Hypothesis H4: Brand loyalty of customers is positively affected when the brand offers contents that are popular among friends on social media.

Hypothesis H5: Brand loyalty of customers is positively affected when the brand appeared on various devices and provides applications on social media.

3.DATA COLLECTION

Research's data was collected through the questionnaire and internet survey with a sample of 300 people who are social media users and following digital brand. Hypotheses are analyzed through descriptive and inferential statistics using SPSS 20.0 software. Results of descriptive statistics are presented below (Table 1).

Tab. 1 – Description statistic of the research sample. Source: Calculated from the research data

Characteristic		Frequency (n = 230)	Percentage (%)
Gender	Female	109	47.4
	Male	121	52.6
Age	< 19	43	18.7
	≤ 19 to 40	125	54.3
	> 40	62	27.0
Education	Vocational school	83	36.1
	Under graduate	107	46.5
	Graduate	40	17.4
Occupation	Business employee	55	23.9
	Technical staff	35	15.2
	Entrepreneur	32	13.9
	Homemaker	28	12.2
	Others	80	34.8
Social network	Facebook	209	91
	Youtube	153	67
	Zalo	143	62
	Google+	119	52
	Viber	78	34
	Skype	67	29
	Others	33	14
Subscribe to at least one brand on social networks	Samsung	142	62
	Apple	118	51
	Microsoft	93	40
	Asus	53	23
	Others	30	13
Usually use of digital devices	Smartphone	180	78
	PC/Laptop	168	73
	Tablet	79	34
	Others	56	24

Quantitative research methods are used in this study. Theoretical models have five independent concepts measured by 23 observed concepts and one dependent concept measured by 5 observed concepts. Scale concepts studied in theoretical models are multivariate scale. The observed concepts are measured on a 5-points Likert scale (1: strongly disagree to 5: strongly agree). It is divided into 2 parts. Part 1 includes the question about personal information such as gender, age, education level, use digital devices, using social networks. Part 2 is the question which measures factors social media marketing and brand loyalty.

The questions to measure reasons to engage brands on social media were drawn from the literature review (Lau & Lee, 1999; Gruen, 2006; Mangold & Faulds, 2009; Leggat, 2010; Freidman, 2011; Brito, 2011; Kim & Adler, 2011). The items included advantageous campaigns, relevancy of the content, frequent update of the contents, the popularity of the content among other users and friends, appears on various devices and offers application

provided on social media. In addition, the content categories scale was formed based on the Media, Digital, social, and mobile Report (Smith, 2009; Nielsen, 2014; We are Social, 2015) and the category types of the video, picture, and document of digital produce sharing websites.

4.RESULTS AND DISCUSSION

The first, statistical analysis to calculate both the factor analysis and the scale reliability analysis, before carrying out factor analyses, a reliability analysis for the scale was run through Cronbach's Alpha. The reliability of the questionnaire was 0.708~0.854 which is in the acceptable range, so scales of this study have a rather high level of internal consistency and are reliable (Table 2). The correlation coefficients of the variables total are greater than 0.3, so all the scales are reached reliability (Hair et al, 1998).

Tab. 2 – Results of testing the scales. Source: Calculated from the research data

Variable	Symbol	Observation	Cronbach's Alpha	Minimum value of Corrected Item-Total Correlations
Advantageous campaigns	AC	6	0.833	0.539
Relevant contents	RC	3	0.708	0.470
Updated contents	UC	3	0.845	0.649
Popular contents	PC	4	0.854	0.652
Appears on various devices	VD	3	0.820	0.655
Brand loyalty	BL	5	0.837	0.523

The second, Exprore factor analysis technique (EFA) is done with Extraction method (Principal Component Analysis) and Rotation method (Varimax with Kaiser Normalization). Factor analysis results for the independent variables are shown in Table 3; the load factor of 19 variables are greater than 0.5 (Hair et al, 1998), Eigenvalue values are greater than 1, and the Rotation Sums of Squared Loadings is 66.969%. Thus, the observed concepts are correlated with each other considering the overall scope. The variables are used to analyze the model using multiple linear regression.

Tab. 3 – Analysis of factors for the independent variables. Source: Calculated from the research data

Item	Factor				
	1	2	3	4	5
Provide brand content on multiple social media .	0.719				
Use blogs and other social media tools to engage customers.	0.612				
Use Internetbased promotional tools to engage customers.	0.752				
Provide outrageous information of brand.	0.744				
Provide Information important to that interest consumers.	0.738				
Utilize the power of stories to advertise products .	0.684				
The content is an important source of information among your friends.		0.753			
The content of the shared brand to enhance knowledge among your friends.		0.774			
Use the content of the brand to provide answers to questions of friends.		0.881			

Trust this proposal opinions.		0.855			
Ensure brand content is current and up to date. Brands content provide and share on social media. Brands content really provide on various social media.			0.849 0.861 0.874		
Using mobile devices to increase Brand Awareness. Use of mobile devices increase Customer Engagement. Use of mobile devices increase Brand commitment.				0.884 0.866 0.841	
Relevant content adds value to the conversation. Relevant content positions the brand as a trusted advisor. Relevant content is authentic but more importantly, believable.					0.792 0.753 0.647
% of Variance	17.617	32.410	44.510	56.570	66.969
Eigenvalues	4.840	2.650	2.132	2.057	1.046
KMO = 0.810	Sig. = 0.00				

The result of analysis of the dependent variable factors has KMO coefficient = 0.734 and test Barlett has Sig = 0.000 (Table 4). Load factor coefficient is greater than 0.5 and % of Variance of Initial Eigenvalues reached 60.94%, hence there are no variables were excluded.

Tab. 4 – Analysis of factors for the dependent variables. Source: Calculated from the research data

Item	Component
Intention to interact more with the brand on a social media	0.845
Intention buy to increase sales from the brand	0.820
Trust towards the brand	0.797
Intention to get interactive with other brands through social media	0.759
Intention to recommend the brand to friends	0.672
% of Variance	60.940
Eigenvalues	3.047
KMO = 0.734	Sig. = 0.0000

The first step of conducting linear regression analysis is to consider the linear correlation between all the concepts. That means to consider the overall relationship between each independent variable with the dependent variable, and between the independent concepts.

Tab. 5 – Pearson correlation matrix results. Source: Calculated from the research data

Variable	Correlation					
	AC	PC	UC	VD	RC	BL
AC	1					
PC	0.312**	1				
UC	-0.005	0.068	1			
VD	-0.003	0.100	0.061	1		
RC	0.572**	0.231**	-0.015	-0.017	1	
BL	0.634**	0.498**	0.383**	0.248**	0.511**	1

*Notes: ** Pearson correlation at significance 5% level*

Results of correlation matrix (Table 5) shows the dependent variable correlates quite closely linear between 5 independent variables. The correlation coefficient between these variables ranged from 0.248 to 0.634 with the statistical significance level is 5%.

Tab. 6 – Model Summary. Source: Calculated from the research data

Model	R	R^2	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.839	0.704	0.697	0.201	1.960

Tab. 7 – Coeficients. Source: Calculated from the research data

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
	0.515	0.130		3.972	.000		
AC	0.227	0.024	0.433	9.502	.000	0.638	1.567
PC	0.109	0.016	0.269	6.965	.000	0.884	1.131
UC	0.149	0.015	0.357	9.785	.000	0.991	1.009
VD	0.123	0.022	0.204	5.579	.000	0.985	1.015
RC	0.119	0.025	0.210	4.713	.000	0.668	1.496

Notes: The dependent variable is BL

The estimated results of the multiple regression model indicate a good fit with the data ($F = 106.33$, $p < 0.001$; $R^2 = 70.4\%$; all VIFs < 2.0). The results of the impact of social media marketing on brand loyalty of customers are shown in Table 7. The Advertising campaign (AC) has the greatest impact on the brand loyalty of customers, follow the Update content (UP), Popular content (PC), Related content (RC) and Various mobile devices (VD).

The study results showed that:
+ (1) The Advertising campaign on social media has a huge influence on brand loyalty in Vietnam. advertising on social media has convenience, the fastest access to consumers; as well as providing the information or stories appealing to consumers. The results are consistent with research by Mangold & Faulds (2009).
+ (2) Relevance content have 4^{th} to influence brand loyalty in Vietnam. This is reasonable for consumers in Vietnam, when the brand has just started doing advertisements, or organize programs on social media; brand's information on social media provide to consumers isn't much.
+ (3) Updating content of the brand is an important after advertising in the present; the future as well as consumers will need more the information. They want the brand update more information about the digital product, that they love and are interested to share or exchange content with friends.
+ (4) Social media have in the most advantageous means of WOM. Today, consumers require the exchange of information with friends, lover. When they have a new information, they will need sharing information in the internet community about especially informations and sensitive (Gruen, 2006). it is also reasonable to consumers in Vietnam. They need to share digital product informations so much with friends, people with similar interests; it is also consistent with the characteristics of Vietnamese.
+ (5) Various mobile devices do not achieve the desired expectations. Because people's income is not high; It leading to the number of people owning multiple devices or multiple brands is not much.

5.CONCLUSION AND IMPLICATIONS

This research aims to study the impact of social media marketing on brand loyalty in the case of digital products in Vietnam; specific factors: advertising campaigns on social media, updated

contents on social media, popular contents among friends on social media, relevant contents on social media, various devices and provides applications on social media; and to find meaningful factors affecting brand loyalty of customer. The study based on the model of Irem and Mesut (2012) to build research model fidelitying digital brand in Ho Chi Minh city, Vietnam. The sample size of the study was n = 230 observations. Results confirmed the 5 factors including: (1) advertising campaigns, (2) updated contents, (3) popular contents, (4) relevant contents, (5) various devices have the positive impact on the brand loyalty of consumer with significance of 5%.

According to the results of this research, for the purpose of enhancing the brand loyalty of the cutomer, the managers who want to use marketing social media, need to pay attention to following five factors:

The first, needing to boost advertising campaigns on social media, especially video ads. Using video advertising will be the emerging trend in future because the video advertisements meet strong demand for information in the content transmission that consumers require. In recent two years, Vietnamese consumers have gradually accustomed to view advertising content in video format. The rate of consumer internet access to view video in advertising significant is increasing. Watching videos is also frequently online habit of consumers in Vietnam.

The second, increasing investment in the quality of advertising content. The era of social media, social media help the brand to "talk" freely; of course, the brand must active talkers; not advertisers and contents decide whether the brand can lure customers or not. The brand is favorited, brand loyalty is more or less, which is largely dependent on the quality of brand content posted. There is a saying another: "Good content is not how to talk lie, which is told to be a true story with compelling way." That's enterprises's goal. Enterprises need to tell enterprises's story is an intriguing way. That is to invest in quality advertising contents.

The third, the advertising content must be constantly updated as fast as possible. Today, information of customers is too much; to update from time to time contents, as well as to follow up to each specific customer behavior; enterprises have a policy or strategy for each specific customer groups, in order to provide relevant content to its consumers, which is recommended as marketing automation. The most important point is that enterprises have to treat each customer on an individual level as possible, and enterprises reach them entirely based on the analysis of their interaction behavior for advertising content.

The fourth, social influencer marketing is the most effective way on social media. These are people who have an impact on the social media. It can be a Blogger, Vlogger, a user of any content that they share with a radial, or a celebrity with social network accounts active and influential. Nowdays, young people believe in the "Social media star" rather than the "TV star", corresponding to the proportion of young people spend time using social networks more time watching television. Ex: OPPO has used Sơn Tùng –the famost singer - to represent their brand on Youtube, it succeeded on 2016 which song's name is 'Lac troi'.

The fifth, mobile becoming main trend. Almost all activities of online users are now made through mobile devices: sending messages, reading newspapers, shopping, booking, money transferring, finding customers, partners, study, investigation, ... therefore enterprises must focus on advertising investment on mobile devices in the future.

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THE EFFECTIVENESS OF INTERNAL CONTROL: THE EXPERIMENT ON RETAIL STORE CHAIN BUSINESS IN VIETNAM

Le Thi My Hanh, Nguyen Ngoc Ly, Son Van Xuan

Abstract

This study investigates factors that effect on the effectiveness of Internal Control System (ICS) within enterprises of retail store chain in Vietnam (RSC VN). A research model is built basing on 5 components of Internal Control System of Coso Report 2013. This study did make a survey around 200 executive officers and staffs of 24 enterprise of retail store change in Vietnam in order to measure all components and effectiveness of ICS. The result of this study shows that the effectiveness of ICS of these enterprises is at pretty average level; the effectiveness of ICS is also at pretty average level (3.6 points); In particular, environmental control factors, risk assessment, control activities, information and communications, and monitoring effect on the effectiveness of ICS within enterprise of RSC VN, results are consistent with theories and former researches on the influence factors of the efficient of ICS.

Keywords: internal control, retail store chain, effectiveness, Vietnam

JEL Classification: G32, M42.

1.INTRODUCTION

Vietnam is one of few countries that achieve high growth (Vietnam 2035, World Bank 2016). With over 90 million people as the 14th most populous in the world, over half population with consumer spending is around or over USD15 per day (Vietnam 2035, World Bank 2016) that lead domestic market having potentiality for the development of domestic retail market. Therefore, there are a number of retail store chains (RSC) in many big cities in Vietnam as Hanoi, Hochiminh city, Da Nang city. Although RSC is gradually becoming the trend as advantages of profit increase, expand customer and minimize the business risk, managers are facing with challenge how to control RSC effectively.

In Vietnam, most investors of RSC are quite successful in a very first store that encourage them invest more in the second shop and the third to form the store chain. Nonetheless, stores opened later are not efficient in business which revenue is much less than the first store's. Although total of revenue increases correlated to the number of retail stores that lead the negotiating with suppliers easily, investors will get in uncontrolled situation of recently opened stores. Mainly reason is that the internal control system (ICS) is ineffective and has not acheive the its objective. In Vietnam recently, there are many research projects on ICS of each enterprise. However, very few of experimental researches are studied in fact, whether ICS has achieved its objective or which factors really affect the effectiveness of ICS of group of companies in the same business, especially retail store chain enterprises. Therefore, the study of effectiveness of ICS in order to enhance the effectiveness of ICS of Retail store chain enterprises in particular and other companies in general is one of the essential problems today. Consequently, this paper is to study the level of the effectiveness of ICS and the influence of the components of ICS on its effectiveness in Vietnamese retail store chain enterprises.

According to the mentioned objective of this study, the paper reviews previous researches related to factors of the effectiveness of ICS. Meanwhile, theoretical framework related to research content will be conducted in part 2. Part 3 describes brief researching methods and

data and part 4 presents the result of research and discussion. The paper will point out some conclusions basing on the results of study.

2.LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1.Literature review

According to the assessment of effectiveness of ICS, there are many studies, such as Noorvee L. (2006) compared ICS of three particular US companies and made some recommendations for ICS's improvement of these companies; Amudo & Inanga (2009) valued ICS of a specific project in Uganda to examine factors of ICS in Uganda and suggested solutions to overcome the system's existing limitation. There are a number of compoents in the research model of these authors, including: environmental control, risk assessment, controlled activities, information and communication, monitoring and information technology. The result shows that these studies less concerned on monitoring factors and these authors suggested this activity should be improved. Another research of ICS's effect on business of small restaurants of Franzer L. (2012) aiming to determine the awareness of restaurant management in term of Internal control, including: asset protection, assigned tasks and task determination. With 270 surveyed restaurants, the result shows that most of the ICS have not commited completely requirements of Coso in internal control. This study requires improving regulations in order to ensure the compliance with government's requirement for small restaurants, to ensure the reliability of financial report and support the effective business of small restaurants. Related to retail sector of big super market in Barbados, the research result of Wood & Brathwaite (2013) shows the effectiveness of internal control procedure in cash management, detecting and preventing of employee fraud. In future, super markets should strengthen the ICS with employee's regulation and supporting program. Moreover, enterprises also need to have a employee's rewarding policy to promote the spirit of staffs and enhance their loyalty. Nonetheless, the study has investigated only on cash management process of super markets. Besides, research on impact of the ICS on the business effectiveness of Mongkolsamai et. al. (2012) is conducted on over 120 listed companies in Thailand showing that environmental control, risk assessment, information and communication have a significant impact on the performance of listed companies. Factors as vision, transparency management, employee's knowledge, diversity of business and participants also have possitive effect on the effectiveness of the ICS.

In Vietnam, there are quite many papers and studies of the ICS of one or a group of enterprises with same industry, such as a study by Hoang V. L. (2012) on internal control of state enterprises. Dinh T. H. (2012) has also research on internal control in accounting information system. In 2013, Nguyen T. P. L. and Le T. L. H. have studied on risk management of internal control in Vietnamese companies. Besides, Pham D. B. (2013) using some particular Vietnamese companies has investigated the ICS to propose solutions of risk minimisation. Meanwhile, Huynh T. K. A. (2013) has conducted a study of the ICS in Big C super market, Vietnam, improving the ICS, ensuring risk minimization for enterprises and heading to the sustainable development. Beside, Tran T.B.D (2014) assessed the effectiveness of internal control of travelling companies and gave the suggestion to improve the effectiveness of internal control of these companies. Especially, in 2016, Ho T. V. has studied factors effecting the effectiveness of the ICS in commercial banks in Viet Nam. The writer has used the basic framework of Cosco report and Basel to experiment on commercial banks. The result shows that environmental control, risk assessment, information and communication, control and monitoring activities can effect on the effectiveness of the ICS in Vietnamese commercial banks. Bisides, this study has been pointed out 2 new factors impacting on the effectiveness of the ICS in commercial banks in Viet Nam, which are political organisations and group benefits.

However, studies in Vietnam mainly focus on the ICS in a particular enterprise and rather than examise the effectiveness of the ICS in all enterprises in same industry. Most of Vietnamese studies mainly follow the qualitative method rather than quantitative method and. They also focus on examining and evaluating the ICS in an enterprise without analysing of achieving objectives and particularity of the ICS. In this study, the writer will research the ICS in a kind of enterprise which are retail store chain business in Vietnam; quantitative method is mainly used and objectives of the effectiveness of the ICS in retail store chain businessin Vietnam are primarily investigated. This is an outstanding of the research compared to previous studies on the ICS in Vietnam.

2.2.Theoretical Framework

Internal control

Internal control is a process, effected by an entity's board of directors, management and other personnel, designed to provide reasonable assurance regarding the achievement of objectives relating to operations, reporting and compliane (Coso, 2013, p.3).

According to Coso 2013, Internal control is designed to achieve the following objectives:

The effectiveness and efficiency of operation.

The reliability, timeliness, transparency of financial and non-financial reports.

Compliance with law and regulations

As regards Vietnamese Accounting Standard (VAS 400, 2001): "Internal control is regulations and controlled procedures conducted by auditted companies in order to ensure the legal compliance, examise, control, detect, prevent fraud and misstatement, and to establish true and fair financial report for the protaction and management of asset control of enterprises".

Content of the internal control (ICS) basing on COSO 2013

After 21 years since COSO Commission has issued COSO 1992 report, the business environment has changed dramatically such as the economic globalization, the change in business method, the expectation of detection and prevention of fraud, especially the development of information technology on a global scale. Therefore, COSO Commission has updated and improved the report issued in 1992 to increase the straightforward, clearness and applicability in reality. The objective of COSO Commission 2013 was to establish the pattern and propose guidance of risk management, internal control and method of fraud reduction; thereby improving the effectiveness of operation and enhancing the monitoring of the organisation.

COSO 2013 report comprises 3 main parts: summarization for the executive, the ICS model and tool of the effectiveness assessment of the ICS. In addition, COSO has issued a manual of internal control for preparing financial report for externals, which presents approaching methods and illustrations.

Components of the ICS of COSO 2013

In 2013 COSO Framework, five integrated components are concluded as 17 principles to help managers more easily setting up the ICS, including:

- ✓ Control Environment (CE): is the foundation of consciousness, organizational culture affecting conscious control of all members in an organization. CE is a base of 4 remaining divisions of the ICS in order to develop regulations and appropriate operating structure.

- ✓ Risk Assessment (RA): is a process of identifying and analyzing risk related to the enterprise's objectives, thereby can be risk management. Each enterprise always deals

with a range of inside and outside risk with a prerequisite of risk management as goal setting. Goals should be set up as different levels of extent and be consistent.

- ✓ Control Activities (CA): Control activities is a set of policies and procedures to ensure the directive of managers should be carried out. CA is also essential activities to deal with risk threatening the objectives of an organization. CA remains in every department and every operation level in an enterprise.

- ✓ Information and Communication (IC): Information and communication are indispensible requirement for establishing, maintaining and improving the controlled abilities within an enterprise throughout forming reports to provide information of operation, finance and compliance, including both inside and outside the company. The required information should be identified, collected and transferred to individual, relevant departments timely and appropriately.

- ✓ Monitoring Activities (MA): Monitoring is a process of qualitative assessment of the ICS by the time, comprising regular and periodic monitoring. Typically, both of regular and periodic monitoring should be combined to ensure the effectiveness of the ICS. Regular monitoring should be conducted in daily activities of a company, including monitoring activities, daily management and other operations.

In summary, the internal control comprises 5 basic factors, 17 principles and concepts of the ICS. Internal control is not a series of processes, which is a component affected the next component. It is an interative proces and multi dimension that each component can be interact with other.

The effectiveness of the Internal control system

According to Vietnamese dictionary, the effectiveness means effectiveness, productivity and contrary to disable (Vietnamese dictionary, 2014). The effectiveness is extent of completion of task or goal. The comparison of what is actually performed with what can be achieved with the same consumption of resources (Cambridge Business English Dictionary, 2016). The effective internal control provide reasonable assurance for relevant objectives (Chen, 2008). The ICS of various organisations are operated with different effective level. Coso (2013) shows that: the effectiveness of an internal control system might be examinised by one of three different objectives once the Board of Directors (BOD) and managers reasonably assure that:

- ✓ Clear understanding of operational objectives being in extent of achievement.

- ✓ The financial report is prepared and disclosed understandable and reliably

- ✓ All policies and regulations should be followed and respected.

Operational feature of Retail Chain Stores Business

Definition of Retail Chain

Retail Chain is one of the most important development of retail outlet that have the same ownership, share brand and central management and usually have standardised business methods and practice to hightlight stores and be easily recognised. Chain Stores have more advantage than independent stores with low price and high quantity of goods consumption. A retail chain store system is a network of branches in various locations, under centralised

management and similar line of goods sales. Retail chain is a group of stores selling the same line of goods with unique ownership and centralised location (Gupta, 2015).

Fearture of Retail Chain Stores effecting on the Internal control system (ICS)

Special features of Retail Store Chain are specializing one, two or more product lines, fixed prices without negotiation, compliance with the rule "Paid in cash" without sales in credit. Besides, main goals of most of chain stores are to create the direct networking with consumers by eliminating agencies; operate under centralized management and integrated horizontally. Moreover, the layout of stores is simple and similar. The supply and purchase of goods is conducted by headquarter. Branches of retail chain are scattered throughout the cites and to serve the demand of remote customers. Most of goods are mainly essential commodities that revenue should be focused and generated instantly.

All Features mentioned above are specific characteristics of Retail chain store business. These points affect the ICS of the company. Therefore, retail chain enterprises should concern these features in order to create the suitable ICS.

3.RESEARCH METHODOLOGY

3.1.Model establishing

Researching model

Basing on COSO report (2013), the ICS comprises 5 factors which are controll environment, risk assessment, controll activities, information and communication; the study proposes research model concluding 5 factors directly affect the effectiveness of Retail chain store business in Vietnam.

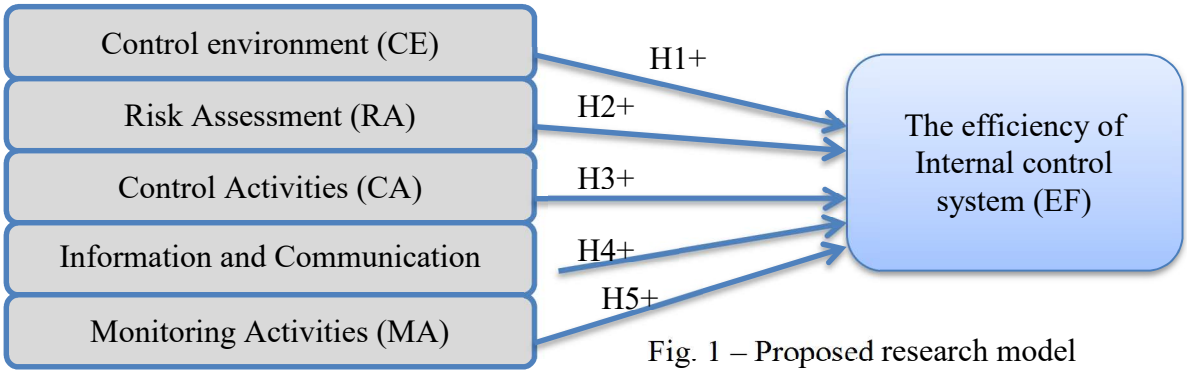


Fig. 1 – Proposed research model

Hypothesis development

Control environment: this is a factor impacting on the effectiveness of the ICS of each company (Lembi Noorvee, 2006; Linval Frazer, 2012; Coso 2013). Hypothesis H1: *Good control environment improves the effectiveness of the ICS of Retail Chain stores in Vietnam*.

Risk assessment: each company is always faced with risk resulting form inside and outside environment. This factor is difficult to control, therefore managers should be prudent to indentify and analyse factors that realated to risk, including potential risk. (Lembi Noorvee, 2006; Linval Frazer, 2012; Mongkolsamai et al., 2012; Coso 2013). Hypothesis H2: Strengthening risk assessment in order to improve the effectiveness of the ICS of retail store chain business in Vietnam.

Control activities: control activities are regulations and procedures that ensure the implementation of managers (Coso 2013). Hypothesis H3: Tight control activities increase the effectiveness of the ICS of retail chain store business in Vietnam.

Information and community: This is an indispensable factor in business control and is the fundamental for desion making of manager correctly and timely in business to achieve the company's objective. (Lembi Noorvee, 2006; Athony Wood và Natalya, 2013; Coso 2013). Hypothesis H4: improving information and communication contributes the effeciency of the ICS of retail chain store business in Vietnam.
Monitoring: this is a process of quality of the ICS during operation to adjust and improve appropriately (Coso 2013). Hypothesis H5: Well organised monitoring is to develop the effectiveness of the ICS of retail chain store business in Vietnam.

Regression model of factors affecting the effectiveness of the ICS of Retail chain business in Vietnam

Equation:
$EF = \beta_0 + \beta_1 CE + \beta_2 RA + \beta_3 CA + \beta_4 IC + \beta_5 MA + \varepsilon$
***Where in*:**
EF: the effectiveness of the ICS of retail chain store business in Vietnam
β_0**:** constant term
β_i**:** coefficient of variation
ε_i**:** Residual

Independent variables **CE, RA, CA, IC, MA** are control environment, risk assessment, control aktivity, information and comunication, monitoring respectively.

3.2.Variable scale

According to previous studies presented above, basing on questionnaire surveyed on genereted rerearchs and 17 principles of Coso 2013 pattern, the study has developer a questionnaire following to Likert scale with 5 levels: 1 – total disagreed, 2 – disagreed, 3 – neutral, 4 – agreed, 5 – total agreed. After collection of documentation, the questionnare is designed based on 5 factors: CE, RA, CA, IC, MA. Fig. 2 and 3 below present the scale of the effectiveness of the ICS:

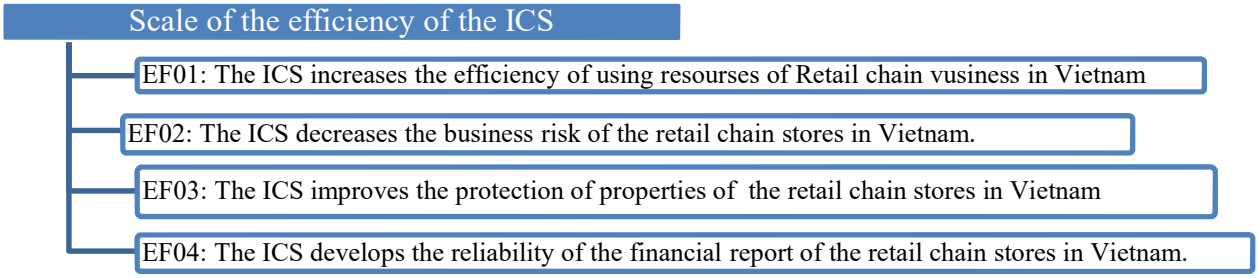


Fig. 2 - Scale of the efficiency of the ICS. Source: Author

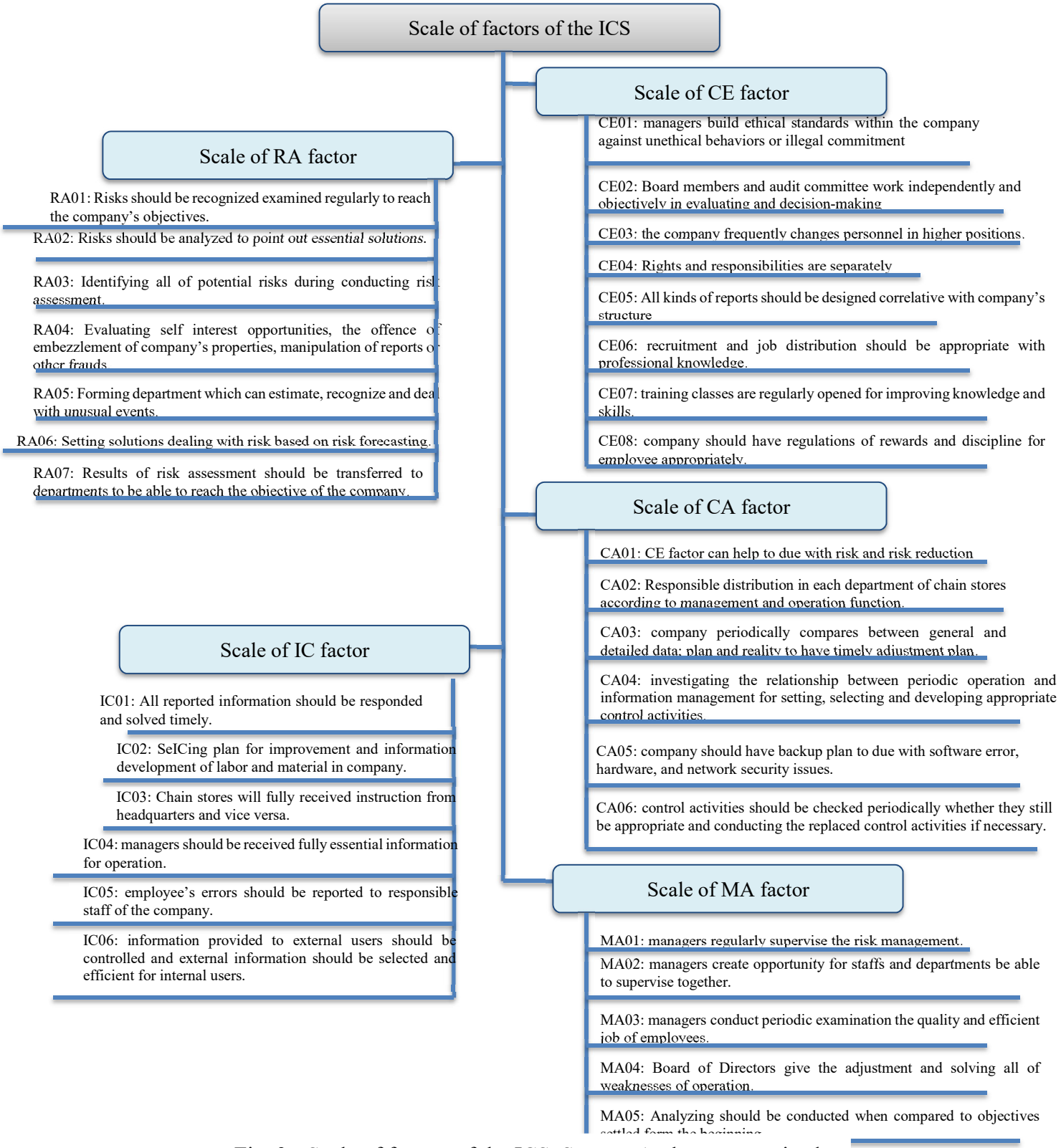


Fig. 3 - Scale of factors of the ICS. Source: Author summarized

3.4 Data description and surveyed objects

Collected data through the questionnaire is surveyed from sales staffs, store managers, others staffs of the retail chain stores in Vietnam who are staffs and managers of 24 enterprises in retail chain, mainly store managers, sales staffs, staffs from different departments. Surveyed sample size: total number of questionnaires: 210 questionnaires were emited, 208 were collected while 2 was fault.

4.RESULT AND DISCUSSION

4.1.Result

Assessment of reliability scale by Cronbach's Alpha variables

The result of assesment of reliability scale by Crobach's Alpha variables (α**)** and Corrected item – Total correlation

- ✓ *Assessment of reliability scale of independent variables (CE, RA, CA, IC, MA)*

Tab.1: Scale of control environment (CE) factor is constituted by 8 observable variables. α of all variables are larger than 0.6 (table 1) and correlation of total minimum variables is 0.467 >0.3 so all of variables are satified. Therefore, scale of factors of the ICS achieves the essential reliability.

Tab. 1 – Statistic of reliability scale of the ICS's factors in retail chain companies in Vietnam. Source: Author's calculation

Reliability									
CE		RA		CA		IC		MA	
α	N.	α	N.	α	N.	α	N.	α	N.
0.864	8	0.831	7	0.838	6	0.816	6	0.841	5

- ✓ *Assessment of reliability scale of effectiveness dependent variables*

Tab. 3: Scale of effectiveness dependent variables is designed by 4 observable variables. In table 3, α = 0.734 (> 0.6) and correlation of total minimum variables is 0.474 >0.3 so all of variables are satified. Therefore, scale of factors of the ICS achieves the essential reliability.

Tab. 2 – Statistic of reliability and correlation of total effectiveness dependent variables. Source: Author's calculation

Reliability Statistics		Item-Total Statistics		
α	No. of Items		Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
0.734	4	EF01	0.489	0.698
		EF02	0.507	0.685
		EF03	0.645	0.609
		EF04	0.474	0.704

Statistic of scale – Exploratory Factor Analysis EFA
After assessing the reliability, we evaluate the value of scale by EFA factor analysis, the following results:

- ✓ *The result of scale value assessment of the ICS's factors*

Conducting KMO and Bartlett's Test. The result shows that KMO is 0.786, larger than 0.5; meanwhile Barllet Test's Sig value is 0.00, less than 0.05. Hence, analysis of factors is appropriate.
The result of total variance conducted after factor analysing has Eigenvalue larger than 1 and there are 5 factors created. Result of Cumulative % is 54.47% , larger than 50%. As the result, 5 elements are formed: Group 1 – control environment (CE) factor comprising 8 variables; Group 2 – Risk assessment (RA) comprising 7 variables; Group 3 – control activity (CA) comprising 6 variables; Group 4 – Information and communication (IC) comprising 6 variables; Group 5: monitoring activities (MA) comrpising 5 variables.

- ✓ *The result of scale value assessment of the ICS's effectiveness*

Tab. 3: KMO và Barllet Test in factor analysis shows that KMO is 0.744, larger than 0.5 with Sig = 0.000; so EFA analysis is appropriate. Eigenvalue > 1, factor analysis has criticized only one factor with variance is 56%, over than 50% - satisfied. The result shows that measurable variables only give one factor. Consequently, the scale gets convergent value and do not consider discriminate value as there is only one factor.
Tab. 3 - KMO and Bartlett's Test. Source: Author's calculation

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.744
Bartlett's Test of Sphericity	Approx. Chi-Square	175.097
	Df	6
	Sig.	0.000

Analysis of descriptive statistics
Tab. 4: Statistical result shows that mean value of independent variables has difference from 3.04 to 4.19. In particular, monitoring factor (MA) has average value from 4.18 to 4.19, which has the highest average value among 5 independent variables. Managers regularly operate risk management. In contrast, Information and communication (IC) factor has the lowest average value from 3.04 to 3.24, which is average level. As the result, IC activity has not been done well.

Tab. 4 – Statistic describes mean values of factors affecting the effectiveness of the ICS.
Source: Author's calculation

Factors (N=207)	Min.	Max.	Mean	Std. Deviation
CE	2.25	5.00	3.8478	.59089
RA	1.86	4.86	3.4596	.68752
CA	1.17	4.83	3.3704	.70134
IC	1.33	4.83	3.1192	.57597
MA	2.60	5.00	4.1787	.58454
General assessment of the internal control system	2.68	4.38	3.5951	.31167

Based on tab. 5: the result shows that the mean value of the ICS of retail chain business is 3.6 point, which is at high medium level.

Tab. 5 – Statistic of observable variables of the effectiveness of the ICS.
Source: Author's calculation

Factors (N=207)	Min.	Max.	Mean	Std. Deviation
EF01	2	5	3.59	.557
EF02	3	5	3.64	.519
EF03	3	5	3.71	.488
EF04	2	5	3.71	.524

Correlative inspection

Correlative inspection uses correlative coefficient of Pearson to quantify the degree of correlation between indepent and dependent variables. In table 7, the result shows that indepent variables - CE, RA, CA, IC, and MA which correlative coefficient is same way with dependent of the ICS; the correlative coefficient of independent variables and dependent variables fluctuate from 0.212 to 0.550. RA and CE variables has an average relationship with the effectiveness of the ICS, remaining variables are not closely related to the effectiveness of the ICS.

Tab. 6 – Correlative matrix of dependent variables and independent variables.
Source: Author's calculation

Correlations							
		EF	CE	RA	CA	IC	MA
Pearson Correlation	EF	1.000	.525	.550	.331	.223	.212
	CE	.525	1.000	.208	.028	.036	.169
	RA	.550	.208	1.000	-.029	-.102	.049
	CA	.331	.028	-.029	1.000	.088	.050
	IC	.223	.036	-.102	.088	1.000	.096
	MA	.212	.169	.049	.050	.096	1.000

Analysis of ANOVA variance

- ✓ *Analysis of the suitability of the general regression model*

The table 7's result shows that the adjusted coefficient R^2 is 0.640, less than R^2 = 0.649. With R^2 = 0.649 means that dependent variables is described 64.9% by independent variables mentioned above.

Tab. 7 – Summarized model with dependent variables is the effectiveness of the ICS.
Source: Author's calculation

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.805[a]	.649	.640	.23392	.649	74.243	5	201	.000	1.752
a. Predictors: (Constant), MA, RA, CA, IC, CE										
b. Dependent Variable: EF										

In tab. 8, ANOVA analysis shows F parameter has Sig = 0.000, suggesting that construct regression model is appropriate with collected data and used variables are satisfied in term of statistic at 5% significance.

Tab.8 – Analysis of the reliability of ANOVA model. Source: Author's calculation

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	20.312	5	4.062	74.243	.000[b]
	Residual	10.998	201	.055		
	Total	31.310	206			
a. Dependent Variable: EF						
b. Predictors: (Constant), MA, RA, CA, IC, CE						

As the result, regression model with dependent variables is the effectiveness of the ICS and independent variables are factors of the ICS, comprising 36 factors related to control environment, risk assessment, control aktivity, information and communication, monitoring; this model is the fundament for 5 hypothesises' analysis.

Hypothesis testing the meaning of regression coefficient and multicollinearity phenomenon

Tab. 7 shows that coefficient R^2 < 0.8; Tab. 9 illustrates that once the reliability is examised, independent variables, Sig value < 0.05, showing high reliability. Also, the table shows that the maximise VIF coefficient is 1.076, less than 2; Tolerance coefficent is quite good (minimum as 0.93) so it can be concluded that there is no multicollinearity phenomenon.

Tab. 9 – Results of regression coefficient. Source: Author's calculation

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.406	.191		2.129	.034		
	CE	.258	.029	.391	9.016	.000	.929	1.076
	RA	.281	.024	.496	11.525	.000	.944	1.060
	CA	.173	.023	.311	7.395	.000	.989	1.011
	IC	.151	.029	.224	5.273	.000	.971	1.030
	MA	.057	.028	.085	1.991	.048	.961	1.040

Testing assumption of multi regression model

Performed testing: assuming the variance of error (residual) is constant; Durbin Watson testing; the result shows that there is no correlative phenomenon of residuals which have standard distribution.

Official regression model of factors affecting the effectiveness of the ICS

According to tab. 9, regression coefficent of these variables is positive, it means that these variables has the same direction with dependent variables as the effectiveness of the ICS. The regression equation of factors of the ICS affecting the effectiveness of ICS:

$$EF = 0.391CE + 0.496RA + 0.311CA + 0.224IC + 0.085MA$$

As the result, all 5 factors – control environment (CE), risk assessment (RA), control activitie (CA), information and communication (IC) and monitoring activities (MA) – have the positive proportion with the effectiveness of the ICS of Retail chain business in Vietnam. It means that the higher CE, RA, CA, IC, MA are valued, the more efficient the ICS of retail chain business in Vietnam is. Among 5 factors, risk assessment (RA) factor strongly impact on the ICS of retail chain business in Vietnam ($\beta = 0.391$), CA factor ($\beta = 0.311$), IC factor ($\beta = 0.224$) and MA factor ($\beta = 0.085$) which weakly impact. This result is consistent with the finding of Amudo & Inanga (2009) conducted in Uganda; Ho T. V. (2016) carried out in Vietnamese commercial banks; be partly appropriate with research of Mongkolsamai et. al. (2012) in Thailand. Therefore, the result of hypothesis testing states that hypothesis H1, H2, H3, H4, H5 for researching model are approved.

4.2 Discussion

Through the mentioned analysis above, the ICS of retail chain business is at pretty average level; the effectiveness of the ICS is also at pretty average level (to 3.6 points); In particular, CE, RA, CA, IC, MA factors have effect on the effectiveness of the INCS of retail chain business in Vietnam, the result is consistent with theory and previous studies studying the effectiveness of the ICS.

As regards the impact of each factor on the effectiveness of the ICS of Retail Chain business in Vietnam; according to the result of research:

- ✓ Risk assessment (RA) factor is the strongest impact on the effectiveness of the ICS in retail chain business in Vietnam, but just reaching at the pretty average level to 3.46. This shows that companies do not really focus on risk assessment activity, especially on potential frauds in financial report, causing property loss and other frauds occurring (only to 3.38), while companies have not identified and assessed risk regularly within company, departments, stores; most of risk have not been analyzed closely lead to the risk countermeasure inappropriately (only to 3.43 points).

- ✓ Control environment factor (CE) is the second level of effecting factor. Average value is 3.85 at the pretty good level. According to the survey, the lowest result shows that companies has not separated right and responsibility clearly and reasonably, some employees hold various of work, while the recruitment and job assignment are not satisfied with professional knowledge of employees.

- ✓ The third level impact on the effectiveness of the ICS is control activities, to 3.37 points, at pretty average level. Regarding the survey result, companies have not relied focused on periodical data checking of each department of retail chain; the on-time-adjustment of data checking both synthetic data and detailed data is only to 3.34. While companies have not concerned about control activities whether they still be appropriate and conducted control activities replacement as needed (only to 3.34).

- ✓ The fourth impact factor is Information and communication (IC) is only average level to 3.12. This is the less concerned factor. Through the interview result, companies have not been interested in current information. Therefore, there is no assurance of information provided to outside and received from outside whether they are appropriate and essential with users (to 3.04 points). Meanwhile, enterprises have not focused on communication to ensure that chain stores will receive full instruction from headquarters or headquarters will receive feedback from chain stores; reported information has not been feed backed and timely processed because companies have not planned for improvement and development the information system (3.12 points).

- ✓ Finally, the weakest impact factor is monitoring activities (MA) but reaches the highest of average value to 4.18, at good level. Based on the interview research, the company has focused on monitoring within the organization. However, the company has still not been interested in creating change for employees and departments getting monitor to each other in daily job.

5 CONCLUSIONS

The result of research shows that the internal control system (ICS) in Retail chain business in Vietnam is not really effective. The effectiveness of the ICS in these companies reachs only at pretty average level and be affected by 5 main factors, namely control environment (CE), risk assessment (RA), control activities (CA), information and communication (IC) and monitoring activities (MA). This result is consistent with the findings of Ho T. V (2016) when investigating in Vietnamese commercial banks. In addition, the ICS of these companies need to be improved, such as according to RA, most of surveyed companies have not set up particular team for risk

forecasting to take measures timely, leading to risk recognisation, risk assessment and risk analysis which get lots of obstacles and be unable to react with risk. According to CE factor: the right and responsibility of employee have not been classified clearly, there is still overlap situation in duty of stores‘ staffs and related departments in headquarters. Regarding CA factor: the comparision of general data and detailed data, plan and reality is incorrelated, the information security is risky and easily to get unuasual incident. About IC factor: surveyed companies have invested the information system inappropriately, leading to the transmission information form headquarters to chain stores and vice versa not be timely. According to MA factor: maintaining of the effectiveness of the ICS in each developed stage has been monitored closely. However, the company has not create change for staffs and departments monitoring together.

The market of retail chain business is growing, full of risk and challenges, number of chain stores are increasing, causing difficulties for managers. Managing the retail store chains effectively requires management building up the appropriate development strategies, increasing the number of customers, expanding market shares but still controlling costs and revenue. Effective internal control system can ensure the truthfulness and reliability of financial information (Jianfei Leng, Yiran Ding, 2011). Internal control helps firms achieve important objectives and sustain and improve performance (Coso, 2013). So, the retail store chains need to improve their monitoring. To achieve that, managers should build up an effective internal control system, leading business's operation be effective; meanwhile the retail chain business in Vietnam shoud overcome disadvantages in order to improve the effectiveness of the ICS as well as strengthen the effectiveness of the ICS, contributing to the development of group of companies. The findings of this study will help the Vietnamese retail store chains review the implications of their internal control system; especially improve the effectiveness of the internal control to get more effectively in the context of Vietnam to increase firms' financial performance. Future studies may expand the sample size and other industries or examining the impact of other factors on the effectiveness of the internal control system to obtain more valuable research results.

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INTERNAL AUDIT EFFECTIVENESS: A CASE FROM VIETNAMESE LISTED COMPANIES

Le Thi My Hanh, Pham Duy Thinh, Tran Do Thuy Linh

Abstract

This study investigates factors that impact on internal audit (IA) effectiveness of in Listed companies on Vietnamese Securities Market. As regards the regression analysis through the surveyed results of 104 high-level managers and internal auditors in listed companies, which pointed that IA effectiveness in listed company on Hochiminh Stock Exchange (HOSE) is at good average level (at 3.8 point). Besides, internal audit effectiveness in these companies are impacted by factors which are independence, competent experience, management's awareness of the internal audit's role. In particular, the competent experience factor of internal audit is a main factor. The result of this study is consistent with theories and previous studies on factors effecting internal audit effectiveness.

Keywords: internal audit effectiveness, Vietnam, listed company

JEL Classification: M42.

1.INTRODUCTION

During the past few years, scholars and practitioners have been aware that IA should experience a major change to 'add more value' to a company (Arena M. & Azzone G., 2009). Besides, internal auditors' role is to mantain information networks and they are related in an economy basing on independently-produced information (Peursem K.A., 2005). The assessment of auditing efficiency is essential as it illustrates how political and bureaucretic players obseve and act the auditing process (Mizrahi S. & Ness-Weisman I., 2007). IA has been founded and developer over 70 years and recognised in almost countries as a professonal career. In particular, after the collapse of large corporations, IA is becoming an effective tool for the risk control of companies through the functions of assurance and consultancy for Board of Directors and owners (Arena M. & Azzone G., 2009; George D. et al, 2015; Wu T. et al, 2016). The role of IA is shifted from traditional roles of management evaluation to consulting activities and giving objective assurance for management.

This paper is relevant to developing countries, where the monitoring activities of mananaging practices is still poor, especially in Vietnam. According to the result of World Bank's assessment (2016), Vietnamese Economic and political reforms have spurred rapid economic growth and development. The Vietnamese Government has showed determination for revolution that focuses on some issues, especially social equity (World Bank 2016). Therefore, the monitoring role of corporation in public corporations has become a central issue to increase social equity's attraction in both the financial and the academic press; especially the supervision over the activities of Internal Audit. In Vietnam, listed companies are required the IA in accordance with regulation in order to protect the property, assess the quality and reliability of economic information, finance, the implement of law, régime, and policies of the Government (Vietnamese Ministry of Finance, 1997). Moreover, the regulations of IA are expected to come into effect in early 2017 requiring IA conducted in all listed companies and kinds of business. However, the result of previous IA, effectiveness and the assessment of IA function in company

should be answered. Hence, the identification of factors affecting internal audit‘s effectiveness should be solved.
According to the mentioned objective of this study, in part 2, it reviews previous researched relating factors effecting internal audit effectiveness (IA). Meanwhile, theoretical framework related to research content will be conducted in part 2. Part 3 describes brief researching methods and datas and part 4 presents the result of research and discussion. The paper will point out some conclusions basing on the results of research.

2.LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1:Literature review

Internal audit (IA) has founded very early in the world, there are a number of studies relating the effectiveness of IA and related factors. The study of Shewamene Hailemariam (2014) was to examine factors deciding the effectiveness of IA within public areas in Ethiopia. The quantitative method concluding 56 companies, the author measured the effect of factors assisting the IA management, the competent experience of IA, the policies of IA, the independence of IA and the manager’s awearness of IA’s value. The result of this study concludes that manager’s support, qualified internal auditor and the effective approved policies of IA significantly impact on IA effectiveness in the public sector of Ethiopia. Drogalas George and partners (2015) examined factors effecting IA effectivenessof listed companies in Athen security market (Egypt). The research model has independent variables, which are the quality of IA, the competence of internal auditor, the independence of IA and the manager’s support. The result shows that all of factors conducted in the research model affect IA effectiveness. Particularly, the independence of IA is the most important factor in the research model. Finally, the study summarises that IA has a huge impact on many Egyptian companies. Another research is of Tušek (2015) mentioning the effect of Audit Committee on IA within the company’s management system. 65 internal auditors and members in Audit Committee within companies in Croatia were taken as samples. The result shows that the effectiveness of IA’s function inreased by combining with the activities of Audit Committee. A research of Wu T. et al. (2016) examises the affect of competence, teamwork capacity and computer audit on IA effectiveness. The sample of 246 members of the Institute of Internal Auditors (IIA) is attending anual meeting in Taiwan in May 2013. The research result shows that teamwork capacity and computer audit directly impact on IA effectiveness and competence indirectly effects through intermediary effects of teamwork and computer audit activity.
In Vietnam, IA’s research is quite small, because most companies have fewer IA departments. Phan T. K. (2014) measures the performance of IA functions in construction firms in Vietnam, with data collected from a survey of eight construction corporations with IA in the period 2008-2013 combined with in-depth interviews. The results show that IA has become a tool used by managers in a few Vietnamese construction corporations; IA’s results do not meet the expectations of managers; The quality of performing IA is low; most IA do not meet the goals set out in terms of time as well as content that reduce the role of IA in corporate governance; Identifying areas with high risk and high risk activities is not as expected. However, the study used a relatively small number of samples and did not represent the overall population. Also in 2014, Nguyen T.T., & Nguyen T.T.D., evaluated IA with 29 listed companies in listed companies on HOSE. The authors conclude that most listed companies have IA; IA department within listed companies are gradually improving, contributing to improving the company's operations as well as ensuring the transparency of information provided on the stock exchange; There are still issues in the scope of operation of the Internal Audit Department and the audit

sector, IA is still confined to control the operation of certain departments; IA's position has not been high valued and the function of IA is still confused with internal management.
Studies in Vietnam mainly focus on studying the aspects of IA in a particular company or group of sectors and locality, with the main method used is the qualitative method. Studies on the impact of factors affecting IA's effectiveness are very few. Especially quantitative research to determine the impact of factors on listed companies' internal auditing performance on HOSE is not many. In this study, the author examines IA effectiveness in listed companies on HOSE and the major influencing factors using quantitative methods. This is the difference of the topic compared to previous research on IA in Vietnam.

2.2.Theoretical Framework

Internal Audit
Internal Audit (IA) is one of three types of auditing when classified according to the entity performing the audit. IA forms and develops after independent auditing and government auditors but have rapidly increase both in terms of awareness and practice. IA exists and develops from companies themselves, and from the manager's requirements. IA has been founded to meet the management requirements of enterprises. As companies' operations increase, the workload and complexity of operations is bigger, the managers cannot directly undertake the monitoring and evaluation activities accurately and fully as well as reliability of information. IA appears and assists managers in the independent monitoring and evaluation of corporate activities. According to the Internal Auditor Institute (IIA, 1999): IA is an independent and impartial assurance and consulting designed to add value and improve an organization's performance. IA assists the organization in achieving objectives through systematic approach to evaluate and improve the effectiveness of its risk management, control and management processes.

***Internal audit effectiveness* (IAE)**
Effectiveness is the achievement of the goal of an organization, a program or activity (Omar et al., 2007). Effectiveness is the capacity to achieve that result correlated to the goal (Arena & Azzone, 2009). IAE is the ability of auditor either internal or external to achieve defined goals within the organization (Arena và Azzone, 2009). Auditing effectiveness is the number and scope of deficiencies corrected following the auditing process (Mizrahi S. & Ness-Weisman I., 2007). Although the definitions are different but the meaning and content are similar which means achieving same objectives. However, the goal of IA for each organization depends on the criteria set by the management, so different organizations will have a different objective for the content of IA to obtain with available sources and other elements that support to reach company's target. Van Peursem (2005), IAE is very important in providing the independent information needed to assist the improvement of controlled environment, risk management and management processes. Therefore, understanding the determinants of IAE is very necessary.
Peursem and Pumphrey (2005) consider internal auditors as representatives and supervisors of the Board of director (BOD) and the Audit Committee. However, internal auditors may have different incentives to act against the BOD and the Audit Committee for self-interest such as financial rewards, personal relationships, positions in the future and their wages. This will greatly affect the effectiveness of the IA reports. The board must take solutions to prevent threats of independence, objectivity and to ensure the independence and objectivity of internal auditors. Internal auditors, as representatives, must perform professional-level auditing procedures that require education level, expertise, experience, and other necessary capabilities to carry out their responsibilities in the best. Auditors with mentioned requirements combined with the training programs by the Audit Committee assists them to make every effort to

maximize their ability to develop the effectiveness of IA. In addition, in order to reinforce the trust, and trust of the Board of Directors, internal auditors constantly learn and improve their knowledge in order to prove their duties in accordance with the professional level thereby increasing the effectiveness of audits.

Internal auditors acting as representatives of organizations significantly need of support from the members of the organization. The presence of an effective audit committee will ensure the independence of the IA and also reduce the intervention of the manager either within the scope of the audit or in its performance. For example, issues related to the potential impact of managers on employment and internal auditors' future wages will be resolved by the BOD, the audit committee that have absolute authority to appoint and dismiss the head of internal auditing department. At the same time, in order for the IA to work effectively, to ensure the independence and objectivity of the Board of Directors, it is necessary to issue the IA's policies and regulations which clearly define the responsibilities and powers of the IA.

According to the IA's professional practice standards, communication skill is one of the key skills of internal auditors. The studies of Davidson (1991) and Quinn & Hargie (2004) confirmed the importance and necessity of effective communication skill in all organizations. Some studies by Lewis and Graham (1988) and Smith (2005) also suggest some ways to improve communication skills. Davidson (1991) asserts that all internal auditors can benefit from understanding the concepts of communication and even believe that they are the best communicators to work consciously in the evaluation, improvement and application of their skills. Good communication among internal auditors, between internal auditors and auditing objects, between the internal auditors and the members of the organization will improve IA effectiveness. The importance of communication in this study is directed to the skills and capabilities of internal auditors. Internal auditors with good communication skills will have many advantages in the process of collecting evidence; working with auditing objects, among audit team members, etc. therefore IA effectiveness will be improved and developed.

3.METHODOLOGY

3.1.Research Model

A research model proposes to inherit factors that are considered to have an impact on the IA effectiveness of previous studies (Hailemariam S., 2014 & George et al., 2015). The proposed model with dependent variable is IA effectiveness. The independent variables are the factors that affect IA effectiveness, including: Independence of IA (ID), The support of management for IA (SM), The competence and experience of IA department (CE), Management perception of the value of IA (MP) and Approved IA's regulations (RE); as follow:

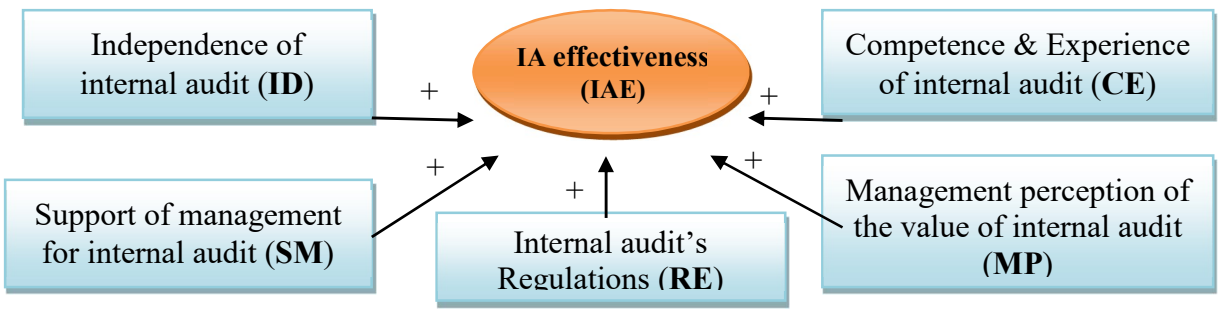


Fig. 1 - The proposed research model. Source: Summary from previous studies

3.2 Research Hypotheses

Independence of internal audit (ID)

The independence of IA is related to IA effectiveness (Al-Twaijry et al., 2003; Wahid Abu-Azza, 2012; Drogalas George et al., 2015). The main reasons affecting the independence of the internal auditors are the lack of direct interaction with the board, the limited reporting of the finding contents to the higher management and the right of access to other necessary information (Wahid Abu-Azza, 2012). The above researches provide the explanation of the relationship between the independence and effectiveness of IA when internal auditors have sufficient independence based on reliable evidence regardless of concerning the relation of audit work, they will be able to access all the activities that taken place within the company, which will provide an overview of the performance of company so that managers make suitable decisions. Based on this discussion, we state the first hypothesis as follows:

H1: The independence of IA and IA effectiveness are in the same direction.

Support of management for internal audit (SM)

Internal audit is most effective when receiving support from senior management. The success of IA depends on the support of senior management for the IA process. Without the support and encouragement of management, the IA process may face failure and waste of money. Studies have used the support of senior management as an independent variable or determinant factor (Ahmad et. al., 2009; Arena & Azzone, 2009; Mihret & Yismaw, 2007). Internal auditors are the representatives of the members of the organization that carry out the supervision and inspection of all matters within the enterprise, thus requiring support from the members of the organization (Peursem & Pumphrey, 2005). An example of the support of the members of the organization when requiring all departments to implement the recommendations of IA, ensuring resources for funding, and labor for IA's operation. The effectiveness of IA functions is directly related to the management style of the managers and their relationships, their position in the society as well as the attitudes and qualities of the manager (Ali et. al., 2007; Mihret & Yismaw, 2007), so we state the second hypothesis as follows:

H2: The support of management for internal audit and IA effectiveness are in the same direction

Competence and experience of internal audit department (CE)

Professional practice standards issued by the internal audit committee require internal auditors to have the knowledge, skills and competence about auditing. Technical competence and continuous training are considered essential elements of IA. Internal auditors' certifications are considered as a capability indicator of IA (Gramling & Meyers, 1997); internal auditors will not have power when they do not have essential capacities (Al-Twaijry et. al., 2003). In addition, internal auditors must constantly improve skills, including communication skills. Internal auditors also need to train communication skills when engaging in auditing. Good communication skills enable them to provide complete, accurate, timely information to managers; to exchange information among auditors (Arena & Azzone, 2009). According to this, we can develop the third hypothesis:

H3: The competence and experience of internal audit and internal audit effectiveness are in the same direction.

Management perception of the value of internal audit (MP)

IA has the role of supporting the organization in monitoring, evaluating, consulting and supporting the process of improving performance and adding value to the organization (Internal

auditing committee, 1999). IA helps organizations to accomplish goals through systematic reviews of activities within the organization. However, do business managers really realize all the functions and roles of IA? If managers are aware of the importance of IA, support, facilitate the IA operation, IA effectiveness will be raised. IA in the Saudi Arabian business sector has not developed, managers sometimes fail to implement the recommendations of IA (Al-Twaijry et al., 2003). The implementation of IA function in construction companies has not been highly valuated by managers; managers have not paid attention to IA (Phan T. Kien, 2014). IA's position has not been appreciated and IA's functions are still confused with internal control (Nguyen T. Tam & Nguyen T.T. Diep, 2014). Hence, we can state the fourth hypothesis:

H4: Management percetion of the value of internal audit and internal audit effectiveness are in the same direction.

Approved internal audit's regulations (RE)
Companies issue IA rules / regulations which clearly define the functions and powers of IA so IA effectiveness will be high. IA's regulations are important components of IA efficiency. The presence of IA rules creates more power and position of IA in the company (Van Peursem, 2005). This is also an important feature in ensuring the independence of IA within the organization. Based on this discussion, we state the ftfth hypothesis as follows:

H5: The approved regulations of internal audit and internal audit effectiveness are in the same direction.

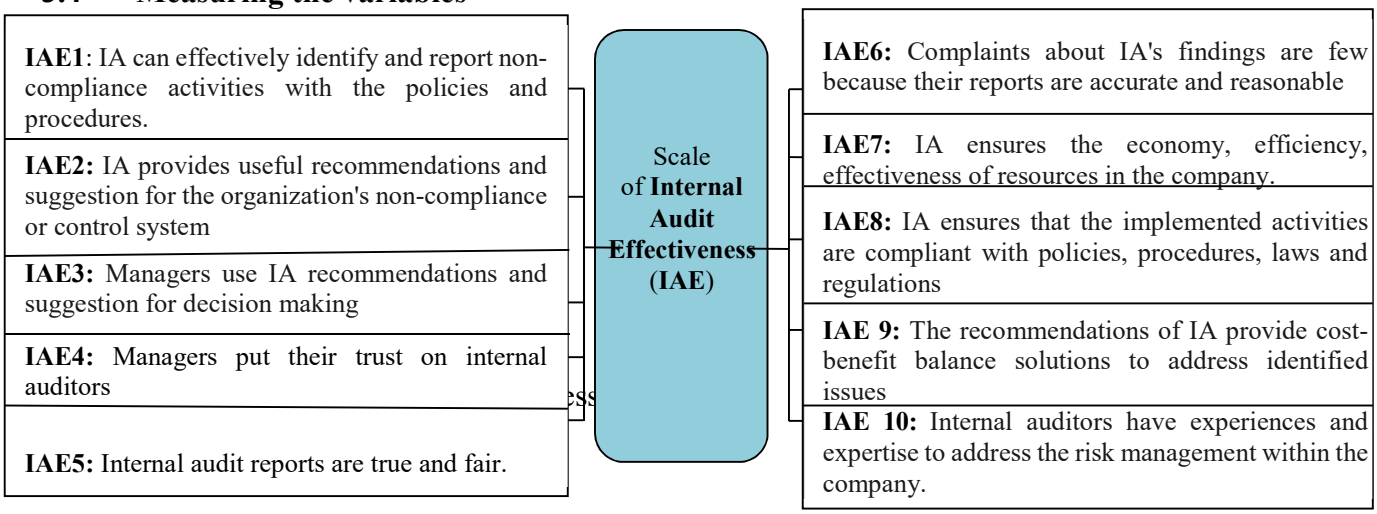
3.3 Experimental Model: The factors impact on Internal Audit Effectiveness

Regression model of factors affecting IA effectiveness in Listed companies on Vietnamese security market.

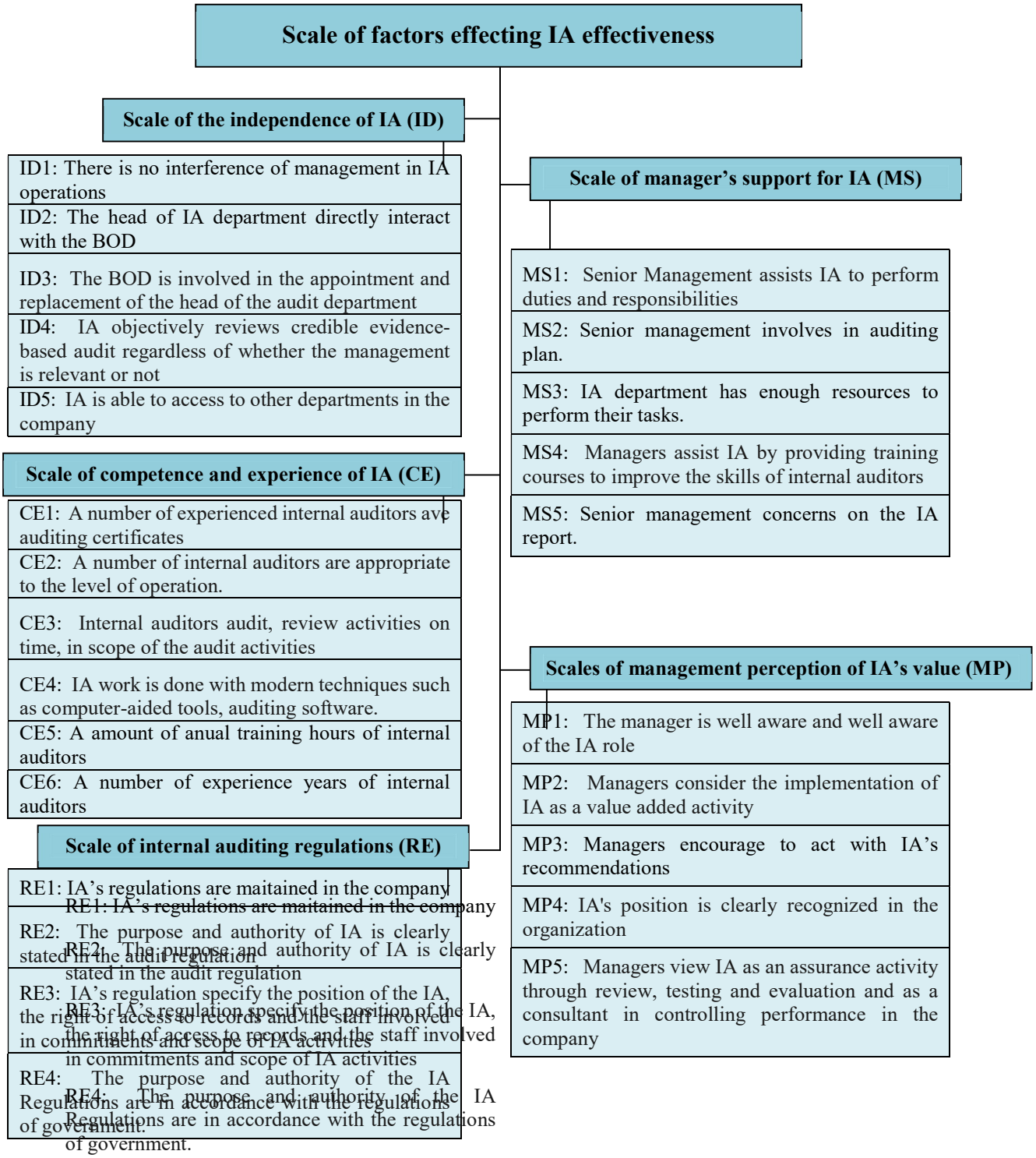
$$IAE = \beta_0 + \beta_1 ID + \beta_2 SM + \beta_3 CE + \beta_4 MP + \beta_5 RE + u$$

Where in:
IAE: the internal audit effectiveness in Listed companies on Vietnam security market
β_0: constant term; β_i : coefficient of variation; u_i: : residual
Independent variables ID, SM, CE, MP, RE are the independence of IA, managers' support for IA, the competence of IA, management perception of IA's value, the approved regulations of IA respectively.

3.4 Measuring the variables



Measuring the independence variables



3.5. Sampling and conduct of survey

Conduct of survey

The data collection was based on a survey of the listed companies in Vietnam. The respondents to the questionnaire survey were senior managers and internal auditors in listed companies on the Vietnam stock market, including two forms:

- ✓ By post: The total number of respondents is 100 and collecting 38 respondents.
- ✓ By email: The total number of respondents if 100 and collecting 72 respondents.

The total number of valid respondents used in the study was 104.

Characteristic of survey's object

According to position lavel: there were 88 respondents answered by management, accounting for 84,6%; 16 respondents answered by internal auditors, accounting for 15.4%. Regarding the duration of working, survey respondents have the most popular working time of 6 to 10 years, in which 46/88 managers account for 52.27%, 16 out of 16 people accounted for 100%; The remaining managers have a working time of more than 10 years and even more than 20 years. This indicates that the respondents have worked long enough to be able to understand the reality at the company and have enough professional experience to recognize the effectiveness of IA in accordance with the actual situation within the company.

4. FINDINGS AND DISCUSSION

4.1 Findings

Assessment of reliability scale by Cronbach's Alpha variables

Assessment of reliability scale of dependent variables

The dependent variable scale is composed of 10 observable variables. In table 1, $\alpha = 0.897 > 0.6$ and the correlation coefficient of the variables are greater than 0.3 and the coefficient α for discarded items is less than 0.897, so the variables are satisfactory. The dependent variable scale has the required reliability.

Tab. 1 – Statistic of reliability and correlation of dependent variables.
Source: Author's calculation

Obsevarable variables	IAE1	IAE2	IAE3	IAE4	IAE5	IAE6	IAE7	IAE8	IAE9	IAE10	α	N
Corrected Item-Total Correlation	0.655	0.702	0.686	0.749	0.597	0.674	0.619	0.515	0.619	0.728	0.897	10
Cronbach's Alpha if Item Deleted	0.886	0.883	0.884	0.879	0.889	0.884	0.888	0.895	0.889	0.885		

Assessment of reliability scale of efficiency independent variables

After evaluating the reliability of each independent variable scale, In tab. 2, scales of the independence of IA concludes 5 observarable variables, $\alpha = 0.862 > 0.6$; factor of management's support for IA concludes 5 observarable variables, $\alpha = 0.863 > 0.6$; factor of the competence and experience of IA concludes 6 observarable variables, $\alpha = 0.892 > 0.6$; Factor of the management's perception of IA's value concludes 4 observarable variables, $\alpha = 0.899 > 0.6$ and factor of auditing's regulation concludes 3 observarable variables, $\alpha = 0.880 > 0.6$. Thus, all variables have the required reliability.

Tab. 2 – Statistic of reliability scale IA EFFECTIVENESS. Source: Author's calculation

Factors	**α**	**No. observarable variables**
The independence of IA	0.862	5
The management's support for IA	0.863	5
The competence and experience of IA	0.892	6
The management's perception of the IA's value	0.899	4
Auditing's regulation	0.880	3

Statistic of scale – Exploratory Factor Analysis EFA
After assessing the reliability, we evaluate the value of scale by EFA factor analysis, the following results:

The result of scale value assessment of the IA's efficiency
Tab. 3: KMO và Barllet Test in factor analysis shows that KMO is 0.832, larger than 0.5 with Sig = 0.000; so EFA analysis is appropriate. Eigenvalue > 1, factor analysis has criticized only one factor with variance is 56%, over than 50% - satisfied. The result shows that measurable variables only give one factor with 07 variables such as: IAE1, IAE3, IAE5, IAE6, IAE8, IAE9 and IAE10. Consequently, the scale gets convergent value and do not consider discriminate value as there is only one factor.

Tab. 3 - KMO and Bartlett's Test. Source: Author's calculation

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.832
Bartlett's Test of Sphericity	Approx. Chi-Square	336.202
	df	21
	Sig.	.000

Total Variance Explained					
Initial Eigenvalues			Extraction Sums of Squared Loadings		
Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
3.929	56.135	56.135	3.929	56.135	56.135
.974	13.918	70.053			

The result of scale value assessment of the IA effectiveness' factors
After 3 times of evaluation the EFA, KMO = 0.726 >0.5 and Bartlett Test has value of Sig. = 0.00<0.05. Therefore, factors analysis is appropriate.
At value of Eigenvalue >1, there are five factors that are formed with the ability to explain, occupying for 74.98%. Factor rotation results have five groups of factors formed, which are ID factor including 5 variables, MS factor including 3 variables, CE factor including 5 variables, MP factor including 4 variables, RE factor including 3 variables.

Analysis of descriptive statistics
Based on Table 4, the statistical result shows that IA effectiveness in listed companies on the HOSE that was just at a moderate level (3.8 points)

Tab. 4 – Statistic describes mean values of factors affecting IA effectiveness.
Source: Author's calculation

	N	Min	Max	Average	Deviation
IAE	**104**	**2.29**	**4.43**	**3.80**	**.395**
IAE1	104	3	5	3.87	.484
IAE3	104	2	5	3.77	.544
IAE5	104	2	5	3.85	.498
IAE6	104	2	5	3.83	.548
IAE8	104	2	5	3.73	.595
IAE9	104	2	5	3.73	.686
IAE10	104	3	4	3.83	.380

As regards table 5, statistical result shows that the mean of the factors ranged from 3.63 to 4.10. In particular, the factor of experience of IA has the highest average value of 4.10, which is the biggest influence factor on IA's efficiency.

Tab. 5 - Statistics describe the mean value of the factors effecting IA effectiveness
Source: Author's calculation

Factors	N	Min	Max	Average	Deviation
CE	104	2.2	5	4.0923	.65176
ID	104	2	5	3.9885	.54386
RE	104	2	5	3.9872	.35351
SM	104	2.33	5	3.9103	.49644
MP	104	2.25	5	3.6346	.65259

Analysis of regression result

To verify the level of interpretation of the model

In Table 6, the R2 coefficient is adjusted to 0.507. Thus, 50.7% of changes in IA's effectiveness were explained by independent variables in the model, 49.3% of variation was due to other factors.

Tab. 6 - Summary of regression model**.** *Source: Author's calculation*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.722[a]	.522	.507	.27751	.522	36.365	3	100	.000	2.109

To verify the suitability of the model

In table 7, ANOVA analysis shows Sig value = 0.000 <0.01, which can be said that the model given corresponds to the actual data. In other words, the independent variable correlates with the dependent variable with a 99% confidence level.

Table 7: Analysis's result of ANOVA variance**.** *Source: Author's calculation*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.402	3	2.801	36.365	.000[b]
	Residual	7.701	100	.077		
	Total	16.103	103			

To verify the partial correlation of regression coefficients and multi-collinearity
In Table 8, we find that all variables have Sig value = 0.000 <0.01. Therefore, these variables correlate with the IA efficiency and are statistically meaning with a 99% confidence level. Variables have a coefficient VIF <2, so it can be concluded that there are no multi-collinearity.

Tab. 8 - Results of regression coefficients. *Source: Author's calculation*

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.228	.262		4.684	.000		
ID	.221	.055	.303	4.039	.000	.847	1.181
CE	.273	.047	.449	5.800	.000	.796	1.256
MP	.158	.043	.261	3.639	.000	.929	1.077

The regression model of factors effecting IA effectiveness in listed companies on HOSE
Tab. 8 shows that variables have positive regression coefficients, which means that they have the same effect on IA efficiency. The regression of factors affecting IA effectiveness in listed companies on HOSE is as follows:

IAE = 0.303ID + 0.449CE + 0.261MP

The results of research shows that if the independence of IA; the competence and experience of IA and the perceptance of managers on IA increase to one unit, the IA's efficiency will increase to 0.303, 0.449 and 0.261 times. This result is consistent with the study of Hailemariam S. (2014); Drogalas George and partners (2015); Tušek, B. (2015); Wu T. et al. (2016).

4.2 Discussion

The research result shows that IA effectiveness in listed companies on the HOSE was only moderately high (3.8 points) and affected by the factors of independence of IA, competence and experience of IA, and perceptance of managers of IA's value. The result shows that the IA of listed companies on HOSE is not really effective. IA has only focused on compliance audits to ensure the procedures in the company complying with regulations. This result is consistent with prior studies of factors affecting the effectiveness of IA.
Regarding the impact of factors on IA's performance in listed companies on HOSE. Research result shows that:

Factors of competence and experience of IA are the factors having the greatest impact on IA's efficiency in listed companies on HOSE with the impact of 44.32%. This shows that internal auditor in listed companies has not meet the job's requirements. Managers have not focused on the recruitment and training of internal auditors. Survey results show that the mean values of influences ranged from 3.9 to 4.4. This is a pretty high score. In particular, the annual number of training hours had the highest impact on 4.4 points, followed by the number of experienced

internal auditors and possession of audit certificates at 4.27 points. This shows that listed companies on the HOSE is not really interested in the training and improving of internal auditors.

The second factor affecting IA effectiveness in listed companies on HOSE was the independence of IA with the impact of 29.91%. The results of study are also consistent with the representative theory that is: internal auditors operating in the company are the representative of the Board of Directors to review and evaluate all activities in the company helps the Board of Directors to have an overview of the company's operation (Peursem & Pumphrey, 2005). The survey results also show that the independence of IA in listed companies in Vietnam does not guarantee and affect IA effectiveness. The highest level of impact is 4.31 points, considering the problems of IA always have to pay attention to the work related to management. In addition, the right to access other parts of IA's company is limited, with a high limitation at 4.13 points. Some previous studies in Vietnam have also proved this point. The number of companies that allowed IA to intervene in all departments was only at a low level of 38.46% (Nguyen T.Tam & Nguyen T.T.Diep, 2014). IA is designed to a part of the company such as accounting department, legal department that makes IA lose its independence, objectivity, and not fully improvement of their role, become a tool to examination of accounting work is essential. This shows that the independence of IA in listed companies is still limited.

The manager's perception of the value of IA is the third most influential factor in IA's performance with an impact of 25.77%. This shows that there is evidence that managers in listed companies on HOSE have realized the value of IA; however, the survey results also show that in Vietnam, awareness of IA is still limited, only at average level (3.6 points), the lowest point among residual factors. The results of previous studies in Vietnam also show that many managers are not aware correctly of the nature and functions of the supervisory board and IA department. Therefore, it is suggested that IA and the board of supervisors of the company can be merged since the nature, the function of these two parts are the same (Phan T.K, 2014).

In addition, there is evidence showing that the approved IA Rules have no impact on IA's efficiency at companies listed on HOSE. The internal audit regulations are a document concluding purposes, rights and responsibilities of IA that are the basic for auditors to carry out activities. However, from the survey results, the Internal Audit regulation does not affect the effectiveness of IA. This shows that IA's activities at companies listed on HOSE are not really focused. The rules of internal audit is just form, not fully play its role

5 CONCLUSIONS

Basing on the research results, the IA's performance in listed companies was not really effective. The effectiveness of IA in companies listed on the HOSE was quite good and affected by three factors: the independence of IA, IA's competent experience and the manager's perception of the value of IA. The most influential factor is the competent experience of IA. The work of IA in the companies listed on the HOSE still reveals many limitations such as the capacity and experience of internal auditors not meeting the requirements of the job; the managers have not paid attention to the training and improving for internal auditors. The independence of the IA has not been ensured, the scope of IA's activities is still limited, and the access to other departments is limited. Managers are not aware all of the importance of the IA of the company. The economy is growing, the competition in the market is more and more fierce, Vietnamese companies in general and listed companies on the HOSE in particular should have regulations and solutions to improve competitiveness in the market. Along with the business manufacturing strategies to achieve the profit targets, enterprises need to pay attention to build the reputation to attract capital from investors, and shareholders. To achieve this, companies must build and maintain an effective IA system. The role of internal auditing needs to change in response to changes in global business, providing opportunities for internal auditors for consulting services

to manage and assist the Risk Management Board (Mihret D.G., et al., 2010), There has been a shift in the operational model of internal auditors in the US, Europe and Asia Pacific towards the added value of this activity (Hass, Abdolmohammadi & Burnaby, 2006; Allegrini et al., 2006). Internal Audit will help the manager to assess the overall performance of the internal control activities while ensuring that information on the financial status as well as operations of the unit is transparent and reasonable, contributing to reinforcing confidence with shareholders, investors and contribute to the development of enterprises.

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RESEARCH ON KNOWLEDGE AND USE OF MODELS PREDICTING FINANCIAL DISTRESS IN SLOVAK COMPANIES

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Abstract

The need for a permanent evaluation of the financial situation of companies has been increasingly emphasized. The goal of models predicting financial distress is to point out early to the factors which could endanger the very existence of a company in the future or could even lead to its bankruptcy. The aim of the paper is to present the results of the research focused on the identification of the current situation concerning the knowledge and use of the models predicting financial distress in Slovak companies. In the paper three partial goals are formulated. The first one is to identify whether the Slovak companies know the term models predicting financial distress and if they apply any of them. The second partial goal is to identify the most frequently models used to predict the financial situation in practice of Slovak companies. The third partial goal is to define the main reasons explaining why Slovak companies do not use the models predicting financial distress. On grounds of the goals of this paper four hypotheses were formulated. Their validity was verified by means of the primary data gained by the questionnaire research with the use of the statistical software. The research results confirmed that Slovak companies did not know the term "models predicting financial distress" neither applied them in practice. The main reasons why they do not apply them involve not knowing them, the company size (too small company) and the use of some own prediction methods. The most often used models are simple methods of point evaluation in business practice. Companies prefer simple methods not demanding of much time.

Keywords: financial analysis, models predicting financial distress, Slovak companies

JEL Classification: G30, M21.

1.INTRODUCTION

The current economic conditions require that all participants in the market economy make use of the models predicting financial distress for the benefit of their past and present financial situation as well as for prediction of their financial health in the future. A need for a permanent evaluation of the financial situation of companies has been increasingly emphasized. An early diagnosis of a potential corporate failure is very important due to an uncertainty of the current business environment. The failure of business entities could have a negative impact on other businesses that are a part of their business environment.

The goal of models predicting financial distress is to point out the existence of a potential danger of a business bankruptcy in the future in advance. Financial managers have a large choice of simple or more complex models to predict financial distress. For this reason, a requirement to define the importance of the use of the models predicting financial distress in financial management and the managerial decision making process has been increasingly appearing in the academic field as well as in business practice.

The first studies focused on the prediction of the business failure and were based on the univariate ratio analysis. These works dealt with a simple analysis of financial indicators, comparing the values of variables of failing and successful companies (Mičudová, 2013). The most well-known univariate model is probably the Beaver study published in 1966. Since

Beaver, a variety of prediction models has been developed in the academic literature using techniques such as the multiple discriminant analysis, logit and probit models, neural networks, etc. The literature review offers a wide as well as narrow view on possible techniques used to create the models predicting financial distress (e.g. Altman, 1968; Altman, 2002; Beaver, 1966; Deakin, 1972; Ohlson 1980; Zmijewski 1984; McKee 2000).

Fundamental principles of the financial health examination, or financial prosperity of a company, represent the statistical methods of the discriminant analysis and logistic regression. The discriminant analysis models are classified into the one-dimensional models (the univariate models) which predict financial distress of a company by using single point indicators (Kralicek Quick Test, Beaver Model, Tamari Model, Zmijevski Model, etc.) and the multivariate discriminant analysis using a set of several weighted indicators (Financial Standing Ratio, Altman Z-score, Taffler Model, etc.).

We have been engaged in research into the issue of the knowledge and use of models predicting financial distress in Slovak companies for several years (Gundová, 2014; Lesáková & Gundová, 2015). As it results from the several previous empirical research works (Altman, 1993; Balcaen & Ooghe, 2006; Boďa & Úradníček, 2005; Grice & Ingram, 2001; Grice & Dugan, 2001; Lesáková et al., 2015; Niemann, Schidt, & Neukirchen, 2008; Wu, Gaunt, & Gray, 2010), it is evident that prediction reliability of the above mentioned models significantly decreases when models are applied in different conditions, time periods or business environment compared to the background conditions under which they were constructed. For all these reasons, the academics construct new prediction models which are based on the logistic regression, conditional trees, random forests and neural networks. Particularly the decision trees have become popular mainly due to their relative simplicity and easy graphical presentation of the classification rules which makes them possible to be clearly interpreted. Grice and Dugan, however, argue that it is not clear whether the models are specifically useful for identifying bankrupt firms or more generally useful for identifying firms that are financially distressed (2001). Forasmuch as many financially distressed companies obviously will not declare bankruptcy, we think that it is useful for them to know a potential danger of financial risks before a real threat of bankruptcy arises. Therefore we refer to the reviewed models as to models predicting financial distress and do not use the term bankruptcy models.

2.AIM OF THE RESEARCH AND METHODOLOGY

The objective of the paper is to present the results of questionnaire research focused on the identification of the current situation concerning the knowledge and use of the models predicting financial distress in business entities in the Slovak Republic. The main objective was broken down into three partial aims.

The first partial goal is to identify whether the Slovak companies know the term models predicting financial distress and if they apply any of them.

The second partial goal is to identify the most frequently models used to predict the financial situation in practice of Slovak companies.

The third partial goal is to define the main reasons explaining why Slovak companies do not use the models predicting financial distress.

Pursuant to the above main and partial objectives, the four hypotheses were formulated. The validity of hypotheses was verified by the statistical software program SPSS (on the basis of the primary data obtained through the questionnaire research).

In the **hypothesis H1** we assumed that more than 50% of Slovak business entities (regardless their size) did not apply any model predicting financial distress in order to forecast their future financial situation. The hypothesis H1 was verified by means of the exact binomial test.

In the **hypothesis H2** we assumed the direct correlation between the size of the company and the use of prediction models, i.e. large companies use models to predict their financial situation to larger extent than smaller ones. The hypothesis H2 was verified by means of the correlation analysis. The Fisher exact test was applied in the statistical software SPSS and to measure the correlation intensity of the analyzed qualitative indicators, we used two correlation coefficients, i.e. the Pearson coefficient and Cramer coefficient.
In the **hypothesis H3** we assumed that in business practice the most frequently applied models were those based on the scoring methods. We verified the hypothesis H3 by the parametric test of the relative frequency.
This statistical test was applied also to verify the **hypothesis H4**, in which we assumed that the main reason why Slovak companies did not use the models predicting financial distress was unacquaintance with the prediction models.
The primary data were gathered by means of a questionnaire. The questionnaire research was realized from June to September 2015. Questionnaires were distributed electronically to all types of companies regarding their size (small, medium size and large companies). With reference to the Statistical Office of the Slovak Republic, there were 196 355 businesses with a registered office in the Slovak Republic as of 31 December 2014. On the basis of the research results (820 respondents) we were able to evaluate the current state relating to the application of the prediction models in Slovak business practice. In accordance with the Chi-squared test, the sample of 820 businesses is representative (according to the regional representativeness p-value = 0,575; according to the classification SK NACE p-value = 0,223). As it results from the goodness of fit test, it can be concluded that the results of the questionnaire research may be used to make general inferences about the whole population of businesses.
According to the regional classification, companies located in the Bratislava region take a major share (276 companies, i.e. 33.66 per cent). The share of companies from the remaining Slovak regions was relatively equal (from 8.90 per cent of companies from the Banská Bystrica region to 9.88 per cent of companies from the Trenčín region). For the most part the research sample contained companies belonging to the wholesale and retail sector (242 companies), industry (96 companies) and construction (65 companies). In terms of the company size small companies have a largest share in the sample (558 companies, i.e. 68.05 per cent), 202 companies (24.63 per cent) are the medium-sized companies and 60 companies (7.32 per cent) are the large companies.

3.RESULTS AND DISCUSSION

To the question whether Slovak companies know the term “models predicting financial distress” more than a half of respondents (59.78 per cent) declared they had never heard this term before. The second largest group of respondents (27.19 per cent, i.e. 223 companies) was represented by companies which had already heard the term “models predicting financial distress”, but they did not have more detailed knowledge and information about them. Only 13.05 per cent of all respondents (107 companies) know the term and these companies use some of the prediction models in their business practice.
Table 1 summarizes the results relating to the knowledge and use of the models predicting financial distress in terms of the company size.

Tab.1 - Knowledge and use of models predicting financial distress in terms of the company size. Source: Own preparation according to the questionnaire research.

Knowledge and use of models predicting financial distress	Type of company			Total
	small	medium size	large	
Know and use models predicting financial distress	33 (5.91%)	50 (24.75%)	24 (40%)	107
Know, but do not have more information	144 (25.81%)	65 (32.18%)	14 (23.33%)	223
Do not know models predicting financial distress	381 (68.28%)	87 (43.07%)	22 (36.67%)	490
Total	558 (100%)	202 (100%)	60 (100%)	820

The questionnaire research results confirmed our assumption that the models predicting financial distress were mostly used by large companies as well as that the lack of information and insufficient knowledge of the prediction models was apparent particularly in small companies (381 companies).

To the question "which are the prediction models companies are familiar with" 115 companies declared they knew the Quick Test, 72 companies were familiar with the Financial Standing Ratio, 68 companies knew the Altman´s Z score and 65 companies had knowledge of the IN Index developed by the Neumaiers. There is no company acquainted with the models based on the use of the decision trees, random forests and neural networks.

To the question "whether Slovak companies currently use any models for prediction of their future financial situation" respondents had three possible answers to choose: yes; no; no, but we used some prediction models in the past. This question was a control question. If respondents completed the questionnaire correctly, the number of positive answers (companies using the prediction models) should account for 107 positive answers. Figure 1 presents the answers to this question. From Figure 1 it is evident that 107 companies (13.05 per cent of our sample) use models predicting financial distress in their practice.

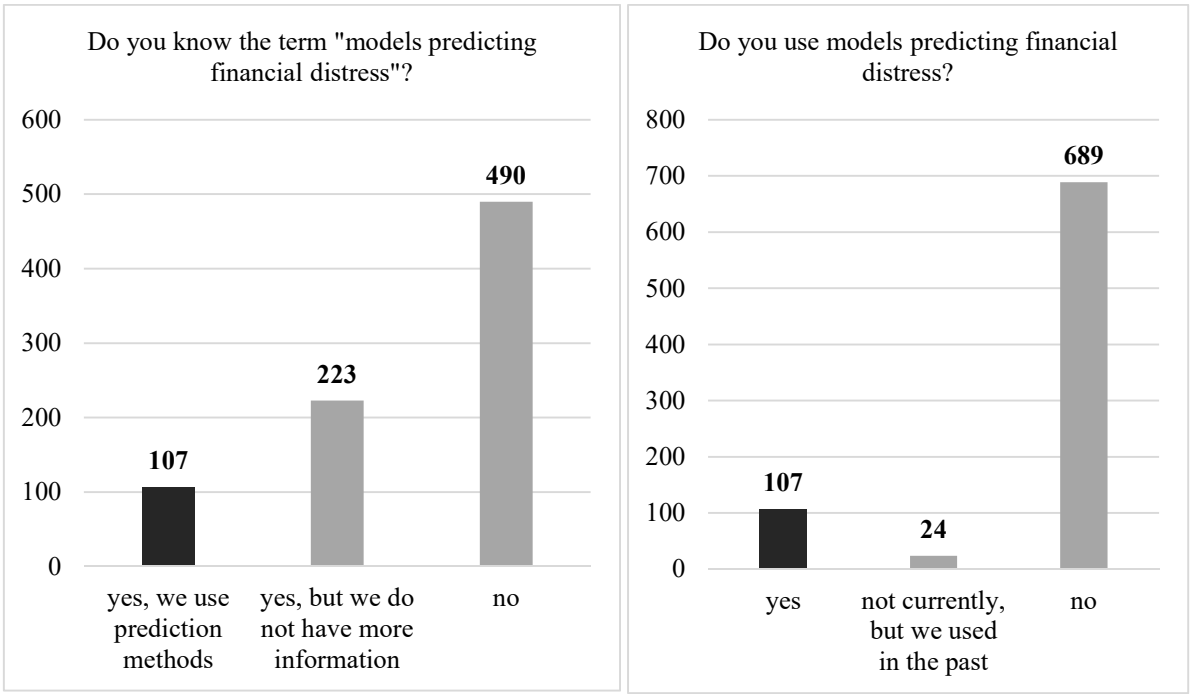


Fig. 1 – The use of models predicting financial distress – the comparison of the results. Source: Own preparation according to the questionnaire research.

On the basis of the research results, it is possible to verify the hypotheses H1 and H2. In the first hypothesis we assumed that more than 50 per cent of Slovak business entities, regardless their size, did not apply models for prediction of their future financial situation. To verify this hypothesis by the statistical software SPSS, the exact binomial test was chosen as a statistical test. The null hypothesis (H0: $\pi = 0.5$) and the alternative hypothesis (H1: $\pi > 0.5$) were formulated. Based upon the results obtained from the binomial test we refuse the null hypothesis (p-value is less than the significance values α (0.05). The results confirmed our assumption formulated in the first hypothesis that more than 50 per cent of Slovak business entities, regardless their size, do not apply any model for prediction of their future financial situation. Therefore, the hypothesis H1 was not rejected.

In the hypothesis H2 we assumed that there was a direct correlation between the size of a company and the use of the models predicting financial distress. Table 1 shows that 33 small, 50 medium-sized and 24 large companies use some of the models predicting financial distress. To verify the existence of the dependence between these two variables we applied the Fisher exact test. In the first step it was necessary to apply the test of independence of two qualitative variables – the Chi-squared test. Thereafter, we formulated the null hypothesis: the variables are independent, that means the use of the prediction models doesn´t depend on the size of a company, and the alternative hypothesis: the variables are not independent, that means the use of the prediction models depends on the company size.

Because the p-value was lower than the significance value α (0.05) we could refuse the null hypothesis concerning the independence of two qualitative variables. That means that the use of the prediction models is dependent on the size of a company. Taking account of the presented results we decided to apply the Cramer coefficient and Pearson contingency coefficient. Their values indicate the dependence between the above two variables. The value of the Cramer coefficient is 0.232 which implies that there is a moderate dependence between the application of the prediction models and the company size. This was also confirmed by the Pearson contingency coefficient the value of which was 0.382. (Both results reflect the moderate dependence between the application of the prediction models and the size of a company). Thus, on the basis of these results, the hypothesis H2 was confirmed.

In the hypothesis H4 we assumed that the main reason why Slovak companies did not use the models predicting financial distress was unacquaintance with them. Therefore, they were required to give reasons why they did not use the prediction models. The main presented reasons are summarized in Table 2.

Tab. 2 - Main reasons why companies do not use the models predicting financial distress (adjusted). Source: Own preparation according to the questionnaire research.

Reason why companies do not use models predicting financial distress	Number of companies	Percentage (%)
Insufficient knowledge	298	41.80
Size of a company (too small company)	120	16.83
Own prediction methods	115	16.13
Time-consuming	17	2.38
Models predicting financial distress are not important	112	15.71
Management does not need models predicting financial distress	51	7.15
Total	713	100.00

As much as 261 companies (36.6 per cent) did not provide an answer to this question, as it was an open question and a disadvantage of this question type, i.e. reluctance of respondents to answer it proved true. To carry out a statistical evaluation of the answers to the question it was necessary to solve this problem (no answer). There were two possibilities: a) to exclude these answers from the further evaluation, or, b) to divide respondents who did not answer this question analogically into the categories of the identified reasons in the same proportion as respondents who answered the question.

To verify the hypothesis H4 we applied the goodness of fit test with the relative frequency expected; we suppose that the main reasons indicating why companies did not use the prediction models - the unacquaintance with the prediction models or other reasons (a small company, own prediction methods, time-consuming methods, prediction models are not considered important, management does not need prediction models) are independent.

Since we carried out the multiple comparison, it was necessary to make the correction (we applied the Bonferroni correction; the significance value was divided in accordance with the number of tests conducted; implying the significance value was 0.05: 5 = 0.01). In all five cases the p-value was lower than 0.01; hereby we confirm the hypothesis H4 (on the significance value $\alpha = 0.05$).

By means of another separate question we wanted to detect the particular models predicting financial distress used by companies. Respondents could choose from various models containing simple scoring methods, methods of the multiple discriminant analysis, the logistic regression but also more sophisticated methods – decision trees, random forests and neural networks. In the hypothesis H3 we assumed that the methods prevailing in business practice were the scoring methods. The simplest models of assessment scoring involve the Quick test and Tamari model. The results of the questionnaire research confirmed that most of respondents (69 respondents) used the Quick Test to predict their future financial health.

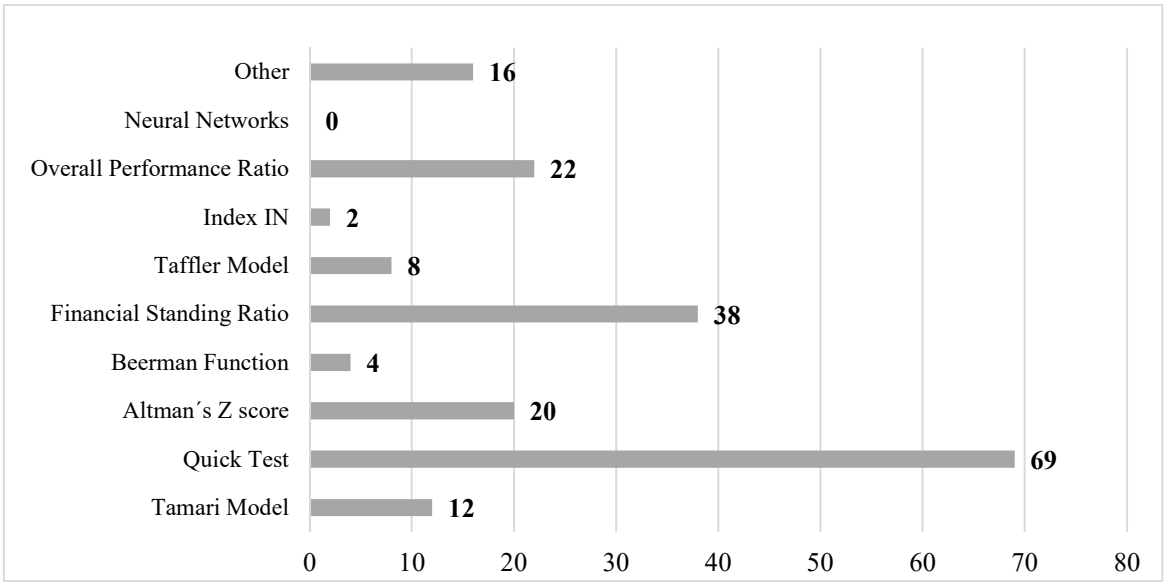


Fig. 2 - Prediction models used in business practice. Source: Own preparation according to the questionnaire research.

As it results from Figure 2, it is evident that companies in Slovakia most often use the Quick test to predict their financial situation (69 companies chose this model – they could choose more prediction models). The group of 69 companies includes 25 small companies, 32 medium-sized companies and 12 large companies. The Financial Standing Ratio was the second most frequently used prediction model – 38 respondents indicated the use of this model in their business practice. The Overall Performance Ratio (checked by 22 companies) was the third most frequently used model predicting financial distress. Only four companies (out of 16 which chose the answer "Other") specified their prediction model – all these companies indicated the Zmijewski model.

To verify the hypothesis H3 we applied the test of the relative frequency. According to the hypothesis H3, the share of companies applying the model of the simplest assessment scoring is higher than that of companies using other financial distress prediction models. We assumed that the application of assessment scoring or other models predicting financial distress was mutually independent (meaning that the use of scoring models does not inform about the use of other prediction models, and vice versa). We carried out the pair comparison and, on the basis of the Chi-square test result (significance value $\alpha = 0.05$), the hypothesis H3 can be confirmed. The statistical verification of hypothesis H3 confirmed that the Slovak companies used mostly the methods of scoring assessment.

In the last part of the questionnaire the respondents were required to indicate the main factors significantly influencing their selection of the models predicting financial distress. The main identified factors include the simplicity of methods (35 companies – 32.71 per cent), easy interpretation (32 companies – 29.90 per cent) and the software support (28 companies – 29.17 per cent). The results of the questionnaire research confirmed our assumption (the hypothesis H3) as the Quick Test is a simple model to predict financial distress and constitutes a part of software products specifically designed for the financial analysis (indexpodnikatela, Sofina, etc.).

4.CONCLUSION

The main aim of this paper was to present the results of the questionnaire research which was focused on the identification of the current situation concerning the knowledge and use of the models predicting financial distress in Slovak companies. The knowledge of corporate financial

distress models is a sine qua non for the use of prediction models. The term "models predicting financial distress" is not known enough in Slovak business practice: as much as 59.76 per cent of respondents have not heard this term before. Results of the questionnaire research confirmed our assumption that large companies were better acquainted with the prediction models (63.33 per cent out of all large companies). The Quick Test, Financial Standing Ratio, Altman´s Z score and Index IN were identified as the best known prediction models. The questionnaire research confirmed that 50 per cent of Slovak companies (regardless their size) do not use models predicting financial distress. Only 13.05 per cent of respondents (107 companies) apply models predicting financial distress. The results of the correlation coefficients (the Cramer and Pearson coefficients) confirmed the moderate dependence between the use of the prediction models and size of the company, i.e. large companies use the prediction models in a larger extent than small companies. As the results of the questionnaire research obviously show, 86.95 per cent of respondents (713 Slovak companies) do not use the models predicting financial distress. Considering this, the research specified the following main reasons explaining why companies do not use the models predicting financial distress: insufficient knowledge, size of a company (too small company) and the use of own prediction methods. The results of the questionnaire research identified the most frequently used prediction models in Slovak business practice which are the Quick Test (69 companies), Financial Standing Ratio (38 companies) and Total Performance Ratio (22 companies).

On the ground of the questionnaire research results we can deduce the current state of the use of models predicting financial distress in Slovak companies.

The issue concerning the practical use of prediction models is still affected by motivation to apply them in Slovak businesses. The results of the questionnaire research confirmed this fact. The significance of the prediction models, particularly under the current conditions, is more than controversial and disputatious in Slovak companies. The scientific discussion about the appropriate explanatory power of the prediction models is usually reopened by serious shocks and changes. One of the latest has started because of the last global economic crisis.

The global economic crisis exerts a considerable influence on the use of the models predicting financial distress. Their prediction reliability has been significantly decreased by risk and uncertainty accompanying the current conditions. When financial managers and analysts apply the prediction models and interpret their results, they have to realize that these are general ranges. The construction of a technical model is easier than ever before because nowadays there are plenty of packages of user-friendly statistical programs available. On the other hand, however, the newly designed models should provide reliable and useful results which effectively support a decision making process. It means that the new models would not be applicable only for the in-sample data but also, and in particular, for the out-sample data. The out-sample data are the data which were not used in the construction of the model at the beginning. It is apparent that the model should work for the in-sample data as a prerequisite (Čámská, 2015).

Slovak companies do not differentiate the models predicting financial distress. They prefer to apply the techniques and methods which are simple, easy to interpret and have a sufficient software support. The reason to choose a certain prediction model is associated with its construction (number of indicators, weights, software support).

Even though the models predicting financial distress are only used by a small percentage of Slovak companies, attention should be given to the prediction issues. Awareness of its importance together with the education of managers in the area of the more sophisticated prediction models should be developed so that managers would be prepared and well-equipped to actively tackle problems resulting from potential risks and threats endangering their future financial health.

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RELATIONSHIP BETWEEN ECONOMIC GROWTH AND THE ENVIRONMENT IN THE CZECH REGIONS

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Abstract

This paper deals with the sustainability assessment and the sustainability performance, because sustainability performance measurement is crucial in sustainability development planning. Aim of this study is not to encompass the whole issue of measurement of sustainable development. The aim of this paper is to provide a clear picture about relationship between economic growth and the environment in the regions of the Czech Republic between 2000 and 2014 by using method of decoupling. This paper uses selected real regional data to demonstrate a practical use of method of decoupling as a tool for evaluation of environmental sustainability performance over time on regional level, because regional level is supposed to play vitally important role in achieving sustainable development goals. Moreover, provided analysis also compare regions of the Czech Republic based on the calculated values - level of decoupling. Besides others, analysis shows that economies of the regions of the Czech Republic can be characterized as creating more value using fewer resources and generating less waste and pollution over time.

Keywords: decoupling, economic growth, ecological modernization, environmental sustainability, regions of the Czech Republic

JEL Classification: O44, O47, Q57, R11

1.INTRODUCTION

Based on the commitments the Czech Republic has adopted in the context of its membership in the EU, UN and OECD, Government of the Czech Republic has the primary responsibility to establish a national framework and strategies for achieving sustainable development goals and targets. National level is stressed as a vital in achieving sustainable development. However, there are regions that play increasingly important role in achieving sustainable development and sustainability planning. The forward-thinking policymaker both on national and regional level is tasked to promote development based on eco-efficient economic growth and, at the same time, record more inclusive gains in human welfare and socio-economic progress. (UN, 2009)

Due to the growing concern about environmental issues with socio-economic issues (Hopwood, 2005) in both public and private sector, there is an enduring need for measuring sustainability on different scales (local, regional, economic sectors and corporations). In particular, there is a need for practical tools that provide a quick access to clear and understandable guidance about measuring performance in the context of environmental sustainability (and sustainability in general). Because the most observed weakness of the concept of sustainable development is the one putting sustainable development into practice. (Atkinson, 2007)

Therefore, a method of decoupling as one of the tools for economy-environment integration was developed. Since that time, the concept has achieved global recognition and has been widely used in various studies. As Wang, Liu, Zhang and Li (2013) describe in detail in their work, Climent and Pardo (2007) took several decoupling factors into account when investigating the relationship between GDP and energy consumption. From EU point of view, Diakoulaki and Mandaraka (2007) evaluated progress in 14 EU countries in decoupling

emissions from industrial growth over years 1990 and 2003. China´s eco-efficiency trends and the cause of their dynamic behaviour during the period 1978-2010 is introduced in study of Yu, Chen, Zhu, Hu (2013).
As it was mentioned above, it is not only public sector that based on the official commitments and public pressure demands such a tool. Also private sector (large companies and SMEs) is pushed to accept measures that are in accordance with principles of sustainable development. Especially SMEs with their special attributes (Mandysová, 2008) are vulnerable towards changes in modern globalized world and can find competitive advantages in terms of ecological modernization.

2.THEORETICAL BACKGROUND

2.1.Environmental Sustainability

To define environmental sustainability, sustainability needs to be defined. *"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."* (Brundtland, 1987) Current definitions confirm ´rights-based´ approach, e.g. United Nations Conference on Sustainable Development was held in Rio de Janeiro in 2012 (UNWTO, 2012) and Sustainable Development was understood as an "*opportunity to define pathways to a safer, more equitable, cleaner, greener and more prosperous world for all."*
Therefore, environmental sustainability includes community development while respecting environmental sources by preserving sources by implementation of renewable solutions, and waste reduction.

2.2.Causes of Unsustainability

Unsustainability can be defined as the scale of human economy is exceeding environmental capacities. When the human economic subsystem was small, the regenerative and assimilative capacities of the environment appeared infinite. (Goodland, 1995) Conventional economists still claim that economic growth is infinite. However, nowadays, besides human, social, manufactured and financial capital, natural capital is considered to be a fifth type of capital to take into consideration when thinking about outcome.

2.3.Environmental Situation in the Czech Republic and its Regions

Following graph gives an overview about air pollution in the Czech Republic as is monitored by Czech Hydro-meteorological Institute.
It is nothing surprising that especially in regions with high concentration of industry, there are exceeded limits of benzopyrene and particulate matter (less than or equal to a nominal 10 and 2,5 microns). Highest concentration of PM_{10} is traditionally in Moravian-Silesian Region in the east of the Czech Republic. Sustained high concentration and often exceeded permitted limits of PM_{10} is mainly caused by extra large and large industrial sources of pollution, then local heating and traffic. It has been shown (Zdravotní ústav, 2009) that due to weather conditions situation in air pollution is often negatively influenced by undefined sources, especially large industrial sources from Polish Silesian voivodship.
For better illustration of the long term development, emissions of large stationary sources are provided.

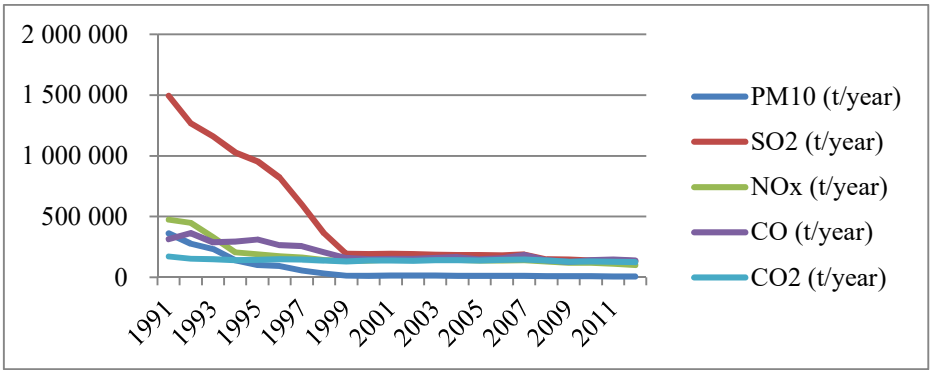


Fig. 1 – Large stationary air pollution sources. Source: own, based on (CHMU, 2012)

Situation in the Czech Republic has slightly improved and there is continuous positive trend over past decade. This improvement in reducing negative impact of the economy on the environment was supported by economic recession in previous years.
Significant decrease of level of sulphur dioxide before 2000 was caused by extensive investments in power plants sulfurization. In the years between 1992 and 1998, the CEZ Power Company realized probably the largest and fastest ecological and development program in Europe. Thanks to the desulfurization program and its 46 billion CZK direct investments and about 65 billion CZK related investments, 92 % of SO_2 emissions were reduced. Moreover, due to the measures, PM emissions were reduced by 95 %, NO_x emissions were reduced by 50 % and CO emissions were reduced by 77 %. (CEZ, 2017)
As the sulphur dioxide (SO_2) was chosen in the analysis as the representative of the emissions of air pollutants and indicates quality of the environment, following paragraphs describe the situation about SO_2 in detail.

2.4.Sulphur Dioxide (SO_2)

SO_2 is considered as the one of the main components of air pollutants. The largest sources of SO_2 emissions are from burning of fossil fuels by power plants and other industrial facilities and households. Emissions of SO_2 have harmful effect on both health and the environment. People shortly exposed to SO_2 suffer from respiratory difficulties. Moreover, SO_2 emissions that lead to high concentrations of SO_2 in the air generally also lead to the formation of other sulphur oxides (SO_x). SO_x can react with other compounds in the atmosphere to form small particles. These particles contribute to particulate matter (PM) pollution: particles may penetrate deeply into sensitive parts of the lungs and cause additional respiratory and health problems. (EPA, 2016) Long-term exposure to SO_2 negatively affects blood formation and damages heart muscle etc. SO_2 (with other sulphur oxides) contributes to well-known rain acidification which has harmful effect on sensitive ecosystems.
Power plants along with other thermal coal processing is responsible for about 60 % of SO_2 emissions. Another 25 % of emissions come from oil refineries and power plants burning oil. (Greenwood, 1993) However, Czech Republic has been meeting the national emission ceilings for sulphur dioxide. (CENIA, 2008)
As it was mentioned above, the challenge concerning environmental sustainability (and sustainable development in general) is putting sustainability into practice. There are several tools that can be used for monitoring progress and performance in terms of achieving environmental sustainability within sustainable development goals. In the following analysis, one of the tools – method of decoupling- is introduced and applied on real regional data.

3.RESEARCH METHODOLOGY

3.1:Method of Decoupling

Decoupling environmental pressures from economic growth is one of the main objectives of the OECD Environmental Strategy for the First Decade of the 21st Century, adopted by OECD Environment Ministers in 2001.
Decoupling occurs when the growth rate of an environmental pressure is less that of its economic driving force (e. g. GDP) over a given period. The aim of decoupling is to achieve (and show) environmental burden decrease when economic performance (both based on selected indicators) increasing. Simply put, decoupling the environmental and economic performance. When expressing decoupling, environmental burden indicator should be related to a suitable indicator of the quality of human life. According to OECD (2003), GDP is the most frequently used indicator of economic driving forces.
Very important is the selection of indicators compared, because in many cases decoupling calculation does not give valuable outputs.

3.2:Data Collection

In the tables below, input data of the analysis is provided. The data source is the Czech Hydrometeorological Institute, which monitor and report data to Czech Statistical Office.
SO_2 was chosen as a representative of the emissions of air pollutants and indicates the quality of the environment. It is considered as the one of the main components of air pollutants in general.

Tab. 1 – SO_2 emissions development in the Czech Republic (in t/year). Source: own, based on (CZSO, 2015)

Region/Year	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Prague	2 157	2 253	1 871	1 967	2 463	10 036	2 100	1 330	1 611	1 492	1 338	499	380	514	253
Central Bohemia	24 432	27 689	24 370	23 435	22 848	41 224	22 118	22 236	21 746	20 109	21 597	21 761	21 471	21 176	19 890
South Bohemia	7 668	10 175	9 429	10 444	10 248	13 959	9 213	8 905	9 141	8 774	9 083	8 130	7 919	7 778	6 548
The Plzen	9 557	11 644	11 370	10 789	10 610	14 465	10 329	9 825	8 681	10 117	6 859	6 583	7 008	6 924	6 512
The Karlovy Vary	20 350	20 453	17 027	15 531	16 865	10 173	16 924	20 861	9 602	8 957	9 393	8 545	9 375	9 516	9 559
The Usti	85 922	71 469	78 973	72 021	70 923	68 861	71 150	75 681	59 261	61 834	57 495	61 606	56 634	41 670	36 725
The Liberec	4 542	5 145	3 959	3 841	3 352	5 145	2 964	2 470	2 507	2 299	1 849	1 403	1 460	1 614	1 289
The Hradec Kralove	7 023	7 626	7 242	7 673	8 115	9 472	7 550	7 120	6 575	5 261	5 515	5 101	5 047	4 793	4 100
The Pardubice	16 360	19 210	17 470	19 107	15 658	17 994	13 480	13 630	12 350	11 211	12 259	12 048	11 617	11 990	11 805
The Vysocina	2 879	3 438	3 966	4 178	2 833	14 481	2 306	2 060	2 112	2 040	2 266	2 236	2 462	2 371	1 808
The South Moravian	2 927	3 115	3 015	3 577	3 876	19 245	3 855	3 833	3 723	3 427	2 911	2 642	2 067	2 235	1 921
The Olomouc	5 852	6 073	5 950	6 122	6 635	11 950	5 596	4 842	3 764	3 966	3 775	3 877	3 850	3 904	3 794
The Zlin	6 758	7 301	6 630	7 339	8 347	8 691	6 465	5 998	4 904	4 950	4 334	4 405	4 928	4 768	4 234
The Moravian-Silesian	27 101	28 110	28 306	29 063	28 620	33 374	29 091	29 829	22 566	21 296	21 591	21 565	20 460	19 862	18 761
SO_2 in total	**223 529**	**223 701**	**219 577**	**215 087**	**211 393**	**279 071**	**203 138**	**208 619**	**168 542**	**165 733**	**160 266**	**160 402**	**154 678**	**139 116**	**127 197**

Tab. 2 – GDP development in the regions of the Czech Republic (in mil. CZK). Source: own, based on (CZSO, 2016)

Region/Year	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Prague	538 681	592 128	625 909	673 103	736 577	799 516	864 789	966 414	1 027 527	1 001 432	1 016 179	1 000 864	999 382	1 005 128	1 037 351
Central Bohemia	257 694	278 201	293 190	298 421	327 813	337 650	376 518	414 893	439 322	419 852	419 500	439 972	447 887	450 361	483 511
South Bohemia	135 964	144 210	150 368	154 230	167 018	180 082	191 540	200 653	203 332	203 518	202 252	203 245	207 502	210 964	218 981
The Plzen	119 571	129 627	134 593	142 292	159 716	165 016	181 563	190 275	189 114	193 336	198 183	202 051	197 560	207 077	220 471
The Karlovy Vary	59 855	62 351	65 950	68 333	71 495	74 130	76 540	83 137	84 114	84 468	82 811	82 807	81 959	81 547	83 049
The Usti	157 675	166 321	174 695	186 915	201 331	213 774	228 374	243 914	255 494	256 371	249 591	249 714	249 587	248 517	255 325
The Liberec	90 082	96 478	99 051	95 556	102 396	113 823	120 553	125 101	127 616	123 138	126 195	128 644	130 995	131 822	138 318
The Hradec Kralove	118 460	125 865	128 079	132 116	143 889	150 598	158 007	173 565	180 543	179 315	181 499	183 001	183 621	184 197	196 438
The Pardubice	100 154	107 396	112 037	117 694	126 010	131 411	144 434	158 720	161 898	156 531	159 564	165 313	157 547	161 022	169 049
The Vysocina	98 359	109 842	113 394	117 731	125 076	133 333	143 355	157 330	156 970	155 747	154 713	161 677	165 060	166 525	170 849
The South Moravian	237 898	257 185	267 551	282 218	304 671	321 740	346 438	382 939	412 275	403 037	407 139	420 506	432 467	450 629	465 032
The Olomouc	117 502	124 992	129 045	135 975	149 141	152 393	160 528	174 709	183 300	179 233	183 272	189 162	190 927	190 689	200 042
The Zlin	113 121	122 341	126 341	131 702	138 733	150 304	164 361	177 344	191 064	186 856	184 895	190 805	190 171	193 194	210 520
The Moravian-Silesian	227 614	245 742	254 431	264 877	303 794	334 202	350 131	382 825	402 777	378 993	387 858	404 750	406 945	395 437	411 950
SO_2 in total	**2 372 630**	**2 562 679**	**2 674 634**	**2 801 163**	**3 057 660**	**3 257 972**	**3 507 131**	**3 831 819**	**4 015 346**	**3 921 827**	**3 953 651**	**4 022 511**	**4 041 610**	**4 077 109**	**4 260 886**

3.3:Method Application

Method of decoupling can serve as a crucial tool for monitoring progress and performance in terms of achieving sustainable development goals over time, and can serve as a platform for evaluating implications of existing decision and policy direction (both on national and regional level).

$$K_{dec} = 1 - \frac{\left(\frac{IEP}{EDFI}\right)_1}{\left(\frac{IEP}{EDFI}\right)_0}$$

IEP… indicator of environmental pressure
EDFI… economic driving force indicator
1… at end of the period
0… at the beginning of the period

Tab. 3 – Interpretation of possible results. Source: own, based on (OECD, 2003)

Resulting Value	**Interpretation**	**Applied policy success**
$K_{dec} \leq 0$	Decoupling does not occur	Policy was not successful
$K_{dec} > 0$	Decoupling occurs	Policy was successful
$K_{dec} = 1$	Environmental burden achieves zero	Policy was successful

Decoupling can be either absolute or relative. Absolute decoupling is said to occur when the environmentally relevant variable is stable or decreasing while the economic driving force is growing. Decoupling is said to be relative when the growth rate of the environmentally relevant variable is positive, but less than the growth rate of the economic variable. (OECD, 2003)
However as previous studies claim, the decoupling index is more effective when combined with other evaluation methods. (Wang, Liu, Zhang, Li, 2013)

4.RESULTS

From the table below it is evident that eco-performance indicator is decreasing over time 2000 and 2014 from 94 kilograms of SO_2 per million CZK of GDP to 30 kilograms of SO_2 per million CZK of GDP. Which indicates the Czech Republic generates more economic output with lower environmental impact. This is also declared in the following figure.

Tab. 4 – SO_2 emissions and GDP of the Czech Republic. Source: own, based on (CZSO, 2015) and (CZSO, 2016)

	SO_2 emissions [t/year]	**index SO_2**	**GDP [mil. CZK]**	**index GDP**	**Emissions/GDP „eco-performance“ [(t/year)/CZK]**
2000	223 529	100,0	2 372 630	100,0	0,094

2001	223 701	100,1	2 562 679	108,0	0,087
2002	219 577	98,2	2 674 634	112,7	0,082
2003	215 087	96,2	2 801 163	118,1	0,077
2004	211 393	94,6	3 057 660	128,9	0,069
2005	279 071	124,8	3 257 972	137,3	0,086
2006	203 138	90,9	3 507 131	147,8	0,058
2007	208 619	93,3	3 831 819	161,5	0,054
2008	168 542	75,4	4 015 346	169,2	0,042
2009	165 733	74,1	3 921 827	165,3	0,042
2010	160 266	71,7	3 953 651	166,6	0,041
2011	160 402	71,8	4 022 511	169,5	0,040
2012	154 678	69,2	4 041 610	170,3	0,038
2013	139 116	62,2	4 077 109	171,8	0,034
2014	127 197	56,9	4 260 886	179,6	0,030

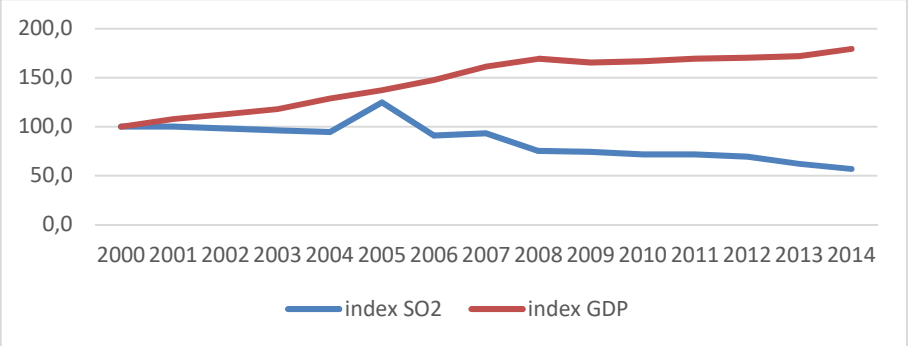


Fig. 2 – SO_2 and GDP indexes development in the Czech Republic. Source: own Source: own

As the example of decoupling calculation, data for Prague was substituted into the formula:

$$K_{dec} = 1 - \frac{\left(\frac{253}{1\,037\,351}\right)_1}{\left(\frac{2\,157}{538\,681}\right)_0}$$

$$K_{dec} = 0{,}939$$

Following table sums up final results and ranks region according to the level of decoupling. The higher level of decoupling, the more successful region is in achieving environmental burden decrease (in terms of SO_2) while economic performance increasing.

Tab. 5 – Level of decoupling in the regions of the Czech Republic. Source: own calculations

Region	**Level of decoupling**
Prague	0,939
The Liberec	0,815
The Usti	0,736
The Czech Republic	**0,683**
The South Moravian	0,664
The Zlin	0,663
The Karlovy Vary	0,661
The Hradec Kralove	0,648
The Vysocina	0,639
The Plzen	0,630
The Olomouc	0,619
The Moravian-Silesian	0,618
The Pardubice	0,573
Central Bohemia	0,566
South Bohemia	0,470

4.1.Evaluation

Czech Republic shows progress towards reducing SO_2 intensity between 2000 and 2014. However, based on the provided input information, absolute value of SO_2 remains high in some regions, such as the Usti Region, the Moravian-Silesian and the Central Bohemia Region. This is mainly due to the extensive industry and densely populated areas.

In 2005, disposable growth of emission of SO_2 was registered. The reason lies in change in calculation methodology. Despite this deviation, level of decupling occurs in every region of the Czech Republic ($K_{dec} > 0$), which means our economy can be characterized by creating more value using fewer resources and generating less waste and pollution. In other words, applied policies concerning SO_2 reduction have been successful both on national and regional level.

In the long-term point of view, analysis could be have been expanded by real data from the period of the 90s´, when 46 billion CZK were invested into power plant desulfurization. However, this was not possible due to limited publicly available data on regional level on Czech Statistical Office.

5.CONCLUSION

This research contributed to the emerging field of sustainability assessment and sustainability performance. Because sustainability performance measurement is a very critical step in sustainability development planning on international, national and regional level. In this paper, environmental sustainability performance of the regions of the Czech Republic is addressed. In terms of regional scope, provided analysis gives us a picture about functioning of the economy of the regions of the Czech Republic, when more value using fewer resources and generating less waste and pollution.

Provided analysis disregards social pillar, which is the third and substantial part of sustainable development theory. However, the aim of this study was not to encompass

the whole issue of measurement of sustainable development, but to demonstrate on real regional data by using selected indicators a method of decoupling as a tool for evaluation of environmental sustainability performance on regional level. Based on the analysis, method of decoupling proved to be a useful tool for monitoring progress and performance, provides valuable information for decision makers and public about achieving chosen sustainable development goals over time, and can serve as a platform for evaluating implications of existing decision and policy direction in terms of environmental and economic issues.
On the other hand, due to the selection of particular environmental burden indicator, a certain distortion could be expected. There exists a wide range of indicators that could represent individual components of the decoupling equation (as it is shown in our previous works), also an aggregated indicator could be used instead. However, this could be a subject of further research.

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EFFECTS OF U.S. ECONOMIC POLICY UNCERTAINTY ON STOCK PRICE IN VIETNAM: AN ARDL BOUND TEST APPROACH

Liang Chia Chin, Cam Hoang Trang

Abstract

The study examines the relationship between U.S. economic policy uncertainty and stock price in Vietnam using the autoregressive distributed lag (ARDL) approach. The results based on the bounds testing procedure confirm that a stable, long-run nexus exists the variables. Furthermore, our results reveal that U.S. economic policy uncertainty have a significant negative effect on stock price of Vietnamese stock market in both short- and long-run.

Keywords: economic policy uncertainty; autoregressive distributed lag (ARDL); bound test; cointegration

JEL Classification: O57, G14, N20.

1.INTRODUCTION

Recently, the relationship between economic policy uncertainty (hereafter, EPU) and the stock market has been a popular topic in economics and finance literature. Major recent studies dealing with this issue provide evidence that the increase in EPU is generally related to a decline in stock returns and a rise in stock price volatility (see, for example, Antonakakis, Chatziantoniou, & Filis, 2013; Bekiros, Gupta, & Kyei, 2016; Chang, Chen, Gupta, & Nguyen, 2015; Donadelli, 2014; Gupta, Hammoudeh, Modise, & Nguyen, 2014; Li, Balcilar, Gupta, & Chang, 2016; Sum, 2012, 2013; Tsai, 2017). While literature in this field is growing, there is limited research about the impact of the EPU in the US on stock price in Vietnam. Nguyen (2014) observes the growing integration between the two economies evidenced by the fact that the USA is Vietnam's largest foreign direct investor and importer, hence, the US macroeconomic conditions is very important for Vietnamese policy makers and market participants. The Vietnamese stock market consists of two stock exchanges: Ho Chi Minh Stock Exchange (HOSE) and Ha Noi Stock Exchange (HNX). HOSE was established in 2000 and HNX was established in 2005. Vietnam is projected to show robust growth at an annual average rate of around 6% over 2016-20. Vietnam's growth has been led by a rapid acceleration of fixed investment, strong foreign direct investment (FDI) inflows and robust consumption. Besides, the private sector's performance has improved, with strong retail sales growth (OECD, 2016).

Against this backdrop, the objectives of this paper are to conduct an empirical investigation into the long run level relationship between U.S. EPU and stock price in Vietnam. We apply the autoregressive distributed lag (ARDL) bounds test approach of Pesaran et al. (2001), which can be employed to determine the existence of long-run equilibrium nexus regardless of the variables used in the cointegration analysis are I(1), or I(0); or mutually integrated or combination of I(1) and I(0).

The rest of the paper is organized as follows. Section 2 describes the data and outlines the methodology. Section 3 empirical results. Section 4 concludes.

2.DATA AND METHODOLOGY

2.1.Data

Monthly data for the Vietnam stock market index collected from the Global Financial Database and the index of U.S. EPU constructed by Baker et al. (2013).[3] The data were running from 2006/10 to 2015/04. This is the longest period of data availability in Vietnam. Figure 1 presents stock price trends in the Vietnam stock market and U.S. EPU.

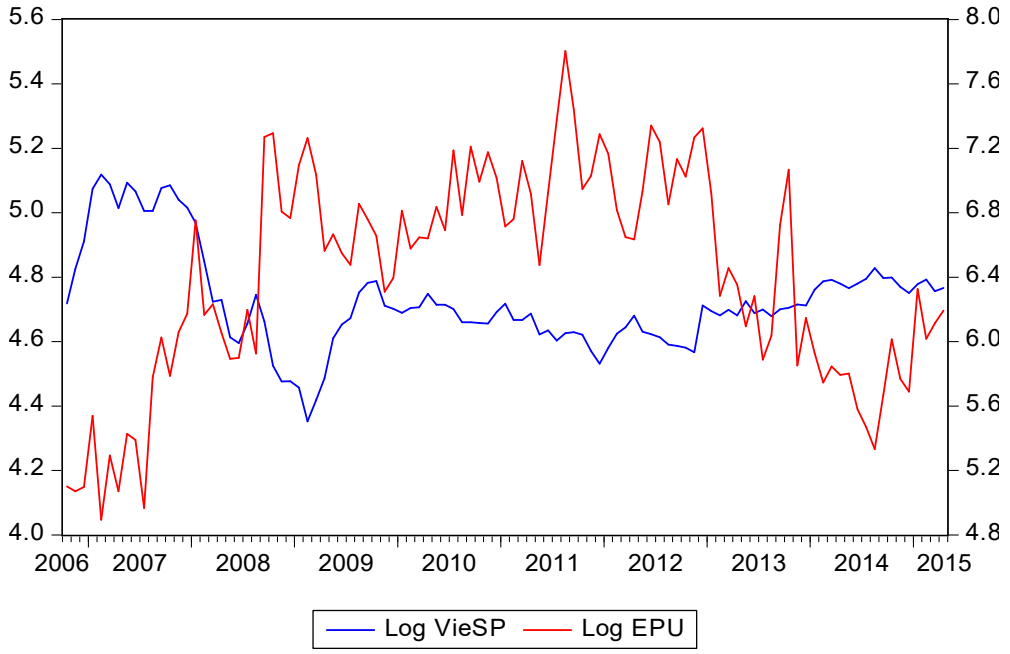


Fig. 1 - Vietnam stock market index (blue line) and U.S. economic policy uncertainty (red line) covering the period between 2006/10 and 2015/4. Source: own

2.2.The Autoregressive Distributed Lag (ARDL) cointegration approach

The ARDL cointegration bounds testing procedure is developed by Pesaran et al. (2001). The method has a number of advantages compare to Johansen cointegration approach (Johansen & Juselius, 1990). The implementation of the ARDL model is specified as follows:

$$\Delta \ln VieSP_t = \alpha_0 + \sum_{i=1}^{p} \alpha_i \Delta \ln VieSP_{t-i} + \sum_{i=1}^{p} \beta_i \Delta \ln EPU_{t-i} + \omega_1 \ln VieSp_{t-1} + \omega_2 \ln EPU_{t-1} + \varepsilon_{1t} \quad (1)$$

$$\Delta \ln EPU_t = \phi_0 + \sum_{i=1}^{p} \phi_i \Delta \ln EPU_{t-i} + \sum_{i=1}^{p} \gamma_i \Delta \ln VieSP_{t-i} + \rho_1 \ln EPU_{t-1} + \rho_2 \ln VieSP_{t-1} + \varepsilon_{2t} \quad (2)$$

[3] EPU combines three variables show a tendency to be influenced by monetary and fiscal policy decisions: (i) forecast data for inflation; (ii) purchases of goods and services by the federal government; and (iii) purchases of goods and services by state and local governments).
Resource: http://www.policyuncertainty.com/.

Where $VieSP_t$ is Vietnam stock market index; EPU_t is U.S. EPU. The two variables are transformed into natural logarithms, Δ denotes the first difference operator, α_0 and ϕ_0 are the drift constant; p is the maximum lag length and ε_t is the white noise residuals.

Existence a long-run nexus among the variables is examined by bounds test. According to the test, the null hypothesis which implies non-existence of a long-run relationship is $H_0: \varpi_1 = \varpi_2 = 0$ against the alternative hypothesis $H_1: \varpi_1 \neq \varpi_2 \neq 0$. If the calculated F-statistic higher than upper bound critical value, the null hypothesis will be rejected. If the calculated F-statistic falls below lower bound critical value, the null hypothesis of no long-run relationship is accepted.

The next step, if there exists the long-run relationship then the error correction model is represented as follows:

$$\Delta \ln VieSP_t = \zeta_0 + \sum_{i=1}^{p} \zeta_i \Delta \ln VieSP_{t-i} + \sum_{i=1}^{p} \kappa_i \Delta \ln EPU_{t-i} + \Omega ECT_{t-1} + \upsilon_{1t} \quad (3)$$

$$\Delta \ln EPU_t = \psi_0 + \sum_{i=1}^{p} \psi_i \Delta \ln EPU_{t-i} + \sum_{i=1}^{p} \delta_i \Delta \ln VieSP_{t-i} + \Psi ECT_{t-1} + \upsilon_{2t} \quad (4)$$

To ensure convergence of the dynamics to long-run equilibrium, the sign of the lagged error correction term (ECT_{t-1}) coefficient must be negative and statistically significant. The diagnostic tests including serial correlation, function form, no-normality, and heteroscedasticity test are conducted to check the goodness of fit of the model. The article also applied the cumulative sum (CUSUM), and the cumulative sum of squares (CUSUMSQ) test of stability developed by Brown et al. (1975), which the two test statistics are within the critical bound of the 5% level of significance, then we cannot reject the null hypothesis and the regression will be considered as stable.

3.EMPIRICAL RESULTS

3.1.Stationarity test

Primarily, we need to check the order of integration before conducting the bounds test of cointegration. Two different unit root tests were used to assess the integration order of the series: (i) the Augmented Dickly-Fuller (ADF); and (ii) Phillips & Perron (PP) tests are presented in Table 1. It can be deduced that the variables are integrated at mixed levels of I(0) and I(1). As expected, the variable VieSP has a unit root and, therefore it is I(1). In turn, the variable EPU appears stationary in level, i.e., I(0). Given that the variables are integrate of an order larger than one, then the ARDL approach could be implemented.

Tab. 1 - The results of unit root test. Source: own

	ADF Test		PP Test	
	Level	First Difference	Level	First Difference
lnVieSP	-2.3165	-7.7302***	-2.1168	-7.6625**
lnEPU	-3.1849**		-2.9208**	

Notes:1.***,**, and * denote significance at 1%, 5%, and 10% levels, respectively.
2. The null hypothesis that a unit root exists.

3.2:Cointegration from bounds test

Table 2 reports the computed F-statistic for testing the existence of long-run relationship between VieSP and U.S. EPU. The calculated F-statistic F(VieSP | EPU) = 6.5453 is higher than upper bound critical at the 1% level of significance, when VieSP is the dependent variable. The calculated F-statistic F(EPU | VieSP) = 3.2681 is lower than upper bound critical at the 5% level of significance, when EPU is the dependent variable. It suggests that there is cointegration between VieSp (dependent variable) and EPU (independent variable).

Tab. 2 - ADRL bounds test for cointegration relationship. Source: own

Variable	lnVieSP	lnEPU
F-statistics	6.5453***	3.2681
Critical values[2]	1% level	5% level
Lower bounds I(0)	5.020	3.145
Upper bounds I(1)	6.006	4.153

Notes:1.***,**, and * denote significance at 1%, 5%, and 10% levels, respectively.
2. Pesaran et al. (2001).
3. The null hypothesis: no cointegration.

3.3:ARDL long-run results

The long-run coefficients of the selected ARDL model are presented in Table 3. According to the SBC model (2, 0) specification, the coefficient of EPU is the negative and significant when VieSp is the dependent variable as in the case for Vietnam. The coefficient implies that a 1% increase in U.S. EPU will lead to a 62.372% decrease in stock price of Vietnam. The results of diagnostic tests suggest that long-run model passes all tests successfully. This finding also is consistent with the previous studies that there is negative relationship between EPU and stock price.

Tab. 3 - Estimation of the Long Run Coefficient. Source: own
ARDL (2, 0) selected based on Schwarz Bayesian Criterion (SBC)
Dependent variable is lnVieSP

Variable	Coefficient	Standard Error	t-Statistics	p-Vlaue
lnEPU	-0.62372	0.19716	-3.1635	0.002
C	9.2210	0.95510	9.6544	0.000
		LM version	F version	
Diagnostic tests		χ^2 (p-values)	χ^2 (p-values)	
Serial Correlation		17.0438	1.4384	
		(0.148)	(0.165)	
Functional Form		1.2344	1.1869	
		(0.267)	(0.279)	
Heteroscedasticity		072672	0.071256	
		(0.787)	(0.790)	

Notes: ***,**, and * denote significance at 1%, 5%, and 10% levels, respectively.

3.4:ARDL short-run results

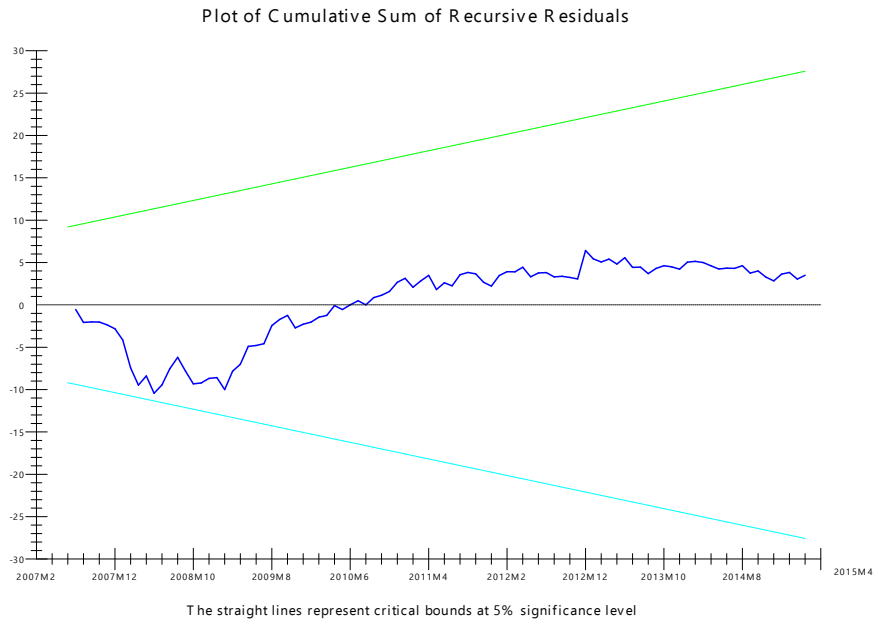
Having estimated a stable long-run model, we now preceded to estimates a dynamic (short-run) model. Table 4 shows the error correction representation of the selected ARDL models, when the first difference of VieSP, is the dependent variable. The sign of the error correction term is significant and negative.

Tab. 4 - Error Correction Representation Results. Source: own
Dependent variable is dlnVieSP

Variable	Coefficient	Standard Error	t-Statistics	p-Vlaue
dlnVieSP1	0.22811**	0.089619	2.5453	0.013
dlnEPU	-0.09194**	0.039447	-2.3309	0.022
dC	1.3593***	0.40349	3.3689	0.001
ecm(-1)	-0.14742***	0.039886	-3.6960	0.000

Notes: ***,**, and * denote significance at 1%, 5%, and 10% levels, respectively.

The plots of the CUSUM and CUSUMSQ statistics (Figure 2) are well within the critical bounds, implying that all coefficients in the ECM model are stable over the sample period 2006/10 - 2015/04.



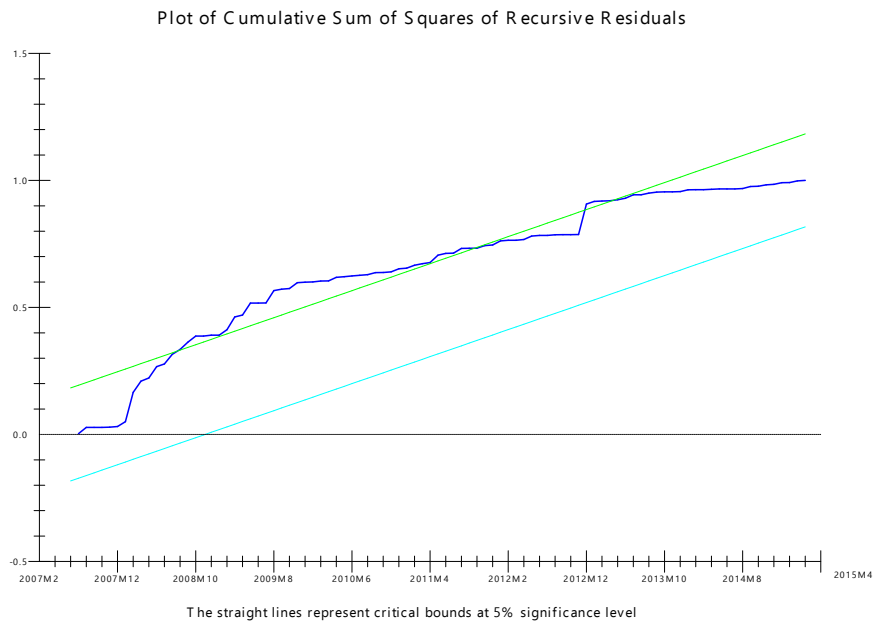


Fig. 2 - Plots of CUSUM and CUSUMSQ statistics. Source: own

4.CONCLUSION

The paper empirically investigated both the short-run and long-run effects of U.S. economic policy uncertainty on stock price in Vietnam over the period of 2006/10 - 2015/04. The Autoregressive Distributed Lag (ARDL) approach is proposed by Pesaran et al. (2001). We found that U.S. economic policy uncertainty has negative and significant effect on stock price of Vietnam in short and long run. Diagnosticis tests are performed to check the perfectness of the model and confirm that model is perfect. Finally, for the Vietnam stock market, the speed of adjustment estimates provide direct information as to the behavior of short run fluctuations that can be incorporated into the investment portfolio strategies of market investor and policy makers. The results also reveal that investors in different regions must consider the contagion risks associated with the policies implemented by the developed count

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CAN FINANCIAL RATIOS INFLUENCE THE STOCK RETURNS OF FINANCIAL SECTOR COMPANIES IN AUSTRIA?

Ligocká Marie

Abstract

The stock prices of companies are influenced by many variables; two basic categories are macroeconomic and microeconomic factors. The objective of this paper is to analyze the existence of a relationship between select microeconomic variables and the stock returns of financial sector companies listed on the Vienna Stock Exchange. The institutions that were chosen are Immofinanz AG, Raiffeisen Bank International AG, Erste Group Bank AG, Uniqa Insurance Group AG and Vienna Insurance Group AG. The focus is on Austria due to the lack of empirical literature on problematics of linkages between stock prices and microeconomic factors. A time series with an annual frequency are used to examine the occurrence of long-term and short-term cointegration links using Johansen and Granger tests. The empirical estimates are calculated for the 2005 – 2015 period, which includes the global financial crisis. The findings indicate that select microeconomic factors do not belong to the group of economic fundamentals that affect the stock returns.

Keywords: financial sector, Austria, cointegration, financial crisis, financial ratios, stock return, Vienna Stock Exchange

JEL Classification: O52, C58, G21

1.INTRODUCTION

Company stock prices are influenced by many factors. There are two basic categories of variables that affect stock prices as follow; macroeconomic factors and microeconomic factors. This paper is oriented on microeconomic variables. Investors evaluate the prospects of companies, especially announcement results of business activity. The time before that is a source of fluctuations of stock prices and the announcement of results should cause the stabilization of fluctuations. It can be expected that some financial ratios can affect the stock prices or stock returns.

The analysis of the relationship is according to the Efficient Market Hypothesis (Fama, 1970), an efficient market, all the relevant information are fully reflected in the current stock prices and preventing investors from earning abnormal profits. The pivotal study in this type of the research is contribution of Drummen & Zimmermann (1992). Their analysis showed the importance of various market and sector factors to European stock prices volatility.

This study is focused on stock returns and identifying the variables that affect the stock returns of financial institutions in Austria. It was selected the financial sector because it is an important component of every national economy and contributes a significant portion of the GDP. It was chosen the Vienna Stock Exchange because it is one of the oldest stock exchanges in the world and is a driving force that contributes substantially to the development of the Austrian market. The market capitalization of the Vienna Stock Exchange is approximately 105.23 billion EUR. The objective of the contribution is to analyze the existence of the relationship between several microeconomic factors and the stock returns of financial sector companies listed on the Vienna Stock Exchange. Therefore, certain institutions are considered, including Erste Group Bank AG, Immofinanz AG, Raiffeisen Bank International AG, Uniqa Insurance Group AG and

Vienna Insurance Group AG. All financial institutions are included in the ATX Financials. The ATX Financials (ATX FIN) is one of five capitalization-weighted price indexes, and is composed of 11 financial sector stocks. The capitalization of ATX FIN is approximately 13.34 billion EUR in 2016Q4. It was chosen only 5 financial institutions due to the significance of their market shares and the attainment of the required time series.
Erste Group Bank AG is the leading bank in Central and Eastern Europe. Erste Group Bank AG is the owner of Česká spořitelna and Slovenská sporiteľňa. The total assets of Česká spořitelna were 1 037.3 billion CZK, Slovenská sporiteľňa had 14 billion EUR in assets in 2015. The total assets of Erste Group Bank AG increased to 204.5 billion EUR in 2015. Vienna Insurance Group is one of the leading insurance groups in Austria and Central and Eastern Europe, a premium volume was approximately 9 billion EUR in 2015. The Vienna Insurance Group now operates in 25 markets; the most important market is in Austria with market share of approximately 24 %.
Raiffeisen Bank International is a leading commercial and investment bank in Austria with an internet market share of 42 %. The UNIQA Group is insurance group and its core markets are in Austria and Central and Eastern Europe. The UNIQA Group and Raiffeisen Versicherung have the two strongest insurance brands in Austria. Immofinanz AG is a commercial real estate company that is focused on the retail and office segments in European markets. The company has a real estate portfolio of approximately 5.4 billion EUR.
Microeconomic factors include the current ratio, the return on assets, the return on equity and the firm size. The problem is that there is a lack of empirical literature focuses on relationship between stock prices (returns) and financial ratios in Central European countries. I try to reference empirical literature that is relevant to the topic of the paper.
The paper is divided into five sections. The review of the literature follows the introduction. The next section, methodology and data, results. The last section is conclusion.

2.REVIEW OF THE LITERATURE

A lot of studies have been conducted to examine the linkage between microeconomic variables and stock prices or stock returns. The classification can be performed by selected financial ratios, development of the stock market or methodology used. It is solely considered literature that is relevant. It is cited relevant papers on microeconomic factors; it is also cited papers that discuss the Central and Eastern European markets but those do not directly address the relationship between microeconomic variables and stock prices or stock returns. The reason is the lack of empirical literature on problematics of linkages between stock prices and microeconomic factors in Central European countries.
Here can be including Pajuste et al. (2000) who examined a wide set of risk factors that may influence equity market fluctuations in the Czech Republic, Estonia, Hungary, Poland and Slovenia. They found out that local risk factors are the most important in explaining fluctuations of stock returns in these 5 countries. And the most significant factor is the market risk.
Casterén et al. (2006) analyzed the driving forces of EU banks stock returns. They used 53 EU banks and data from 1991 to 2004. They found that while in the short-term expected returns are mainly driven by the momentum of past returns and past leverage, over longer term returns show some mean reversion to shocks. At the same time, the positive covariance between the return news components showed that the market tends to initially underreact to positive news on bank-specific fundamentals and only gradually incorporate such information into the prices.
McKnight & Todd (2006) analyzed the role of earnings forecast revisions by equity analysts in predicting the cross section of European stock returns. They used a sample of 3 084 firms from 13 European countries, including Austria. Their sample period was from May 1988 to November 2001. They showed that European stock returns are positively related to their

measure of forecast revisions. In contrast, they found that neither the mean consensus recommendation nor changes in that metric are significant in explaining the cross section of European stock returns.
Drobetz et al. (2007) examined the impact of individual bank fundamental variables on stock market returns using data from a panel of 235 European banks from 1991 to 2005. Their results indicate that several bank-specific variables exhibit a robust explanatory power across different model specifications. The most important finding is a positive impact of the ratio of loans to total assets, the ratio of non-interest income to total income, and the ratio of off-balance sheet items to total assets on subsequent bank stock returns.
Sivaprasad & Muradoglu (2009) investigated the effect of firm´s leverage on stock returns. They used 788 non – financial companies listed on London Stock Exchange for the period 1980 – 2008. Data were classified into 9 main industries: oil&gas, basic material, industries, consumer – goods, healthcare, consumer – services, telecommunications, utilities and technology. The results showed that leverage has a negative relation to stock returns.
Dzikevičius & Šaranda (2011) determined whether it is possible to forecast stock prices by estimating the financial ratios of a particular company in the Lithuanian stock market. They used correlation and covariance as the main analytical tools. They chose 5 companies and calculated with 20 financial ratios. They found out positive and negative links between stock returns and financial ratios, but results can be different depending on the method of calculation ratios.
Mirza & Afzal (2011) explored the power of the FF three – factor model in an international framework. They selected stock s from 15 European countries and sorted them into six portfolios at the intersection of size and book – to – market value. Data were employed for a period from January 2002 to December 2006. The results showed that except for one portfolio the model could not explain global European portfolio returns.
Atanasov & Nitschka (2013) investigated influence of the size effect and momentum factor on stock returns. They formed 25 portfolios, the European portfolio involve 16 states including Austria. The sample period covered data from 1990 to 2012. They found that the small stock component of value and momentum factors can explain differences in returns on regional and global size, value and momentum portfolios. This result does not hold for the big stock component of common risk factors.
Berglund & Bergman (2013) analyzed from two perspectives the performance predictability of financial ratios on Swedish listed firms by using statistical methods and fundamental analysis. The Swedish market was analyzed for the time period of 1980 – 2013. This paper has come to the conclusion that the predictability power of financial ratios does exist to some degree when using statistical methods, however, the significant observations were few and results were viewed as anomalies rather than true relationships.

3.DATA AND METHODOLOGY

It was used five financial institutions that are listed on the Vienna Stock Exchange: Erste Group Bank AG (EGBA), Immofinanz AG (IA), Raiffeisen Bank International AG (RBIA), Uniqa Insurance Group AG (UIGA) and Vienna Insurance Group AG (VIGA). Annually data from the 2005 – 2015 periods in EUR are used. The stock price data are from the Vienna Stock Exchange database.
The microeconomic factors studied are as follows: the current ratio (L3) calculated as current assets/current liabilities; the return on assets (ROA) calculated as net income/total assets; the return on equity (ROE) calculated as net income/equity capital and the firm size (FS) measured by total assets in billion EUR. These time series are from financial statements of the companies. The L3 gives us the information that there is a sufficient amount of short-term assets to cover

its short-term liability position. The ROA and ROE present how well the firm uses its resources in generating profit. And the FS is connected with business activities and it is related to the possibility of making higher profit.

Before calculating the empirical estimations, it was utilized chart that show the behavior of stock prices; thus, we could find descriptive statistics. Fig. 1 shows the behavior of the stock prices of EGBA, IA, RBIA, UIGA and VIGA from 2005 – 2015; the values are annual end, and all data are in EUR. Fig. 1 shows that the fluctuation of stock prices in the RBIA and VIGA were very similar in some years. The development of EGBA and UIGA were nearly identical. The development of stock price of the IA stock price has the most pronounced changes, mainly a sharp decline at the beginning of 2009. All stock prices decreased in 2009; however, IA decreased the most. A decrease in stock prices in 2009 may have been caused by the beginning of the global financial crisis and fears regarding the economic development in Central and Eastern European countries. This finding mean lower capital and lower capital quality, higher risk exposure, lower asset quality, problems with loan repayments, uncertainty in dividend policy, underpricing of risks, higher volatility, and lower profitability; all these represent potential losses for the financial sector.

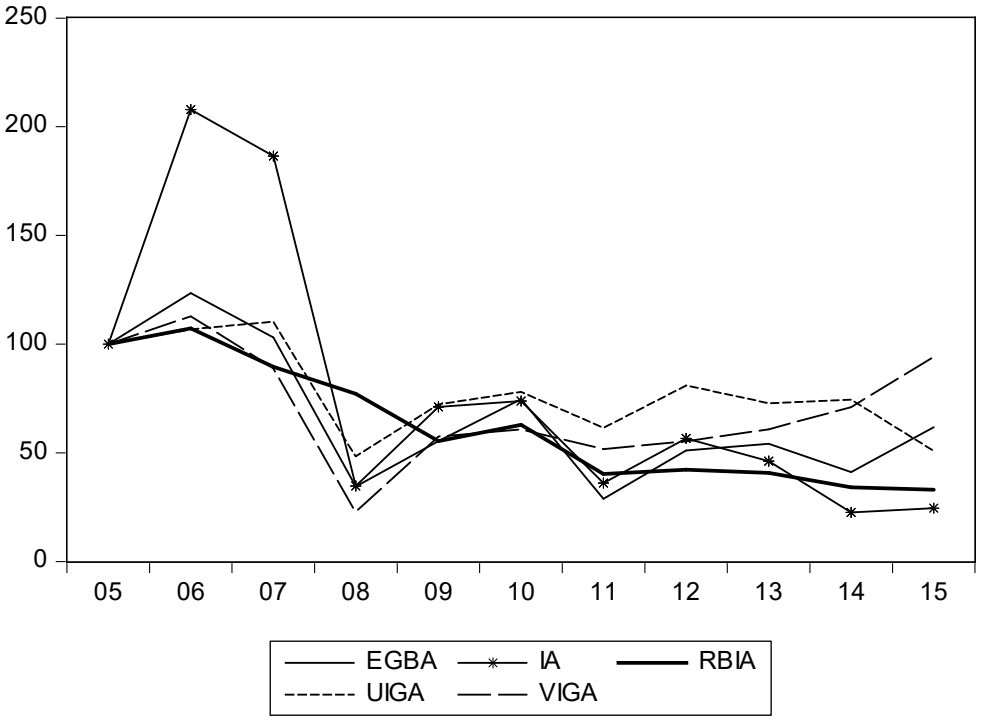


Fig. 1 – Development of stock prices in % (2005 = 100 %). Source: Vienna Stock Exchange

Tab. 1 shows the descriptive statistics of select financial institutions listed on the Vienna stock exchange. It is specified the mean, median, maximum, minimum and standard deviation. The table shows that the maximum value of the stock returns is 26.17 for IA, and the minimum value of VIGA is -32.12. The standard deviation, which is the highest for IA, means the market risk.

Tab. 7 – Descriptive statistics of stock returns. Source: Authors´calculations

	EGBA	IA	RBIA	UIGA	VIGA
Mean	-0.0077	-1.0942	0.0802	4.3394	-0.6148
Median	-0.9981	-1.2578	0.0000	7.5507	2.2195
Maximum	14.7863	26.1732	20.8296	13.3251	9.2846
Minimum	-12.2652	-27.7861	-11.5935	-5.6686	-32.1204
Std. Dev.	7.8061	13.9574	9.2713	6.9184	11.0077

After providing the figure for the development of stock prices and descriptive statistics, it is presented the methodology. First, it was checked the stationarity of the time series. We have more methods for implementing stationarity tests. In the empirical literature, the Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) tests are used to verify whether the time series are stationary or not.

Then, data were subjected to correlation analyses to determine the linear relationship between the stock returns and the microeconomic variables. Correlation analyses results can be between -1 to 1.

Thereafter, it was examined the long-term equilibrium relationships using the Johansen test to determine the presence of cointegrating vectors, VAR. The equation used for the VAR model is (Johansen & Juselius, 1990):

$$\Delta Y_t = C_0 + \sum_{i=1}^{p-1} \Gamma_i \Delta Y_{t-1} + \Pi Y_{t-1} + \eta_t \quad (1)$$

where Yt is a vector of non-stationary variables, C0 is a constant and η_t is the white noise term. The information on the coefficient matrix between the levels of the Π is decomposed as $\Pi = \alpha\beta'$ where the relevant elements of the α matrix are adjustment coefficients, and the β matrix contains the cointegrating vectors. The first likelihood ratio statistics for the null hypothesis of the precise r cointegrating vectors against the alternative r + 1 vector is the maximum eigenvalue statistic. The second statistic for the hypothesis of at most r cointegrating vectors against the alternative is the Trace statistic.

Furthermore the analysis of the short-term causality of the relationship between stock returns and microeconomic variables is performed using the Granger test; the causal model in the mathematical equation is in accordance with Granger (1969):

$$\Delta Y_t = \beta_0 + \sum_{i=1}^{q} \beta_{1i} \Delta Y_{t-i} + \sum_{i=1}^{q} \beta_{2i} \Delta X_{t-i} + \varepsilon_{1t} \quad (2)$$

$$\Delta X_t = \varphi_0 + \sum_{i=1}^{r} \varphi_{1i} \Delta X_{t-i} + \sum_{i=1}^{r} \varphi_{2i} \Delta Y_{t-i} + \varepsilon_{2t} \quad (3)$$

where Y_t and X_t represent stock returns and microeconomic variables, respectively. Coefficient t symbolizes the time period, ε_{1t} and ε_{2t} are uncorrelated stationary random variables. The objective of this test is to reject the H_0: $\beta_{21} = \beta_{22} = ... = \beta_{2q} = 0$. This hypothesis implies that microeconomic variables do not Granger cause stock returns. Similarly, failing to reject H_0: $\varphi_{11} = \varphi_{12} = ... = \varphi_{1r} = 0$ suggests that stock returns do not Granger cause microeconomic factors.

4.RESULTS

At the beginning, it was calculated correlation coefficients between the stock returns and the financial ratios and firm size and identified the lag used in the cointegration tests. The resulting correlation matrix is provided in Tab. 2.
The correlation coefficients between the stock returns and microeconomic variables are negative or positive. The financial ratios that display significant correlation coefficients are the ROA and the ROE. The coefficients of FS are significant in two cases. The coefficients of the other microeconomic factors are frequently insignificant; this indicates that the co-movements with stock returns are not sufficiently strong. But, there are differences between the stock returns of the financial institutions. While RBIA and IA show a statistically insignificant coefficient with all financial ratios and firm size, the stock returns of EGBA display a statistically significant correlation with ROA and ROE. And the stock returns of UIGA and VIGA demonstrate statistically significant coefficients with firm size.

Tab. 8 – Correlation Matrix. Source: Authors´calculations

	EGBA	IA	RBIA	UIGA	VIGA
L3	-0.0160	-11.0776	-0.8549	0.0033	1.6092
ROA	0.3591**	-0.1505	-0.0065	-0.0150	-4.27E-05
ROE	0.2268**	0.8060	-0.0758	-0.1115	0.1182
FS	14 518.29	-41 496.96	20 308.35	-13 574.65**	-16 913.04*

Note: *, ** and *** denote significance at the 1 %, 5 % and 10 % levels.

In Tab. 3, we can find results of Johansen cointegration test. It was used Trace statistics and Max - Eigen Statistics. It was found that microeconomic variables and stock returns do not prove to be cointegrated. For one of the five models, there it was revealed the possibility of existence of cointegrating vector but results of Trace statistics and Max - Eigen Statistics were not consistent. These results show it is not possible to confirm that select microeconomic variables belong to the economic fundamentals that affect the stock returns in the long-term.

Tab. 9 – Results of Johansen test. Source: Authors´calculations

	r=0	r ≤1	r ≤2	r ≤3	r ≤4
EGBA / FS, ROE, ROA, L3					
Trace Statistics	64.1475	41.9202	27.1900	16.6603	7.6082
Max-Eigen Statistics	22.2273	14.7301	10.5297	9.0521	7.6082
IA / FS, ROE, ROA, L3					
Trace Statistics	58.9149	40.8831	24.4682	12.4954	4.3258
Max-Eigen Statistics	18.0317	16.4149	11.9728	8.1695	4.3258
RBIA / FS, ROE, ROA, L3					
Trace Statistics	76.6704**	48.9077	33.7870***	19.3170***	6.5563
Max-Eigen Statistics	27.7626	15.1207	14.4700	12.7606	6.5563
UIGA / FS, ROE, ROA, L3					
Trace Statistics	72.2145	44.3469	27.2351	13.7884	3.139
Max-Eigen Statistics	28.8676	17.1117	13.4466	10.6844	3.1039
VIGA / FS, ROE, ROA, L3					

Trace Statistics	69.0310	44.9506	28.4678	14.6796	3.9545
Max-Eigen Statistics	24.0804	16.4827	13.7882	10.7250	3.9545

Note: *, ** and *** denote significance at the 1 %, 5 % and 10 % levels. The critical value of the Trace statistics for the null hypothesis of no cointegration (r=0) is 76.97 (5 % level); for the null hypothesis of at most one cointegrating relationship (r≤1), is 54.07 (5 % level). The critical value, for the null hypothesis of at most two cointegrating relationships (r≤2) is 35.19 (5 % level); for the null hypothesis of at most three cointegrating relationships (r≤3), it is 20.29 (5 % level). The critical value, for the null hypothesis of at most four cointegrating relationships (r≤4) is 9.16 (5 % level). The critical values of the Max – Eigen statistic for the same hypotheses are 34.80, 28.58, 22.29, 15.89 and 9.16 (all at 5 % level), respectively. The numbers in the parentheses beneath are the standard errors.

Then, there was tested the short-term relationship between stock returns and microeconomic variables. This causality linkage was analyzed using the Granger causality test. The Granger causality test results for the institutions analyzed are shown in Tab. 4. The F-statistic results show that short-term dynamics is not demonstrated between the microeconomic factors and the stock returns of the select companies. Tab. 4 shows the statistically significant result of Granger causality for VIGA, other results are statistically insignificant.

Tab. 10 – Results of Granger causality test. Source: Authors´ calculations

	F-statistic	**Probability**
EGBA		
L3 =/=> EGBA	0.0159	0.9035
EGBA =/=>L3	0.1169	0.7440
ROA =/=> EGBA	3.5E-05	0.9955
EGBA =/=> ROA	1.6041	0.2523
ROE =/=> EGBA	0.0111	0.9193
EGBA =/=> ROE	1.6260	0.2494
FS =/=> EGBA	0.0758	0.7923
EGBA =/=> FS	0.2759	0.6181
IA		
L3 =/=> IA	0.2328	0.6465
IA =/=> L3	0.0096	0.9250
ROA =/=> IA	0.0356	0.8565
IA =/=> ROA	0.0051	0.9450
ROE =/=> IA	3.5E-05	0.9955
IA =/=> ROE	0.3185	0.5930
FS =/=> IA	1.1819	0.3187
IA =/=> FS	1.5041	0.2660
RBIA		
L3 =/=> RBIA	0.4390	0.5322
RBIA =/=> L3	0.5076	0.5029
ROA =/=> RBIA	0.0042	0.9502
RBIA =/=> ROA	1.9714	0.2099
ROE =/=> RBIA	0.1932	0.6756
RBIA =/=> ROE	1.7718	0.2315

FS =/=> RBIA	0.0768	0.7910
RBIA =/=> FS	0.0378	0.8521
UIGA		
L3 =/=> UIGA	0.1683	0.6958
UIGA =/=> L3	0.9344	0.3710
ROA =/=> UIGA	1.4339	0.2763
UIGA =/=> ROA	0.1576	0.7051
ROE =/=> UIGA	1.4054	0.2806
UIGA =/=> ROE	0.0734	0.7955
FS =/=> UIGA	0.1735	0.6915
UIGA =/=> FS	1.2754	0.3019
VIGA		
L3 =/=> VIGA	3.4468	0.1057
VIGA =/=> L3	0.2214	0.6523
ROA =/=> VIGA	3.0940	0.1220
VIGA =/=> ROA	0.9914	0.3526
ROE =/=> VIGA	7.2533	0.0309**
VIGA =/=> ROE	1.2917	0.2931
FS =/=> VIGA	0.4890	0.5069
VIGA =/=> FS	0.0020	0.9656

Note: *, ** and *** denote significance at the 1 %, 5 % and 10 % levels.

5.CONCLUSION

The objective of this study was to analyze the existence of the relationship between select microeconomic variables and the financial sector stock returns of stocks listed on the Vienna Stock Exchange. The sample period was from 2005 to 2015.

It was used the Johansen cointegration test to examine long-run equilibrium relationships between the stock returns of Austrian financial institutions and L3, ROA, ROE and FS. It was detected a significant relationship to certain variables for the Trace statistics, however; none of microeconomic factors were cointegrated with stock returns using the Max – Eigen Statistics. It is not possible to prove that select microeconomic variables belong to the economic fundamentals that affect the stock returns in the long-term.

Then it was investigated short-run dynamics between the stock returns of Austrian financial institutions and the microeconomic variables using Granger causality tests. It was detected the relationship between the VIGA stock returns and the ROE. Other results were not statistically significant and there was not determined causality in the opposite direction from the stock returns to the L3, ROA, ROE or FS.

The results of this paper indicate that linkages between the stock returns of Austrian financial institutions and select microeconomic variables are very sporadic. The following research could be extended to other financial ratios and utilization of different statistical method to determine the existence of possible linkages between the stock returns and other financial ratios.

The business activity of companies can influence the stock prices in various extents. It is a reason why studies of this type can be useful for investors. They can know the key financial ratios and monitor their development.

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SUSTAINABLE DEVELOPMENT MANAGEMENT OF THE ECONOMY: PROBLEMS AND PROSPECTS

Lyaskovskaya Elena

Abstract

Today, creating a new methodology for the development management is not just a topic of abstract researches, but a civilization problem, the solution of which influences the existence of our civilization. The development management is the highest-level form of the management, but today, in most cases the management of firms and corporations is focused on quantitative financial and production results. Accumulated global economic, environmental, and social contradictions determine the need to use the system paradigm; they also determine the study of socio-economic systems of different classes and levels within the framework of their interrelated and interconnected operation and development, while the use of traditional approaches (including nonclassical, evolutionary, institutional, authority school, etc.) worsens the crisis, questioning the existence possibility of our civilization. The sustainable development is manageable and well-balanced development achieving a complex of social, environmental, and economic oals through the use of an innovative model and effective mechanisms of its resources supply. Management mechanisms should be aimed at maintaining the dynamic resilience of economic systems; and they should include internal and external imperatives of the development management. This article is devoted to the study of problems and prospects of the sustainable development management, paradigmatic bases, internal and external imperatives of the development.

Keywords: development management, sustainable management, economic resilience, innovative development, system management, system paradigm.

JEL Classification: 010.

1. INTRODUCTION

The problems of economic development have not only analytical but also political significance, and opportunities of the sustainable development are the main object of the study and the management at various levels of the economy: from a separate economic entity to the world economic system. In the world, as in a self-organizing system, there are acute global contradictions requiring joint decisions at the country level. First, it concerns reproductive capacities of the biosphere, the ability to deal with human impacts, to maintain the homeostasis that is acceptable for civilization, a strategy of the biosphere use adopted by the international community and objectives of its development. Second, it affects interests of the present generation that works on the expanded reproduction, and interests of future generations, which will not have acceptable starting conditions because of this policy. Third, it is about "the first world" consuming more than 80% of the world's resources and "the third world" ensuring the first world' well-being. The process of resolving accumulated contradictions is connected with the creation of a new systematic methodology of the development management based on paradigms of consistency, innovations, and the concept of "sustainable development". According to the system paradigm by J. Kornai [17], the economy at any level is considered from the perspective of the creation, the interrelated and interconnected operation and the development of economic systems. According to the postulates of the system management [4,

6, 29, 14, 15, 16, 27], under the system, we understand a relatively autonomous and stable in time and space part of the world that has external integrity properties and the internal diversity. Economic systems are the systems, establishment and functioning of which ensures processes of production, distribution, exchange, and consumption of goods and the process is impossible without human intervention. The fundamentally important fact is that the nature of the operation and development of an economic system is not defined so much by its level (Macro-, Meso-, Micro- and Nano-Level), but by features of the nature and functions of the system in the space-time continuum.

2. CONCEPTUAL APPARATUS OF THE CATEGORY "DEVELOPMENT"

From a philosophical point of view, the development is a category reflecting a process of movement, change of whole systems. Modern science confirms the deep irreversibility of development, its multiplicity, and variety, as well as the fact that the "carrier" of development is complex, open and self-organizing systems. Various aspects of the concept of "development" are studied by many sciences associated with the cyclic reoccurrence or orientation of (linear or nonlinear) changes, single or multi-vector nature, being completely determinate or having possibilities of development, evolutionary or sudden (revolutionary) nature of political, economic and socio-cultural changes, artificial and "natural" character. In the 21 century, internal mechanisms of development, the analysis of which is associated with the study of the structure of developing objects became the subject of study. In modern socio-economic researches, one can find many interpretations of the category "economic development". In general, the development involves growth, enlargement, improvement, quality changes and can be regarded as a cumulative change in relations between quantitative, qualitative, and structural categories in the material or ideal system. One can say that the development has subjective-objective nature which demonstrates that in the process of development individual (qualitative, quantitative, structural) characteristics of investigated objects vary, while they maintain the integrity of their existence in the environment; these changes can depend and cannot depend on the subject of management and participants of the production process and they also have the subjective assessment of their significance. In modern socio-economic researches the development is studied in the context of three categories: growth, change, and improvement. Under the economic development we understand a multi-dimensional and multi-purpose process that includes: forming new goals and ways to achieve them; radical changes in the economic sphere, social structures, social institutions, and human behavior; the establishment of new quantitative, qualitative and structural characteristics of socio-economic systems [10, 3, 14, 18, 20 and 21]. In the course of further research under the economic development, we will understand the combination of structural, informational, and functional changes in socio-economic systems allowing to achieve qualitative and quantitative objectives of the high-level order.

3. DEVELOPMENT AND BALANCE AS THE OBJECT OF STUDY AND MANAGEMENT

Problems of the economic development have not only the analytical but also political significance; the development is both the subject and object of management. The retrospective analysis of the concepts of theories of the social development and the economic performance shows that the solution to the problems of development has always been associated with identifying the causes of the crisis and the search for conditions of the restart of the economic growth. Every researcher (J. Sismondi, J. Mill, F. Bastiat, K. Marx, N. Kondratiev, J. Schumpeter, F. Perroux, P. Keynes, V. Leontev, J. Neumann, R. Solow, T. F. Harrod, R.

Hawtrey, A. Pigou) offered their own strategies [3, 20]. However, happening all over again violations of the economic balance and the emergence of new data on the nature of the forces led to the need to clarify the existing scientific views. The theories of economic development and balance have a common staring point which is represented by the search for patterns and factors of the resilient current and prospective operation. Under the balance, one understands such condition of a system, in which the amount of affecting it external and internal forces (parameters) is equal to zero. Only when there are no external disturbances (impacts), the system can remain in equilibrium. For open dynamic systems, the balance is a complex notion, a middle state between continuous changes. A.A. Bogdanov said that "balance was a particular case of crises, as it is the crisis of movement" [6]. Back in the late 50 's in the 20-century the Australian scientist-biologist F. Bertalanffy noted such distinctive feature of open systems as "the state of dynamic equilibrium", in which the structure of an open system "remains constant, but in contrast to the usual equilibrium this constancy is maintained in the process of continuous exchange and movement of its substance" [4]. In accordance with the law of equilibrium by Le Chatelier for physical and chemical systems (known as Le Chatelier's principle) any system of dynamic equilibrium tends to change in such a way in order to minimize the effect of external influences while maintaining its qualitative certainty. The essence of the principle is that in such systems there are opposite processes mutually neutralizing each other at some level. An increase of one process leads to the increased resistance of a reaction. Bogdanov called the mechanism for the implementation of this principle "bi-regulator" [6]. Thus, the sustainability of complex systems is dynamic or according to the law of equilibrium by Le Chatelier, it is the case of more complicated equilibrium with the environment reflected in the dynamics of the interaction between the system and the environment [20, 21].

4. SUSTAINABILITY AS A BASIS FOR DEVELOPMENT

The concepts of sustainability and development are closely interrelated determining each other. Sustainability issues of systems of different nature and complexity are today among the most important in various sciences which explore "sustainability" as a condition or "sustainable development" as a process. Since the notion of sustainability is an attributive characteristic, it is impossible to give it a single "objective" definition, it will vary depending on the application object. In general, the sustainability is the ability to maintain itself during changes in external and internal factors, the ability to exist. The resilience of the system depends on the combination of three parameters: extensive parameters that characterize material and energy potential, intensive parameters that describe reproduction processes, and informational parameters that describe the composition and structure of the system parameters. The resilience of the system refers to an ability to function and to resist the inevitable disturbances (influences). A structural stability of the system implies the constant nature of its constituent elements. A functional stability is a stable performance of some functions of the system. An informational stability means that the system has stable information components that resist disturbances. Let us emphasize that the resilience of the system is a relative notion, so the system is quite resilient in some circumstances, but it may be unstable in another situation [6, 27]. The resilience is a property, an attribute characteristic, and a necessary condition for determining the efficiency of functioning of (current state) and possibilities for the development (movement) of economic entities as open systems. As a parameter of system’s matching, it is determined by system’s factors of low and high levels (internal and external environment). Enterprises interacting with the external environment and being open, dynamic, and complex systems are rarely in a sustainably-equilibrium condition, they are constantly moving from one relative state to another [20, 21].

5. PARADIGMATIC BASES OF THE DEVELOPMENT MANAGEMENT

The sustainable, manageable development implies the use of special methodological tools based on the study of paradigmatic bases and imperatives of the development management in the context of the new system paradigm. The concept of paradigm was first introduced in the history of science by G. Bergman. The paradigm is not manifested and it is not reflective structuring reality, which is always hidden, but still it establishes basic, fundamental proportions of human thinking and human existence. We can say that the paradigm is a great complex of undeveloped goals, a common denominator which determines the direction of the research at this stage in history [12]. According to the results of the study of the theory of the economic development, balance, sustainability, analysis of crisis problems and cyclic nature, as well as tools for the strategic management, marketing and financial management, and one can believe that paradigmatic bases of the development in the 21 century are "sustainable development" and "innovative development".

5.1. The paradigm of the sustainable development

The paradigm of the sustainable development is a paradigm of the balanced, self-sustaining development through the interrelated achievement of environmental, social, and economic objectives. Essential foundations of the concept of the sustainable development and its principles are shown in Fig. 1. The sustainable development means a quick progressive change of the system, without crises, recessions, and stagnation; it resists degradation, stagnation, balancing on the verge of preservation and destruction (survival), as well as the unsustainable development – progressive changes associated with recurrent crises. The sustainable development reflects such a development model of the society when basic necessities of life of present and future generations are met. Unfortunately, we can say that at present the international community does not have a final theoretical base of the concept of the sustainable development. With all the variety of views, the sustainable development problem exists in two main directions [6, 7, 11, 14, 19, 18, 24, 25, 26, 28].

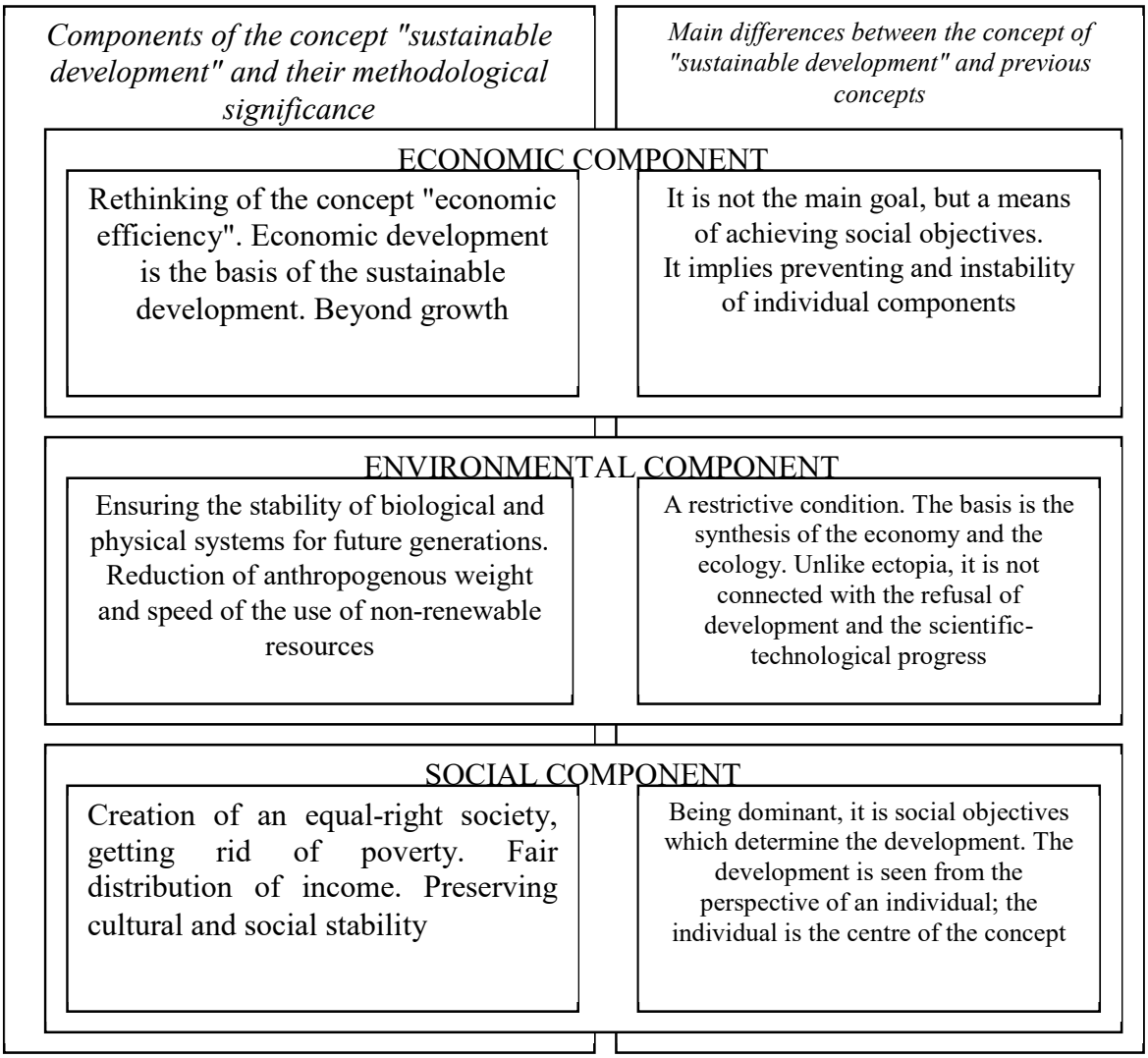


Fig. 1 – The essence of the paradigm of "sustainable development"

First direction is identifying objectives of social development in general, and defining conditions that ensure their achievement. According to a hierarchy of objectives of achieving the sustainable development, economic goals are put in a subordinate position in relation to the objectives of the development of the society that is seen as a means of ensuring the development sustainability in general. Second direction is studying of the conditions and factors that ensure the sustainability of economic development per se. The direction defines parameters and factors of the sustainable development model, it studies conditions of its balance, optimum development criteria, and it explores issues of the economic growth and the dynamic equilibrium. Achieving environmental, social, and economic goals through the usual methods of organizing production and the industrial economy management is almost impossible [9, 11, 19, 21, 22, 24, 25 and 26]. The basis for this is, firstly, limited resources, and, secondly, the opposite direction of the development goals when one accomplishes some goals then other achievement possibilities are violated. In modern conditions the only acceptable option for implementing the concept of the sustainable development is a paradigm of the post-industrial development of innovative production capabilities and more efficient methods of their resource supply.

5.2. Paradigm of the innovative development

The analysis of patterns, cyclic nature, and modern development tendencies allows making a conclusion that all modern development processes are defined or accompanied by innovations. Innovative mechanisms allow overcoming resource crisis by shifting the economy to a qualitatively new level and to ensure the solving of the three-level task specified in the concept of sustainable development – the unity of social, environmental, and economic goals. The implementation of innovative projects is connected with the creation of the innovation infrastructure and the development of the innovative capacity of an economic entity, it ensures the correspondence of products with technical, environmental, and social standards, and it improves the economic efficiency and competitiveness of enterprises, their investment attractiveness from the point of view of the foreign investor. What's the point of investing in the concept of "innovation"? The concept of "innovation" (Latin. "Innovation" – the introduction of something new) first appeared in the cultural researches in the 19th century meaning the introduction of some elements of one culture to another [8]. The founder of the innovation theory is an Austrian scientist J. Schumpeter [23]. The subject of innovation can be presented by a product, a manufacturing process, and the organization if they are new and implemented. In the future, on the basis of the Schumpeter's definition, there have been created some approaches to the definition of an innovation: functional, attributive, and subject. Under the innovative activity in the broadest sense, we understand the exploration of science and leading experience through the creation, implementation, and development of innovations in social, economic, political, scientific and technical, and other spheres of the activity. An innovation is always associated with the progress, and secondly, a necessary condition is the introduction of innovations into practice, and thirdly, innovation involves a number of effects. It should be noted that the relationship between the innovation process and the market economy are very contradictory. On the one hand, market relations involve such stimulating innovation factors as social energy, creative initiative, selective ability of a market to ensure the selection and survival of the most effective and adopted innovations [2, 5, 9, 19, 30]. On the other hand, market relations cannot be considered complete having the impact on innovations, because the behaviour of economic entities of the market is determined by short-term, conjunctural solutions, while the innovation activity has a long-term period. The implementation of innovation projects requires special attention to non-production factors. This determines the need for the state regulation and support for the innovative activity. This can be equally applied to opportunities of the implementation of the sustainable development concept, which is impossible without the state participation. In this regard, it is necessary to consider both internal and external imperatives of the development management.

6. DEVELOPMENT MANAGEMENT IMPERATIVES

An imperative as a definite and absolute requirement carries the meaning of obligation in future management processes or "creating future". The imperative is based on paradigmatic bases partially emerging from them. Development imperatives are divided into two classes: external and internal. External development imperatives constitute "requirements-restrictions", which are specified or applied to the system from the position of "supersystems" in the operation and development [1, 24].

6.1. External development imperatives (here and then – EDI)

To get a view of the development management, it is necessary to analyze external imperatives that form development tendencies of the world economic system:

EDI 1. The technological imperative is based on the industry of knowledge, inventions, and technologies. The main mechanism of the historical movement is new technologies.
EDI 2. The information imperative, the presence of a single information space, the importance of information security technologies in distributed systems.
EDI 3. The environmental imperative, solving dilemmas: "natural resources or commodity production", achieving a reasonable medium-term balance between production and consumption which will maintain/improve the quality of life reducing the consumption of non-renewable natural resources. "Coevolution" of a human being and nature based on changes in public consciousness. The introduction of conscious restrictions concerning human activity, violations of restrictions can lead to the most disastrous consequences for the civilization in the near future.
EDI 4. The imperative of a cluster project approach. Solving development problems of the transition from software to the project approach or the management of a cluster of programs allows distributing resources rationally, formulating objectives, and increasing chances of achieving them.
EDI 5. The imperative of the existence of a single economic space as a result of the globalization and internationalization of the economy.
EDI 6. The shift from the extrapolation and barometric forecasting to the regulatory prediction, development of desirable states and approval of development fields. One of the fundamental scientific achievements at the end of the 20th century was the awareness of the concept of limited prediction capacity (for the first time this has been proven in 1963 by the American meteorologist Edward Lorenz, who studied chaos in deterministic systems [22]).
EDI 7. The formation of new social subculture, participants of which are devoted to spiritual values, a sense of solidarity, concerned about the environment and social issues, open to new ideas and creation of a positive future with a nonantagonistic development component.
EDI 8. New criteria of efficiency, a transition from absolute or percentage financial indicators to efficiency indicators in terms of selection criteria for management decisions. The maximization of the profit growth in the modern world not only acquired global proportions, but it became a business mission, enslaving minds and consciousness of people, managers, owners of capital [13]. Based on the growth of the price of the company, sales, profitability, and a market share, business offers to the consumer that the consumer "wants", not taking into consideration what not only the consumer but the society, ecosystem, and future generations "need". In these circumstances, we question the existence of our civilization and the development as well.

6.2. Internal development imperatives (here and then – IDI)

Internal development imperatives are developed from laws of functioning of the system being a form of reflection of the subject over "laws" and a form of the corresponding obligation towards the future. In addition, domestic imperatives reveal a genetic, inherited part of the logic of the development of the system which was determined by the state of the system in the past. Thus, in accordance with the principle of continuity by Wieser" … the picture changes involuntary, but every following moment is agreed upon with the previous state [22]. According to the features of the socio-economic development of the Russian Federation, some internal imperatives of the development management are formulated:
IDI 1. Turning the innovative orientation of the development of the economy into a new national idea that performs a uniting and stabilizing role.
IDI 2. Centralized nature of the innovation policy that involves strengthening a national identity, a clear state innovation strategy, and policy.

IDI 3. The prevalence of the socio-humanistic orientation involving the revival of a creative direction of the individual and spiritual liberation of a person. In the political science, nations are divided into three generations. Nations of the first generation focus on such industries as heavy engineering, power generation, agriculture, great chemistry. In nations of the second generation, the basis of the economy is high technologies: microelectronics, computer science, biotechnology, light chemistry. In nations of the third generation, the main product is information, new technologies, new ideas, and images of mass consciousness. When transitioning from one generation to another labour productivity increases, living standards go up, the level of anthropogenic impact on the environment decreases. The creation of conditions for this transition is one of the most important tasks of the system of the development management, and it is achieved by building the innovative economy [11, 22, 24, 27].
IDI 4. The reconstruction of market infrastructure, in general, taking into account new macro logistic approaches and creating the innovation infrastructure, the development of relations of science, production, and business with the subsequent transfer to production enterprises.
IDI 5. The imperative of the advanced development of science and education, revival and preservation of the Russian educational system qualitatively altered through the use of modern educational technologies.
IDI 6. The development of the innovative capacity of the individual, personnel of the enterprise and the country in general. The formation of new, innovatively designed leaders.
IDI 7. The development of the material-productive capacity of industries and enterprises. The transition to the advanced innovation-oriented reproduction of fixed assets.
IDI 8. Support of the fast development and the efficiency improvement of industrial enterprises with a high proportion of the added value and enterprises of the military-industrial complex.
IDI 9. The improvement of the system of the right security aimed at solving problems of the commercialization and the distribution of innovations, the management of intellectual and industrial property rights.
IDI 10. The preservation of natural ecosystems. Currently, Russia is one of the centers of environmental stabilization which is referred as "wild nature" or the ecosystem that didn't reduce bioproductivity and didn't lose its original biodiversity according to official United Nation standards.

7. SYSTEM GROUPING OF DEVELOPMENT MANAGEMENT IMPERATIVES

According to the classification of G.B. Kleyner [15, 16] on the basis of the presence or absence of boundaries in space and time, all systems are divided into 4 classes: S1, S2, S3, and S4. The properties of economic systems of the class S1 (the lack of boundaries in space and time) are similar to properties of the environment, some examples are socio-economic institutions, business climate, infrastructure. Properties of S2 class systems are similar to properties of the object (the existence of boundaries in space and the lack of boundaries in time, some examples are countries; regions, enterprises). Properties of S3 class systems are similar to properties of processes (the lack of boundaries in space and the existence of boundaries in time, some examples are logistics processes, spread of innovation; transfer of knowledge). Properties of S4 class systems are similar to properties of the projects (the existence of boundaries in space and time, some examples are mastering the manufacture of new kinds of production, investment and construction projects). Summarizing all the information, one can say that the achievement of the sustainable development in the framework of the system paradigm involves the use of management tools based on the studied imperatives, the realization of which will allow maintaining a dynamic balance between the four main classes of systems (fig. 2).

Type of the economic system					
Time characteristics		environmental	object	process	project
		S_1	S_2	S_3	S_4
		Space characteristics			
Paradigmatic development bases	Sustainable development	Environmental imperative Imperative of the existence of a single economic space Formation of cultural creatives Preservation of the natural ecosystems	New efficiency criteria in terms of selection criteria of a management decision	Transition to the regulatory prediction	Prevalence of the socio-humanistic orientation
	Innovative development	Information imperative National "innovative idea" Creation of the innovative infrastructure Development of the institutional environment	Centralized nature of the innovation policy	Technological imperative Advanced development of science and education	Imperative of the cluster project approach Development of the innovation capacity Development of the material-production capacity

Fig. 2 – System grouping of development management imperatives

8.CONCLUSION

The new methodology of the development management is based on the system paradigm. As paradigmatic bases, the use of the concept of the sustainable development and innovative development is justified. The significance of the concept of the sustainable development is that it alters basic value orientations of the development of the society from Homo economicus to Homo sapiens; and it is an external and internal development imperative determining the emergence of new methods, forms, and practical mechanisms for the development management. Being a new concept of the development of the society and all its production elements, the concept of the sustainable development is oriented towards the development through the interrelated achievement of environmental, social, and economic objectives. The achievement of economic objectives on the basis of the usual methods of the production organization and the industrial economy management is almost impossible. It is based, firstly, on limited resources, and secondly, on the opposite direction of development goals because when you accomplish some goals, other achievement possibilities are violated. The original contradiction in the system of economic contradictions is the contradiction between ever-growing needs and the limited production of economic goods to meet these needs. This

contradiction is resolved by the production of goods to meet new needs. Being resolved at one historical stage in the development of the society, it reappears at the other. The reproduction of fundamental economic contradictions drives the economic progress and encourages the emergence of higher level needs. In modern conditions, the only acceptable alternative to resolve economic contradictions is the paradigm of the post-industrial development with capabilities of innovative production and more efficient methods of their resource supply. The intellectual orientation, rather than raw material orientation allows ensuring high paces of the economic growth, maintaining the natural ecosystem, reducing the number of harmful and dangerous production facilities. The sustainable development management is maintaining the dynamic equilibrium between systems of environmental, project, object, and process classes through the use of management mechanisms that are based on internal and external imperatives of the development management.

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CONTROL OF STATE AUDIT IN BUDGET REVENUE REALIZATION AND TAX REVENUE DYNAMICS

Mahaček Dubravka

Abstract

Size of realized budgetary funds affects the possibilities of meeting public needs, both at the state and at the local government level. The importance of the state audit is in control of realization and use of budgetary funds. The purpose of this paper is to investigate the size of the budgetary funds at the county level in the Republic of Croatia, as well as to explore and analyse the size and movement of tax revenue in overall realized funds. The purpose of this paper is to point out the possibility of influencing government auditing procedures through controls on improving realization and use of funds of local government units. This paper provides an overview of legislative framework governing the structure of local units, financing of local government units and supervision. The empirical part of the paper analyses the general government revenues and overall revenues at the county level and the movement in tax revenues. The main source of data is data of the Ministry of Finance and the State Audit Office. The survey data show that tax revenues in 2014 compared to 2013 have reduced at the level of counties. The share of tax revenues in overall revenues in every county is different. A characteristic of tax revenues is that they do not have a purpose defined by law, unlike most other local government revenues.

Keywords: local government units, budget, tax revenues, control, state audit

JEL Classification: M42, H71

1.INTRODUCTION

Monitoring the realization of the budgetary resources of local government units is performed by the National Audit Office, which is the highest auditing institution of the Republic of Croatia. The basic law governing the conduct of the audit is the State Audit Office Act (2011) according to which the audit represents an examination of documents, deeds, statements, internal control and internal audit, accounting and financial procedures and other records in order to determine whether financial statements provide accurate financial position and financial activities in accordance with accepted accounting principles and accounting standards. The audit is also a procedure of examining financial transactions in terms of the legal use of funds. An audit also includes an assessment of the efficiency and effectiveness of activities and an assessment of the effectiveness of achieving business goals or objectives of certain financial transactions, programs and projects (State Audit Office Act, paragraph 7). The primary tasks of the audit are focused on financial activities, but also include activities with a purpose of achieving the effectiveness, economy and efficiency.
Audits are conducted in accordance with international auditing standards and code of ethics. The standards aim to improve the quality and professionalism of work, and are developed through international cooperation. Audits are conducted in a manner and according to the procedures laid down in the audit standards framework of the International Organization of Supreme Audit Institutions (INTOSAI). Conducted financial audit gives orders to act, while performance audit provides recommendations for improving business operations.

International Organisation of Supreme Audit Institutions has adopted standards. ISSAI 100 standard (International Standards of Supreme Audit Institutions) provides the Fundamental Principles of Public-Sector Auditing. ISSAI 100, paragraph 22 (p. 5) states that there are three main types of public sector audits, financial audits, performance audits and compliance audits. Performance is examined in relation to the relevant criteria and the causes of deviations from these criteria are analysed. The goal is to answer the key audit issues and make recommendations for improvements.
ISSAI 300 standard provides Fundamental Principles of Performance Auditing. ISSAI 300 in Section 11 (p. 2) defines economics, efficiency and purposefulness:

- The principle of economy means minimizing the costs of resources. The resources used should be available in due time, in and of appropriate quantity and quality and at the best price.
- The principle of efficiency means getting the most from the available resources. It is concerned with the relationship between resources employed and outputs delivered in terms of quantity, quality and timing.
- The principle of effectiveness concerns meeting the objectives set and achieving the intended results. "

The main objective of performance auditing is to constructively promote economical, effective and efficient governance. It contributes to accountability and transparency. The definition of performance audits according to ISSAI 300 standard, item 9 (p. 2) is: "As carried out by SAIs, performance auditing is an independent, objective and reliable examination of whether government undertakings, systems, operations, programs, activities or organizations are operating in accordance with the principles of economy, efficiency and effectiveness and whether there is room for improvement." From the above we can see that the subject of an audit depends on the set goal of the audit, i.e. subjects to an audit can be parts of a certain whole, depending on the interest of the public. For performance audit it is important to emphasize that the focus is on the optimal use of resources, it may question the whole business conduct or a certain part of it, projects or activities of the audited entity, evaluating in this process economy, efficiency and expediency, and one audit differs from another in selection of criteria for assessing, auditing methods are not standardized etc.
The State Audit Office can perform in a subject financial audits, as well as performance audits, which vary according to their objectives and methods used.

2.MATERIALS AND METHODOLOGY

The main purpose of this paper is to investigate the size of realized budgetary funds at the county level in the Republic of Croatia and to investigate the size, determine the movement and conduct an analysis of tax revenues in overall realized funds in the period from 2012 to 2014. The paper presents the revenues of the general government, and provides an overview of tax revenues at the level of general government.
Statistical methods have been used for researching trends and analysis of tax revenues. This issue was examined using the relative numbers, i.e. indexes - basic and chained, and with the use of percentages. For drawing conclusions, this paper used methods of synthesis, and comparisons with the realization of tax revenues at the level of the general government budget. The main sources of data are the data of the Ministry of Finance and the State Audit Office, legislation and scientific literature.

3.TAX SYSTEM AND TAX REVENUES

The issue of the tax system is of particular importance in the context of each country. Tadin, H. (2012) states that the tax system represents a unity of political goals, tax policies and all forms of taxes that exist in a Member State of the European Union, and that tax systems usually have political, economic, fiscal and social objectives. Furthermore, the same author states that the tax system of each Member State of the European Union represents a fundamental feature of national sovereignty, with an aim of implementing their own development strategies and policies that enable faster reaching of the average development of EU member states. He also claims that the competitiveness of each country depends mostly on direct taxes, which are: income tax, profit tax and property tax.
Karras, G & Furceri D. (2009.) investigated the effects of changes in taxes on economic growth in EU. The results show that an increase in the tax has a negative impact on long-run growth in the EU. In addition, an increase in the total tax rate by 1% of GP will have a long-run effect on GDP per capita of 0,5% and 1% (Belullo & Dužman, 2011).
Brummerhoff, D. (2000) states that taxes are in fact an important instrument of economic policy, which among other things can be used to influence the distribution of income, the realization of higher employment and price stability. When you want to achieve these goals, revenue collection has mainly only secondary importance. Both groups of objectives - the desired distribution of costs of public goods and services, and directing private activity, are today recognized both in theory and practice.

Dražić, L. I. et al. (2015) state that taxes are the most abundant and the most important public revenue, but not the only revenue for financing public needs. In the context of public revenues at the level of general government in the Republic of Croatia, in the period from 2006 to 2013 the same authors state that the most important are taxes, followed by social contributions (pension insurance, health insurance, contributions for employment injuries and occupational diseases, employment contributions), other income and help. In 2013, public revenues at the level of the general government budget amounted to HRK 125.9 billion and were realized by:

a) taxes in the amount of HRK 74.5 billion (59.2%), which includes:
- Value added tax amounting to HRK 40.2 billion
- Excise duty in the amount of HRK 11.7 billion
- Income tax in the amount of HRK 10.3 billion
- Profit tax in the amount of HRK 6.4 billion
- Other taxes in the amount of HRK 5.9 billion

b) contribution in the amount of HRK 37.2 billion (29.6%)
c) other income in the amount of HRK 12.4 billion (9.9%)
d) assistance in the amount of HRK 1.8 billion (1.3%).

The same authors state that in 2008 public revenues at the level of the general government budget amounted to HRK 134.7 billion, of which taxes amounted to HRK 79.7 billion (59.2%), contributions in the amount of HRK 40.7 billion (30.2%), other income HRK 13.8 billion (10.2%), and help HRK 0.5 billion(0.4%). In the period from 2006 to 2013 there was a reduction in public revenues of the general government in relation to 2008 when they were the highest and amounted to HRK 134.7 billion. From this, we can see that in the context of public revenues at the general government level taxes are the most important. We have also seen the types of taxes that are realized at the level of the general government, and what is the significance of each individual tax.

The main instrument that distributes most of the collected funds is the budget, which is adopted for a period of one year. The budget should be planned and its execution has to be monitored. Importance is placed on both the spending of budget funds, and their collection. Mahaček, D. (2015) gives an overview of revenues and receipts of all counties in the Republic of Croatia and determines that tax revenues in 2010 accounted for 58.1% of the overall realized revenues and receipts at the level of all counties.
Šimović (2008) used the regression analysis to confirm the significant taxation-economic growth relation, and the vector auto-regression (VAR) model to explore the interaction of taxation and economic growth in Croatia. Results showed the correlation between the taxation and the economic growth in Croatia and proved that there is mutual influence between taxation and economic growth, but that taxation has more significant affect on the economic growth (Belullo & Dužman, 2011).

4.REALIZATION OF LOCAL GOVERNMENT FUNDS

This paper examines trends in tax revenues at the county level. In order to understand this subject matter, we must first note that the Organization of the Republic of Croatia is based on 20 counties as units of regional self-government, and cities and municipalities as local self-government units, amounting to 126 cities and 428 municipalities, and the City of Zagreb which has a special status of both a city and a county, which means that there are 555 local self-government units, and a total of 576 local and regional self-government units. From the foregoing it follows that each county has a different number of cities and municipalities. The realization of revenue at the county level in this paper includes the realization of revenues of cities and municipalities that exist in a specific county.
The fiscal capacity of LGUs in Croatia is determined as the per capita income of LGUs reduced by aid from abroad and from entities within the general government and the portion of income obtained through equalisation grants for decentralised functions (Primorac, 2015).The fiscal equalisation in Croatia relies on the personal income tax (PIT) revenue sharing and allocation of grants from the central government budget. The PIT revenue is shared between counties, cities and municipalities, with distribution coefficients depending on the status of LGUs. Owing to different shares in the PIT revenue, this tax sharing arrangement could have an impact on fiscal inequalities if the preferentially treated LGUs are adequately determined. In general, the PIT is divided between counties (16%) and cities and municipalities (56.5%) (Primorac, 2015).
The effectiveness of the fiscal equalisation system is assessed by measuring inequalities in per capita fiscal capacities of local government units (LGUs). Martinez-Vazquez & Timofeev (2008) define the term fiscal capacity as the ability of the particular area to collect revenue for public consumption, with a given level of economic activity within the boundaries of that area and the authority for deriving public revenue from these activities.
Bronić (2008, 2010) indicates the ineffectiveness of the fiscal equalisation system at the county level and points out the necessity of determining the extent to which fiscal instruments reduce inequalities at the level of cities and LGUs. Primorac (2014) proposed the new fiscal equalisation model that alleviates inequalities in the fiscal capacities of LGUs much better than the existing equalisation system for the same cost. In addition, the complete abolition of the redistribution (tax sharing) and release of the total PIT revenue to LGUs would reduce fiscal inequalities. In other words, the tax sharing system and the distribution of central government grants reduce fiscal inequalities, but only by the negligible effect, which could be achieved at much lower cost.

4.1.Financing local and regional self-governments

Financing Local and Regional Self-Government Act establishes sources and methods of funding local government activities of counties, municipalities and cities, and local and regional self-governments. Revenues are collected from their own sources, shared taxes and grants from state and county budgets. Own sources of county revenue are own assets, county taxes, fines and other revenues set by the law. County taxes are taxes on inheritance and gift tax, motor vehicle tax, vessels tax and tax on gambling machines. County taxes may be fully or partially be given to the city or municipality in whose territory the taxpayer resides. Municipalities or cities can introduce taxes: surtax on income tax, taxes on consumption, vacation houses, company or name, and the tax on public land use.
In line with the transfer of responsibility for the provision of certain public functions from central to LGUs, the central government gives away part of the revenue for their financing. In order to alleviate fiscal inequalities between LGUs, Croatian authorities have employed different fiscal instruments, applied according to the status of LGUs in the financing system. LGUs that are considered financially weaker enjoy the preferential treatmentand they are identified based on their geographic location (Primorac, 2015).
Provisions of Local and Regional Self-Government Act define the scope of operations of a county, city and municipality.The scope of the operations of the County are operations of regional importance and harmonization of interests regarding even development of municipalities and cities in its area, as well as a county as a whole, and especially operations regarding education, health, spatial and urban planning, economic development, traffic and traffic infrastructure, public roads maintenance, planning and developing a network of education, health, social and cultural institutions, issuing construction and location permits, other acts related to construction, implementation documents Zoning and other activities in accordance with special laws.
Local units should improve the standard of life of residents in their area.The aboveneeds to be achieved via revenue collection through the existing system of financing.Revenues should allow unhindered execution of responsibilities of the local unit. Duties within the scope of cities and municipalities are related to settlement planning and housing, spatial and urban planning, communal economy, childcare, social care, primary health care, education, culture, sports and physical education, consumer protection, protection and improvement of natural environment, fire and civil protection traffic in its area and large cities also perform other tasks such as public road maintenance, issuance of building and location permits, other acts related to construction and implementation of spatial planning documents.Large cities are the only local self-governments that are also economic, financial, cultural, health, transport and scientific centres of the development of the region and which have more than 35,000 inhabitants.According to the census of 2011 in the Republic of Croatia there are 17 cities with more than 35,000 inhabitants (together with the City of Zagreb, which has 790,017 inhabitants).

4.2.Realization of funds at the level of counties as local and regional self-governments

Below is an overview of the realization of funds at the county level in the Republic of Croatia in a defined time period. Realized funds are used for financing public needs. Therefore, their availability defines the possibilities of meeting public needs, which is within their scope. Within the frame of realization of revenues and receipts at the county level is included the realization of revenues and receipts of cities and municipality located on the territory of each county.
Table 1 provides an overview of revenues and receipts of each county. The percentages that show the participation of each county in the overall revenue realization have been calculated.

We note that in the overall achievement in 2013 and 2014 the largest share was realized by the City of Zagreb (31.5% and 32.0%). Other counties participated in varying degrees. Some counties have very little participation in overall revenues. Base and chain indexes have been calculated. Total realized overall revenues in 2013 and 2014 are higher compared to the base year 2012, which is shown by calculated indexes. Calculated index of overall revenue achievement for 2014 compared to 2013 shows an increase in overall revenues in all counties by 3.6%. In the same way, we can analyse the movement of revenue of each county. Seven counties realized lower revenues in 2014 compared to 2013.

Tab. 1 – Revenues and receipts by county. Source: table drafted by the author according to the data by the Ministry of Finance available on http://www.mfin.hr/hr/ostvarenje-proracuna-jlprs-za-period-2010-2014

County and number of local units	Overall revenues and receipts, in HRK		Share in%		Index for 2013 2012 = 100	Index for 2014 2012 = 100	Index 2014 / 2013
	2013	2014	2013	2014			
1	2	3	4	5	6	7	8
Zagreb, 35	1,373,904,484	1,357,503,140	5.8	5.5	105.0	103.7	98.8
Krapina - Zagorje, 33	454,438,440	447,112,699	1.9	1.8	107.1	105.4	98.4
Sisak-Moslavina 20	682,618,800	659,114,871	2.9	2.7	94.3	91.0	96.6
Karlovac, 23	544,432,122	561,407,802	2.3	2.3	108.7	112.1	103.1
Varazdin, 29	703,184,773	682,549,313	3.0	2.8	116.5	113.1	97.1
Koprivnica-Krizevci, 26	489,227,277	523,847,052	2.1	2.1	95.0	101.8	107.1
Bjelovar-Bilogora, 24	395,059,749	385,959,616	1.7	1.6	107.0	104.6	97.7
Primorje-Gorski Kotar, 37	2.075,561,739	2,033,145,010	8.8	8.3	91.5	89.7	98.0
Lika-Senj, 13	299,819,962	328,831,489	1.3	1.3	110.2	120.8	109.7
Virovitica-Podravina, 17	328,469,150	350,059,899	1.4	1.4	111.9	119.2	106.6
Pozega-Slavonia, 11	280,583,319	328,794,888	1.2	1.3	111.1	130.2	117.2
Brod-Posavina, 29	486,306,457	449,560,815	2.1	1.8	113.1	104.5	92.4
Zadar, 35	884,488,743	982,939,710	3.7	4.0	105.3	117.0	111.1
Osijek-Baranja, 43	1,102,751,028	1,156,974,976	4.7	4.7	99.4	104.3	104.9

Sibenik-Knin, 21	546,810,684	596,018,414	2.3	2.4	105.0	114.5	109.0
Vukovar-Srem, 32	586,592,734	647,809,268	2.5	2.6	103.5	114.3	110.4
Split-Dalmatia, 56	2,228,568,487	2,263,564,439	9.4	9.2	109.5	111.2	101.6
Istria, 42	1,606,495,533	1,680,944,376	6.8	6.9	110.0	115.1	104.6
Dubrovnik-Neretva, 23	799,688,025	894,369,717	3.4	3.6	107.8	120.6	111.8
Medjimurje, 26	344,602,230	358,951,332	1.5	1.5	97.6	101.7	104.2
City of Zagreb, 1	7,466,250,223	7,843,849,387	31.5	32.0	116.6	122.5	105.1
Total - 576	23,679,853,959	24,533,308,213	100	100	107.7	111.6	103.6

Table 2 provides an overview of the overall revenues and receipts of all counties in the period from 2012 to 2014. An emphasis is placed on the type of income that has been realized. If we look at overall realization of all revenue, we conclude that in all three years (2012, 2013 and 2014), tax revenues have the largest share (54.3%, 55.7%, 52.0%), and that share is decreasing. With the existence of the same legislation, reduction in realized tax revenues in the absolute, but also in relative terms, it may be due to the inability of their collection. Other forms of revenues participate in the realization of overall revenues, but with smaller share and they are not the subject of research in this paper.

Tab. 2 - Overall revenues and receipts by type of revenue at the level of all counties, cities and municipalities, in HRK. Source: table drafted by the author according to the data by the Ministry of Finance available on http://www.mfin.hr/hr/ostvarenje-proracuna-jlprs-za-period-2010-2014

Revenues	2012	Share in% 2012	2013	Share in% 2013	2014	Share in% 2014
1	2	3	4	5	6	7
A) Operating revenues (a + b + c + d + e + f + g + h)	20,687,119,854	94.1	22,166,131,483	93.6	22,109,792,677	90.1
a) income tax	11,938,587,467	54.3	13,198,733,035	55.7	12768532.804	52.0
b) contributions	0	-	0	-	0	-
c) help from abroad and from subjects within the general budget	2,865,530,323	13.0	3,051,695,747	12.9	3,386,852,307	13.8
d) income from property	1,696,627,948	7.7	1,733,642,121	7.3	1,882,686,631	7.7

e) income from management and administrative fees, fees based on specific regulations and fee	3,618,620,316	16.5	3,743,517,882	15.8	3,718,281,706	15.2
f) income from sales of products and goods and services provided and revenues from donations	340,958,151	1.6	178,473,567	0.8	186,442,945	0.8
g) Income from budget	12,353,671	0.1	18,022,829	0.1	17,314,016	0.1
h) fines, administrative measures and other income	214,441,979	1.0	242,046,302	1.0	149,682,268	0.6
B) Sales of non-financial assets	651,551,676	3.0	778,792,846	3.3	683,349,982	2.8
C) Proceeds from financial assets and borrowing	654,358,657	3.0	734,929,630	3.1	1,740,165,554	7.1
Total (A + B + C)	21,993,030,187	100	23,679,853,959	100	24,533,308,213	100

Table 3 provides an overview of the revenue realized from taxes in counties in the period from 2012 to 2014. From the data we can see that each county has different revenues from taxes, which we presented in absolute terms. For each county, revenues from taxes are related to the overall revenues in that county. From these relative numbers, percentages, we see that in the context of income of each county, tax revenues participate in different shares. At the level of county, tax revenues in 2012 had the share of 54.3%, in 2013 the share was 55.7%, while in 2014 the share was 52.0%. The largest share of tax revenues is seen in the City of Zagreb in 2013 (74.2%), while the lowest was observed in Virovitica-Podravina County in 2014 (26.7%).

Tab. 3 - Income from taxes and their share in overall revenues for each of the counties. Source: table drafted by the author according to the data by the Ministry of Finance available on http://www.mfin.hr/hr/ostvarenje-proracuna-jlprs-za-period-2010-2014

County	Tax revenues per county, in HRK			The share of tax revenues in total revenues of the County		
	2012	2013	2014	2012	2013	2014
1	2	3	4	5	6	7
Zagreb	846,934,987	868,872,126	901,548,556	64.7	63.2	66.4
Krapina-Zagorje	226,338,404	236,622,047	238,160,466	53.3	52.1	53.3
Sisak-Moslavina	299,258,949	297,304,663	295,836,914	41.3	43.6	44.9
Karlovac	256,340,485	270,161,845	269,181,203	51.2	49.6	47.9
Varazdin	325,595,907	337,977,430	343,022,100	54.0	48.1	50.3
Koprivnica-Krizevci	177,938,398	180,357,270	176,088,369	34.6	36.9	33.6
Bjelovar-Bilogora	166,844,211	169,252,658	165,913,917	45.2	42.8	43.0
Primorje-Gorski Kotar	994,354,581	1,054,869,940	1,059,201,456	43.9	50.8	52.1
Lika-Senj	106,535,992	110,479,356	114,457,070	39.1	36.8	34.8
Virovitica-Podravina	93,180,977	95,929,460	93,487,520	31.7	29.2	26.7
Pozega-Slavonia	97,875,165	99,600,204	100,103,549	38.8	35.5	30.4
Brod-Posavina	181,709,059	193,493,803	192,814,931	42.3	39.8	42.9
Zadar	365,678,492	393,258,437	411,882,437	43.5	44.5	41.9
Osijek-Baranja	541,431,216	542,520,744	533,462,385	48.8	49.2	46.1
Sibenik-Knin	215,809,722	234,082,395	229,887,967	41.5	42.8	38.6
Vukovar-Srem	214,900,643	220,932,563	212,180,559	37.9	37.7	32.8
Split-Dalmatia	1,066,277,252	1,121,582,507	1,131,208,071	52.4	50.3	50.0
Istria	667,410,765	705,614,736	719,341,050	45.7	43.9	42.8
Dubrovnik-Neretva	337,940,107	353,489,144	370,764,201	45.6	44.2	41.5
Medjimurje	161,382,850	169,743,712	179,776,149	45.7	49.3	50.1
City of Zagreb	4,594,849,305	5,542,587,995	5,030,213,934	71.7	74.2	64.1
Total	11,938,587,467	13,198,733,035	12,768,532,804	54.3	55.7	52.0

Tab. 4 shows the participation of tax revenues realized by each county in the overall revenues from taxes at the level of all counties from 2012 to 2014. The calculation of the said shares was based on the data from Table 3, which shows the amount of revenues in absolute terms, by each county. In the overall tax revenues at the level of all counties the largest share is of the City of Zagreb, in all three observed years. The smallest share in the overall revenue realization at the level of all counties has been achieved by Virovitica-Podravina County, in both 2013 and 2014, with the share of only 0.7%.

Tab. 4 - The share of tax revenues of each county in the realization of overall tax revenues at the level of counties from 2012 2014. Source: table drafted by the author according to the data by the Ministry of Finance available on http://www.mfin.hr/hr/ostvarenje-proracuna-jlprs-za-period-2010-2014

County	Share in % for 2012	Share in % for 2013	Share in % for 2014
1	2	3	4
Zagreb	7.1	6.6	7.1
Krapina-Zagorje	1.9	1.8	1.9
Sisak-Moslavina	2.5	2.3	2.3
Karlovac	2.1	2.0	2.1
Varazdin	2.7	2.6	2.7
Koprivnica-Krizevci	1.5	1.4	1.4
Bjelovar-Bilogora	1.4	1.3	1.3
Primorje-Gorski Kotar	8.3	8.0	8.3
Lika-Senj	0.9	0.8	0.9
Virovitica-Podravina	0.8	0.7	0.7
Pozega-Slavonia	0.8	0.8	0.8
Brod-Posavina	1.5	1.5	1.5
Zadar	3.1	3.0	3.2
Osijek-Baranja	4.5	4.1	4.2
Sibenik-Knin	1.8	1.8	1.8
Vukovar-Srem	1.8	1.7	1.7
Split-Dalmatia	8.9	8.5	8.9
Istria	5.6	5.3	5.6
Dubrovnik-Neretva	2.8	2.7	2.9
Medjimurje	1.5	1.3	1.4
City of Zagreb	38.5	41.8	39.3
Total tax revenues of all counties	100	100	100

From the data we can conclude on the significance of tax revenues at the county level. We also conclude that in the context of income of each county, tax revenues participate with different shares, which is reflected on the possibilities of financing various needs. Peric, R. and Mahaček, D. (2009) provide a detailed overview of the realization of tax revenue in the period 2003 to 2006, and also in the mentioned period concludes on their significant share. Mahaček, D. et al. (2015) presented fiscal capacity of the counties by analysing the revenues and receipts in relation to the number of inhabitants for each unit of local (regional) self-government for the period from 2007 to 2011, and conclusion differences in the development of counties.
The importance of tax collection is confirmed by the literature from which we understand that the competitiveness of each country depends mostly on direct taxes, which are: income tax,

profit tax and property tax. Because of the diversity of tax systems it is very difficult to conduct analyses and comparisons between countries. According to a survey on taxes in Croatia and Europe, which was conducted in Deloitte (2015), the most frequently cited source of insecurity in Croatia are frequent legislative changes and deficiencies and ambiguities in issuing tax opinions. As in Croatia, those three sources of tax uncertainties have also been listed for other European countries.

According to the Eurostat data, across the EU-28 the main components of overall general government revenues are taxes and net social contributions. Taxes in 2014 accounted for 58.8% of overall revenues in the EU-28 (member states) and 55.5% in the EA-19 (member states which adopted the euro as their common currency), and net social contributions amounted to 29.8 % of overall revenues in the EU-28 and 33.3% in the EA-19. In the overall revenues in the EU-28 and EA-19 the share of market production, production for own final use and payments for non-market production ("sales/fees" and investments in capital for own account) amounted to 6.9 %. Property income (mainly interests, dividends and rents) amounted to 2.2% of overall revenues in the EU-28 and 2.0% in the EA-19. The same source states that if any Member State is observed separately, significant differences can be seen in the relative importance of different categories of income. Taxes in 2014 accounted for less than 50% of government revenue in Slovakia, Lithuania, the Czech Republic and Slovenia, but they accounted for 86.4% of overall general government revenues in Denmark and 77.9% in Sweden.

According to the World Bank Group Flagship Report, Doing Business 2017 (2016, p. 35) it is stated that: "Properly developed, effective taxation systems are crucial for a well-functioning society. In most economies taxes are the main source of federal, state and local government revenues that are needed to fund projects related to health care, education, public transport and unemployment benefits, among others. The corporate tax burden has a direct impact on investment and growth."

Summaries of Doing Business Reforms in 2015/16 for Croatia (2016, p. 174) are:

"Starting a business: Croatia made starting a business more difficult by increasing notary fees.

Protecting minority investors: Croatia strengthened minority investor protections by requiring detailed internal disclosure of conflicts of interest by directors.

Paying taxes: Croatia made paying taxes more complicated by introducing a radio and television fee, and eliminating the reduction of the Chamber of Economy fee for new companies."

The analysis of income and realization of tax revenues is evident that the sources of income of local budget law certain and stable, but they are different in their counties. Therefore, it could be concluded that in each county, the public needs are met, depending on the means with which to dispose. This led to the development of different counties. Arises the question of justification of the existing system of administrative-territorial organization, and the need to implement reforms that would enable a different allocation of resources at the national level which should eventually lead to equal development of all counties.

4.3.The impact of state auditing through procedures of controlling the realization of assets of local units

During the audit, various irregularities may be established. The State Audit Office issues orders and recommendations, and subjects are obliged to act according to them. According to Akrap, V. et al. (2009, p. 81) on the basis of the number of irregularities and their importance, an opinion on financial statements and operations of the audited entity is issued.

The monitoring of carried out orders and recommendations that were given subjects influences the improvement of the realization and use of funds. In the Report of the State Audit Office in 2015 (2015, p. 33), there is a list of local units (cities and districts) in which an audit has been

performed during the reporting period from 10.01.2014 to 30.09.2015 and listed are local government units that have not executed orders issued by earlier audits. According to the Report data, of 68 local government units (cities and municipalities), only14 units, or 20.6%, have complied with the orders from previous audits, while 54 local units, or 79.4%, failed to comply with the orders issued during previous audits. These data indicate the need and justification of monitoring execution of issued orders and recommendations by the state audit.

5.CONCLUSION

Researches in this paper have confirmed the hypothesis on the significance of the share of tax revenues in overall revenues at: the general government level, at the level of overall revenues and receipts of all counties (which includes realization by all cities and municipalities), and in the context of the revenue achievement in each county. Taxes are an important instrument of economic policy that can be applied to influence the achievement of certain targets at the national level, from income distribution, price stability, creating greater employment etc. This paper investigated the realization of tax revenues by counties, in shows the diversity of counties and their different abilities in meeting public needs that had been placed under their jurisdiction. This paper has not analysed the type of tax, which should be done in order to present more detailed reasoning, since the competitiveness of each country depends mostly on direct taxes, which are: income tax, profit tax and property tax. In this way it would be possible to explore the possibilities for achieving the objectives at the national level such as, achieving higher employment or some other goals. In order to achieve the goal of increased employment, revenue collection would not have the primary meaning, but only secondary. The author presented the unequal opportunities county in meeting the public needs and the need to review the existing distribution of income within the existing or new organization of local government units. In this moment financially weaker local government units are identified based on their geographic location rather than financial criteria and the EU accession process has encouraged Croatia to define the strategy for regional development and establish a map of regional disparities through underdevelopment indices.

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FINANCIAL PERFORMANCE OF AUTOMOTIVE COMPANIES AND ITS IMPACT ON CONCENTRATION OF AUTOMOTIVE INDUSTRY IN SLOVAK REPUBLIC

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Abstract

This article describes how financial results of Slovak automotive companies influenced competition and concentration in this sector during years after latest financial crisis. It also analyse the concentration of automotive industry by using relevant metrics as market share, concentration ratio CR3, CR5, CR10 and Herfindahl index. The aim of this paper is to complete and present financial results, then measure the degree of concentration in the Slovak automotive industry and also explain possible future trends within this sector. Finally, the article should inspire a reader and make him to consider, how strong is the impact of strongest automotive industry companies on whole Slovak economy.

Keywords: financial performance, concentration ratio, Herfindahl index, automotive industry

JEL classification: D22, G39, L62, M21,

1. PREWORD

The automotive industry represents a key sector of the Slovak economy. However, this industry is not only about producers, but also about suppliers. For the production of the final product, wide range of components is necessary and that is why automotive industry is closely connected with the other sectors of the economy.

Automotive industry gradually became the biggest driver of the Slovak GDP. The first newcoming automotive company was in the mid-nineties Volkswagen in Bratislava. Later, in a year 2006, Kia Motors established their factory in Žilina and PSA Slovakia did the same nearby Trnava. Additional investments helped to build the supply chain and the number of companies producing parts for automakers expanded. By the time, automotive sector became the "backbone" of the Slovak economy. That is why it is important to know the competitiveness and financial stability of the industry. Both of them, competitiveness and also financial stability are closely related to financial results of automotive companies and that all has an effect on the performance of whole Slovak economy.

2. Structure of automotive industry in Slovak Republic

Considering the automotive industry, it is crucial to realize that this sector is not only about automakers producing cars for the final consumers. Supply companies that are indirectly involved in the production of cars, have an enormous impact on the operation of the sector, too. Automotive in Slovakia is thus formed by manufacturers (in Slovakia, there are three – Volkswagen, KIA, PSA Slovakia) and suppliers and there are financial relations between these subjects.

Total number of Slovak companies operating in the automotive industry reached up to number 413, according to financial website finstat.sk in mid-November 2016. From these companies, 256 subjects reported revenues in fiscal year 2015. Among the largest suppliers in the automotive industry in Slovakia we can include Mobis Slovakia, Johnson Controls

International, YURA Corporation, SAS Automotive and from eastern Slovakia companies as Magneti Marelli Slovakia or Getrag Ford Transmissions (database of automotive companies published on website *finstat.sk*).

According to the report published by SARIO agency in September 2015, up to 200,000 jobs are created directly and indirectly by the automotive industry. Moreover, the share of automotive industry on the total industrial revenues climbed nearly to the level of 33% in year 2015 (SARIO, 2016). Slovak automotive sector also accounted for more than a third of total exports, reaching totally 35 percent (Statistical Office of the Slovak Republic, 2015).

3. CHARACTERISTICS OF MARKET CONCENTRATION INDICATORS BASED ON FINANCIAL RESULTS

Development of market concentration and the concentration ratio in the industry is very important factor which assesses quality of the competitive environment. Concentration ratio quantification and evaluation of the competitive environment by using specific indicators gives institutions an opportunity to monitor the level of industry-developed competition. These indicators also allow tracking how companies adhere to the rules while executing their business activities (Rhoades, 1993).

The literature is home to numerous methods that help to evaluate concentration ratio in the industry. In this article, we will use indicators that measure the absolute concentration of industry (absolute concentration indicators quantify the degree of concentration in all subjects). Among absolute concentration indicators we include concentration ratio and Herfindahl index. The fundamental financial data for quantifying the value of the indicators will be total revenues of individual subjects.

3.1 Market share

The basic indicator of concentration ratio is the market share. It is share of the individual enterprise revenues on the revenues of whole sector. Market share measures, how the manufacturer performs in comparison to the other market participants. Analytically, it is possible determine it by the following formula:

$$r_k = \frac{q_k}{q} = \frac{q_k}{\sum_{j=1}^{n} q_j}$$

Figure 1 – Corporate market share calculation. Source: Fendek, 2008

kde n – number of companies operating in the sector,
q_k – revenues of k company, k = 1, ..., n,
q – total revenues for whole sector,
r_k – market share of k company.

Market share can be expressed as relative or as percentage result. For the first it takes values from the interval <0; 1>, for the latter it lays in the range <0; 100>. Extreme values indicate either full concentration in the industry – monopoly for r_k=1, or the absence of market operators in the sector for r_k = 0 (Fendek, 2008).

3.2 Concentration ratio

Concentration ratio is an indicator that expresses the sum of the market shares held by few of the strongest sector companies. Calculation of the concentration ratio is as follows:

$$CR_{\psi} = \frac{1}{q} * \sum_{k=1}^{\psi} q_k$$

Figure 2 – Concentration ratio calculation. Source: Fendek, 2008

in which ψ lays in the range <1;*n*> and CR_{ψ} takes values from interval <0;1> when calculating in relative numbers, or <0,100> if we calculate percentage results. In practice, the concentration ratio is commonly quantified for three, five or ten strongest companies in the industry. It is therefore quantification of indicators *CR3, CR5* and *CR10* (Hlaváčiková, 2012).

3.3 Herfindahl index

Herfindahl index (in the literature we may also be encountered with the concept of the Herfindahl-Hirschmann Index) is an indicator for measuring the absolute concentration in the industry. In many countries it represents a standard indicator used for the analysis of the sector. In this paper, it explains, how financial power of individual subjects impacts the concentration of whole industry. It is based on the hypothesis that influence of businesses is growing with the square of its market share (Kračinovský, 2008).

Analytical expression of Herfindahl index is as follows:

$$H = \sum_{k=1}^{n} \left(\frac{q_k}{q}\right)^2$$

Figure 3 – Conctruction of Herfindahl index. Source: Fendek, 2008

and the meaning of the variables remains identical, as in the previously defined formulas.

Herfindahl index *H* can take values from <1/*n*, 1>. Extreme value *H* = 1/n means that every company has equal market share in the industry. For upper level, for which *H* = 1 there is a pure monopoly on the market, in other words, one company in the industry produces 100% of whole production (Hlaváčiková, 2012).

In practical use, the Herfindahl index is not used as a number of the interval mentioned above. It is because in sectors with a higher number of enterprises we would operate with very low numbers. The value of *H* therefore tends to be adjusted by the appropriate multiplier, most commonly used multiplier is 10,000. Depending on what is the value *H* after conversion, we can classify the degree of concentration of the industry, according to the following criteria defined by the US Federal Trade Commission (FTC)

- for *H* <1500, the industry is concentrated.
- for *H* is in the range of <1,500; 2500>, the industry is moderately concentrated.
- for *H*> = 2500, the industry is not concentrated (U.S. Department of Justice and Federal Trade Commision, 2010).

4. FINANCIAL RESULTS AND CONCENTRATION RATIO OF SLOVAK AUTOMOTIVE INDUSTRY

For needs of this work, financial performance of companies will be represented by revenues of companies. In this paper, we use company revenues reported between years 2009 – 2015. Total revenues represent a key metric for measuring their financial performance As the number of entities operating in this sector is significant, for the purposes of this work we will focus on a limited number of businesses. The database provides information on company revenues of those companies, which in 2015 were among the TOP 40 according to reported revenues. Other companies within the automotive industry and their total revenues are all included in subject "other".

The automotive industry in Slovakia is made up of manufacturers and suppliers. Obviously, the manufacturers selling finished products have a certain advantage to suppliers, and this clearly shows the predominance in the amount of revenues. The work will therefore focus on the analysis of both subsectors – subsector of manufacturers as well as subsector of suppliers.

The following table (Table 1) represents a fundamental database, and shows the revenues in whole automotive industry in Slovakia. It includes manufacturers and suppliers, and provides information on how revenues were developing in the years after the financial crisis, from 2009 through 2015 (data for 2016 were not yet available in most subjects). Companies are ranked on the basis of their revenues achieved in the accounting period of the fiscal year 2015. In this paper, only data between 2010 – 2015 will be analyzed, because 2009 was the first post-crisis year, and large number of companies did not report the necessary financial information (eg. PCA Slovakia and Mobis Slovakia), which would significantly distort the results of key indicators. Revenues of year 2009 will be reported in following table but they will not be analyzed.

Tab. 1 – Total revenues of automotive companies in years 2010 – 2015. Source: financial data published on *finstat.sk*

#	COMPANY	Revenues 2015 (mil. EUR)	Revenues 2014 (mil. EUR)	Revenues 2013 (mil. EUR)	Revenues 2012 (mil. EUR)	Revenues 2011 (mil. EUR)	Revenues 2010 (mil. EUR)	Revenues 2009 (mil. EUR)
1.	VOLKSWAGEN SLOVAKIA, a.s.	7 227	6 171	6 524	6 532	5 154	3 764	2 944
2.	Kia Motors Slovakia s.r.o.	5 073	4 586	4 447	3 919	3 328	2 889	1 685
3.	PCA Slovakia, s.r.o.	2 449	2 084	2 182	1 936	1 642	1 654	-
4.	Mobis Slovakia s.r.o.	1 261	1 135	1 089	952	788	704	-
5.	Johnson Controls International s.r.o.	625	633	616	640	508	386	302
6.	SAS Automotive s.r.o.	611	495	563	577	420	293	150
7.	Faurecia Slovakia s.r.o.	611	529	497	442	296	264	186
8.	ZF Slovakia, a.s.	382	193	137	109	85	63	34
9.	Magneti Marelli Slovakia, s.r.o.	376	261	121	103	89	73	42
10.	YURA Corporation Slovakia, s. r. o.	314	273	266	256	215	175	89
11.	Inteva Products Slovakia spol. s r. o.	268	201	165	168	17	-	-
12.	GETRAG FORD Transmissions SK, s.r.o.	246	221	240	317	360	234	102
13.	Continental Automotive Systems Slovakia s.r.o.	244	220	228	231	217	160	104
14.	U-Shin Slovakia s. r. o.	194	176	158	138	147	137	124
15.	SEJONG Slovakia s.r.o.	184	168	168	141	60	40	12
16.	MATADOR Automotive Vráble, a.s.	184	137	125	111	113	102	-
17.	HBPO Slovakia s.r.o.	170	139	153	153	119	89	72
18.	SEOYON E-HWA Automotive SK s.r.o.	157	177	165	153	107	86	40
19.	Lear Corporation Seating Slovakia s.r.o.	157	151	161	144	125	110	74

20.	Plastic Omnium Auto Exteriors, s.r.o.	156	166	174	134	124	121	79
21.	ILJIN Slovakia, s.r.o.	150	133	129	128	104	89	55
22.	Brose Bratislava, spol. s r.o.	148	142	136	140	-	60	60
23.	DONGHEE Slovakia, s.r.o.	140	138	129	113	102	73	44
24.	Hyundai Steel Slovakia s.r.o.	140	142	133	135	24	22	14
25.	MAGNA Slovteca, s.r.o.	139	137	111	90	87	80	73
26.	IAC Group (Slovakia) s.r.o.	117	64	58	64	56	41	63
27.	TOWER Automotive, a.s.	115	124	151	168	137	89	73
28.	Johnson Controls Lučenec, s.r.o.	115	265	257	-	-	0	0
29.	Yazaki Wiring Slovakia s.r.o.	112	114	119	110	117	109	54
30.	MAHLE Behr Námestovo s.r.o.	109	50	29	8	-	-	-
31.	Boge Elastmetall Slovakia, a.s.	100	94	91	86	84	61	-
32.	Prodcen, s.r.o.	97	79	58	41	42	30	-
33.	Delphi Slovensko, s.r.o.	97	94	102	98	81	55	-
34.	TRIM LEADER, a.s.	93	91	82	81	74	68	-
35.	Benteler Automotive SK s. r. o.	73	59	57	54	41	17	-
36.	GRUPO Antolin Bratislava s.r.o.	72	58	58	58	49	35	-
37.	Nissens Slovakia, s.r.o.	67	50	47	43	55	38	-
38.	Webasto - Edscha Cabrio Slovakia s.r.o.	66	35	51	72	63	-	-
39.	Yanfeng SK Automotive Interior Systems s. r. o.	64	-	-	-	-	-	-
40.	Magneti Marelli Powertrain SK s.r.o.	64	44	32	20	16	4	-
41.	other subjects	1 292	929	1 188	1 310	1 650	1 088	2 652
-	TOTAL AUTOMOTIVE REVENUES	24 272	20	21 206	19 984	16 709	13 313	9 752
-	TOTAL SLOVAK INDUSTRY REVENUES	74 690	69 881	68 284	71 868	67 876	59 764	51 047
-	REVENUES OF TOP40 COMPANIES	22 979	20 040	20 017	18 673	15 058	12 225	6 475
-	REVENUES OF SUPPLIERS	9 522	8 127	8 052	7 597	6 584	5 006	5 124
-	REVENUES OD PRODUCERS	14 749	12 842	13 153	12 386	10 125	8 307	4 628

4.1 Market share of an industry

As already indicated, we will analyze not only the sector as a whole, but we will also look deeper on the market shares of subsectors of manufacturers and suppliers. On the basis of the financial data, specifically company revenues, we will be able to assess how the market share gradually evolved.

The following table shows the market shares of operators of the automotive industry, calculated according to the amount of revenues. The table includes data for the years 2010 - 2015 for the TOP 40 most powerful companies. Market shares remaining entities is included under "other". The table shows the market shares throughout the whole industry, but it also outlines market shares within the subsectors – particularly within producers subsector and particularly within the subsector of suppliers. Producers subsector consists of three entities (Volkswagen Slovakia, Kia Motors and PCA Slovakia), other companies belong to suppliers subsector.

Tab. 2: Market shares of subjects in whole automotive industry (I) and in subsectors (S) in years 2010 – 2015 (%). Source: processing of authors

#	COMPANY	2015 I	2015 S	2014 I	2014 S	2013 I	2013 S	2012 I	2012 S	2011 I	2011 S	2010 I	2010 S
1.	VOLKSWAGEN SLOVAKIA, a.s.	29,77	49,00	29,4	48,05	30,76	49,60	32,68	52,73	30,87	50,90	28,27	45,31
2.	Kia Motors Slovakia s.r.o.	20,90	34,39	21,8	35,71	20,97	33,81	19,61	31,64	19,92	32,87	21,69	34,77
3.	PCA Slovakia, s.r.o.	10,08	16,60	9,94	16,23	10,28	16,58	9,67	15,62	9,830	16,22	12,42	19,91
4.	Mobis Slovakia s.r.o.	5,19	13,23	5,41	13,97	5,13	13,52	4,76	12,52	4,718	11,97	5,28	14,05
5.	Johnson Controls International spol. s r.o.	2,57	6,56	3,02	7,79	2,90	7,65	3,20	8,43	3,038	7,71	2,90	7,71
6.	SAS Automotive s.r.o.	2,51	6,42	2,36	6,09	2,65	6,99	2,88	7,59	2,513	6,37	2,20	5,86
7.	Faurecia Slovakia s.r.o.	2,51	6,42	2,52	6,51	2,34	6,16	2,21	5,82	1,773	4,50	1,98	5,27
8.	ZF Slovakia, a.s.	1,57	4,01	0,92	2,37	0,64	1,69	0,54	1,43	0,514	1,30	0,48	1,27
9.	Magneti Marelli Slovakia, s.r.o.	1,55	3,95	1,24	3,21	0,56	1,50	0,51	1,35	0,534	1,35	0,55	1,46
10.	YURA Corporation SK, s.r.o.	1,29	3,30	1,30	3,36	1,25	3,30	1,28	3,37	1,285	3,26	1,31	3,50
11.	Inteva Products Slovakia spol. s r. o.	1,10	2,81	0,95	2,47	0,78	2,05	0,83	2,20	0,107	0,27	0,00	0,00
12.	GETRAG FORD Transmissions Slovakia, s.r.o.	1,01	2,59	1,05	2,72	1,13	2,97	1,58	4,16	2,155	5,47	1,75	4,67
13.	Continental Automotive Systems Slovakia s.r.o.	1,00	2,57	1,04	2,70	1,07	2,82	1,15	3,03	1,302	3,30	1,20	3,19
14.	U-Shin Slovakia s. r. o.	0,80	2,04	0,84	2,17	0,74	1,96	0,68	1,81	0,878	2,22	1,02	2,72
15.	SEJONG Slovakia s.r.o.	0,76	1,94	0,80	2,06	0,79	2,09	0,70	1,84	0,359	0,91	0,30	0,80
16.	MATADOR Automotive Vráble, a.s.	0,75	1,93	0,65	1,69	0,59	1,55	0,55	1,46	0,679	1,72	0,77	2,04
17.	HBPO Slovakia s.r.o.	0,70	1,78	0,66	1,71	0,72	1,89	0,76	2,01	0,713	1,80	0,66	1,77
18.	SEOYON E-HWA Automotive Slovakia s.r.o.	0,64	1,65	0,84	2,17	0,78	2,05	0,76	2,01	0,642	1,63	0,64	1,71
19.	Lear Corporation Seating Slovakia s.r.o.	0,64	1,64	0,72	1,85	0,75	1,99	0,71	1,89	0,749	1,90	0,82	2,19
20.	Plastic Omnium Auto Exteriors, s.r.o.	0,64	1,63	0,79	2,03	0,82	2,16	0,67	1,77	0,746	1,89	0,91	2,42
21.	ILJIN SLOVAKIA, s.r.o.	0,61	1,57	0,63	1,63	0,60	1,59	0,64	1,68	0,623	1,58	0,66	1,77
22.	Brose Bratislava, spol. s r.o.	0,61	1,55	0,67	1,74	0,64	1,68	0,70	1,84	0,000	0,00	0,44	1,19
23.	DONGHEE Slovakia, s.r.o.	0,57	1,47	0,65	1,69	0,60	1,60	0,56	1,49	0,612	1,55	0,55	1,46
24.	Hyundai Steel Slovakia s.r.o.	0,57	1,47	0,67	1,75	0,62	1,64	0,67	1,77	0,145	0,36	0,16	0,43
25.	MAGNA SLOVTECA, s.r.o.	0,57	1,46	0,65	1,69	0,52	1,39	0,45	1,19	0,523	1,32	0,60	1,60
26.	IAC Group (Slovakia) s.r.o.	0,48	1,23	0,30	0,79	0,27	0,72	0,32	0,84	0,340	0,86	0,31	0,82
27.	TOWER AUTOMOTIVE, a.s.	0,47	1,21	0,59	1,53	0,71	1,88	0,84	2,21	0,825	2,09	0,67	1,79
28.	Johnson Controls Lučenec, s.r.o.	0,47	1,20	1,26	3,26	1,21	3,20	0,00	0,00	0,000	0,00	0,00	0,00

29.	Yazaki Wiring Technologies Slovakia s.r.o.	0,46	1,18	0,54	1,40	0,56	1,48	0,55	1,46	0,701	1,77	0,82	2,19
30.	MAHLE Behr Námestovo s.r.o.	0,45	1,15	0,24	0,62	0,14	0,37	0,04	0,11	0,000	0,00	0,00	0,00
31.	Boge Elastmetall Slovakia, a.s.	0,41	1,05	0,44	1,15	0,43	1,14	0,43	1,13	0,509	1,29	0,46	1,23
32.	PRODCEN, s.r.o.	0,40	1,02	0,37	0,97	0,27	0,72	0,20	0,54	0,255	0,64	0,22	0,60
33.	Delphi Slovensko, s.r.o.	0,40	1,01	0,45	1,16	0,48	1,27	0,49	1,30	0,487	1,23	0,41	1,11
34.	TRIM LEADER, a.s.	0,38	0,98	0,43	1,13	0,38	1,01	0,40	1,07	0,443	1,12	0,51	1,36
35.	Benteler Automotive SK s. r. o.	0,30	0,77	0,28	0,72	0,26	0,70	0,27	0,72	0,249	0,63	0,13	0,35
36.	GRUPO ANTOLIN BRATISLAVA s.r.o.	0,29	0,75	0,27	0,71	0,27	0,72	0,29	0,77	0,296	0,75	0,26	0,71
37.	Nissens Slovakia, s.r.o.	0,28	0,71	0,24	0,61	0,22	0,58	0,21	0,57	0,334	0,84	0,29	0,77
38.	Webasto - Edscha Cabrio Slovakia s.r.o.	0,27	0,69	0,17	0,43	0,24	0,64	0,36	0,95	0,382	0,97	0,00	0,00
39.	Yanfeng Slovakia Automotive Interior Systems s. r. o.	0,26	0,67	0,00	0,00	0,00	0,00	0,00	0,00	0,000	0,00	0,00	0,00
40.	Magneti Marelli Powertrain SLOVAKIA s. r. o.	0,26	0,67	0,21	0,54	0,15	0,40	0,10	0,27	0,098	0,24	0,03	0,09
41.	Other subjects	5,32	13,55	4,43	11,44	5,60	14,76	6,56	17,25	9,87	25,06	8,17	21,73

Table shows us the balance of power within the industry. At first glance it is clear that three producers clearly keep the distance while Volkswagen, as leading company, holds top position without any problems. The dynamics between producers remained fairly steady during analyzed period, there was no any radical change. Volkswagen holds approximately 30 % market share in the industry and it controls about half of the market among producers subsector.

More interesting is the situation between suppliers, where Mobis Slovakia is the major player. This company also places fourth in the total revenues ranking of the whole industry. Mobis Slovakia is the strongest supply company, and nothing has changed on that from 2010 to the present. In long-term it has been holding market share above 5 %. Among subsector of suppliers it has very strong position as it generates about twice as high revenue as the second largest supplier Johnson Controls.

Suppliers subsector similarly as subsector of producers, is not experiencing any significant shifts in market shares. However, big change is going to happen next year as the company Faurecia Slovakia, which in June 2016 ceased operations and was canceled, will disappear from the industry (*finstat.sk*). Worthy of note is gradual loss of Getrag Ford Transmissions market share – while in 2011 it held 5,4 % of the suppliers market, currently it possesses less than half of this value. As the consequence of worse financial results and decreasing revenue, the company dropped from 7th place to 12th place in the sector. On the contrary, over the past three years we spotted significant improvement of supply companies Magneti Marelli Slovakia and ZF Slovakia.

Trinity of manufacturers absolutely dictates conditions of the Slovak automotive, when the total revenues of three strongest companies accounts for about 60 percent of the industry. Production among suppliers is heavily fragmented and none of them comes close to the level of producers revenues. It is mainly due to the character of the products sold – while suppliers sell only parts, producers sell the finished product with incomparably higher added value which favors them in achieving higher sales. For example, reported value added of Volkswagen Slovakia reached 779 million EUR in 2015, while Mobis Slovakia generated only 143 million EUR. (*finstat.sk*).

4.2 Concentration ratio in the automotive industry

As already mentioned before, concentration ratio in the industry is most often calculated for three, five and ten strongest companies in the industry. The following table shows already calculated concentration levels *CR3, CR5* and *CR10* for the automotive industry in Slovakia, based on revenues achieved by enterprises in the relevant period.

Tab. 3 – Concentration ratio *CR3, CR5 a CR10* in years 2009 – 2015 (%). Source: authors' calculations

Indicators/year	2015	2014	2013	2012	2011	2010
Concentration ratio *CR3*	60,77	61,24	62,03	61,98	60,59	62,40
Concentration ratio *CR5*	68,54	69,68	70,07	69,95	68,35	70,58
Concentration ratio *CR10*	77,99	78,37	78,67	79,08	77,38	79,04

Data in the table prove that the concentration ratio remained quite stable throughout the period. Concentration ratio *CR3* de facto represents the share of three producers, which means it sums up market share for Volkswagen Slovakia, Kia Motors and PCA Slovakia. Considering the fact that three largest Slovak automotive companies control about three fifths of the local automotive industry, it is obvious they have very strong position and it is very unlikely that in the near future something will threaten their dominance. In addition, their hegemony is not short-term at all – they stand on the top of the market since 2010.

Concentration ratio *CR5* for five largest companies also does not indicate any significant fluctuations, and this statement applies to the concentration in *CR10*, too. What is more interesting, however, is comparison of concentration ratios *CR5* and *CR10*. In case of *CR10*, we can notice significant asymmetry comparing first 5 strongest and second 5 strongest players. In 2015 the top 5 companies recorded 68,54 % of Slovak automotive production, while the second strongest quintet achieved only 9,54 % of total industry production. Ratio 68,54 % to 9,54 % is highly inclined to elite five companies and this trend is evident throughout all the years under review.

The above statements confirm that among the TOP 10 industry participants there are relatively large differences between financial power of individual companies. For example, in 2013 market share of fourth and fifth strongest company reached 8,04 % of sector production, which almost equals to the market share, that in this same year achieved firms ranked from 6th to 10th position in the revenues order (8,6 %).

4.3 Herfindahl index

A first step before actual quantification of Herfindahl Index, a key metric evaluating a degree of industry concentration, was to determine the number of enterprises in the sector to 41 (n = 41). The first 40 strongest companies are autonomous subjects, other companies in the industry will be merged into the aggregate entity with serial number 41. This simplification will cause slight distortion in calculation of Herfindahl index. However, the aggregate market share of other producers (entities merged under the serial number 41) in the reported period recorded relatively low values in the range of about 4 – 10%, and therefore distortion of final result is negligible and will not affect results of Herfindahl index negatively.

Tab. 4 – Herfindahl index of automotive industry in years 2010 – 2015. Source: authors' calculations

Indicator/year	2015	2014	2013	2012	2011	2010
Herfindahl index *H*	1517,33	1530,28	1585,49	1650,09	1598,89	1551

Herfindahl index gives probably the best view on the situation in the industry. Herfindahl index is a complex indicator of the degree of industry concentration, and during the analyzed period *H* maintained values in the range of <1517,33; 1650,09>. According to the criteria of the Federal Trade Commission (FTC) and based on the values of *H*, the industry can be classified as moderately concentrated (because *H* is in the interval <1500; 2500>. This suggestion is confirmed by other criterion where Herfindahl index for moderately concentrated industry takes values from interval <1000; 1800> (Brezina, 2009).

Although the result of Herfindahl index ranks Slovak automotive industry as moderately concentrated industry, it is necessary to analyze this result also from different points of view. On the one hand, a large number of entities operate in the industry which could support claim that the sector is relatively open and thus not concentrated. On the other hand, there are three very powerful entities in the industry which account for more than half of the total market revenue, and that would by contrast support the thesis of a highly concentrated industry. But, important and positive fact is, that none of the entities is so strong that it could use or abuse their financial power in their favor. As positive may also be considered the development of Herfindahl index, which since 2012 gradually decreased, and that would point out that competitive environment in the Slovak automotive industry is improving.

5. SUMMARY

Research in this paper proved, that financial performance of three strongest automotive companies (Volkswagen Slovakia, Kia Motors and PSA Slovakia) has enormous effect on whole automotive industry in Slovakia. After a deep analysis of automotive sector and operating companies, it is obvious that industry shows signs of concentrated and also not concentrated industries. According to methodology for calculating the Herfindahl index, Slovak automotive industry ranks in the category of moderately concentrated industries, and thus we can conclude that conditions for entrepreneurship and competition in this sector are relatively good.

Maintaining or further improvement of optimal operating conditions for automotive companies is a key precondition for the successful development of the Slovak economy. In 2015, the automotive industry contributed to the overall industrial production by almost a third (see a Tab. 5). Slovak automotive sector currently employs around 66 thousand people and is thus an important pillar of employment. It is also very stable sector and it still continues to grow.

Tab. 5 – Share of automotive sector production on whole Slovak industry production (%). Source: Statistical Office of the Slovak Republic, 2015)

Year	2010	2011	2012	2013	2014	2015
Share	22	24	28	31	30	32

The fact that the automotive industry plays a major role in Slovak republic, is supported by the data published in magazine TREND in November 2016. In engineering industry as a whole, up to nine automotive companies placed in TOP 10 companies with highest total revenues.

Especially three big automotive players achieved impressive financial results. Volkswagen Slovakia was the largest non-financial company with the highest added value generated in 2015. It also recorded the highest year on year increase in revenues and added value. This company also placed third in the volume of investment and number of employees. Moreover, Kia Motors closed the year 2015 with third highest net profit (TREND TOP 2016, 2016).

Such operation of automotive sector has many possible interpretations. On the one hand, its further expansion will probably have an positive short-term impact on development of Slovakia and whole national economy. On the other hand, from long-term point of view, Slovak economy should focus on diversification of its economy as national GDP is mostly generated by revenues of automotive sector. This statement also creates a concern about fragile Slovak economy to the future, because of its over-orientation on one sector. Any financial or investment problems in automotive industry could potencially lead to increased unemployment, lower revenues of companies and thus weakening whole Slovak economy.

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MODEL SPECIFICATIONS FOR GENERATING TECHNICAL RESERVES IN INSURANCE INDUSTRY

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Abstract

Each insurance company´s activities are connected with an extremely high level of responsibility as they deal with a high volume of extrinsic sources - retained insurance premium from clients. The submitted paper´s goal is to point out the specifications in insurance company´s activities and their generating of technical reserves. Technical reserves are tools insurance company draws from means for compensating future indemnities. To settle their volume properly constitutes a significant factor from the point of view of future abilities to meet their commitments and thus follow each particular insurance company´s principal role. The contribution submits specific calculation – an assessment model for generating technical reserves for future years. As the practical experience proves, the mostly utilized method is the chain and ladder methods – this was the reason why we decided to focus on this particular type of calculation model. Calculation of technical reserves through properly selected methods based on given input data as well as detailed analysis of the determined technical reserves present a practical process in insurance company´s activities.

Key words: insurance company, technical reserves, sufficiency test, chain ladder method

JEL Classification: G22

1. INTRODUCTION

Every particular insurance company´s activities are connected with an exceedingly high level of responsibility. The reason for it is that each insurance company is a financial institution the property structure of which is completely different from other entrepreneural entities on the market. It is the disposal of a large amount of extrinsic sources – insurance premium retained from clients that accentuates the necessity of supervision with the aim of avoiding insolvency risks or any other risk that might threaten its activities. This particular fact is very important especially regarding application of contemporary new regulation system Solvency II. The above mentioned guideline has been valid since January 1, 2016. It is supposed that the legislative standard would ensure the global financial system stability and advancement of European insurance system regulation aiming thus at stability increase of both insurance companies as well as financial markets.

Solvency II is based on a three-pillar structure. Our research is based on the first one that presents quantitative requirements and out of these we focused on technical reserves. They particularly constitute a significant item regarding insurance company´s commitments. They comprise an instrument the insurance company draws its means from for future compensation of damages, i.e. from insurance money. To decide on adequate amount is an extremely important factor from the point of view of insurance company´s abilities to meet their commitments in future thus following every insurance company´s principal function. Therefore actuary methods, input data and assessment calculations comprise a significant area for generating technical reserves.

The paper aims at pointing out the specific activities of insurance companies as well as generating technical reserves. Generating technical reserves is exclusively typical for insurance

companies and this process is very demanding and extremely important. The paper focuses on specific assessment calculation for generating technical reserves for following years. The model we focused on is based on specific data of one renowned insurance company in the Slovak Republic, however upon their requirement it is not allowed to release further details.
The submitted aim has been reflected in the structure of the submitted paper – the first part provides brief characteristics of the importance and generation of technical reserves. The second part then analyzes in details the technical reserves in both life and non-life insurances.
The submitted paper is an output of the VEGA 1/0242/16 research project "Globalized Trends and Dynamism of Changes on the EU Insurance Market " being solved on the Insurance Business Department of the Faculty of National Economy, at the University of Economics in Bratislava.

2. TECHNICAL RESERVES – IMPORTANCE AND PROCESS OF GENERATION

Each insurance company is a financial institution the dominant activity of which is to cover risks for recompensation – insurance premium that brings huge volume of financial resources. These are extrinsic sources for insurance company. Insurance company valorizes the resources on the capital market for obtaining additional financial means that are inevitable not only for covering particular risks and costs connected with their activities but also for generating profit. Insurance premium collection has been implemented through signed-up insurance contract. For recompensation the insurance company provides its clients with covering risks as negotiated in contract. In case of insurance event insurance company shall provide financial means through insurance recompensation. To ensure that they will be able to recompensate all their contracted commitments any time, the insurance company is obliged to follow certain regulations as they have been stated in particular legislation.
The major obligation is to generate suitable volume of financial means – technical reserves – they should ensure insurance company´s solvency and liquidity in future. It is a complicated process of estimating those financial means the insurance company would need in the period of time, yet unknown. In spite of the fact that insurance companies have qualified actuaries and their assessment calculations for the regulator, it is inevitable to acquire an independent attendance to make sure that insurance companies generate sufficient volume of technical reserves.
Apart from generating technical reserves, each insurance company provides a number of other activities that are rather complicated concerning their calculation, evaluation, recording or implementation. Improper handling could reveal unreal facts, the consequences of which might lead to instability not only of insurance company as such but the whole financial market.
Specific activities of insurance companies are reflected also in the structure of their assets and commitments. Following the insurance company´s data as well as the detailed analysis the assets structure is as follows: financial investments 89.69%; tangible and intangible assets 7.63%; the rest of property 2.68%.
Insurance company as a financial entity provides specific kind of service and it disposes predominantly with extrinsic means – insurance rate. It was collected from its clients for covering certain risks and contracted by insurance policy. Due to this fact insurance company is obliged to generate technical reserves (Zákon NR SR 39/2015 Z.z. o poisťovníctve. 2015a) to ensure the ability to recompensate its commitments resulting from insurance policies. As the dominant activity of each insurance company is to cover risks as recompensation for contracted insurance premium, this fact will be reflected in insurance company´s commitments.

The particular insurance company´s structure of commitments is as follows: 24.43% own resources; 67.86% technical reserves; 3.51% insurance and reinsurance commitments; 4.14% other commitments.
Following the above mentioned facts we can prove that technical reserves comprise the largest volume of insurance company´s commitments – this is the subject of our further research.

2.1 Generating Technical Reserves in Insurance Companies

Technical reserves have been generated following contracted insurance policies between insurance companies and their clients. The contracts provide a certain guarantee that insurance company shall be able to meet their commitments resulting from insurance contracts.
As mentioned above, technical reserves constitute the major volume of insurance company´s liabilities. These liabilities result from contracted insurance policies and as such they are insurance company´s extrinsic sources for covering their commitments. This is the reason why the generating of these is strictly regulated. The Solvency II project also pays much attention to evaluation of technical reserves (EIOPA. 2014b).
Technical reserves form a cost item for insurance company. It results from the following: "in case the whole contracted transaction (in this case insurance service) would be accomplished by the end of that particular accounting period not only all acquisition costs and insurance administration might be invested but also costs for insurance compensation" (Meluchová,J. 2009). In fact there is a certain overlapping of insurance contract including its incomes and costs to several accounting periods. From this point of view it is necessary to distinguish between transactions and their accounting periods. To simplify the process insurance policies are not contracted for a calendar year but for the so called technical year. Technical year, however might be identical with the calendar year or it may be shorter. This fact ensures one of the basic principles of accountancy as follows: "accounting entity accounts and performs accounting cases in periods that meet chronologically and matter-of-factly" (Zákon č. 431/2002 Z. z. o účtovníctve. 2002). Considering the fact that technical reserves comprise cost items they play a significant role in insurance company´s economic outputs.
For proper calculation regarding technical reserves the insurance company follows the principles of actuarial mathematics and statistics that have been anchored in the framework of the European Union through the Solvency II project, IFRS and the EU Guidelines. The insurance company generates their technical reserves specifically for life and non-life insurance. The company´s interest is to estimate the level of technical reserves as adequately as possible. If they overestimate them they would fix their resources that might be exploited following their own decisions, on the other side if they underestimate them the company may lack financial means for covering their commitments.

3. TECHNICAL RESERVES GENERATED IN LIFE INSURANCE

Technical reserves create the most significant part for insurance company within their life insurance programmes. It comprises a certain value the insurance company is obliged to generate in the first years after the insurance policy was contracted – to meet their commitments towards their clients. It results, first of all, from the fact that life insurance policy is contracted for surviving certain age or whole life insurance, i.e. benefits would probably occur much later after the contract had been signed. It means that there is a gradual increase of risk resulting from the insurance policy contract. This specific type of insurance involves the fact that there is a high, almost 100% probability for insurance event compensation, however the moment of its origin is unknown. This is the reason why during the first years the insured contributes higher amounts than insurance company needs to cover their risks and later in last years he pays less

than it is necessary for insurance company to cover particular risks. It is the way how insurance company can cumulate certain volume of financial means during the first years to be able to meet their commitments in future.
Insurance company calculates the amount of technical reserves in life insurance "using adequately precautious methods, the calculations of which result from insurance rate-to-be-paid and future commitments that have been stated in insurance conditions for each particular insurance policy contract" (Opatrenie NB SR. 2013).
For calculating technical reserves, several factors are to be considered, e.g.: interest rates, inflation, annulment probability, mortality, costs or additional risk charge. It is absolutely up to insurance company´s decision which requirements they would involve in calculation of their technical reserves.
The method used for calculating the volume of technical reserves " shall not be modified resulting from alterations in basic documents and the same method shall be applied – to prove unambiguously and demonstrably the way of profit allocation during the whole duration of each particular insurance policy contract" (Zákon NR SR 39/2015 Z.z. o poisťovníctve. 2015b). At the same time, when calculating particular technical reserves, the insurance company is obliged to use the same mortality tables and the level of technical interest rate they used for calculating particular insurance rate.
Technical reserves shall be calculated separately for each particular insurance contract. Following the fact that insurance company signs up a great number of insurance contracts and the calculation of technical reserves for each of them might be time demanding, insurance company is entitled to divide these contracts into several segments based upon the same criteria (e.g. based upon the same insurance product, input parameters, contract duration, etc.).
Such a group of insurance contracts having similar backgrounds is to be considered as one insurance contract from the point of view of its technical reserve calculation.

3.1 Adequacy Test for Technical Reserves in Life Insurance

Adequacy test aims at verifying the sufficient level of technical reserves having been generated by insurance companies. Such a test determines the minimum value of technical reserves and consequently, these shall be compared to adapted technical reserves in life insurance. For the test´ s sake, technical reserves are to be adapted following "the adequate unredeemed part of acquisition costs on time differentiating accounts, particular untangible assets having been booked with portfolio transfer as well as some other technical reserves being calculated on the property or commitments side" (Odborná smernica SSA č. 1 v 2. 2011).
In case the level of minimum value of technical reserves is higher than the value of adapted technical reserves, technical reserves are insufficient. It results in the fact that insurance company is to increase the level of technical reserves to guarantee their adequate level. In case technical reserves´ volume is sufficient, no alteration is required.
Adequacy test is performed at least once a year, usually at the book closing day. Insurance company is entitled to perform adequacy test more times per year, following their own goals.
As it was stated above, life insurance is contracted for several years. During this period of years there is a fluctuant value of expectations that have been included in assessment calculation of technical reserves, however the model itself does not change at all. Following the fluctuating values of assessments included in calculation of technical reserves, the level of these fluctuates as well during the validity of insurance contract. Therefore it is extremely important to follow the difference between the primary assessment of technical reserves and consequently causes resulting in changes. These causes are to be adequate.
Another focus on research regarding the volume of technical reserves is settling proper limits of insurance rate. The insurance premium shall be specified to the extent that it would

adequately cover all costs for insurance contracts acquisition, their administration as well as for generating adequate volume of financial means for insurance compensations. Particular emphasis is to be placed especially upon the expected insurance fulfillments which result from particular insurance company´s mortality tables.
Mortality indicator belongs to undisputable indicators for life insurance. It is inevitable to compare the data whether real mortality does not differ from statistical estimation, as mortality is one of the primary pre-requisites insurance companies involve when calculating both technical reserves and insurance premium.
As it has already been mentioned above insurance companies dispose of a large number of insurance contracts and for the reason of calculating technical reserves they segment them to groups following the same characteristics. It is inevitable to determine the ways insurance companies segment particular insurance contracts and especially the fact whether particular segments do not include insurance contracts of different types. Improper filing may result in unsound assessment of technical reserves.
Last but not least, it is extremely important to fix proper models for calculating technical reserves as well as pre-requisites such a model involves. From the point of view of insurance company, the most important fact is to introduce suitable pre-requisites for calculating technical reserves. The focus is especially on progressive development of particular indicators within insurance company.

4. TECHNICAL RESERVES GENERATED IN NON-LIFE INSURANCE

Non-life insurance contracts are usually contracted for a short period, usually one year. By completing the term, the insurance contract can be either prolonged or annulled. In case the insurance contract is annulled, it does not automatically mean the insurance company is obliged to provide compensation resulting from the insurance contract. It frequently happens that a certain insurance event originated during insurance coverage, however due to different reasons it has not been claimed for, yet. At the same time calculating the indemnity sum may last for years. Insurance companies are to consider such situations and therefore, apart from legislative requirements, it is their interest to generate proper technical reserves for the above mentioned situtions as well.
Another aspect to prove that technical reserves assessment in non-life insurance is more complex is the fact that insurance event may not incur at all, or it may incur several times during insurance period. It means that insurance company shall consider such probablities as well.
The most significant reserves for non-life insurance are technical reserves for compensation. Similarly to those of life insurance, these technical reserves shall involve acquisition costs for insurance contracts as well as their administration. However, there are differences in calculations between the two types.
Technical reserves for compensation are denoted for damages that incurred till the end of accounting period and the following is to be taken into consideration:
whether these are reported but not settled events (RBNS)
or incurred but not reported events (IBNR) (Majtánová, A. 2009)
Technical reserves for RBNS events "are normally generated from partial values for particular insurance events"(Cipra, T. 2006a). Liquidator provides assessment of indemnity sum and in case of receiving additional data regarding the insurane event, he precises the valuation.
Insurance company is to consider also IBNR events within their accounting period. In this case, reserves assessments has been provided by mathematical-statistical methods.
The so called Run Off Triangle schemes are predominantly used for insurance compensations. They involve data orgnized in a triangle scheme and they denote values of insurance compensations of recent years. To acquire adequate data for correct assessment regarding

technical reserve, insurance company needs appropriate data for at least recent five years. The triangle scheme includes "already compensated sums placed in a line considering their periods of origin and columns follow development periods" (Cipra, T. 2006b). Period of origin of insurance event usually means the year of its origin and development period is the number of years from insurance event´s origin up to the moment of claim settlement. Thus, it means that particular insurance event being recorded in its "0" development period was liquidated the same year.

The so called chain ladder method is a major method for technical reserves assessment in practical experience. For that reason the particular calculation model for the simulated assessment of technical reserves has been used.

Table 1 includes non-cumulative forms of insurance compensations *Ci,j* for each particular year of origin *i* and development year *j*. The value is expressed in thousands of euros. The particular insurance company´s insurance compensations are denoted to in development years 0, 1, 2, …., 8. **At the same time, it is believed the insurance compensations will be paid up to the end of year 8 at the latest after the year of their origin. Consequently, through the chain ladder method it is assessed the assumed level of reserves for the years 2016 – 2023.**

Tab. 1 - Insurance compensations in their non-cumulative forms expressed in thousands of euros. Source: Authors´ adaptation following the data of the analyzed insurance company

Year of origin *i*		Development year *j*								
		0	1	2	3	4	5	6	7	8
2007	0	80 304	126 761	142 910	164 783	247 870	276 122	289 460	289 460	292 053
2008	1	134 705	195 905	370 632	408 214	756 423	918 991	918 991	921 224	
2009	2	133 358	321 363	554 421	612 358	702 265	707 544	728 161		
2010	3	143 448	342 251	1 132 950	1 371 007	1 665 779	2 072 269			
2011	4	401 559	903 384	1 148 051	1 794 238	2 008 277				
2012	5	406 247	1 322 345	2 201 920	2 459 325					
2013	6	1 052 497	2 256 650	3 144 865						
2014	7	669 922	2 093 278							
2015	8	1 104 976								

The first step to calculate technical reserves is gradual counting of insurance compensations and thus acquiring cumulative values of insurance compensations that are introduced in Table 2.

Tab. 2 - Insurance compensations in their cumulative forms expressed in thousands of euros. Source: Authors´ adaptation following the data of the analyzed insurance company

Year of origin *i*		Development year *j*								
		0	1	2	3	4	5	6	7	8
2007	0	80 304	207 065	349 974	514 757	762 627	1 038 749	1 328 208	1 617 668	1 909 721
2008	1	134 705	330 611	701 243	1 109 457	1 865 880	2 784 871	3 703 862	4 625 085	
2009	2	133 358	454 721	1 009 142	1 621 500	2 323 765	3 031 309	3 759 470		
2010	3	143 448	485 699	1 618 649	2 989 656	4 655 434	6 727 704			
2011	4	401 559	1 304 943	2 452 995	4 247 232	6 255 510				
2012	5	406 247	1 728 591	3 930 511	6 389 836					
2013	6	1 052 497	3 309 147	6 454 011						
2014	7	669 922	2 763 200							
2015	8	1 104 976								

Following the data of the Table 2 the development constant 1, 2, ….8 is being assessed. The constant is to be calculated as "the ratio of the total of *j* column of the table and cumulative compensations in column *j* – 1 of the table" (Pacáková, V. 2004a). It is as follows:

$$n = {}_n =$$

The following constants present the particular model:

$_1 = 3.50226$
$_2 = 2.11188$
$_3 = 1.67676$
$_4 = 1.51329$
$_5 = 1.41372$
$_6 = 1.28251$
$_7 = 1.24059$
$_8 = 1.18054$

The acquired development constants for particular years enabled to complete the missing data in the Table 2. It has been calculated as follows (Pacáková, V. 2004b):

$_{n,1} = {}_1.C_{n,0}$
$_{n,2} = {}_2 \cdot {}_{n,1}$

Tab. 3 – The completed triangle in its cumulative form expressed in thousands of euros. Source: Authors´ adaptation following the data of the analyzed insurance company

Year of origin *i*		Development year *j*								
		0	1	2	3	4	5	6	7	8
2007	0	80 304	207 065	349 974	514 757	762 627	1 038 749	1 328 208	1 617 668	1 909 721
2008	1	134 705	330 611	701 243	1 109 457	1 865 880	2 784 871	3 703 862	4 625 085	5 460 096
2009	2	133 358	454 721	1 009 142	1 621 500	2 323 765	3 031 309	3 759 470	4 663 973	5 506 005
2010	3	143 448	485 699	1 618 649	2 989 656	4 655 434	6 727 704	8 628 372	10 704 302	12 636 852
2011	4	401 559	1 304 943	2 452 995	4 247 232	6 255 510	8 843 556	11 341 982	14 070 788	16 611 121
2012	5	406 247	1 728 591	3 930 511	6 389 836	9 669 674	13 670 237	17 532 267	21 750 415	25 677 225
2013	6	1 052 497	3 309 147	6 454 011	10 821 839	16 376 579	23 151 941	29 692 682	36 836 547	43 486 999
2014	7	669 922	2 763 200	5 835 541	9 784 811	14 807 256	20 933 354	26 847 313	33 306 601	39 319 759
2015	8	1 104 976	3 869 915	8 172 789	13 703 818	20 737 850	29 317 569	37 600 184	46 646 541	55 068 085

The next step is to create Table No. 4 that includes assessment of reserves for unsettled compensations in the years 2016 to 2023, in its uncumulated form**. The data were acquired in the following way – in each year (the table line) they were calculated as the difference of assessed reserves in that particular year and in the previous development year, i.e. in the given and preceding column of the same line. From the point of view of mathematics it can be illustrated as follows** (Pacáková, V. 2004c):

Calculation on the first diagonal: $_{i,j} – C_{i,j-1}$
Calculation on the following diagonals: $_{i,j} – {}_{i,j}-1$

Tab. 4 – The completed triangle in its non-cumulative form expressed in thousands of euros. Source: Authors´ adaptation following the data of the analyzed insurance company

Year of origin *i*		Development year *j*								
		0	1	2	3	4	5	6	7	8
2007	0	80 304	126 761	142 910	164 783	247 870	276 122	289 460	289 460	292 053
2008	1	134 705	195 905	370 632	408 214	756 423	918 991	918 991	921 224	835 011
2009	2	133 358	321 363	554 421	612 358	702 265	707 544	728 161	904 504	842 032
2010	3	143 448	342 251	1 132 950	1 371 007	1 665 779	2 072 269	1 900 669	2 075 930	1 932 550
2011	4	401 559	903 384	1 148 051	1 794 238	2 008 277	2 588 046	2 498 426	2 728 806	2 540 333
2012	5	406 247	1 322 345	2 201 920	2 459 325	3 279 838	4 000 564	3 862 029	4 218 148	3 926 810
2013	6	1 052 497	2 256 650	3 144 865	4 367 827	5 554 740	6 775 362	6 540 741	7 143 865	6 650 452
2014	7	669 922	2 093 278	3 072 341	3 949 270	5 022 445	6 126 098	5 913 959	6 459 288	6 013 158
2015	8	1 104 976	2 764 939	4 302 873	5 531 030	7 034 031	8 579 719	8 282 615	9 046 358	8 421 544

The ultimate decisive step for determining the assumed reserves that will be needed for the years 2016 – 2023 is to calculate the figures " on diagonals below the principal diagonal" of the Table 4.

The Table 5 includes the assessed technical reserves for the years 2016 - 2023

Tab. 5 – Assessed technical reserves in thousands of euros. Source: Authors´ own adaptation

Year	Level of reserves
2016	19 713 175
2017	23 223 834
2018	25 852 222
2019	26 459 352
2020	25 564 353
2021	21 392 355
2022	15 059 515
2023	8 421 544

The given method enables to fix the level of technical reserves and depending on input data the ultimate level involves both IBNR events as well as RBNS events. In case when the calculated technical reserves involve both of these reserves, the RBNS events reserves are to be deducted from the given figures. This method of determining reserves is denoted to as *claims paid.* It is consequently required to deduct the assessed level of RBNS from the final output having been achieved by the given method.
In reality insurance companies usually slightly modify these methods. Similarly, as it was pointed out regarding technical reserves for life insurance, their calculations for non-life insurance involve a number of various assumptions, e.g.: inflation, interest rate, annulment probability, costs, risk assumptions, expected burden of losses, law suits, etc.

4.1 Adequacy Test for Technical Reserves in Non-life Insurance

Following the adequacy test for technical reserves in non-life insurance, it is necessary to focus particularly on the following two factors: run off results and adequate sum of insurance rate test.
The run off test involves comparison between assessed reserves of RBNS events and IBNR ones and the real level of insurance compensations paid. It enables to appraise adequacy of reserve assessment in the past as well as the quality of those assessments that had been used for

creating account balance in the past. It is more than probable that technical reserves assessments will not coincide with really paid insurance compensations. Therefore assessments can be either higher or lower than really paid insurance compensations. In case the difference is low, regardless whether it is assessed reserves or really paid insurance compensations that exceed – technical reserves are generated in adequate volume. Insurance company shall generate technical reserves as precisely as possible because in contrary case it may lead to insurance company´s inability to meet their commitments resulting from insurance contracts, and thus jeopardize the total stability of insurance company. In reverse situation, insurance company blocks their financial means, formed by technical reserves that might be exploited in a more efficient way following their own needs.

Tests are used to compare adequacy of insurance rates and costs that have been spent on their acquisition, administration and insurance compensations paid and financial means collected from the insured in the form of insurance rates.

As it had been stated above, insurance companies exploit especially triangle schemes for assessing reserves. Insurance companies follow the data that result from accountancy facts. Therefore it is very important to verify whether the input data used by insurance company for calculating technical reserves are relevant and complete. In case some of the input data would be incorrect it might be reflected in the final calculation of technical reserves assessment. It may consequently result in their underestimation or overestimation.

If any time in the past a very specific insurance event incurred that had demanded extreme insurance compensation, it is inevitable to focus on the fact and take it in consideration for the purpose of calculating technical reserves. Its level and volume would significantly influence the technical reserves assessment.

There is another inherent indicator to be focused on – " burden of losses and factor of costs" that are calculated in percentage (Ducháčková, E., Daňhel, J. 2010). The burden of losses of insurance product considers insurance compensation costs and net well-earned insurance rate.This particular indicator expresses the percentage of financial means per one received currency unit, the insurance company is to pay in the form of indemnity. In case this indicator exceeds 100%, insurance company will pay higher volume of financial indemnities than it would collect from clients. The cost indicator constitutes the balance between cost - connected with insurance contract provisions and their administration and collected insurance premiums. It expresses the percentage of one particular financial unit insurance company would use to cover that particular insurance contract costs. Insurance company especially focuses on the total of these two particular indicators, i.e. the combined ratio. In case this particular indicator is higher than 100% the result proves that the collected sum of insurance premiums will not cover the total costs regarding insurance contracts. In that case insurance company should generate additional technical reserves through the so called reserves to cover insufficient insurance premium, and thus secure the ability to meet all their commitments that result from insurance contracts.

Another important factor to be considered when generating technical reserves for non-life insurance is observing the progress of liquidity test during the recent years. If insurance company accounts a low and stable long-term liquidity, there is no need for any kind of special actions. In case that recent years reveal increasing or decreasing liquidation, it is obvious that such a trend will continue in following years. Therefore, it is inevitable to reveal "the responsible factor" and to modify the technical reserves calculation model in a way to eliminate the negative reason. However, in reality it is highly improbable that insurance company would account high difference between assessed technical reserves and really paid indemnities. It is for their own benefit to generate technical reserves in optimal volume and thus prevent either their overestimation or underestimation.

5. CONCLUSION

The process of settling technical reserves is an extremely responsible and demanding act and successful estimation is the principal base for meeting insurance companies goals.
Balance is the key word for optimal settling of the volume of technical reserves - it is to be adequate to subscribed risks and insurance copany should be able to cover clients´ claims at each particular moment. On the other side, if the volume of technical reserves is overestimated, insurance company´s means are uselessly bound. Thus insurance company fails in their activities to invest and generate profit.
The submitted contribution focused on selected technical reserves for life and non-life insurance. It was revealed that in case of non-life insurance it was a rather complicated process. This results from extreme variety of conditions and a host of other factors linked with these types of insurance events, and therefore to calculate optimal volume of technical reserves is more complicated than in the case of life insurance. To be successful in this process, it is inevitable to consider all the factors involved. The principle base for the whole process lies in determining adequate statistical methods and actuary.
Calculating technical reserves through adequately selected method based on input data as well as analyzing the volume of determined technical reserves results in a practical process that is specific exclusively for insurance companies.

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EVALUATION OF EFFICIENCY ON PRINCIPLE OF DATA ENVELOPMENT ANALYSIS AS A PART OF PERSONNEL MANAGEMENT

Mazanec Jaroslav, Bielikova Alzbeta

Abstract

The primary aim of paper is to evaluate and compare efficiency level of Decision Making Units (DMUs) in the form of international airports by nonparametric method – Data Envelopment Analysis (DEA) in the analyzed period. The sample size contains 10 international airports in the Czech Republic (Brno Airport, Karlove Vary Airport, Ostrava Airport, Pardubice Airport and Prague Airport) and the Slovak Republic (Bratislava Airport, Kosice Airport, Piestany Airport, Poprad-Tatry Airport and Sliac Airport). The data are gathered from financial statements which are published on – the Register of Financial Statement – Ministry Finance of the Slovak Republic and the Public Register – Ministry of Justice of the Czech Republic. Information on revenues in Czech currency are converted to Euro by exchange rate of 31. 12. 2015 published on the official webpage of the National Bank of Slovakia (NBS). For quantification of efficiency score we applied input-oriented and output-oriented DEA models based on Constant Returns to Scale (CRS) and Variable Returns to Scale (VRS). Based on result of CCR DEA model we claim that only one efficient international airport is Prague Airport. On the other hand, another international airport reach low efficiency level. The least efficient international airport is Piestany Airport. By contrast, BCC DEA model indicated three efficient international airports (Pardubice Airport, Piestany Airport and Prague Airport). Thus, the international airports in the Slovak Republic reach low efficiency level compared with international airports in the Czech Republic.

Keywords: Personnel Marketing, Personnel Management, Data Envelopment Analysis, Decision Making Unit, Returns to Scale, Technical Efficiency, Allocative Efficiency

JEL Classification: M12, C02, C52, C61

1.INTRODUCTION

In recently, many authors have focused on evaluate efficiency level of international airports all over the world, mainly, in North America, Europe and Asia using DEA models. For instance, Lin and Hong (2006) evaluated operational performance of 20 international airports from around the world. According to results, international airports in North America and Europe reached higher efficiency level than airports in Asia and Australia. Moreover, ownership form and airport size don't have impact on airport performance. On the other hand, existence of hub airport and airport location are significant for airport efficiency. Suziki and Nijkamp (2011) applied so-called Distance Friction Minimization (DFM) associated with DEA. DFM model calculates an optimal input reduction or output increase. The sample consist of 25 airports in Japan. Inputs variables contained operating cost, employment cost and total runway length. Output variable was operating revenue. Next, Ahn and Min (2014) researched efficiency score of 23 international airports in Europe, North America and East Asia from 2006 to 2011 using CCR DEA model and Malmquist Test. Based on results authors claim that Gatwick, Zurich, Hong-Kong, etc. are efficient international airports with respect to Most Productive Scale Size (MPSS), scale efficiency and technical efficiency. In addition, authors applied one-way

ANOVA test and t-test for input and output variables. Based on these results, Ahn and Min (2014) argue that among international airports isn't significant difference in efficiency score with connection to the region, airport ownership and airport size. Moreover, according to authors, smaller airports have low productivity level. It is associated with technical efficiency change. Authors suggest to increase number of passengers per aircraft movement due to airport productivity. Jardim et al. (2015) compare results of airport efficiency which are calculated by DEA models and Multi-Criteria Decision Analysis (MCDA) in the form of MACBETH. According to authors, the main disadvantage of MACBETH is subjectivity. It relates to determine variable weights. Wanke, Barros and Nwaogbe (2016) examined airport efficiency in Nigeria. The data set involve information on 30 international and regional airports, for instance, among input variables belong terminal capacity, runway dimension, number of employees, apron area and output variables were number of passengers, number of movements and cargo traffic. The all information is gathered for year 2013. Authors applied FDEA models based on the α-level approach.
On the other hand, few authors focus on efficiency issue of international or regional airports in East Europe, specifically, in Slovakia and the Czech Republic. It is main reason why we decided to assess of efficiency score of the Slovak and the Czech international airports. This paper deals with application of CCR DEA model and BCC DEA model as a part of personnel management. In the first part of the article there is explanation of personnel management as a part of personnel marketing. Among function of personnel management belong planning, organizing, coordination, directing, motivating and controling, but also performance evaluation. The primary aim of personnel management and of marketing is to build prosperous organization through qualified workforce. The main reason is to improve the efficiency level in the DMUs. In other part, there is characteristics of multivariate method – Data Envelopment Analysis (DEA), especially, CCR DEA model based on Constant Returns to Scale (CRS) and BCC DEA model based on Variable Returns to Scale (VRS).

2.LITERATURE REVIEW

The primary aim of enterprises is to improve efficiency. In this case, we focus to evaluate efficiency in personnel management area. Personnel management is significant part in each company because its task is to choose potential employees. We will evaluate efficiency level using DEA models. It used to find the set of coefficients that enable to achieve greater possible efficiency score of input and output variables. The model required data about inputs and outputs during analysed period.

2.1 Personnel marketing

Nowadays among new trends in area of human resources management (HRM) belong, for instance, participative management (Rolkova & Farkasova, 2014) and personnel marketing. Szarková et al. (2014) personal marketing is a scientific discipline that connects instruments of personnel management and of marketing. It represents a new area of personnel activities in relation to personnel management. The relationship between personnel marketing and personnel management can be defined based on research subject. The primary difference is that personnel management focus on manage employees and subject of personnel marketing is to search manpower. According to Janosova (2016) personnel marketing is focused on gathering information on situation on the labour market that personnel management applied in recruiting employees in company. It relates to active approach of searching and motivating manpower. The main aim of personnel marketing is to ensure qualified workforce from external and internal market. Personnel marketing tools provide optimal number and structure of potential

employees based on recruitment of the enterprises. On the other hand, personnel management is focused on recruitment and motivation of manpower in the organization. Personnel marketing and personnel management participate on common objective in enterprise, i. e. obtaining and retaining a skilled workforce.
The main objective of personnel management is to achieve synergistic effect through strategic management. According to Kachaňáková et al. (2008) personnel management has a positive influence on increasing the efficiency level in organization because support human development. Therefore, we can claim that employee's education is essential condition for efficiently using of manpower. According to Kachaňáková et al. (2010) employees represent a primary source of prosperity in organizations. Enterprises support to develop strengths due to competitive advantage. According to Armstrong (2007) organizations create prosperity by investing in employees who are the main source of wealth. In general, human capital is an essential element in the private, public, but also in the nonprofit sector. It associated with building a prosperous society. The part of personnel management is HRM that is a systematic process of improving employee's performance. It means to support a corporate culture in which employees take responsibility for continuous improvement of business processes. By contrast, Stýblo (1998) characterise HRM as a recruitment process and personnel management. Moreover, personal marketing is an important precondition for improving sustainable development of the organization. Nowadays personnel management and marketing play an important role in achieving the efficient operation of organization. According to Gogolova (2015) product of personnel marketing is job that organization offers to prospective candidates in the domestic or foreign market. The role of personnel marketing is to gain a lot of potential applicants for a job by mix of personnel marketing, including product, price, place and communication. The primary objective of personnel marketing is to attract qualified workforce. The reason is to raise performance in companies.

2.2 Data Envelopment Analysis

In following part, we focus on efficiency defined as the ratio of output to input (Jackova, 2011). We might measure efficiency level, for instance, labour cost per employee. According to Kachaňáková et al. (2008) performance measurement is an important element in the performance management, because it provides feedback for identifying the inefficiency sources. The next aim of HRM is to support programs that improve the efficiency of organization through application of effective procedures.
We applied method called as DEA to evaluate the performance of employees in international airports in Slovak and Czech Republic. DEA method belongs among multivariate models, as well as TOPSIS, WSA, etc. (Misankova & Bartosova, 2016, Valaskova et al., 2015). DEA method used to evaluate efficiency of Decision Making Units (DMUs) in private, public and nonprofit sector for improving efficiency based on dataset about input and output variables for period (Jablonsky & Dlouhy, 2015). DEA models are parts of non-parametric methods for estimating weights. Among most commonly used non-parametric method belong Monte Carlo simulation, also (Frajtova-Michalikova et al., 2015). DMU is called decision unit that use similar inputs for producing similar outputs.

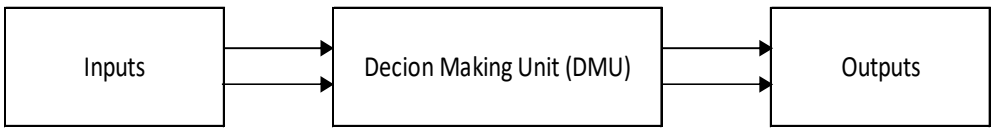


Figure 2 Transformation of inputs on outputs
Source: authors

In general, the output variables have maximization character. Therefore, more quantity of outputs at unchanged input level cause greater efficiency rate. On the other hand, input variables have minimization character. Therefore, less quantity of inputs at unchanged output level cause greater efficiency rate. DEA model provide efficiency ratio among 0 and 1, i. e. in percentage between the range 0 and 100 % (Jablonsky & Dlouhy, 2015).
DEA model based on Production Possibility Set (PPS) that consists of all efficient DMUs within analysed set. Therefore, efficient DMU lies on the efficient frontier. It means that DMU have optimal combination of inputs and outputs within all analysed DMUs. The primary idea of DEA model is to compare DMUs with others and to identify those DMUs that are operating inefficiently, respectively efficiently (Klieštik, 2009). It considered for primary advantage. Other advantage of the DEA method is that input data can be in different measurement units. For instance, input data of hospitals can be number of doctors, the number of nurses, the number of surgeons, the amount of medication, technical equipment, buildings, etc. and output data can be number of hospitalized patient, surgery, etc.
The origin of DEA methods is associated with Debreu (1951) Koopmans (1951), Shepard (1951) and Farrell (1957), who suggested efficiency level based on two attributes – Technical Efficiency (TE) and Allocative Efficiency (AE). Then, Charnes, Cooper and Rhodes (1978) participated on significant development of BCC DEA model based on Constant Returns to Scale (CRS). CCR DEA name model is based on the authors' initials. CCR model calculates the input and output weights by optimization calculation to maximize efficiency level. Efficiency level is less than or equal 1 (Klieštik & Zvarikova, 2013, Farrell, 1957).

$$\text{Minimalize} \quad e\,(DMU_j) = \frac{\sum_{k=1}^{r} u_k y_{kq}}{\sum_{i=1}^{m} v_i x_{IQ}} \rightarrow \max, \tag{1}$$

$$\frac{\sum_{k=1}^{r} u_k y_{kj}}{\sum_{i=1}^{m} v_i x_{ij}} \leq 1,\ j = 1, 2, \ldots, n, \tag{2}$$

$$u_k \geq \varepsilon\ ,\ k = 1, 2, \ldots, r, \tag{3}$$

$$v_i \geq \varepsilon,\ i = 1, 2, \ldots, m. \tag{4}$$

Notes:

e	efficiency rating of DMU being evaluated by DEA,
ε	infinitesimal constant, according to it, input weights and output weights have positive number,
u_k	coefficient of weight assigned by DEA to output k,
v_i	coefficient of weight assigned by DEA to input i,
x_{ij}	amount of input i used by DMU_j,
y_{kj}	amount of output k used by DMU_j,
i	number of input used by the DMUs,
k	number of outputs used by the DMUs.

Input and output variables are organised in an X and Y matrix that have dimension (m, n), respectively (r, n).

$$X = \begin{vmatrix} x_{11} & \cdots & x_{1n} \\ \vdots & \ddots & \vdots \\ x_{m1} & \cdots & x_{mn} \end{vmatrix} \quad Y = \begin{vmatrix} y_{11} & \cdots & y_{1n} \\ \vdots & \ddots & \vdots \\ y_{r1} & \cdots & y_{rn} \end{vmatrix} \tag{5}$$

We can modify previous model on linear model via Charnes-Cooper transformation in two ways. The first approach maximizes numerator of objective function in case of denominator is equal to 1. It is input-oriented CCR DEA model. The second approach minimizes the denominator in case of numerator is equal to 1. It is output-oriented CCR DEA model.

Maximize
$$e\,(DMU_j) = \sum_{k=1}^{r} u_k\, y_{kq} \rightarrow \max, \quad (6)$$
$$\sum_{i=1}^{m} v_i\, x_{iq} = 1, \quad (7)$$
$$-\sum_{i=1}^{m} v_i\, x_{ij} + \sum_{k=1}^{r} u_k\, y_{kj} \leq 0,\ j = 1, 2, \ldots, n, \quad (8)$$
$$u_k \geq \varepsilon,\ i = 1, 2, \ldots, r, \quad (9)$$
$$v_i \geq \varepsilon,\ j = 1, 2, \ldots, m, \quad (10)$$

or

minimalize
$$e\,(DMU_j) = \sum_{i=1}^{m} v_i\, x_{jq} \rightarrow \min, \quad (11)$$
$$\sum_{k=1}^{r} u_k\, y_{kq} = 1, \quad (12)$$
$$\sum_{k=1}^{r} u_k\, y_{kq} - \sum_{i=1}^{m} u_i\, x_{ij} \leq 0,\ j = 1, 2, \ldots, n, \quad (13)$$
$$u_k \geq 0,\ i = 1, 2, \ldots, r, \quad (14)$$
$$v_i \geq 0,\ j = 1, 2, \ldots, m. \quad (15)$$

In case of input-oriented CCR DEA model, efficiency rating is equal to 1. It means that DMU is located on efficient frontier. On the other hand, efficiency rating isn't equal to 1, so DMU is inefficient unit. In case of output-oriented model CCR DEA model, efficiency level is greater than 1, so DMU is inefficient unit. If DMU is not efficient, then it is necessary to find virtual unit on efficient frontier (Fiala, 2008).
Input-oriented or output-oriented CCR DEA model are mentioned as multiplier models. To evaluate efficiency level is necessary to solve these models for each DMUs separately. In case of multiple set is available to use dual models for previous models. These models are mentioned as envelopment model (Fiala, 2008). Input-oriented dual CCR DEA model have following form:

minimalize
$$\theta_q - \varepsilon\,(\sum_{i=1}^{m} s_i^- + \sum_{k=1}^{r} s_k^+), \quad (16)$$
$$\sum_{j=1}^{n} \lambda_j x_{ij} + s_i^- = \theta_q x_{iq},\ i = 1, 2, \ldots, m, \quad (17)$$
$$\sum_{j=1}^{n} \lambda_j y_{kj} - s_k^+ = y_{kq},\ k = 1, 2, \ldots, r, \quad (18)$$
$$\lambda_j \geq 0,\ s_i^- \geq 0,\ s_k^+ \geq 0. \quad (19)$$

Individual "λ" means weights of the inputs and output variables. The purpose of the model is to find the linear combination of input and output quantity of all the analysed sample.

For efficient DMU applies:

- optimal value θq = 1,
- optimal value of all additional variables s_k^+, k = 1, 2, ..., r, a s_i^-, i = 1, 2, ..., m, are equal to 0.

Radial DEA models provide information on efficiency level and answer to question how to achieve efficient frontier, respectively (PPS). It means to change inefficient unit to efficient unit (or virtual unit) by radial DEA model. Input and output variables about virtual units are referred to as target variable for inputs and outputs variables.
Then, Banker, Charnes and Cooper (1984) created the BCC DEA model base on Variable Returns to Scale (VRS), i. e. rising, falling, as well as constant returns. In this case, a conical

shape of efficient frontier is changed to convex shape. It follows that number of efficient units is greater compared with CCR DEA model (Coelli et al., 2005, Sengupta, 1995). In analysing the efficiency based on VRS, it is necessary to complete dual model about convexity condition:

$$\sum_{j=1}^{n} \lambda_j = 1 \qquad (20)$$

The way to calculate BCC DEA model is similar with calculation of BCC DEA model. In similar way to achieve weights for input and output variables by inefficient DMUs.
The efficiency level (calculated by the CCR DEA model) is referred to as the overall technical efficiency. The efficiency level (calculated by the BCC DEA model) is referred to as net technical efficiency. Scale Efficiency of DMU is proportion of these indicators.

3.THE RESEACH OBJECTIVE AND METHODOLOGY

The aim of paper is to quantify efficiency level of international airports. The dataset includes 10 international airports (Figure 2) in the Czech Republic (Prague Airport, Brno Airport, Ostrava Airport, Pardubice Airport and Karlove Vary) and the Slovak Republic (Bratislava Airport, Kosice Airport, Piestany Airport, Sliac Airport and Poprad-Tatry Airport).



Figure 3 Analysed international airports in the Slovak and the Czech Republic. Source: authors

The DEA models require input variable and output variables. In this study, the variables are chosen based on literature review, for instance, Wanke, Barros and Nwaogbe (2016), Ahn and Min (2014), etc. (look at references). Thus, input variable is number of employees and output variables are number of passengers and revenues. The output variables (passenger volume and revenues) were chosen because international airports require to increase these variables with respect to given certain input variable. Information on number of employees, number of passengers and revenues are gathered based financial statements of year 2015 which are published on official webpage, i. e. the Register of Financial Statements – Ministry Finance of the Slovak Republic and the Public Register – Ministry of Justice of the Czech Republic. The financial data in Czech currency are converted to Euro by exchange rate of 31. 12. 2015 published on the webpage of the National Bank of Slovakia (NBS). Then, we applied DEA models based on Constant Returns to Scale and Variable Returns to Scale. DEA models determine efficiency score, slack variable analysis and variable weights. Based on result we divide international airports into two groups, i. e. efficient and inefficient international airports. Finally, we suggest measures how to improve efficiency score of analysed airports. The research process is shown on Figure 3.

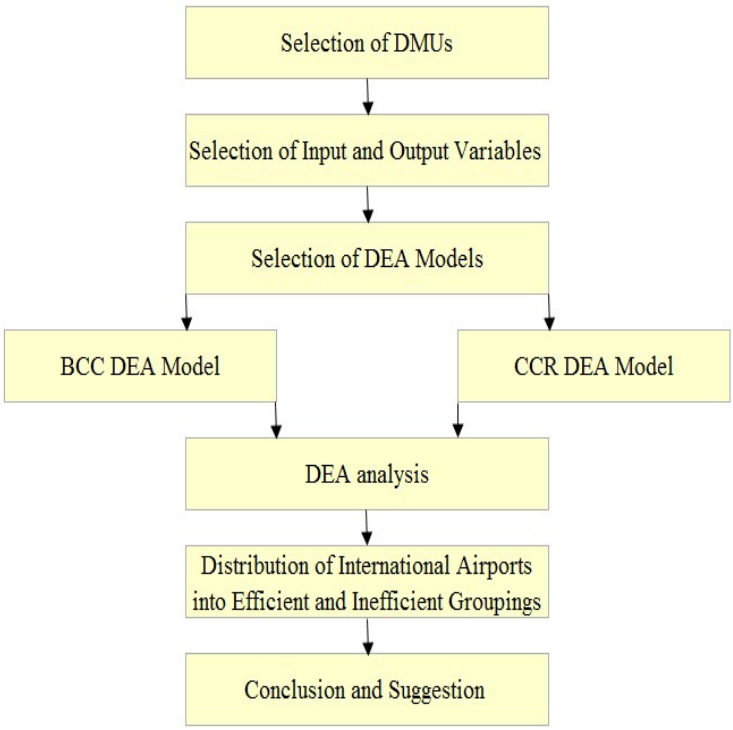


Figure 4 Reseach process. Source: authors.

4.RESULTS

We conclude based on application of CCR DEA model that the only efficient international airport is Prague Airport. It means that in the Slovak Republic there are no effective international airports. The main reason is that international airports don't achieve input and output efficiency that is equal to 1, respectively 100 %.

The least efficient international airport is Piestany Airport that achieves efficiency score of 0.12394 (more than 13 %), respectively output efficiency rate of 8.06875. Based on the calculated variables via CCR DEA model, international airport should take some actions, for instance, on the input side to radically reduce the number of employees and mainly increase number of passengers from more than 2k to almost 28k. On the other hand, Piestany Airport can reach efficiency rate on output side, for instance, to increase revenues from more than 503k to more than 4 million euros and to increase the number of passengers from more than 2k to almost 221k. Other opportunity is to make changes on input and output side at once.

In the case of Poprad-Tatry Airport that achieves input efficiency rate at the level of 0.19753 (i. e. more than 20 %), respectively output efficiency rate at level of 5.06258. The international airport should take some actions to improve efficiency ratio, for instance, on the input side we suggest to drastically reduce the number of employees from the original number of 64 to 13 employees and to increase number of passengers from more than 85k to almost 88k. Another way to increase the efficiency ratio of Poprad-Tatry Airport can be detected by output-oriented CCR DEA model. Therefore, Poprad-Tatry Airport can achieve efficiency ratio, for instance, to increase the number of passengers from more than thousand to over 441k and to increase revenues from more than 1.6 million to more than 8.1 million euros.

The third least efficient international airport is Karlove Vary Airport. It is necessary to accept some actions in the form of reduction in the original number of 49 to 12 employees. Th efficiency score of Piestany Airport is at level of 0.24858 (i. e. almost 25 %), respectively output efficiency rate of 4.02293. Piestany Airport can achieve greater efficiency rate by increase outputs based on output-oriented CCR DEA model, for instance, to increase revenues of more

than 1.5 million to more than 6.2 million euros and to increase the number of passengers from more than 51k to more than 338k.

Tab. 1 Input data for evaluation of DEA model.
Source: authors based on http://www.registeruz.sk/, https://or.justice.cz/ias/ui/vypis-sl-firma?subjektId=715683.

DMU	Employees	Passengers	Revenues
Bratislava Airport	561	1 564 311	20 365 224
Kosice Airport	130	410 449	8 192 772
Piestany Airport	32	2 036	503 883
Sliac Airport	38	35 682	1 603 818
Poprad-Tatry Airport	64	85 224	1 606 180
Prague Airport	1 743	12 030 928	221 453 984
Brno Airport	143	459 192	6 202 679
Ostrava Airport	177	308 933	5 444 510
Pardubice Airport	35	59 260	1 717 167
Karlove Vary Airport	49	51 780	1 547 534

Table 2 shows the statistical parameters of input and output variables.
Tab. 2 Descriptive Statistics of input and output variables. Source: authors.

	Employees	Passengers	Revenues
Mean	297	1 500 780	26 863 775
Standard Error	168	1 179 248	21 701 503
Median	97	197 079	3 580 839
Minimum	32	2 036	503 883
Maximum	1 743	12 030 928	221 453 984

Tab. 3 Results of efficiency score for input and output oriented CCR DEA model
Source: authors based on http://www.registeruz.sk/, https://or.justice.cz/ias/ui/vypis-sl-firma?subjektId=715683.

DMU	Efficiency score of input-oriented DEA model	Efficiency score of output-oriented DEA model
Bratislava Airport	0.40398	2.47538
Kosice Airport	0.49602	2.01604
Piestany Airport	0.12394	8.06875
Sliac Airport	0.33219	3.01033
Poprad-Tatry Airport	0.19753	5.06258
Prague Airport	**1.00000**	**1.00000**
Brno Airport	0.46522	2.14953
Ostrava Airport	0.25287	3.95467
Pardubice Airport	0.38615	2.58965
Karlove Vary Airport	0.24858	4.02293

Tab. 4 Results of input-oriented CCR DEA model in the form of efficient input and output targets. Source: authors based on http://www.registeruz.sk/, https://or.justice.cz/ias/ui/vypis-sl-firma?subjektId=715683.

DMU	Employees	Passengers	Revenues
Bratislava Airport	227	1 564 311	28 794 363
Kosice Airport	64	445 089	8 192 772
Piestany Airport	4	27 374	503 883
Sliac Airport	13	87 131	1 603 818
Poprad-Tatry Airport	13	87 259	1 606 180
Prague Airport	1 743	12 030 928	221 453 984
Brno Airport	67	459 192	8 452 374
Ostrava Airport	45	308 933	5 686 547
Pardubice Airport	14	93 289	1 717 167
Karlove Vary Airport	12	84 073	1 547 534

Tab. 5 Results of output-oriented CCR DEA model in the form of efficient input and output targets. Source: authors based on http://www.registeruz.sk/, https://or.justice.cz/ias/ui/vypis-sl-firma?subjektId=715683.

DMU	Employees	Passengers	Revenues
Bratislava Airport	561	3 872 261	71 276 928
Kosice Airport	130	897 315	16 516 935
Piestany Airport	32	220 878	4 065 707
Sliac Airport	38	262 292	4 828 027
Poprad-Tatry Airport	64	441 755	8 131 414
Prague Airport	1 743	12 030 928	221 453 984
Brno Airport	143	987 047	18 168 629
Ostrava Airport	177	1 221 729	22 488 442
Pardubice Airport	35	241 585	4 446 867
Karlove Vary Airport	49	338 219	6 225 614

According to BCC DEA model based VRS, among efficiency international airports belong Pardubice Airport, Prague Airport and Piestany Airport. Among the least efficient airports belong Ostrava Airport and Bratislava Airport. These international airports achieve efficiency score of less than 50 %, especially, Ostrava Airport (less than 40 %) and Bratislava Airport (almost 45 %). Inefficiency international airports shall take necessary actions to increase efficiency. The following part we focus primarily on the least efficient international airports. Ostrava Airport achieve efficiency score of 100 % to reduce number of employees from more than 170 to less than 80, and the same time increase revenues of more than 5.4 million to almost 6.3 million euros. Based on the output-oriented BCC DEA model, we should increase number of passengers from more than 308k to over a million, at the same time increase revenues from more than 5.4 million to almost 20 million euros.

Based on input-oriented model BCC DEA model in Bratislava Airport we can increase efficiency score by reduce number of employees from more than 560 to 250 and to increase revenues from than 20 to almost 30 million euros. Another way is to increase the number of passengers to nearly 4 million from more than 1.5 million, at the same time increase from more than 20 million to nearly 70 million euros. Details of other international airports are shown in the following tables.

Tab. 6 Results of efficiency score for input and output oriented BCC DEA model
Source: authors based on http://www.registeruz.sk/, https://or.justice.cz/ias/ui/vypis-sl-firma?subjektId=715683.

DMU	Efficiency score of input-oriented DEA model	Efficiency score of output-oriented DEA model
Bratislava Airport	0.44514	2.39472
Kosice Airport	0.65642	1.70139
Piestany Airport	**1.00000**	**1.00000**
Sliac Airport	0.91368	1.31132
Poprad-Tatry Airport	0.60476	3.08042
Prague Airport	**1.00000**	**1.00000**
Brno Airport	0.64377	1.77758
Ostrava Airport	0.39899	3.41356
Pardubice Airport	**1.00000**	**1.00000**
Karlove Vary Airport	0.70628	2.27348

Tab. 7 Results of input-oriented BCC DEA model in the form of efficient input and output targets. Source: authors based on http://www.registeruz.sk/, https://or.justice.cz/ias/ui/vypis-sl-firma?subjektId=715683.

DMU	Employees	Passengers	Revenues
Bratislava Airport	250	1 564 311	29 341 982
Kosice Airport	85	412 063	8 192 772
Piestany Airport	32	2 036	503 883
Sliac Airport	35	53 914	1 603 818
Poprad-Tatry Airport	39	85 224	2 193 729
Prague Airport	1 743	12 030 928	221 453 984
Brno Airport	92	459 192	9 057 814
Ostrava Airport	71	308 933	6 299 849
Pardubice Airport	35	59 260	1 717 167
Karlove Vary Airport	35	51 780	1 558 575

Tab. 8 Results of output-oriented BCC DEA model in the form of efficient input and output targets. Source: authors based on http://www.registeruz.sk/, https://or.justice.cz/ias/ui/vypis-sl-firma?subjektId=715683.

DMU	Employees	Passengers	Revenues
Bratislava Airport	561	3 746 085	69 387 873
Kosice Airport	130	725 131	13 939 062
Piestany Airport	32	2 036	503 883
Sliac Airport	38	80 288	2 103 121
Poprad-Tatry Airport	64	262 526	5 448 061
Prague Airport	1 743	12 030 928	221 453 984
Brno Airport	143	816 251	15 611 532
Ostrava Airport	177	1 054 563	19 985 684
Pardubice Airport	35	59 260	1 717 167
Karlove Vary Airport	49	157 388	3 518 288

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Based on these facts, most international airports should focus on revenues through increase airline connections to new destinations, for instance, the Scandinavian countries, the Baltic countries, Poland and Eastern Europe via low-cost airline companies. Managment of international airports may negotiate with low-cost airline companies about airline connection, but also emphasize on creating so-called "air base" in airports which may increase revenues from "aircraft parking". Moreover, it has advantage in terms of possible early and late flights which can be more comfortable for most of potential passengers. Next advantage is that international airports in Slovakia and the Czech Republic compared to international airports abroad are characterised as "safe" airport. It relates lower likelihood of a terrorist attack what can be considered as positive feature in term of passenger selection. Thus, increase of revenues from "aircraft parking", as well as revenues from increase of passenger volume have positive impact on profitability ratios, respectively efficiency level.

5.DISCUSSION

This research study has specific character because in this field there aren't similar research with connected to international airports in the Slovak and the Czech Republic. Although, many authors deal with evaluating efficiency level of international and regional airport from all over the world, mainly North America, Europe and East Asia. In most research, authors quantify efficiency level of the most significant international airports around world.
In the future, research study should be extended about international airport from Poland and Hungary. Thus, primary idea of potential research is to evaluate and compare airports in the Visegrad Group (V4). It can be interesting because in V4 there is strong competitive environment in aviation transport. Moreover, we can add some new variables and models based on principle of DEA models. For instance, Olfat et al. (2016) researched efficiency level of Iranian airports based on fuzzy dynamic network DEA model. Apart from, we would apply Malmquistov Index. It is a quantitative tool that accept time factor. The index evaluates multiple inputs and outputs without price data. In evaluating of efficiency changes over time, index enable to create decomposition on two components - the relative effectiveness changes of analyzed unit in the sector and change of production possibilities frontier that is caused by technology. The main reason is that BCC and CCR DEA models are static models. Malmquistov test is used in different types, for instance, input-oriented, output-oriented, Constant Returns to Scale (CRS), Increasing Returns to Scale (IRS) and Decreasing Returns to Scale (DRS). Further research can be focused on assessing efficiency score during certain period. For instance, Coto-Millan et al. (2016) investigated efficiency level of 35 Spanish airports over 2009 to 2011 period. They analysed influence of airport size, low-cost carrier and cargo traffic on efficiency. The result of research project showed that cargo traffic has a positive influence on the technical and scale efficiency in Spanish airports. Apart from, future research can be focused on determine efficient level of significant international airport in EU with emphasis on ownership form and cluster analysis based on analysis results.

6.CONCLUSION

Comparison and analysis of the efficiency score of DMUs based on DEA models have widely using in various fields of economy. The aim is to identify the inefficiency source because it has impact on competitive advantage. The paper provides information on efficiency level of international airports. Performance evaluation is significant for improving efficiency in aviation industry in the future. DEA analysis provide several important information. First, efficiency level compare performance of DMUs within sample. Secondly, slack variables provide information on way of improving performance, i. e. input reduction or output increase. The

primary aim of paper was to determine efficiency level of international airports based on nonparametric methods, specifically, CCR DEA model and BCC DEA model. Based on result of CCR DEA model we claim that only one efficient international airport is Prague Airport. Other international airports have low efficiency score (less than 50 %) compared with Prague Airport. The main reason is connected to number of passengers and total revenues. On the other hand, BCC DEA model demonstrate that among efficient international airports belong Prague Airport, but also Piestany Airport and Pardubice Airport. The greater number of international airports is associated with principle of BCC model which based on VRS. In addition, international airports in the Slovak Republic are less efficient than international airports in the Czech Republic. Finally, among limitations of the study belong small sample size because DEA models require data availability about same DMUs (international airports). In the Slovak and the Czech Republic there are 11 international airports, but we didn't analyse Zilina Airport. The main reason was lack of necessary data about number of employees.

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EVALUATION OF SELECTED ASPECTS OF ENTERPRISES IN THE CONSTRUCTION INDUSTRY: A RESEARCH STUDY FROM THE OLOMOUC REGION

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Abstract

The paper deals with the evaluation of selected aspects and their mutual connections in small and medium-sized enterprises in the Olomouc region of the Czech Republic in the field of construction in the years 2009-2015. These indicators from the field of finance are obtained from financial reports. The aim of this paper is to identify and evaluate whether there are dependencies between these indicators in the context of domestic and international environment by using selected methods. Research findings confirm that there is a dependency for example between cash flows and profitability. Small and medium-sized enterprises with an international connection in particular have a significant potential. The growing global nature of economy also affects the accounting field in terms of the use of international financial reporting standards. In the paper, the methods of regression and correlation analysis as well as the methods of analysis, synthesis and comparison are used.

Keywords: Small and Medium-Sized Enterprises, International Accounting Harmonization, Construction, Profitability Indicators, Profit or Loss

JEL Classification: C50, M21, M41

1.INTRODUCTION

Financial performance is a necessary condition for a company to work not only in the short term, but also in the long term. The company should have an effective amount of capital to cover assets. Attention must be also paid to liquidity, so that it is able to meet its obligations and could turn the assets into financial resources.
The scales which are based on the profit or loss belong to the widespread scales for measuring performance. In general, the profit or loss is the difference between revenues and costs. It is purposeful to monitor not only the amount of profit or loss in the absolute value of the numeric indicator, but also the relation to the incurred costs and generated revenues.
Financial reports provide the basic source of data for the evaluation of the company performance. Collectively, these documents comprise the financial statement and are included in the annual report. In addition to financial reports, the annual report contains information about the vision for the future, more detailed statistics of sales or the company management report. The financial report showing the structure of assets and sources of their funding is the balance sheet, the importance and structure of which is elaborated on in e.g. McKeith and Collins (2013). The form of this financial report in the Czech Republic (CR) affects in particular the implementing decree 500/2002 Coll. which sets the layout of entries and the binding pattern of the report. Assets are primarily divided according to the liquidity into four main groups, i.e. receivables for subscribed capital, fixed assets, current assets and accrual basis. The balance sheet liabilities provide information on the financial structure, they are broken down on the equity, foreign resources and accrual basis. When assessing the overall balance sheet total and its structure, it is necessary to take into account the company performance, field of business, the degree of assets utilization, capital maturity or the standards in the industry.

In the Czech Republic, the profit and loss account, the form of which is based on the implementing decree to the Act on Accounting (which is also the case of the balance sheet), provides information on the amount and structure of costs and revenues during the monitored accounting period. It needs to be mentioned that both the balance sheet and profit and loss account use terms such as assets, liabilities, costs or revenues. However, the Czech accounting standards do not contain their exact definitions unlike IFRS or US GAAP, for IFRS in more detail see e.g. Reimers (2013). The operating costs and revenues usually comprise the largest part of costs and revenues. In order to overall analyse and evaluate the impact, it is necessary to pay attention to both the volume and structure of financial costs and revenues.

The profit and loss account shows costs and revenues at the moment of their creation. Actual incomes and expenses frequently arise later. For this reason, it is necessary to track cash flow using the cash flow statement. This statement informs about cash inflows and outflows for the operational, financial and investment activities. Important information for financial statements is provided in the annex (comment). The information content in the annex helps to interpret the data obtained from the financial analysis.

The nature of economy is becoming more global. This causes pressure on the unification of information systems, increase of clarity and comparability of all the economic information. If the information is compared in an international context, it is not appropriate to use financial reports compiled according to national accounting regulations. Each country has a number of its accounting specifics which can cause limited comparability in the global context. Currently, the International Financial Reporting Standards (IFRS) and US GAAP have played an important role in the accounting harmonization. The IFRS have been selected as the instrument of accounting harmonization in Europe. The findings of a series of studies, for example Barth et al. (2008) or Bartov, Goldberg and Kim (2005), state that the financial statements compiled according to IFRS provide information of higher quality in comparison with the financial statements compiled according to national accounting regulations. The procedure of converting financial statements compiled according to national accounting regulations to the financial statements according to IFRS is governed by IFRS 1 standard, as reported by Hakalová, Pšenková and Losová (2014).

Accounting provides the basis for tax purposes. Accounting profit is transformed into the tax base, and it is then taxed at either a corporate tax (in the Czech Republic, it is the corporate income tax) or a personal income tax (in the Czech Republic, it is the income tax of natural persons), depending on the legal form of the business. It should be noted that if the books were kept only under IFRS in the Czech Republic, according to the Income Tax Act, there would be an obligation to purge this tax base under IFRS from the effect of IFRS.

The objective of the paper is to analyze the selected financial and accounting aspects of the micro, small and medium-sized enterprises in the construction industry of the Olomouc region in the Czech Republic by using selected mathematical-statistical methods. These aspects are considered in relation to business performance in the context of profit or loss, assets and capital structure and profitability in the context of domestic and international activities of enterprises. Companies in the construction sector are analyzed according to CZ NACE section F. The construction sector is exposed to great competitive pressures, seasonal cycles, the excess of supply over demand both in the public and private sector. Businesses are forced to significantly streamline processes, carefully manage risks and prudently assess investments. According to Euroconstruct, the construction sector is gently growing. In the past, it was remarked by the crises of China and Germany, uncertainty in the US and persistent problems of European banks, etc. The current outlooks are an opportunity created by the combination of cheap loans and a more favourable interest in construction as an investment (Eurocontruct, 2016). The entire paper evaluates the mentioned aspects in small and medium-sized enterprises because they play a major role in the economic environment development in the context of not only domestic, but

also international environment. The specifics of small and medium-sized entrepreneurship in the current market environment are analyzed by e.g. Mikušová (2013).
The first part of the paper is devoted to the literature review of financial reports as a business management tool in the context of financial and accounting aspects of small and medium-sized enterprises. The second part defines the examined sample of respondents and the method of research. The third part presents the results of the research from the period 2009 - 2015. The final part of the paper is the evaluation of enterprises in the construction sector in relation to the international environment.

2.LITERATURE REVIEW

Accounting is an information and measurement system that identifies, records and communicates relevant, reliable and comparable information about business activities of an organization (Wild, Larson and Chiappetta, 2008). Financial reports provide information on the financial position and performance which is important for economic decisions of a wide range of users (Elliot and Elliot, 2013). The compilation of financial records is based on the assumption of the 'going concern' and an accrual basis. Going concern or the assumption of the company duration arises from the fact that the company exists and will continue in its activities in the foreseeable future.
In particular, the amount of profit or loss expressed in absolute value as well as its amount in relation to the ratio of revenues, capital, assets or costs - the profitability - belong to the scales of performance based on the profit or loss. The factors affecting financial performance include the asset and capital structure of the company.
In the years 2010-2014 in Malaysia, Elwin and Hamid (2016) examined the relationship among the ownership structure, corporate governance and firm **performance**. From their findings, it is concluded that firms often have different ownership structure depending on the field of business or competition. Based on the research results, the ownership structure is a factor affecting company performance. In addition to the assets structure, the company performance is also affected by the capital structure. The conclusions by Barthodly and Mateus (2011) state that the marginal income tax rate affects the capital structure. The interest, which the company pays on foreign capital, is usually a tax deductible expense. The variability of the company value or even the cost of the lack of capital are other variables affecting the capital structure (Bradley, Jarrell and Kim, 1984).
Mateev, Poutziouris and Ivanov (2013) examined the factors influencing the capital structure in micro, small and medium-sized enterprises in countries of Central Europe. The research results, in which over 3,000 companies participated, show that larger companies use less external financial resources for funding in comparison with smaller companies. The research on the capital structure in European countries was the subject matter of the study by Jensen and Uhl (2008). Companies participating in the research were divided into two categories – the countries of Western Europe and the countries of Eastern Europe. It was found out that the countries of Eastern Europe show a lower level of debt. Lower loan availability in comparison with the countries of Western Europe was given as one of the reasons.
Differences in attitudes to borrowing, the existence of the tax shield, or even social factors affect the capital structure of European small and medium-sized enterprises (Hall, Hutchinson and Michaelas, 2004). It is important to choose such a ratio between own and foreign resources which minimizes the overall cost of capital. From the macroeconomic perspective, financial performance is no doubt influenced also by the phase of the economic cycle or the company age (Rossi, 2016). The way in which legislative changes in taxation influence investments of small and medium-sized enterprises, service providers with a high proportion of human labour

in the Czech Republic and the subsequent impact on the collection of the value added tax is also discussed in Krizikallová and Střílková (2015).
The ownership structure has an influence on financial performance. Shleifer and Vishy (1986) further state that the ownership structure differs depending on whether from the point of view of maturity it is a developing or developed country. Mugomo, Mutize and Aspeling (2016) conducted a similar study in Africa. This study analyzed a sample of 80 companies; 40 of them listed on the Johannesburg Stock Exchange (JSE) and the other 40 are private companies with a balance sheet of more than US$500 000. The result is that there is a significant correlation between the ownership concentration, government ownership and company performance as measured by ROA.
The impact of the **ownership structure** and **corporate** control on the **performance** of the listed companies was analyzed by Darko, Aribi and Uzonwanne (2016). This study focused on 20 of the 34 listed companies on the Ghana Stock Exchange across a five-year period from 2008 to 2012. They found out that there is a positive relationship between the number of independence and firm performance or that there is no relationship between the audit committee size and company performance.
A positive relationship between entrepreneurial orientation and business performance was found out by other studies. Pomar et al. (2016) investigated, among other things, the influence of the company size and the subject of business in the context of return on investment. In this case, higher performance was noted by smaller companies.
It is appropriate to compare the results of the financial performance evaluation not only in the context of its development in time, but also for example according to CZ-NACE categorization codes, as the field of activity has an impact on financial and economic performance of firms (Santis, Albuquerque and Lizarelli, 2016). It is appropriate to examine the company performance evaluation also from the perspective of the categorization of business entities. From the perspective of business economics, we divide companies to small, medium and large companies. The term ‘company’ is absent from accounting, this term is replaced by the term ‘accounting unit’. The categorization of an accounting unit is based on the European Union directive and its categorization (micro, small, medium and large accounting unit) is dependent on the implementation of the directive in the particular country. In accordance with the rules of the European Union (Recommendation 2003/361/EC), an enterprise is considered medium-sized if the number of employees does not exceed 250, the annual turnover EUR50 million and the annual balance sheet total EUR43 million, the classification limits for a small and micro enterprise are lower.

3.DATA AND METHODOLOGY

The paper follows the research implemented at Moravian College Olomouc in the field of small and medium-sized enterprises (Sikorová et al., 2015) and the authors´ own research. In the paper, section F - Construction based on CZ NACE is analyzed. The primary objective of the research study was the analysis of performance of enterprises in the construction sector in terms of international activities.
The analysis of company performance in relation to the profit or loss paid attention to the following areas:

- the asset structure of the company,
- the capital structure of the company,
- profitability.

The selection of respondents was conducted on the basis of a precondition and occasional choice. Due to the easy feasibility and previously verified procedure of prior researches, the method of occasional choice of respondents was chosen. The chosen method made it possible to ensure a relatively large number of respondents in a short period of time and also ensured higher motivation of respondents involved in the research project. With regard to the intended research objective, the short-term research of primary information of descriptive and explanatory character was chosen. The research was conceived as a qualitative research due to its character. Given by the research objectives, the basic preconditions to include a business in the research were:

- the categorization of accounting units of the Olomouc region,
- financial reports available on the website www.justice.cz which is administered by Telefónica O2 Business Solutions for the Ministry of Justice.
- companies operating in the Czech Republic and in international markets.

In the examined period 2009 - 2015, a total of 1 240 respondents - business entities (accounting units) of the Olomouc region in the Czech Republic was involved in the survey. The individual respondents were continuously investigated in terms of the changes which occurred in the examined period and were related to the development of their business activities, in direct continuity with a focus on accounting and overall business activity of the monitored companies. In that context, a comparison of the results obtained in the examined years was made as well as the determination of development trends of business activities in connection to the related accounting, tax and legislative aspects. The research was conducted from March 2014 till April 2016 and this research still continues. The research results have been continuously processed and the data of 1 050 business entities out of the original 1 240 business entities before the statistical adjustments were used. Results from the secondary data were evaluated using Microsoft Office Excel and the statistical software IBM SPSS 19.
In addition to standard scientific methods such as description, analysis, synthesis and comparison, authors also used selected methods of the regression and correlation analysis and ANOVA method.
The basic feature of the data is performed using the empirical characteristics of location (mean, median, mode), variabilities (variance, standard deviation), skewness (the coefficient of skewness) and kurtosis (the coefficient of kurtosis).
The dependency ratio between the selected characters x and y is evaluated by the correlation coefficient, the form of which is determined by (1),

$$r = \frac{\sum_{i=1}^{n}(x_i-\bar{x})(y_i-\bar{y})}{\sqrt{\sum_{i=1}^{n}(x_i-\bar{x})^2 \sum_{i=1}^{n}(y_i-\bar{y})^2}}, \quad (1)$$

For expressing the progress of the dependent variable *y* on the independent variable *x,* the regression analysis is used. The form of the regression function is determined by (2),

$$y = B_0 + B_1 x + \mathcal{E}, \quad (2)$$

where $\mathcal{E}$ is a random error, B_0 and B_1 are the population model coefficients.
The determination index R^2 (3) expresses to what extent the ascertained regression function depicts the dependence of Y on X,

$$R^2 = \frac{S_T}{S_y}, \qquad (3)$$

where S_T is the theoretical sum of squares and S_Y is the total sum of squares (Barrow, 1988).

The variance of Anova, which is dealt with in more detail in Newbold, Carlson and Thorne (2013) or Buglear (2012), decides the equality of mean values. The aim is to find out if one statistical character affects the second character, whether the factor affects the values of the second statistical set. First, the null hypothesis H_0 is verified: $\mu_1 = \mu_2 = \ldots = \mu_k$ at the specified level of significance.

In order to accept H_0, there must be a big difference between the variances. The test criterion F is specified (2),

$$F = \frac{S_M/(k-1)}{S_V/(n-k)} = \frac{(n-k)}{(k-1)} \cdot \frac{S_M}{S_V} \qquad \sim \qquad F(k-1; n-k) \qquad (4)$$

where S_M is the factor (intergroup) sum of squares (variability caused by the given factor) and S_V is the residual (introgroup) sum of squares.

If the value of the test criteria F lies in the field of critical values, H_0 at the given significance level p is rejected. The rejection of the null hypothesis is considered a statistical proof of significance of the given factor influence on the monitored random variable.

With regard to the given objective, indicators related to the company performance in the particular analyzed sector - section F - were specified:

- short-term financial assets, in the paper marked “Fin. assets”,
- the operating profit or loss, in the paper marked “Operating P/L”,
- the financial profit or loss, in the paper marked “Financial P/L”,,
- cash flow as the operation affecting the company liquidity, it is measured by revenues, in the paper marked “Revenues”,,
- the profit or loss for the accounting period, in the paper marked “P/L”,,
- ROA, return on assets,
- ROE, return on equity,
- ROC, return on sales.

On the basis of present knowledge, experience and above-mentioned information, the following hypotheses were formulated:
H_0: Sales are not influenced by the short-term financial assets (a), operating profit or loss (b), financial profit or loss (c), cash flow (d), and profit or loss for the accounting period (e).
H_1: Sales are influenced by the short-term financial assets (a), operating profit or loss (b), financial profit or loss (c), cash flow (d), and profit or loss for the accounting period (e).

4.ANALYSIS

Graph 1 shows the sectoral structure and existing development of the industry in the Olomouc region. Companies were divided into 21 sections according to CZ-NACE codes, except the following 4 sections which were not represented in the sample of respondents: E - water supply; sewerage; waste management and remediation activities; R - arts, entertainment and recreation; T - activities of households as employers; undifferentiated goods - and services - producing activities of households for own use; U - activities of extraterritorial organizations and bodies, see Appendix 1, Tab. 1. The strongest representation of businesses in the group of section G – wholesale and retail trade; repair of motor vehicles and motorcycles, which confirms the widely known long-term tradition of the region, particularly in the field of road and rail connections and links to logistics centres in Central Europe (Olomouc region, 2016). The research has not confirmed the industry history in the field of agriculture (Kraftová et al., 2013), but confirmed the wholesale and retail trade; maintenance and repair of motor vehicles and motorcycles (section G), followed by construction (section F); professional, scientific and technical activities (section M) and other service activities (section S) which are represented by ½ of the section G in the region. The Olomouc region is characterized by a relatively large sector base. Weak economic power of the region and wide sector diversity have been confirmed, which is caused by the economic structure of the region, territorial location, natural conditions of the region, interest or disinterest of state authorities and the public, the population mobility, industrial restructuring, unemployment, population qualifications, new business activities, and allocation of research and development, this, however, does not mean that the performance and development of the region are weaker.

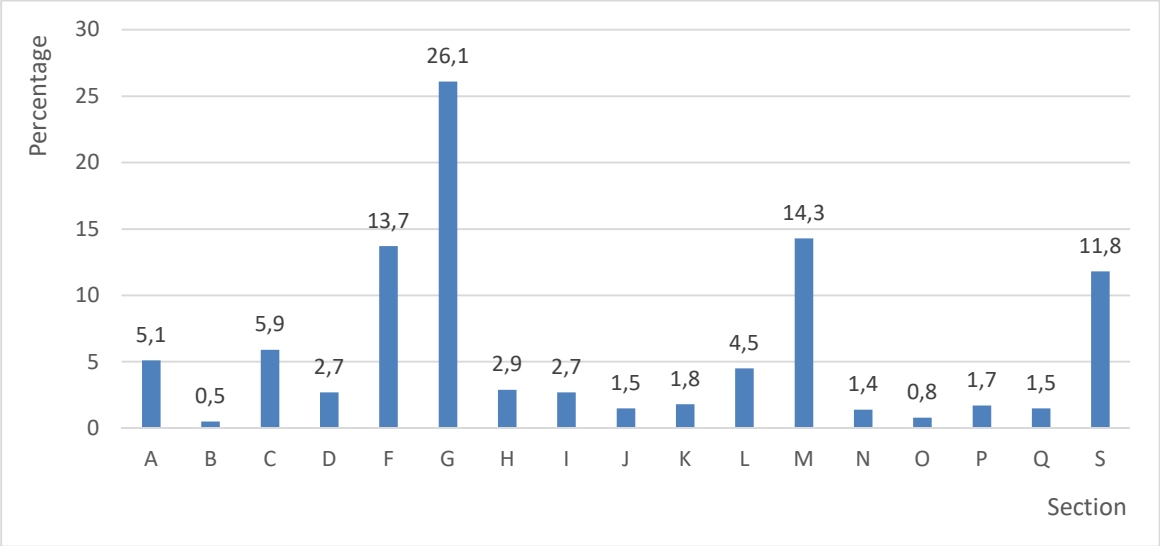


Fig. 1 – Structure of accounting units according to the sectoral focus. Source: authors

4.1 Section F

Micro and small enterprises are the least active in the international environment as was found out on the basis of own research of business entities in 2015 and by selected factors: business entity categorization by the number of employees and the length of operation in the domestic and international markets. The representation of the medium-sized enterprises in international markets is the largest, which is confirmed in the Fig. 2.

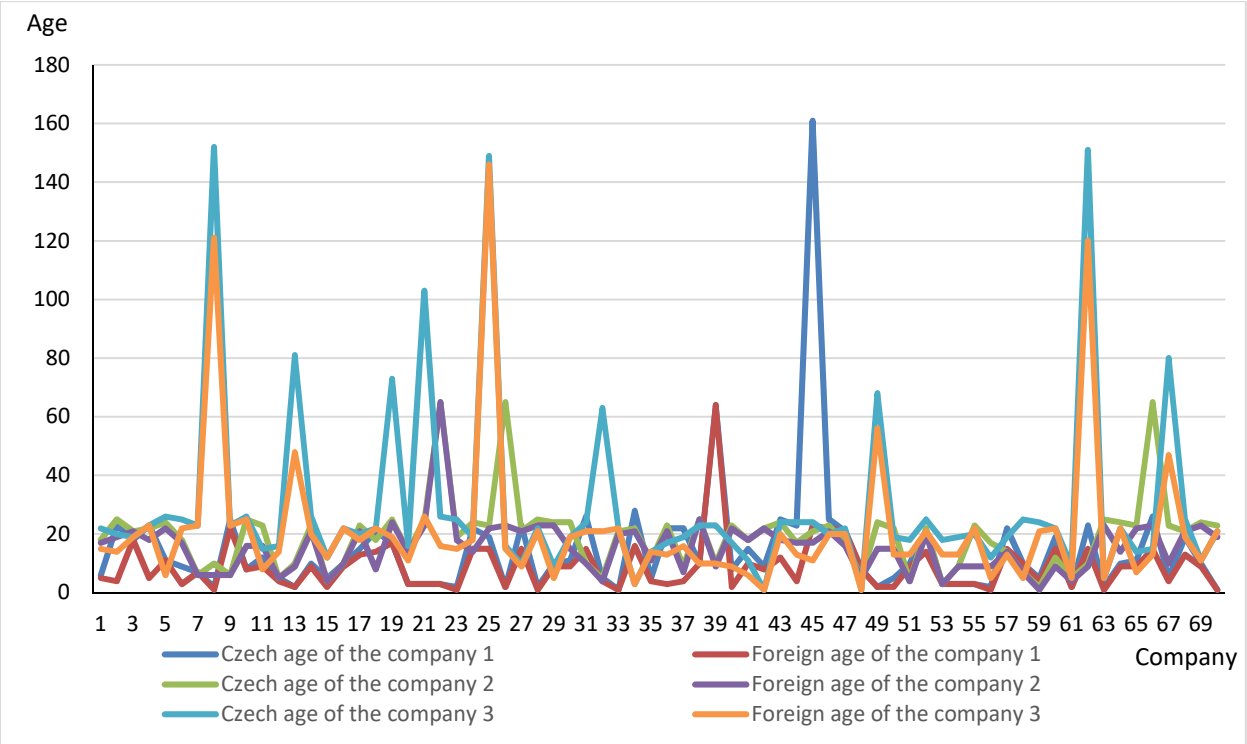


Fig.2 – Comparison of the length of company operation in the domestic and international environment. Source: authors

In order to enter international markets, business entities operating in the Czech Republic have the following characteristic features: high industry specialization, lack of financial resources, narrow environment and above all an impact of the free movement of goods and capital, development of modern communication technologies, transport and logistics systems, and other factors that form a stimulus for the development of international business. We include language barriers, knowledge of the market including regulations and legislation, the lack of information about the environment, etc. among the reasons for the low level of activity in the international environment. Operation in international markets has a positive significance for micro, small and medium-sized enterprises.

4.2 Companies operating in the Czech Republic

Diagnostics of collinearity through correlation, Tab. 1, was carried out before the analysis of the section F indicators in the Czech environment The selected indicators, the dependence of which was tested, include the total profit or loss, turnover, operation and financial profit or loss, and the volume of the financial assets (financial assets are understood as funds on bank accounts and in cash). Except the last item, all the mentioned items can be found in the profit and loss statement that is why their interdependence is analyzed. The item financial assets was included because of assessing the dependence between the volume of financial assets and the amount of profit or loss as the subject often shows profit but has no funds.

Tab. 1 – Correlation analysis of the section F in the Czech environment. Source: authors

	Fin. Assets	P/L	Revenues	Operating P/L	Financial P/L
Fin. assets	1				
P/L	0.5469173	1			
Revenues	0.3955788	0.54103	1		
Operating P/L	0.5165241	0.95515	0.6001	1	
Financial P/L	0.0402086	-0.0298	-0.2926	-0.296630827	1

As shown in Tab. 1, the relationships between individual variables show a mostly moderate dependency. The operating performance is a significant item of the profit or loss that is why here the value of the Pearson correlation coefficient determined by (1) is the highest. If the profit or loss as a whole increases, the amount of the profit or loss from operation activities increases as well. There is the second highest value between the amount of revenue and the operation profit or loss. Nearly a zero dependency exists between the total profit or loss and the financial profit or loss.

Subsequent analyses were conducted to further analyse these relationships and confirm the hypotheses.

The descriptive statistics in Tab. 2 confirms the variability of indicators. The average value is several times higher than the median. Monitoring the mean indicator (median) and its achievement may not disprove the appropriateness of the indicator. It is more efficient to monitor also other industry indicators. Seasonal fluctuations in construction at different points in time are variously interpreted. The resulting values of financial assets (inventories) before and after the season can vary considerably. It is confirmed that the basis of business activities of the company is sales from sold products - the trading margin. Negative financial profit or loss confirms lower sales, a possible loss of business or higher debt of companies. Higher debt of companies is influenced by foreign resources. Companies are profitable and earn more even with loaned resources than is the interest for the loaned resources. An important item of profit or loss is the operating profit or loss which is positive.

Tab. 2 – Basic statistics of the section F in the Czech environment. Source: authors

	Fin. assets	P/L	Revenues	Operating P/L	Financial P/L
Aver. value	3870.13579	2136.39548	62229.8	2937.12	-335.52
Aver. value error	364.758645	262.621452	4143.46	314.306	73.1478
Median	901	277	20640	544	-85
Mode	0	110	5	2	-2
Standard deviation	9698.73963	6987.90234	110328	8369.05	1947.71
Selection variance	94065550.5	48830779.2	1.2E+10	7E+07	3793573
Kurtosis	24.8407181	30.9558168	11.6088	29.2352	39.3867
Skewness	4.4927482	4.40178829	3.21079	4.51707	2.04169
Minimum	-23036	-24960	-160	-23139	-14393
Maximum	79099	73664	706973	76787	18398

Results in Tab. 3 confirms a statistically significant indicator of sales. H_0 is rejected and the validity of the alternative hypothesis that the selected indicators affect the development of sales is confirmed.

Tab. 3 – Regression statistics and ANOVA. Source: authors

Regression statistics	
Multiple R	0.475333
R-squared value	0.225941
Set R-squared value	0.224657
Aver. value error	91884.35
Observation	605

ANOVA

	Difference	SS	MS	*F*	Significance F
Regression	1	1.49E+12	1.49E+12	176.0104	0.00012
Residues	603	5.09E+12	8.44E+09		
Total	604	6.58E+12			

4.3 Companies operating in international markets

Tab. 4 shows the mostly moderate dependency between individual variables.

Tab. 4 – Correlation analysis of the section F in the international environment. Source: authors

	Fin. assets	P/L	Revenues	Operating P/L	Financial P/L
Fin. Assets	1				
P/L	0.37267086	1			
Revenues	0.65340085	0.16957	1		
Operating P/L	0.72533374	0.80088	0.60522	1	
Financial P/L	-0.3221442	0.48369	-0.4599	-0.0901185	1

Basic statistics in Tab. 5 confirms the variability of indicators. The average value is twice as high as the median. This means that most companies only reach half sales. It is confirmed that the basis of business activities of the company is sales from sold products - the trading margin. Negative financial profit or loss confirms lower sales, a possible loss of business or higher debt of companies. Higher debt of companies is influenced by foreign resources and affects the productivity of entrepreneurship and risks. Companies are affected by the risk meaning the standard deviation (or variance). High values of the standard deviation are associated with uncertainty and variability of expected future flows of operating profit or loss. The consequence may be that sales will not cover costs, which confirms the seasonality of activities in the construction industry. Financing the company by own resources in the highly competitive international environment is unthinkable. A relatively lower price compared to own resources and reduction of costs for using capital in the company are the motives of financing by foreign resources, Fig. 3. The current trend of low interest rates and a surplus of bank resources have an impact on the growth of profitability ratio of equity and it cannot be marked as the cause of immoderate indebtedness of companies. An important item of profit or loss is the operating profit or loss which is positive.

Tab. 5 – Descriptive statistics of the section F in the international environment. Source: authors

	Fin. assets	P/L	Revenues	Operating P/L	Financial P/L
Aver. value	5570.496063	1439.15748	114742.085	3776.65873	-1394.015873
Aver. value error	803.8355344	605.07762	13618.9465	667.6307242	295.6382541
Median	2035	597	58506	1653	-393.5
Mode	0	574	0	461	-176
Standard deviation	9058.766414	6818.87848	154681.498	7494.136293	3318.531171
Selection variance	82061248.93	46497103.7	2.3926E+10	56162078.77	11012649.14
Kurtosis	23.80337621	8.94631821	7.1955389	9.532308304	28.48126182
Skewness	4.011928454	0.23847793	2.58982537	2.711889469	-4.718159164
Minimum	-137	-29623	0	-9516	-25901
Maximum	72555	30914	852790	39757	4377

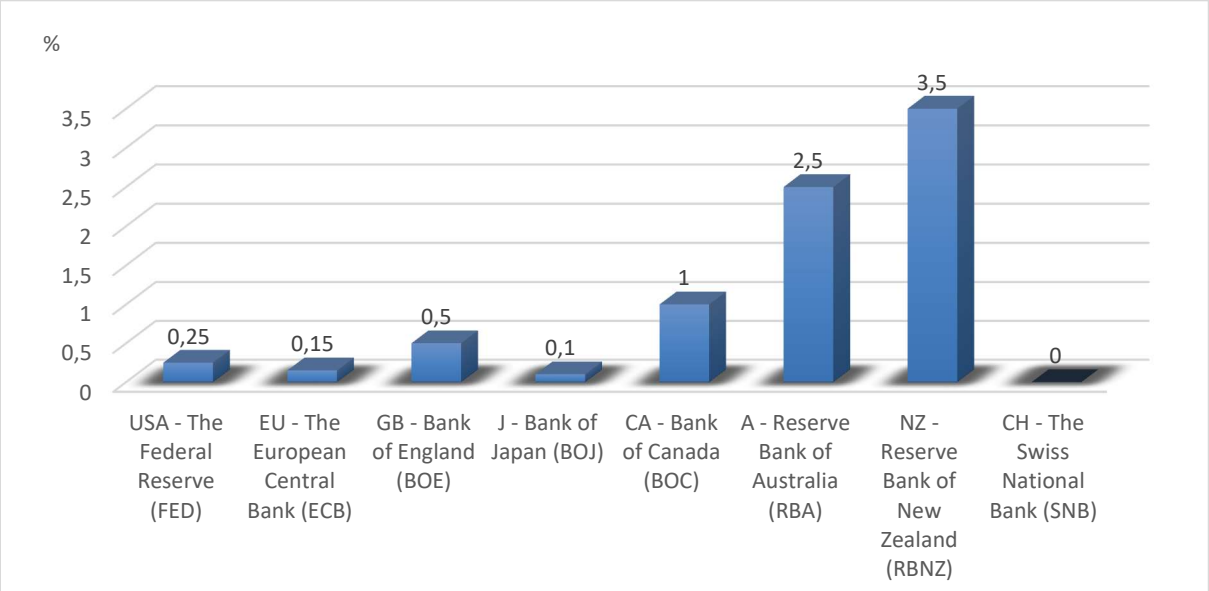


Fig. 3 – Basic interest rates in the world in 2016. Source: authors

Tab. 6 confirms the statistically significant indicator of sales. H_0 is rejected and the selected indicators affect the development of sales. For companies, it is important to operate in international markets, which makes them able to achieve higher performance compared to the local environment. Inventories, demand, prices and competition affect the outputs of the company in the international environment.

Tab. 6 – Regression statistics and ANOVA. Source: authors

Regression statistics	
Multiple R	0.373156
R-squared value	0.139245
Set R-squared value	0.131491
Aver. value error	8808.891
Observation	117

ANOVA

	Difference	*SS*	*MS*	*F*	*Significance F*
Regression	1	1.39E+09	1.39E+09	17.95657	0.0006
Residues	115	8.61E+09	77596559		
Total	116	1E+10			

The results of correlation analysis in Tab. 7 show that there is there is a strong degree of dependence among the indicators of profitability (ROA, ROE, ROC), since the value of the coefficient *r* is equal to 0.7. One of the reasons is the long-term company operation in the international environment. Companies must be not only reasonably profitable, but they must be able to reconcile their needs, i.e. bind capital in short-term parts of assets that must be paid by costs associated with their funding and also must seek financial structure with minimal costs of capital, both their own and foreign capital. The low level of financing by the long-term resources and subsequent high interfirm indebtedness of companies are referred to as one of the serious problems of companies. Compliance with the use of foreign capital for financing the asset part should always correspond to the degree of company's liquidity and financing rules that significantly affect profitability. Other influences that affect the asset and capital structure are: the cost of capital, inventories, accounts receivable, interest, taxes, liquidity, dividend policy, risk, etc., these are absent from the paper. Strong dependency of ROA, ROE, and ROC indicators points to positive capital appreciation which is one of the most important indicators of financial performance of the company.

Tab. 7 – Comparison of profitability indicators. Source: authors

	ROE	ROA	ROC
ROE	1		
ROA	0.38627	1	
ROC	0.74697	0.73591	1

5.DISCUSSION AND CONCLUSION

The objective of the paper was to analyze the selected financial and accounting aspects of the micro, small and medium-sized enterprises in the construction industry of the Olomouc region in the Czech Republic in the context of international activities. The evaluation of companies operating in the construction industry showed that a higher number and growth of enterprises is in enterprises with international activities. The number of companies which increasingly cooperate with foreign business entities (suppliers, investors, customers) is growing in connection with the reasons for processing financial statements according to the international form of accounting harmonization. A sample of 35% of companies does not process reports according to any different accounting system than national, 65% confirmed reporting using a form of global standards (US GAAP or IFRS). The process of accounting harmonization lies in overcoming the existing differences between national accounting standards. The Czech Republic and all other countries must also come to terms with this development in order to get integrated into the global economy. The reason for this are the benefits of international cooperation and company development. The growing influence of international environment on business entities is thus confirmed. Unresolved questions still remain in the field of tax and related laws which substantially affect financial accounting and reporting. These are not included in this paper.

The selection of indicators of the research confirms that section F - construction is mostly dedicated to operating activities. The cash flow indicator, characterized as sales, takes into account the real flow of financial resources. It consists of cash flow from operating activities or alternatively from investment activities such as long-term investments, factory buildings, technology, etc. The negative indicator of financial profit or loss confirms that companies with international activities are more indebted, pay back their liabilities or pay dividends. If the company cuts down its financial expenses (increased purchases) in the future, it will create a positive cash flow. Owners tend to keep control over the company at the given business risk and productivity by increasing financial resources using foreign resources. According to the length of operation in international markets and increase in sales, it is possible to estimate positive values of the financial profit or loss in the future. According to the statistical analysis, section F companies are well managed, and, despite minor variations, it is confirmed that the outflow of financial resources has an effect on sales growth.

Ease of Doing Business index by the World Bank has confirmed that the Czech Republic rightfully ranks the 27th in the world. The Czech Republic has made a great progress in entrepreneurship in these fields: conditions for entrepreneurship, business regulation, property rights, attractiveness of the country for foreign investors or competitiveness. The negative situation remains in obtaining the building permit. Many companies enter international markets with more favourable conditions for entrepreneurship in construction (Doing Business, 2017).

In the research, it has been found out that the development of sales, profit or loss and its forms belong to significant indicators of evaluation of the company situation. Using these and other indicators, the management controls and then evaluates its activity which creates the picture of the independent management of the business entity. A stable and growing development of company sales can be attributed to a well-set strategy, portfolio diversification and adequate resistance of international sales to market development. However, the examined indicators as such are not a measure of the company success because they do not mirror the business risk: the risks of using foreign capital and related company liquidity and a possible threat of insolvency. They evaluate only the past and do not take into account an estimate of future benefits. Above all, growing sales and profits of the business entity tell us about the healthy functioning of the company operating in the international market. It is problematic to compare the performance of companies in the highly competitive and international environment. The competition is located in different countries, operates in different conditions and with different legislation.

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Appendix 1

Table 1 NACE classification of economic activities

A	Agriculture, forestry and fishing
B	Mining and quarrying
C	Manufacturing
D	Electricity, gas, steam, and air conditioning supply
E	Water supply; sewerage; waste mangement and remediation activities
F	Construction
G	Wholesale and retail trade; repair of motor vehicles and motorcycles
H	Transportation and storage
I	Accommodation and food service activities
J	Information and communication
K	Financial and insurance activities
L	Real estate activities
M	Professional, scientific and technical activities
N	Administrative and support service activities
O	Public administration and defence; compulsory social security
P	Education
Q	Human health and social work activities
R	Arts, entertainment and recreation
S	Other service activities
T	Activities of households
U	Activities of extraterritorial organizations and bodies

Source: The Czech Statistical Office

LEVELS OF DEBT TO EQUITY RELATIONSHIP IN POLISH SOCIAL ECONOMY ORGANIZATIONS: EMPIRICAL SURVEY DATA

Michalski Grzegorz

Abstract

In the paper are presented findings that help to derive model based on survey data about debt to equity relationship. Survey results were collected from 300 Polish nonprofit organizations that operate in social economy sector. The indicator of capital structure testifies level of financial risk. Polish nonprofit organizations are important part of general social policy in the Polish economy. They realize important aim in education, in healthcare and in many other socially important areas. Considering of nonprofit organizations efficiency there is a need of remembering the fact that from the donor perspective, important is the way the managing team uses resources of the nonprofit organization. That resources should be used in the most effective way. The nonprofit organization efficiency should be considered in the context of the risk. The one from the most important way to be out from business is the debt to equity relationship. In the paper are considered relations between debt measures and efficiency measures. That relation is also illustrated for Polish nonprofit organizations data.

Keywords: equity, foreign capital, nonprofit organizations, efficiency of NGO

JEL Classification: G30, G31, G32

1.INTRODUCTION

Kuo et. al. (2014) noticed that Magnus et al. (2003) and Yetman (2007) argued that debt financing would have a negative impact on the charitable donations of nonprofit entities (Kuo et. al., 2014). Kuo et. al. (2014) investigate the relationship between debt financing and donation levels and according to Kuo et. al. (2014) empirical results, was proved that debt financing has both a crowd-in effect and crowd-out effect on nonprofit entities donations. Kuo et. al. (2014) show that the crowd-in effect tends to exist in low debt ratio nonprofit entities, and the crowd-out effect is often found to exist in not-for-profit nonprofit entities with higher debt ratios (Kuo et. al., 2014).
Grizzle et. al. (2015) examine organizational factors that impact the level of operating reserves in nonprofit organizations and explore the relationship of operating reserves with organizational demographics and financial health variables (Grizzle et. al., 2015). Tuckman and Chang (1993) analyse why nonprofits accrue debt and whether the funds they borrow are used productively. Work of Tuckman and Chang (1993) distinguishes between productive, problematic, and deferred debt. Tuckman and Chang (1993) examine the pervasiveness of nonprofit debt and the relation between this debt and nonprofit financial health and they find that over 70 percent of the nonprofits hold debt, the distribution of this debt is highly concentrated, and the level of debt and leverage varies with asset size and type of activity what is in one accord with findings of that paper (Tuckman, Chang, 1993). Nonprofit entities with higher debt levels are financially healthier than those with lower levels (Tuckman, Chang, 1993).
Prentice (2016a) explores the organizational and environmental factors that affect nonprofit financial health (Prentice, 2016a). Turner et. al. (2015) focuse on the differential use of debt financing among forprofit and nonprofit entities. Forprofit entities use significantly and substantially more debt than nonprofit entities (Turner et. al., 2015). Calabrese (2011) analyzed

the static trade-off and pecking order capital structure theories and applied to nonprofit organizations. Calabrese (2011) also considers how nonprofits adjust their debt to equity relation over time. Calabrese (2011) indicates that nonprofit capital structure choices are best explained using the pecking order theory, in which internal funds are preferred over external borrowing (Calabrese, 2011). Rosen and Sappington (2016) investigate the decisions of nonprofit entities to issue debt and they test whether the expected value and uncertainty of a nonprofit entity nonfinancial income affect its capital structure (Rosen, Sappington, 2016). Rosen and Sappington (2016) find that debt to equity increase is negatively related to both the expected value and the uncertainty (Rosen, Sappington, 2016).

Szymanska and Jegers (2016) theoretically describe social enterprises taking into consideration their main aims and they point out the direction which social enterprises should follow in order to obtain the highest value of their objective functions (Szymanska, Jegers, 2016). Wedig (1994) points that nonprofit entities are similar to proprietary firms except that their financial residual is expensed on a philanthropic activity which is similar to a dividend-in-kind for a donnors (Wedig, 1994). Wedig (1994) shows how the constraint against paying cash dividends affects the intertemporal paths of capital structure and argue that the nonprofit entities dividend-in-kind are similat to dividends in for-profit firms. Nonprofit entities are risk averse over cash flows and fund balance and behaves like a risk averse consumer rather than a risk neutral firm (Wedig, 1994). Wedig (1994) used a dynamic model to derive closed form expressions for the time paths of debt ant in comparison with empirical data Wedig (1994) confirms the hypothesis of risk aversion.

Long (1976) finds that debt to equity decisions must be based on many inputs—including financial valuation, which has not traditionally been applied in the nonprofit entities sector (Long, 1976). Reiter et. al. (2000) claims that in capital structure decisions of nonprofit entities play the same rules as in for profit entities (Zietlow, 1989; Zietlow, 2010).

Copeland and Smith (1978) make suggest that nonprofit entities that are donor funded have the primary objective of donor utility maximisation to ensure that the resources provided by the donor are utilised in the most efficient manner possible (Copeland, Smith, 1978), (Strydom, Stephen, 2014). Upadhyay et. al. (2015) studied the relationship between the nonprofit entity profitability and cash tied in operational activity (Upadhyay et. al., 2015).

Rauscher and Wheeler (2012) claims that increased financial pressures on nonprofit entities have elevated the importance of working capital management. Efficient working capital management allows nonprofit entities to reduce their holdings of current assets and cash inflows can be used to reduce borrowing (Rauscher, Wheeler, 2012). Rauscher and Wheeler (2012) examine the relationship between nonprofit entities profitability and their performance at managing accounts payable (Rauscher, Wheeler, 2012). Singh and Wheeler (2012) investigate used data for 1,397 bond-issuing, not-for-profit US entities for 2000 to 2007, and Singh and Wheeler (2012) analyzed the relationship between nonprofit entities performance at managing the revenue cycle and their profitability and ability to build equity capital (Singh, Wheeler, 2012). Singh and Wheeler (2012) model four different measures of profitability and equity capital as functions of two key financial indicators and their results indicated that higher amounts of revenue in relation to a nonprofit entity assets were associated with statistically significant increases in equity capital ($p < 0.01$ for all four models). Singh and Wheeler (2012) claims that nonprofit entities that generated more revenue per assets invested reported improved financial performance (Singh, Wheeler, 2012). Statistically significant link existed between lower revenue collection periods and equity ($p < 0.01$ for three models; $p < 0.05$ for one model): nonprofit entities that collected faster on their revenue reported larger equity values (Singh, Wheeler, 2012). Findings of Singh and Wheeler (2012) means that nonprofit organization can advance the financial viability by improving profitability and enabling equity growth (Singh, Wheeler, 2012).

Wheeler and Smith (1988) show that the appropriate discount rate for evaluation of capital expenditures depends on risk, leverage, cost-based reimbursement. Method presented by Wheeler and Smith (1988) can be used to account for these effects that is both practical and consistent with theory (Wheeler, Smith 1988). Wacht (1978) deals with the financial problem of integrating debt financing and fund-raising campaigns in nonprofit equities. Objective of Wacht (1978) findings is the model of the capital budgeting process for nonprofit entities. Nonprofit institutions, as claims Wacht (1978) cannot use orthodox cost-benefit tests because they are inappropriate and impractical because of the multi-dimensional character of the capital structure decision (Wacht, 1978).

Trussel (2012) claims that a capital structure used by nonprofit entities is an important determination of financial risk. Trussel (2012) indicates that there is no difference in the amount of leverage between the two institutional types od NGO's. Nonprofit and social economics entities have unique financing mechanisms which do not impact the relative amount of debt and equity in their capital structures (Trussel, 2012). Woronkowicz (2016) investigates nonprofit financial vulnerability metrics resulted from the effect of a capital facilities project. Woronkowicz (2016) uses data for a sample of nonprofit organizations and models the relationship between financial vulnerability indicators and facilities investments. The findings of Woronkowicz (2016) are evidence for fact that investments in facilities are associated with the costs of debt associated with facilities projects and influence nonprofit finances. The Woronkowicz (2016) findings have implications for the financial management of nonprofit organizations costs of capital (Woronkowicz, 2016).

Wacht (1984) claims that characteristics of nonprofit entities prevent the transfer and successful application of standard financial management solutions to financial management decisions in the nonprofit context (Wacht, 1984). Such characteristics include a dual management structure composed of professional and financial managers (Wacht, 1984), restrictions on the disposition of assets and earnings, and the constant threat of illiquidity as the result of the uncoupling of organizational goals and cash flows (Wacht, 1984). The theory of financial management separates the financial management goals from the professional goals (Wacht, 1978). A nonprofit entity can survive financially through time while its professional manager pursues utility-denominated goals delineated by the organization's tax-exempt status (Wacht, 1978).

Tuckman and Chang (1992) claims that nonprofit decisionmakers have an incentive to earn and accumulate surpluses. Tuckman and Chang (1992) developed a behavioral model and used to derive a demand function for equity. Tuckman and Chang (1992) applied such model to a national sample of 6168 charitable nonprofits and establish the hypothesis that nonprofit decisionmakers consciously plan to increase their organization's equity (Tuckman, Chang, 1992).

Prentice (2016b) claims that financial measures are used in nonprofit research to predict funding opportunities. The findings of Prentice (2016b) suggest that using debt to equity measures in nonprofit entities do not guarantee to find the searched answer (Prentice, 2016b).

Nonprofit organization may be defined as the entity that is concerned in its actions about realization of social value adding mission. Such mission is realized thanks to sources collected thru donations from donors (Michalski, 2016b). Donor is an individual (person, firm, other entity) who appreciate social value generated by realization of the mission realized by nonprofit organization. Such appreciation results in supporting nonprofit organization by donor’s donations. Donation is a supporting of nonprofit organization actions amount of money, other assets or volunteer work that donor delivers to supported nonprofit organization (Michalski, 2016a). Presented discussion contributes in corporate finance theory in its narrower area concerned about nonprofit organizations model of financial management in financial liquidity with efficiency measures as the context. That context is seen by some as controversial, especially from technical point of view. Some claim that nonprofit finance and its managerial

decisions in them, are not different from for-profit business decisions (Hansmann, 1987, Jegers, 2011; Michalski, 2016c, Gavurova, Korony, 2016, Simionescu et. al. 2017). Such position is only partially correct. Sloan et al. and Wedig et al. use with modifications financial management portfolio theory to nonprofit organization financial management (Sloan et al., 1988; Wedig 1994, Wedig et al. 1996, Jegers, Verschueren, 2006; Soltes, Gavurova, 2015). In the paper is used the model of financial debt management in nonprofit organizations from the perspective that states the fundamental financial target of nonprofit organization is the best financially effective implementation of the mission that cause the donors support for the nonprofit organization (Leone, Van Horn, 2005; Eldenburg, 2011; Gavurová, Šoltés, 2014). Nonprofit organization financial debt management decisions need to take in account relation between future effects in the context of risk as debt financing is a specific form that increase financial risk (Soltes 2010, Bem, Michalski, 2015, Sinicakova, 2017). That perspective is close to creation of for-profit firms value (Michalski, 2016a; Chapelle, 2010; Siedlecki, Bem, 2016). The requirements for net working capital linked with the elements shaping it, such as the level of cash tied up in inventories, accounts receivable, cash and near cash assets, the early settlement of accounts payable, are one from fields where could be seen difference. Fig. 1 presents relationship of cash and total assets in social economy entities for 8 European economies.

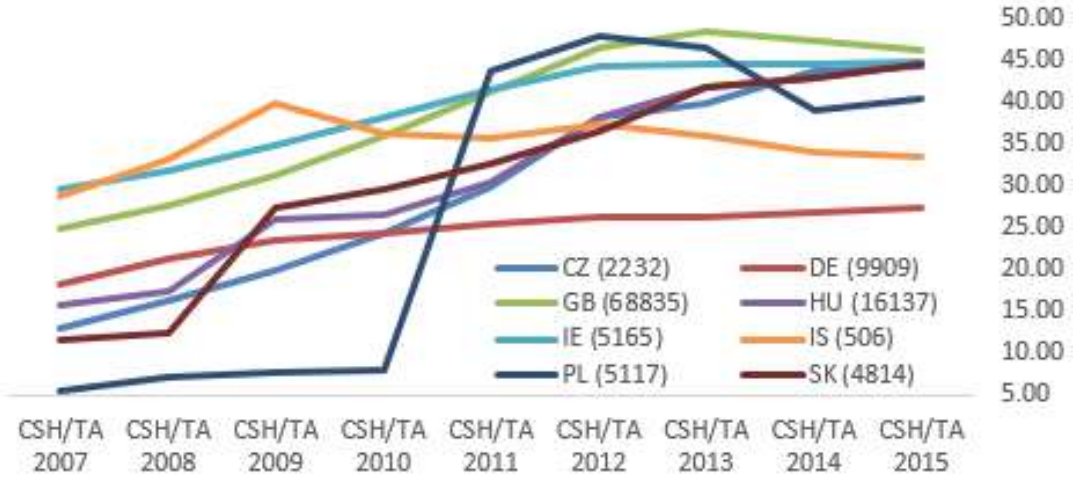


Fig. 1: CASH to Total Assets levels in chosen European social economy organizations
Source: own study based on data from 122925 social economy organizations reported in Database Amadeus product of Bureau van Dijk, [date: 2017 MAY 15].

As we can see, such relation is grooving between 2007 and 2015 years. Not many nonprofit organizations has to do with all aspects of debt decisions. Like for-profit organizations, part of them, use only equity and sources from direct donations, redistributing it from donors to beneficent. Other nonprofit organizations collect free of charge goods for resale, using incomes to realizing the mission. Many of nonprofit organizations are almost identical in operating processes with for-profit businesses, but are nonprofit because of their main mission.
Polish nonprofit organizations are important part of general social policy in Polish economy. By them are realized important targets in education, in healthcare, and many other socially key areas. Considering efficiency of nonprofit organizations, should be remembered that from the donor perspective, is important the way the managing team uses resources of the nonprofit organization and if it is used in the most effective way. The nonprofit organization efficiency should be considered in the context of the risk. The one from the most important way to be out

from business is the lack of the financial flexibility. In paper are considered relations between debt measures. That relation is also illustrated for Polish nonprofit organizations data.
Nonprofit organization managing team decision about the financial debt level policy, is a balance of gaining new opportunities to serve thru realization of the mission. That kind of decision shapes the level and quality of financial debt (Michalski, 2012). Paraphrasing Keith Smith and James A. Gentry observations, is possible to observe that Robichek et al. (Gentry, 1988; Robichek et al., 1965; Smith, 1973) tell about risk involved to financial debt level decisions, which must be accepted by financial institutions pledging of financial debt level of the nonprofit organization. Keith Smith (Smith, 1973; Gentry, 1988) predicted and Michalski (Michalski, 2008; Michalski, 2012) showed how portfolio theory may be used to decrease financial debt level risk. Debt to equity could be viewed in portfolio context as presented by Friedland (1966); Gentry, (1988). Pringle and Cohn (1974; Gentry, 1988) tried to adapt the CAPM theory to capital elements. Bierman and Hausman (1970); Gentry (1988) discuss the granting policy of organization and shows that financial debt level policy requires balancing the future sales gains against possible losses. Lewellen, Johnson and Edmister (Lewellen, Johnson, 1972; Lewellen, Edmister, 1973) explain how and why traditional devices used for monitoring financial debt level should be changed by new and better ones. Freitas (Freitas, 1973) shows relation between debt and risk during financial debt level management. The question discussed in presented paper concerns the making decisions by nonprofit organizations in financial debt level area in connection with efficiency measures (Michalski 2016b).

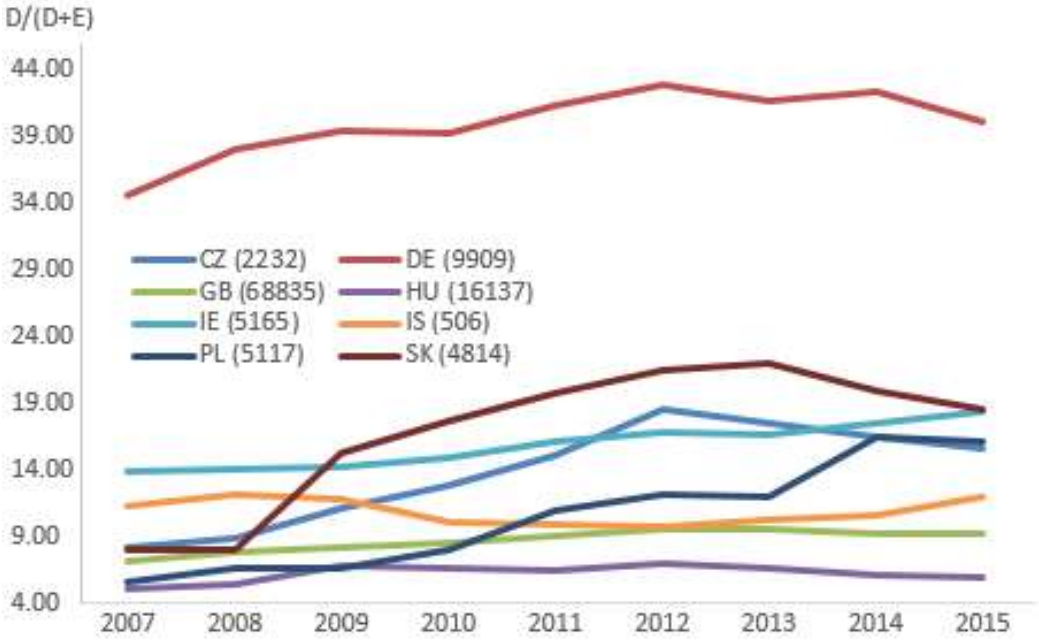


Fig. 2: DEBT to Capital Invested (Debt + Equity) levels in chosen European social economy organizations
Source: own study based on data from 122925 social economy organizations reported in Database Amadeus product of Bureau van Dijk, [date: 2017 MAY 15].

2 THEORETICAL SOLUTIONS AND OBJECTIVES AND METHODOLOGY: MODEL FOR NONPROFIT ORGANIZATIONS FINANCIAL DEBT TO EQUITY LEVELS

If holding financial debt level on a level defined by the organization provides greater advantages than negative influence, the nonprofit organization efficiency will grow (Michalski, 2016c; Shin, 1998; Ranjith Appuhami, 2008). Changes in financial debt level effect on the efficiency of the nonprofit organization. To measure the effects that these changes produce, is use the following formula, which is based on the assumption that the nonprofit organization efficiency is the sum of the future free cash flows to the nonprofit organization (FCNPO), discounted by the rate of the cost of capital financing the realization of nonprofit organization mission:

$$p \times (EREV_t - CE_t - \Delta NWR_t - CAPEX_t) = FCNPO \Rightarrow \Delta V_{npo} = \sum_{t=1}^{n} \frac{\Delta FCNPO_t}{(1+CoC)^t}, \quad (1)$$

where EREV - expected revenues of nonprofit organization, p - probability of realization expected revenues, CE - cash expenditures (fixed and variable costs), NWR - net working capital requirements, ΔNWR – net working capital requirements changes, CAPEX - capital expenditures resulted from long term operational investments; ΔVnpo - nonprofit organization efficiency increase; ΔFCNPOt - future free cash flow growth in period t; and CoC - discount rate equal to cost of capital rate.

Changes in financial debt levels influence nonprofit organization efficiency, to estimate such effect, acceptation of discount rate equal to the average weighted cost of capital (CoC) is needed. Results of mentioned changes are long term in their character and strategic in some meaning, although they refer to financial debt level and traditionally short run area decisions, see: (Michalski, 2016a; Maness, 1998, pp. 62-63). Remembering that fundamental financial target of the nonprofit organization is not the enterprise value creation but as close as possible realization of the mission of that organization (Zietlow, 2007, p. 6-7), controversial is to use analogous rules like for for-profit enterprises, but in fact such solution is proposed in textbook literature (Brigham, 2004; Brigham, 2006). I the paper is used modified version of that classical approach. That paper rules claim that the higher risk should be linked with the higher cost of capital rate used to evaluate the future results of current decision (Michalski, 2016c). That approach is also positively connected with the level of efficiency and effectiveness in realization of the nonprofit organization mission. Effectiveness is understood here as more accurate realization of nonprofit organization donors. They spent their money issuing the organization in capital and by revenues sourced from their answer on that how organization mission appeal to their personal social aims. Cost of financing financial debt level policy is a result of the risk included to the organization strategy of financing and/or investment in financial debt level.

The holding and increasing of financial debt level ties up money used for financing financial debt level. Basing on that, is possible estimation of the free cash flows, which are treated as the free amount of money after cash expenses which could be used for future nonprofit organization actions. Nonprofit organization offer growth, usually necessitates increased levels of debt of nonprofit organization.

The remaining money requirements (that are noted as net working capital requirements growth, ΔNWR) will require a different form of financing (Michalski, 2016a). In Figure 1, the influence of financial debt level policy changes on nonprofit organization efficiency is presented. These decisions change: future free cash flows generated by nonprofit organization operations (FCNPO), time of the organization life (t) and rate of the cost of capital financing the nonprofit organization operations (CoC). Changes to these three components influence the efficiency of nonprofit organization (ΔVnpo = nonprofit organization efficiency increase). Financial debt level policy decisions changing the terms of realization of operating cycle create a new financial capital requirements level. Consequently, financial debt level policy has an influence on nonprofit organization efficiency. This comes as a result of alternative costs of money needed

to cover burdens connected with financial debt level and general costs associated with managing financial debt level. Both the first and the second involve modification of future cost of capital rate and as a consequence the nonprofit organization efficiency changes.

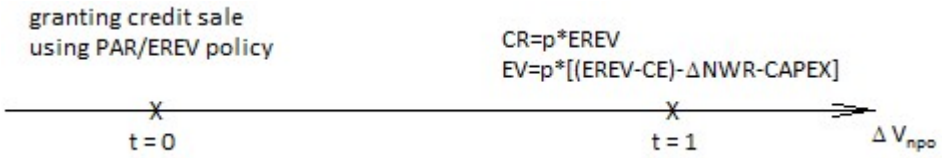


Fig. 3: The debt policy influence on nonprofit organization efficiency
where: *EREV* - expected revenues of the nonprofit organization, *CR* - cash revenues, *CE* - cash expenses (cash expenditures), *CAPEX* - capital expenditures linked with investing in fixed operating assets; *PAR* - projected accounts receivable level in the nonprofit organization; ΔNWR – changes in net working capital requirements; *p* - probability of expected revenues realization; and *t* - the time the decision is taken and their results on *FCNPO* and ΔV_{npo}.
Source: own study based on Michalski (2008), Holmstrom (2001), Holmstrom (1996), Holmstrom (2000)

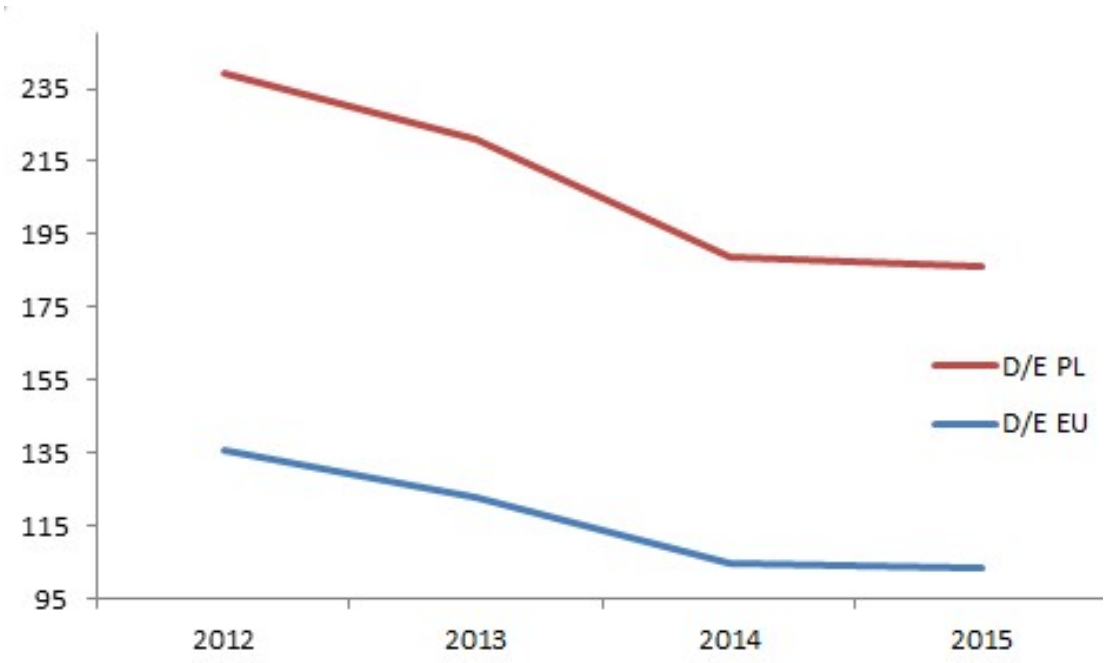


Fig. 4: Debt to Equity (D/E) levels in Polish and European nonprofit organizations
Source: own study based on data from 1560 Polish Nonprofit Organizations reported in Database Amadeus product of Bureau van Dijk, [date: 2016 DEC 01].

Nonprofit organizations are a kind of organizations that from organizational side are almost identical as for-profit businesses. Such entities offer unpaid and paid products and services and as nonprofit organizations they are allowed to generate even large revenues which are sufficient to cover costs of realization of their mission, but nonprofit organizations have no right to collect equity capital thru stock issuing and have no stockholders. The main difference between nonprofit organizations and for-profit businesses is an economic calculation and financial motivation of the staff, capital providers, and whole population of stakeholders. In our results (Fig. 2, Fig. 4, Fig. 5, Fig. 6) we can see that between 2012 and 2015 the relation between debt

and equity is decreasing for surveyed Polish nonprofit organizations. That results are an information that we can expect smaller financial risk in such organizations.

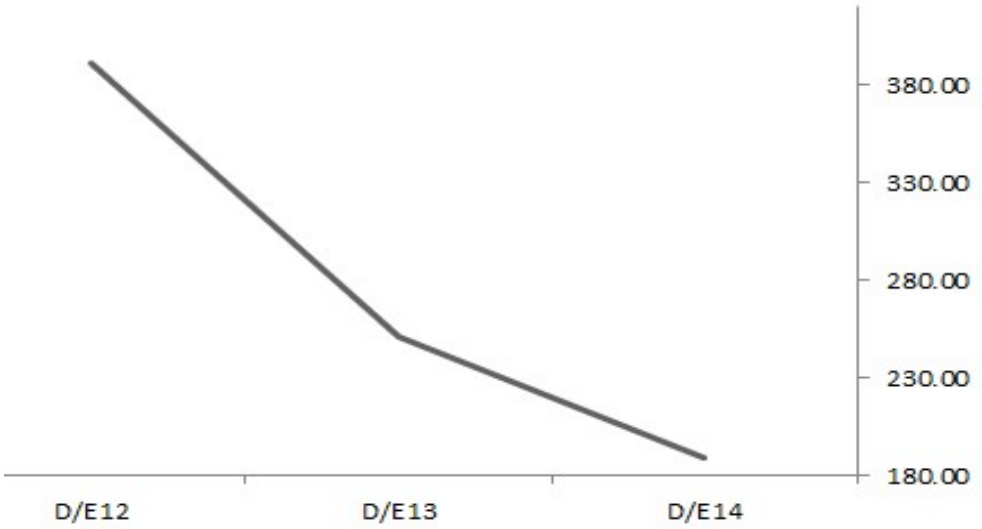


Fig. 5: D/E levels in surveyed 300 Polish nonprofit organizations
Source: own study based on data from 300 social economy organizations reported in Database Amadeus product of Bureau van Dijk, [date: 2017 MAY 15].

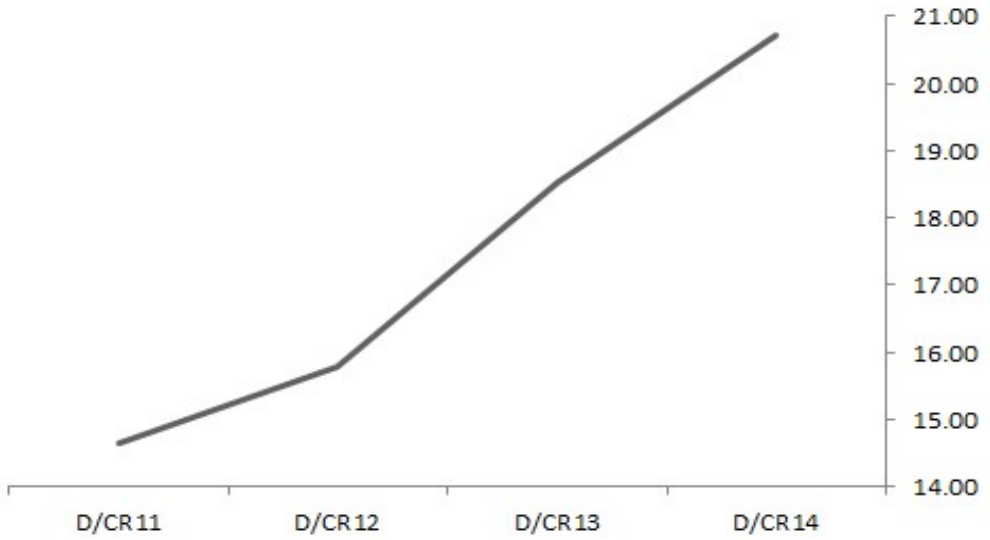


Fig. 6: Debt to Cash Revenues (D/CR) levels in surveyed 300 Polish nonprofit organizations
Source: own study based on data from 300 social economy organizations reported in Database Amadeus product of Bureau van Dijk, [date: 2017 MAY 15].

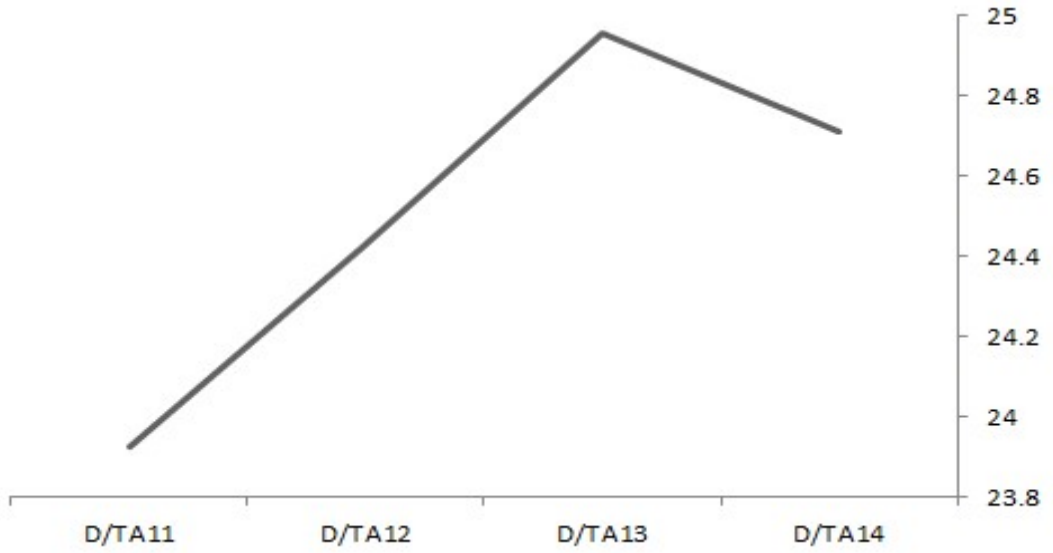


Fig. 7: Debt to Total Assets (D/TA) levels in surveyed 300 Polish nonprofit organizations
Source: own study based on data from 300 social economy organizations reported in Database Amadeus product of Bureau van Dijk, [date: 2017 MAY 15].

Debt to equity data for 300 surveyed Polish NPO shows that D/E indicator is decreasing but still intention of their managers is to use unhealthy capital structure with dominant debt in it (see Fig. 8).

Similar information is presented in the table 1. where the same decreasing tendency is illustrated.

Tab. 1: D/E levels in Polish and European nonprofit organizations

	2012	2013	2014	2015
D/E EU	136	123	105	103
D/E PL	104	98	84	83

Source: Source: own study based on data from 1560 Polish Nonprofit Organizations reported in Database Amadeus product of Bureau van Dijk, [date: 2016 DEC 01].

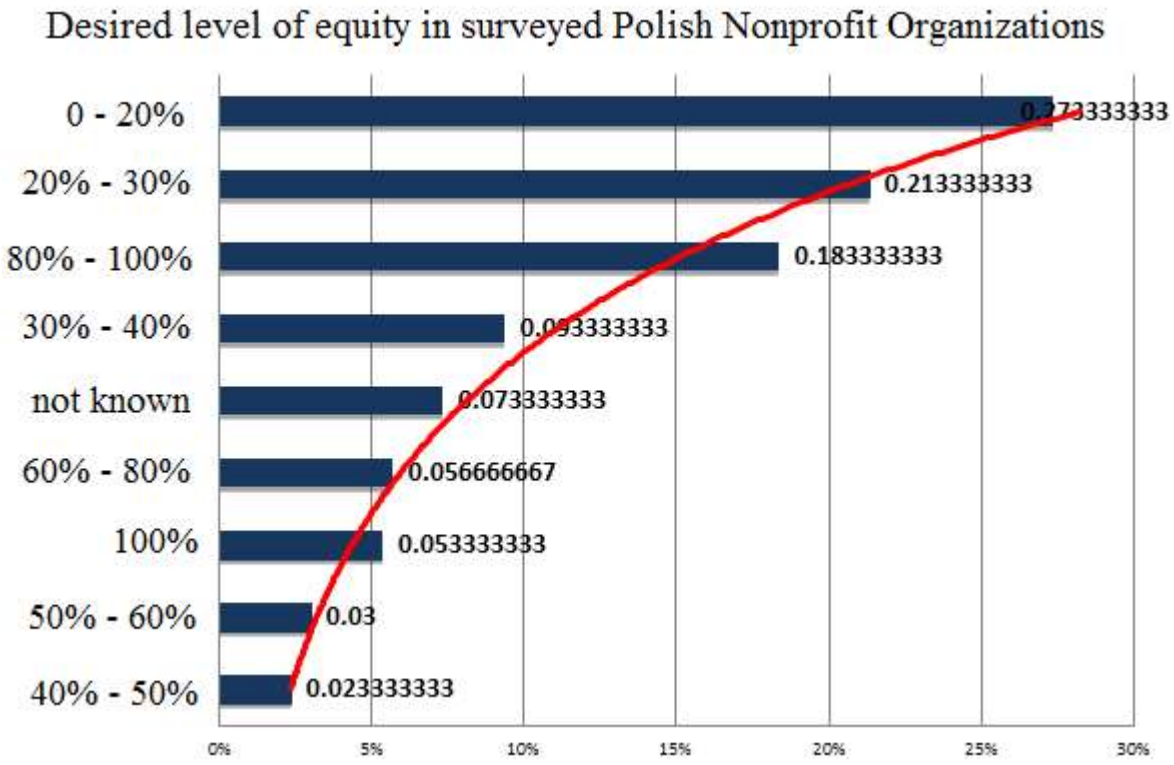


Fig. 8: The equity policy expressed by surveyed Polish Nonprofit Organizations
Source: own study based on data from survey among 300 Polish nonprofit entities [date: 2017 MAR 01]

3 RESULTS AND DISCUSSION: PRACTICAL CONSEQUENCES FOR NONPROFIT ORGANIZATIONS

There is difference in treating the entitlements of people who control organizations in prohibiting distribution of earnings and excess of revenues over expenses of organization: Equity type capital providers of for-profit firms can expect return money in case the business makes excess of revenues over expenses from operations. Nonprofit organizations do not have right to issue stock and equity of nonprofit organizations is issued by donors and persons who have no right to express control over the nonprofit organization. Equity type capital providers of nonprofit organizations in case the nonprofit organization generates money or excess of revenues over expenses from operations can consider additional support for organization but have no possibility to withdraw the money previously tied in organization. In nonprofit organizations, there is no equity capital but nonprofit organizations collect fund capital which is an equivalent of equity capital. Fund capital is collected in nonprofit organizations by earning excess of revenues over expenses, that are forced by regulation as money which should be retained within the nonprofit organization. Other source of fund capital is receiving contributions from individual persons or from private or public entities and from for profit businesses. The last possibility to collect fund capital are money from grants received by nonprofit organizations from governmental entities. Calabrese (2011) indicates that nonprofit capital structure choices are best explained using the pecking order theory. That means that in nonprofit organizations internal funds are used more likely than external borrowing.
Nonprofit organizations act because expected future advantages measured by realization of ideas and mission that are expression of donor's vision of the world. Both nonprofit and for-profit entities have an aim, which is a result of its owner preferences. For-profit organizations

are active because of expected future advantages measured in money, non-profit organizations do their business because of expected future advantages measured by degree of realization of their mission.

Nonprofit organizations serve in each areas of social activities and depending on size can be registered or not in internal revenue authorities. Among nonprofit organizations can be listed: educational businesses like universities or schools, healthcare organizations like hospitals, charities working as religion institutions branches, etc.

Because of the benefits to the society generated by nonprofit organizations most governments allow tax exemptions both for donors and for the nonprofit organizations. Such tax exemptions are usually limited only to charitable nonprofit organizations, which are listed on government records of such organizations that meet the condition for tax exemptions. Usually governments decide that according to their policy only the largest and the most useful for fixing society needs and most helpful for the people of society organizations have right for tax exemptions and of course the definitions and understanding of usefulness or helpfulness differ from country to country, and depends on dominating philosophy or religion of local societies (Michalski, 2016b). Tax exemption for the nonprofit organization could be for all money generated as profit in these organizations but more popular is solution where only profits that are effect of realization of programs or activities concerned on realization of the main mission of nonprofit organization are basis for tax exemption and other profits are subject of normal taxation. Such a solution helps to prevent situation when under nonprofit banner is hidden full for-profit activity not concerned on social needs and is not of help in leveling of disabilities of weaker participants of social interaction. Usually nonprofit organizations to keep tax exemption status are required to keep all excess revenues for the realization of the mission of nonprofit organization. There is not a custom among governments to allow nonprofit organizations to pay out money from excess of revenues over expenses to anyone who normally deserve it in for-profit entities. Board members, employees and clients of nonprofit organizations are excluded from receiving money that are larger than average expenses. Each amount of any money in nonprofit organizations should be directed to beneficiaries defined by the mission of nonprofit organization (Michalski, 2016b).

4 CONCLUSION

Polish nonprofit organizations are important part of general social policy in Polish economy. They realize important aims in healthcare, in education and many other socially important areas. Considering efficiency of nonprofit organizations, should be remembered that from the donor perspective, is important the way the managing team uses resources of the nonprofit organization and if it is used in the most effective way. The nonprofit organization efficiency should be considered in the context of the risk. The one from the most important way to be out from business is the lack of the money for realization of the aim of organization. In paper were considered relations between debt measures. That relation was also illustrated for Polish nonprofit organizations data.

Current policy of Polish nonprofit entities, that allows to use too much debt, is rather dangerous, and there is a need to increase level of understanding about risk and its destroying influence on possibilities of realization nonprofit organization mission.

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PUBLIC SERVICES INNOVATIONS IN THE CONTEXT OF PUBLIC ADMINISTRATION REFORM IN THE SLOVAK REPUBLIC

Mikušová Meričková Beáta, Hronec Štefan, Muthová Nikoleta, Mikuš Tomáš

Abstract

Reforms of government and public administrations in the spirit of New Public Management combined with the use of information and communication technologies have brought about many innovations in public service delivery. The goal of this study is to identify the possible constraints (evaluation of the innovations supply gives priority to the evaluation of the innovation capability of organizations) and benefits (identified by Cost Benefit Analysis that approves technical effectiveness increasing in service delivery by electronization of services) of information-communication technologies implemented into the public services delivery system as an NPM public service innovation in the conditions of the Slovak Republic. The primary research is realised in 25 towns which participated in the appeal Electronisation of municipality services "eMesto" to obtain NPG. The results of this study show that the most significant challenges and factors influencing the innovative capability of the executive branch of local government and successful implementation of innovations are related to employee initiative. Innovations allow the local governments to more intensively monitor their citizens' needs and adapt to these needs by the nature of innovation and the course of the innovation process. Electronization should therefore increase the cost-effectiveness of service provision with regard to the cost savings on the service provider side also on the citizens' side. The research was supported by VEGA under the contract No. 1/0405/15 Programme budgeting as a New public management tool.

Keywords: CBA analysis, diamond model, electronization of public services, innovation capabiltiy, public services innovations.

JEL Classification: H11, H43, O31

1.INTRODUCTION

Most of the developed countries have implemented new principles of public sector reform – new approaches to the management of the public sector. A major feature of the new public management (NPM) is the introduction of market type mechanisms (MTM) to the running of public service organizations: the marketization of the public service. The marketization of public services aims at a continuous increase in public expenditure efficiency, continual improvements in public services quality, the implementation of the professional management tools in the public sector. The principles for good governance, openness, participation, accountability, effectiveness and coherence can be supported by introduction of information and communication technologies (ICT) to public administration. Many innovations of public services are based on the use of information-communication technologies and such technologies can significantly contribute to the realization of one of the key conditions for successful implementation of innovations in the system of public services which is the direct involvement of a citizen as a consumer of public services in the innovation process of this service (Von Hippel, 2007). A stimulus for innovation is identification with the new idea of not only all those involved externally in the provision of public services, i.e. building social capital, but also from those within the body itself. From this perspective, it is important to address the

innovation capability of public organizations as providers of public services which determines the supply of public services innovation. The paper focuses on evaluation of the innovations supply by public services based on the use of information-communication technologies. The goal of this study is to identify the possible constraints and benefits of information-communication technologies implemented into the public services delivery system as an NPM public service innovation in the conditions of the Slovak Republic.

2.THEORETICAL BACKGROUND

The classic Weber concept is characterized by the bureaucratic methods how public administration functions as a hierarchical organization with operations based on rules (Baumol, 1965; Niskanen, 1971; Rosenbloom, 1986) which does not apply sufficient pressure on the system of public services for innovation of the public services and therefor no pressure for efficient and quality public services required by society.
The result of social pressure to increase the efficiency and quality of public services is a reform of public administration by New Public Management (NPM). A collective provision of public services is replaced by a flexible way of providing services such as personalized products. This in turn leads to a change of political governance for management control, to the transition from a pyramid scheme administration to a headquarters organizational structure; operational management is replaced with strategic direction, the pressure to reduce costs while maintaining quality and quantity of output increase (value for money) (Keraudren and Mierlo, 1997). These changes also create favourable conditions for the development of innovations in the system of providing public services through the introduction of new techniques and methods including market mechanisms (Pollidano, 1999; Larbi, 1999).
It is, however, necessary to mention the growing criticism of NPM directed towards the universality of its application without reference to context and local conditions (Acouin 1990; Christensen and Lægreid, 2009). As reported by Medveď, Nemec (2010) using NPM tools in the conditions of Central and Eastern Europe, and also in less developed countries, is specifically influenced by the specifics of the market and the market environment. In connection with the criticism of NPM, a new concept of public administration is emerging – that of governance, which is based on the mutual interaction of actors in the public and private sectors. The aim, in the process, is to develop a civil society (Pollit, Bouckaert, 2011). The concept of governance also appears in European Commission documents (e.g. Green Paper, 2004) which defines the various principles of "good governance": openness, participation, accountability, effectiveness, and coherence. Building "good governance" is possible by the introduction of information and communication technology (ICT) in public administration, therefore, it is increasingly appearing in the context of reform of the public administration management concept of "Digital Era Governance" (Dunleavy, 2005).
Similar to New Public Management, the concepts of Governance, Good Governance, or Digital Era Governance present reform changes in the management of public administration, reflecting the changes in the provision of public services, which can perhaps be seen as innovation.
Innovation in the system of public services can be seen as the development of public services towards better meeting needs based on the modification of the status of entities / actors in the provision of the system (Osborne, Brown, 2005; Mulgan, Albury 2003; Hartley, 2005). These entities are then able and willing to learn, improve their operations and work together (Von Hippel, 2007).
From the perspective of the introduction of innovations, it is necessary to deal with existing problems in implementation of innovations such as incentives and barriers to innovation processes in the system of public services. These can be seen in the plane of the inputs of the innovation process in the innovation process and the outcomes / results of the innovation

process. Failure to adopt innovation of public services, respectively its frequent understanding as "extra work" by public employees themselves, is often behind the failure of such innovation (Coinsidine et al., 2009). From this perspective, it is important to address the innovation capability of public organizations as providers of public services which determines the supply of public services innovation.

Research into the characteristics of organizations which have an impact on their innovation capability has been carried out in numerous studies (Burns and Stalker, 1961; Damanpour 1991). There are a large number of studies of the other features of organizations influencing their ability to innovate. A summary of 83 studies published concerning this issue in the period 1980-2003 was attempted by the authors Vincent, Bharadwaj, and Challagalla (2004) using meta-analysis; they defined 15 factors of the innovation capacity of organizations: economic (competitiveness (+) turbulence (+), uniformity (-), urbanization (+), organizational (hierarchy (+), complexity (+), formalization (+) functional coordination (+), specialization (+), demographic (age (+), management education (+) , professionalism (+), number of employees (+) and processes (dichotomous evaluation of innovation (-), an intersectoral evaluation of innovation (+)).

In the evaluation of the various combinations of the above-mentioned factors, several models evaluating the innovation capability of an organization have been devised: the diamond model (Tidd, Bessant, Pavitt, 2005), the innovation channel model (Hansen and Birkinshaw, 2007), the innovation funnel model (Barber, 2011). The diamond model works with five areas of evaluation: strategy, processes, organization, networking and learning (Tidd, Bessant, Pavitt, 2005). Evaluation of each area is represented by the individual axes of the diamond. The greater the area of the pentagon, the higher the organization's innovation capacity (
Fig. 8).

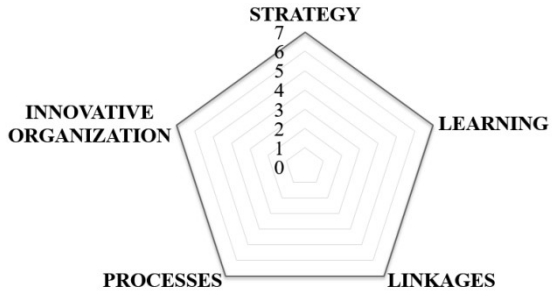


Fig. 8- Evaluation of the innovation capacity of an organisation – Diamond model. Source: Author's own based on Tidd, Bessant, Pavitt (2007).

At all these levels of the innovation process (innovation process inputs course, the results of the innovation process) the moment of direct citizen participation (Von Hippel, 2007) as a consumer in developing and implementing innovation - co-creation dominates. The role of the citizen in the field of innovation of public services is still far less pronounced than the role of the client, the consumer in the innovation process in the private sector. The active role of clients in the innovation process in the private sector, however, is inspiration for the public sector and implementation of innovation in public services (more incentives for innovation in the public sector still come from citizens themselves, for example, civic activities in environmental protection and construction of public spaces). Local authorities currently have at their disposal a number of ICT tools (mobile applications, e-petitions, open-source databases, data analysis of the community, competitions, innovation "jams", open databases, participatory design workshops and specialized online civic communities) which may increase the mobilization of citizens in the innovation process.

3.OBJECTIVE AND METHODOLOGY

The goal of this study is to identify the possible constraints and benefits of information-communication technologies implemented into the public services delivery system as an NPM public service innovation in the conditions of the Slovak Republic.
In relation to the fulfilment of the stated objectives, a scientific background in the form of research questions is formulated, the authenticity of which is the subject of the application part of the paper, *RQ1: development and implementation of innovative concepts of public services fail because of weak innovation capability of providers of local public services.*
In evaluating the innovation capability of providers of local public services which translates into innovations supply by these services, we will use the concept of the diamond model. The innovative capability of local governments will be assessed in five areas, as identified by the diamond model, transformation of qualitative data to quantitative. The questionnaire to evaluate the innovation capability of an organization through the diamond model (
Fig. 8) normally contains statements to 2-3 questions from each part of the diamond model with possible answers: Disagree = 1 point, Agree = 2 points.

Tab. 5- Evaluation of the innovation capability of the executive branch of local governments. Source: Author's own.

Field	**Criteria**
Strategy	Development strategy of a municipality
	Innovation as part of the development strategy of a municipality
	Mechanisms for implementation of development strategy of a municipality
Processes	Innovation of local public services
	Monitoring the needs of citizens
Organisation	Initiating new ideas in providing public services by local government employees
	Implementation of new ideas in the provision of public services by local government employees
Networking	The existence of relationships with external organizations; individuals bringing new information; exchange experiences; building social capital - public-private-civic mix and co-creation in the innovation process
Learning	Education of local government employees
	Learning from own and transferred experience (e.g. from other local government, organizations)

The basic methods of scientific research are those of classification analysis, comparison and abstraction in the development of theoretical and methodological framework for dealing with and determining the research questions; methods of causal analysis and comparison in the application part, and methods of synthesis and partial induction in drawing conclusions of the research.
Electronic public services in the strict sense are perceived as deeds, efforts or performance, the supply of which is mediated by information technologies such as the Internet, information kiosks, and mobile devices (Rowley 2006, p. 341). In a broader sense, they are construed as customer-driven interactive, content-based web client services and integrated in relation to the organizational processes of client support and technology to strengthen the relationship between client / citizen - service provider / operator of public administration (de Ruyter et al. 2001, p. 186; Lindgren and Jansson, 2013).

In Slovakia, the process of informatization of public administration is governed by the following strategic documents (see Fig. 9).

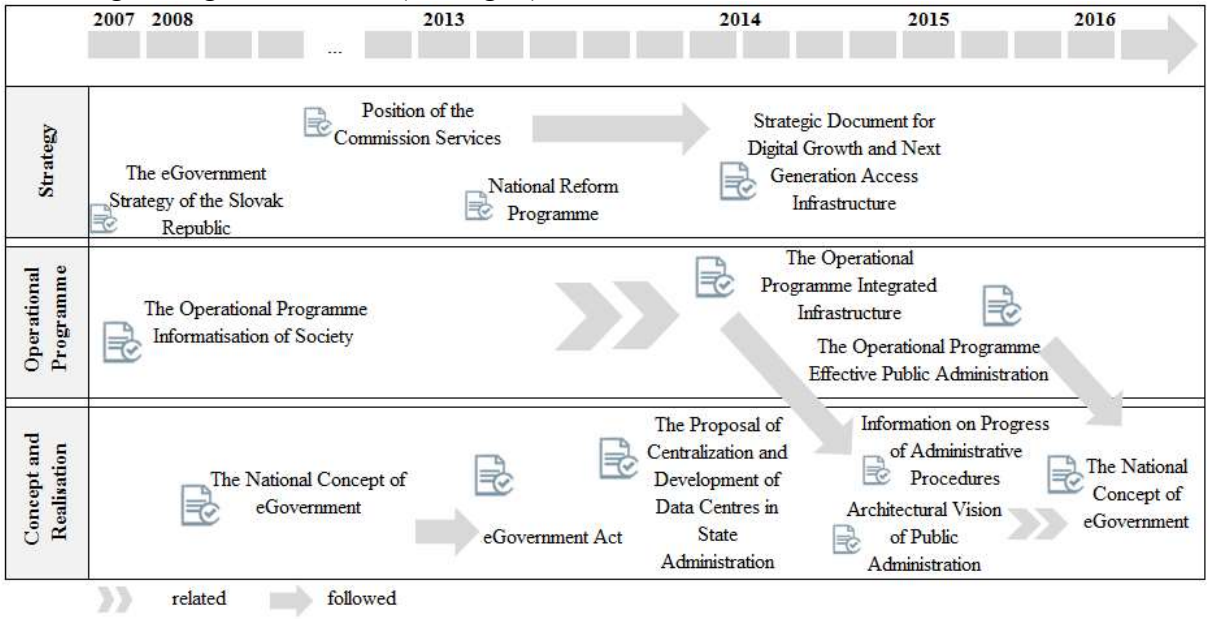


Fig. 9 - Relationship of positional documents. Source: Office of the Deputy Prime Minister for Investment and Information Technology, the National concept of electronization of public administration of the Slovak Republic, 2016

The subject of the research is specific innovation projects of local public services which use information-communication technologies. Specifically, the projects under the appeal Electronisation of municipality services "eMestá" launched in 2013 to obtain non-repayable grants (hereinafter NPG) in order to provide access to municipal electronic services. The main aim should be the electronization of those local public services which are genuine competencies of local government. Electronic local government services are divided into two main parts (compulsory and optional). Mandatory electronic services are services which have been allocated, on the basis of analysis, the highest priority for implementation and their electronization is a mandatory part of project applicants for the NPG. From the optional electronic services, applicants are entitled to choose as many from the project framework that are capable of being electronisized. Towns with populations of at least 20,000 in 2011 were eligible for NPG. Financial assistance in the form of NPG was paid in the form of pre-financing, a refund or a combination thereof, and represented 95% of total eligible costs. The towns were also committed to put in place information systems from their own resources within at least five years after project completion. The appeal for proposals was launched on 18. 04. 2013 and closed 21. 08. 2013. Implementation of the project had to fall in the period 01. 01. 2007 - 31. 12. 2015. 50 million € (European Development Fund ERDF + Slovak state budget) was allocated to the project. The amount of each NPG ranged from 10,000 to 4,500,000 €. The total amount of funds allocated to applicants for NPG amounted to 37,628,871.29 €, with total eligible costs for projects to the sum of 39,609,338.20 €, while co-financing of 1,980,466.91 € was ensured by the applicants. 32 municipalities responded to the appeal, and the request for an NPG was approved for all the municipalities involved. By 2016, electronic services had been launched in only four municipalities (Banská Bystrica, 2013; Košice, Nitra and Žilina, 2015).
Data collection methods in the primary research, with respect to the applied evaluation concept of the diamond model, is a structured questionnaire. The questionnaire was distributed to all 32 towns which participated in the appeal Electronisation of municipality services "eMesto" to obtain NPG, however, completed questionnaires we returned from only 25 towns (Bardejov

(BE), Humenné (HE), Košice (KE), Levice (LV), Liptovský Mikuláš (LM), Lučenec (LC), Michalovce (MI), Nitra (NR), Nové mesto nad Váhom (NM), Nové Zámky (NZ), Partizánske (PE), Piešťany (PN), Považská Bystrica (PB), Prešov (PO), Ružomberok (RK), Senica (SE), Snina (SV), Spišská Nová Ves (SN), Šaľa (SA), Topoľčany (TO), Trebišov (TV), Trnava (TT), Vranov nad Topľou (VT), Zvolen (ZV) and Žilina (ZA)). Seven of the surveyed towns, despite repeated written, telephone, and even personal requests for the requested information refused to cooperate. Nevertheless, the selected sample can be considered representative. We transcribed the information received through a numeric code following which we statistically processed using statistical methods:

1. Chi-square test (tests the representativeness of the selected sample),
2. Multiple response analysis and Spearman correlation coefficient (evaluates the innovation capability of the executive branch of local government within the diamond model and innovation supply by local public services based on information-communication technology). For evaluation, we use statistical software IBM SPSS Statistics19; for testing we consider the significance level of 0.1

NPG applicants had to carry out economic and financial cost-benefit analysis. They had to demonstrate financial sustainability of the investment after the implementation of activities from OPIS sources. According to the CBA methodology, the payback period was not permitted to exceed the life of the investment (MoF, 2013, OPIS, 2013, p. 20).

Part of the NPG application was the selection of measurable indicators as a tool to measure the achievement of the objective, of mobilizing resources, achievements and measurement of the quality or contextual variable (OPIS, 2013). In the preparation phase of the application, the relevant local government had to set the frequency of service usage (number / period), response time (e.g. 24-hour, on-line, etc.), the frequency of incidents (number / period), the cost of services rendered (costs to provider), costs for the use of services (user cost), benefits - financial (e.g. saving costs and fees from service provision) benefit - monetised non-financial (e.g. quantification of the amount of time saved and the positive impact on the environment) (MoF, 2008, p. 26). Each local government had to, in addition to the qualitative and quantitative indicators, indicate conformity with horizontal priorities of sustainable development in economic terms, in terms of improving the quality of the environment, social inclusion and solidarity and in terms of balanced regional development.

Three towns - Košice, Nitra and Žilina implemented the project for electronisation of local public services in the e-Mesto appeal in 2015 with support in the form of NPG. Banská Bystrica launched the electronisation of local public services in 2013 using its own resources. The remaining 32 towns, despite the possibility of support through NPG, have not launched the project for electronisation of local public services. Seven of them even refused to give reasons why it happened. The other towns interviewed stated a lack of time for project implementation and failure to comply with Ministry of Finance deadlines, early termination of the project in the design phase due to non-completion of public procurement, or termination of the contract due to the Government Office for NPG for towns with a population over 20,000 as reasons.

In the case of innovation, of importance is the emphasis on the benefits and positives of the relevant innovation or on the reduction of the perceived risk resulting from the adoption of the innovation.

The benefits of implementation of electronic public services are identified by Cost Benefit Analysis that approves technical effectiveness increasing in service delivery by electronization of services in specific innovation project. We set the research question, *RQ2: electronization of public services increase the cost-effectiveness of those services provided.*

For the object of research, we chose the city of Košice. In this case, it was the largest project of computerization of local public services due to the integration of 22 boroughs (MoF, 2012). Electronization took place on 80 services (information and transaction services).

4.RESULT AND DISCUSSION

RQ1: development and implementation of innovative concepts of public services fail because of weak innovation capability of providers of local public services.

The analysis of innovation supply by local public services leads to testing the scientific hypothesis of the low innovation capability of providers of local public services, which is one of the reasons for the failure of the creation process and successful implementation of innovations of local public services. The key is the evaluation of the innovative capability of the executive branch of local governments in the following areas: strategy, processes, organization, networking and learning, as identified in the evaluation of the diamond model. Each individual area is provided with statements to which the employees of the assessed organizations express their affirmative or negative arguments. The qualitative features in the form of statements / responses are transformed into quantitative indicators: agree / yes = 2, disagree / no = 1. For each question, in the event of a "yes", the local government is permitted an "open" answer with the possibility to give a more detailed description, respectively to provide examples to the issue of local public services where innovation is implemented. These responses are evaluated separately.

We evaluate the innovation capability of 25 from 32 towns involved in the appeal for the electronisation of local public services in the e-Mesto project. The information obtained from the research questionnaire is processed and evaluated by means of multiple response analysis and is based on the responses to questions asked of local governments based on the evaluation concepts of the innovative capability of the organization - diamond model. Figure (Fig. 10) clearly illustrates the towns' answers to the questions.

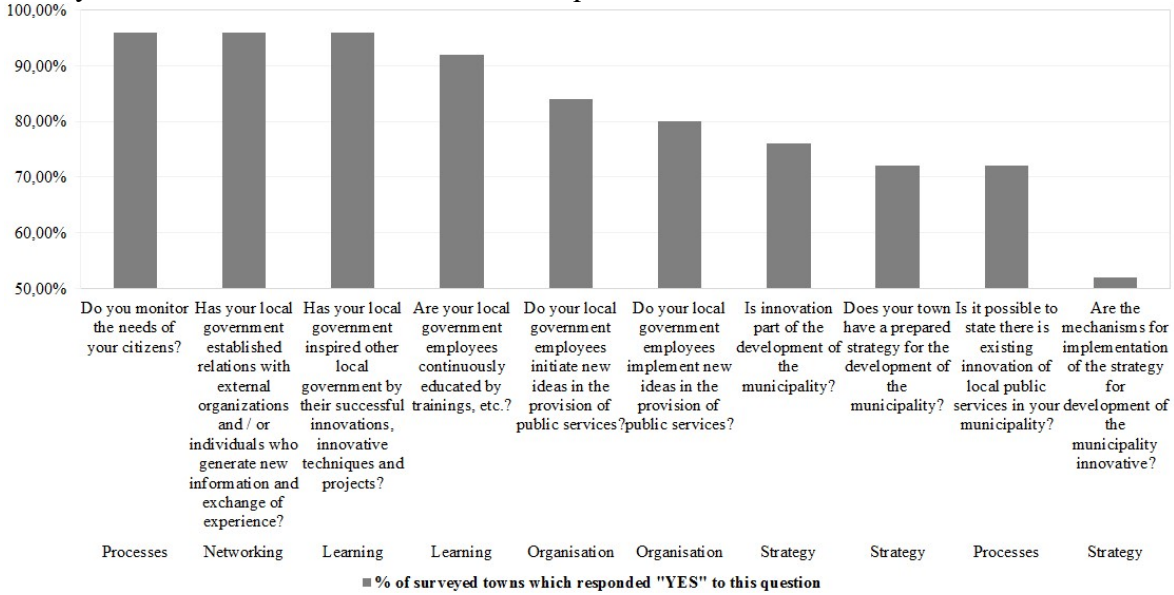


Fig. 10 - Evaluation of the innovation capability of the executive branch of local government – innovation supply by local public services. Source: Author's own.

We evaluated the innovation capability of the towns by means of the diamond model in terms of strategy, processes, organization, networking and learning from the towns' responses to a number of issues in each field. The average gained points from the responses to each area we apply to each of the axes of the diamond model representing the evaluated fields. Figure (Fig. 11) illustrates the results of the evaluation of innovation capacity from the perspective of the local governments in the diamond model.

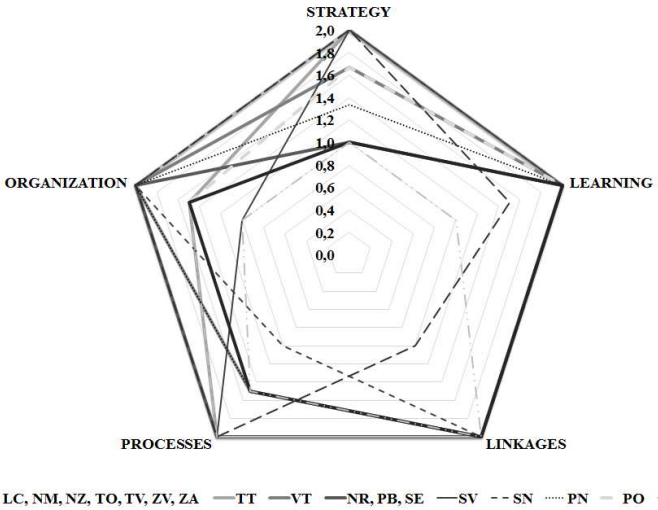


Fig. 11 - Evaluation of innovation capacity from the perspective of the local governments (diamond model). Source: Author's own.

The areas of the diamond corresponding to individual towns vary in relation to their innovation capability in the different evaluated areas. The towns with high innovative capability in all evaluated areas include Bardejov, Humenné, Košice, Liptovský Mikuláš, Lučenec, Nové Zámky, Trebišov, Zvolen and Žilina. Towns with a lower evaluated capability in all areas are Nitra, Michalovce, Považská Bystrica, Senica, Partizánske and Ružomberok. The remaining towns achieve differing evaluations in various fields.

The evaluated towns have the largest reserves in the area of strategy. Law no. 309/2014 Coll., amending and supplementing Law no. 539/2008 Coll. on regional development support imposes an obligation to establish a Programme of economic and social development (hereinafter PHSR) of the community (§ 5) that, as a basic strategic document for development may be accompanied by other documents: Concept of development of informatization of local governments, Programme for urban development, Strategy for tourism development. Community plan of social services of the town, Programme for housing development, Programme for waste management, Priority town development and Development plans of the town; however, these documents were presented by only some of the towns. Moreover, innovation as expressed by the local governments in these documents appears sporadically. Towns introduce innovation namely in communicating with citizens (sending information via SMS notification, e-mail or RSS feeds), and the use of renewable energy and waste management. More than 70% of the towns declared that they have a strategy for development and that innovation is a part of it, however, half of the towns lack the mechanisms for implementing the strategy. The declared efforts to innovate in the interest of development can therefore be considered more or less as a formality.

Insofar as we view the evaluated area "process", as a positive it can be seen that 96% of the towns, according to their response, monitor the needs of their citizens, and more than 70% of this is achieved also thanks to innovations of local public services. Innovation is most often cited by the towns as the electronization of public services, electronic discussion forums for the townspeople, mobile applications through which citizens can draw attention to illegal waste dumps or the poor condition of public spaces, and communicating through Facebook. Monitoring the needs of the citizens takes place through the City Monitoring application, web sites, Facebook, offices of first contact and questionnaires.

The answer to the question of the role played by local government employees in the innovation process is evaluated in the "organisation" area. 80% of the towns claimed that the authors of ideas and innovation and their implementation are their own employees. According to the

responses, it is notably innovations in communication with citizens, monitoring of citizens' needs and providing benefits for those members of the population with permanent residency.
According to claims, local government employees of more than 90% of the towns are continuously educated through courses (mainly focused on legislative changes, to increase computer literacy, e-learning courses, etc.). Similarly, according to the claims by more than 90% of the towns and local governments, the same number, as a whole, also learn in that they take on the positive experience of innovation from other local governments, not only from Slovakia but also from abroad, e.g. cross-border projects, conferences and forums.
Local governments not only take on the positive experiences from other local governments, but build cooperation with external organizations and individuals; this is claimed by more than 90% of the towns in the evaluation of the "networking" area. The towns declare the building of partnerships with other municipalities in Slovakia and abroad, regional development agencies, suppliers of information systems, businesses and so on.
Evaluation of cost-effectiveness of the specific innovation project of local public services via Cost benefit analysis is in the following part.
Electronization of local public services in Košice is an integral part of eGovernment together with eGovernment services provided at other levels of local government. eGovernment is defined as an electronic form of public administration through information and communication technologies (ICT). Services are available through the central portal of the public authority and through an integrated portal of the city, some only with an electronic identity card (eID), part of which is an electronic signature. Citizens of Košice can also use a mobile application that provides access to certain services (to report damage to roads, provide relevant information from different districts in the city).
Implementation of the project commenced in March 2014 and ended in September 2015 after the launch of the pilot operation. In April 2016, the city launched the online services in full operation. The total cost of the electronization of the public services in the integrated 22 boroughs and electronization of 80 services amounted to 1,987,070.54 €, while at the same time the city was allocated the NPG to the sum of 1,826,459.09 €. The main activities carried out under the project were the analysis and design of information systems, implementation of information systems, testing, deployment of information systems, procurement and deployment of hardware and software licenses. The support activities included project management, publicity and public awareness about the project. The project had an external manager with the company Greyson Consulting s. r. o. and on the part of the contractor Lomtec.com a.s. Project Management took place under Prince 2 methodology (description, 2013b).
RQ2: Electronization of public services increase the cost-effectiveness of those services provided.
When monitoring the efficiency of the provision of public services, we focus on the use of public resources with the question of whether these funds were used optimally to the achievement of the relevant outcomes (outputs of local public services), respectively, or results of the same quality and availability can be achieved at a lower cost (which form of the provision of services is the "cheapest" while maintaining the same result, i.e. the range and quality of service - "value for money"). The simplest measure of efficiency are unit costs.
Part of the NPG application was the development of CBA analysis (MoF, 2013a). A content of the analysis is the quantification of future costs (C) and benefits (B) of the relevant project. The output is a summary indicator of the net present value (NPV) presented in € and return on investment (PBP) referred to in years. At the same time, both indicators compare the two alternatives. Alternative 1. (as is - quantification of costs and benefits of the initial status non-electrified section of the public authority, mostly in paper form, without the project) and the second alternative (to-be - quantification of the target state after the implementation of the electronization section of the authority).

CBA analysis identifies costs and benefits for each year of the project lifetime for each alternative. For the calculation of inputs, it is necessary to define the conditions of analysis (time delay, for the two alternatives the same factors are valid, e.g. consideration of the possibility of 100% substitution of the paper version with the electronic form of the provided services, the frequency of use of electronic services is greater than the frequency of use of non-electronic services, etc.), the parameters of each service sector of public authority (e.g. the frequency of calls, the average cost of the provided service, the height of administrative service fees, the average duration for processing one telephone call, the average number of employees who process one telephone call, etc.) and determining the factors. The factors include the determination of the project life **t** (15 years), discount rate **r** (5.5% for public investment projects financed by the Structural and Cohesion Funds), personal expenses **Cper** (hourly average wage in the public authority), and material costs of filing **Cpap** (postage + printing + paper + envelope).
To illustrate this, for the period 2013 - 2015, with a standard "paper" provision of public services, the cost of services in 2013 was 302,955.16 €, in 2014 it was 302,886.12 € and in 2015 320,000.00 €.
Table 2 below shows a comparison of fixed costs for Alternative 1 (as is) and Alternative 2 (to-be). Fixed costs represent the costs of hardware, software and services (especially in IT as management of existing applications). In Alternative 1, over the period of 5 years there is a gradual uniform increase in fixed hardware costs. Fixed costs represent the average of capital and current expenditures for the acquisition of ICT (separately for hardware, software and special services) for the three years prior to submission of the NPG application. The resultant figure is the value of the 0-th year of the project. The costs of this alternative for each year of the project life are subject to parametric estimation. Fixed costs are linked to expenses directly related to the agendas and services covered by the project and include items for the purchase / renewal of hardware, software, and services (management and operation of existing applications). Fixed costs for Alternative 2 are calculated as the sum of the cost of the project and its sustainability (operation). They reflect the needs arising from the electronization of the administration section, respectively, results of public procurement. Data is provided for the years during which the implementation of the project activities take place. In the early years, together with variable costs they are consistent with the amount of the requested NPG. After realization of the project, respectively, introduction of the created solutions into full operation, the fixed costs consist of costs of the administration section on hardware, software and services directly related to the provision of digitalized services (MoF, 2013a). In the case of Alternative 2, higher fixed costs are expected to occur over a five-year period than Alternative 1. The higher costs are due to the realization and implementation of electronization of public services, building analyses and design of services and their implementation, testing and deployment. Fixed costs for software are for both alternatives nearly identical; there is a significant difference only in the second year (t2) which is similarly caused as a consequence of the implementation of activities relating to the actual implementation and the development of electronic public services.

Tab. 6 - CBA analysis of fixed costs of electronization of local public services in Kosice in €. Source: Author's own based on internal information provided by the local government of the city Košice.

Fixed costs on:	**Period**	**t1**	**t2**	**t3**	**t4**	**t5**
HW	Alternative 1.	65,862	69,329	72,795	76,435	80,257
	Alternative 2.	81,707	363,585	112,561	116,201	120,022
	Difference	15,845	294,257	39,766	39,766	39,766
SW	Alternative 1.	30,416	32,017	33,618	35,299	37,064
	Alternative 2.	30,416	127,036	33,637	35,318	37,083
	Difference	-	95,019	19	19	19
Services	Alternative 1.	133,894	140,941	147,988	155,388	163,157
	Alternative 2.	133,894	1,866,834	280,063	287,463	296,288
	Difference	-	1,725,893	132,075	132,075	133,131

A more even development of Alternative 1 is expected with fixed costs for services (without the project, the default provision of public services) than in Alternative 2 (with the project, electronization of public services).
The following table (Tab. 7) shows the expected development of variable costs over five years. In Alternative 1, variable costs are costs that increase with the number of calls for services segment and includes such items as general materials (paper, printing costs, postage, etc.) and personnel costs (service provider staff ensuring the execution of the agenda). In Alternative 2, variable costs as well as fixed costs are equal to the amount of the requested NPG in the NPG application. In a full operation environment, they are connected with the provision of services and include costs for general material and personnel costs.

Tab. 7 - CBA analysis of variable costs of electronization of local public services in Kosice in €. Source: Author's own based on internal information provided by the local government of the city Košice.

Variable costs on:	**Period**	**t1**	**t2**	**t3**	**t4**	**t5**
General supplies	Alternative 1.	989,868	999,767	1,009,765	1,019,862	1,030,061
	Alternative 2.	989,868	999,767	757,324	713,904	669,54
	Difference	-	-	-252,441	-305,959	-360,521
Personnel costs	Alternative 1.	1,100,166	1,111,168	1,122,279	1,133,502	1,144,837
	Alternative 2.	1,100,166	1,111,168	1,066,165	1,065,492	1,064,698
	Difference	-	-	-56,114	-68,01	-80,139

Variable costs were based on methodological guidelines (MoF, 2013a). In both alternatives for the first two years (t1, t2) the general material costs and personnel costs are predicted to be at the same level. Alternative 2 from the third year (t3) will see a gradual reduction in costs. At the same time, the city of Košice predicts a decrease, respectively, savings of at least 50% in the time delivery of public services on the part of citizens, achieving 20% savings in time on the part of officials in the case of electronically supplied services and is forecasting a 5% cost increase to the existing IT items (hardware, software, services). The following table (

Tab. 8) shows the sum of fixed and variable costs in the period t1 to t5. The biggest difference between the cost of the alternatives is in the second year (t2) due to the already mentioned introduction of electronic public services. In the third to fifth year (t3 to t5), cost savings are predicted.

Tab. 8 - CBA analysis of the total cost of electronization of local public services in Kosice in €. Source: Author's own based on internal information provided by the local government of the city Košice.

Total costs	Alternative 1.	2,320 206	2,353,222	2,386,445	2,420,486	2,455,376
	Alternative 2.	2,336 051	4,468,390	2,249,750	2,218,378	2,187,631
	Difference	-15,845	-2,115,168	136,695	202,108	267,745

Benefits to the municipality are both financial (in the form of administrative fees such as administrative fees, stamps, legal fees, etc.) which the local government expects in the fifth year to total 514,825 € for Alternative 2, and economic (financial benefits extended to indirect benefits represent a wider impact of the implemented environment). Economic benefits are given only for Alternative 2, for which the city of Košice determined at 514,825 € for the fifth year. Economic benefits are time savings for the service users (assuming that the time savings in the fifth year of use will be 524,620 €). In addition to time savings, economic benefits include other tax and non-tax revenues.

5.CONCLUSION

Based on the analysis of the adaptation of the selected project for electronization of public services in conditions prevalent in the Slovak Republic, the paper aimed to identify the potencial limitations and benefits of the implementation of information and communication technologies into the public service as a public service innovation. The object of research was 25 towns which participated in the appeal Electronisation of municipality services "eMesto" to obtain NPG: Bardejov, Humenné, Košice, Levice, Liptovský Mikuláš, Lučenec, Michalovce, Nitra, Nové mesto nad Váhom, Nové Zámky, Partizánske, Piešťany, Považská Bystrica, Prešov, Ružomberok, Senica, Snina, Spišská Nová Ves, Šaľa, Topoľčany, Trebišov, Trnava, Vranov nad Topľou, Zvolen and Žilina.
Evaluation of the innovation capability of the executive branch of local government through the diamond model provides us with the answer to the research question: the process of development and implementation of innovative concepts of public services fails for reasons of low motivation and innovation capability of the providers of local public services. The next question is which components of the innovation capability impact on the supply of innovation of local public services using information-communication technologies. There is a strong correlation between the implemented mechanisms utilised in innovation within the framework of the strategy of development of municipalities and existing innovations in the provision of local public services (p-value 0.000, respectively 0.003; rs = 0.871, respectively 0.637). Innovations allow the local governments to more intensively monitor their citizens' needs and adapt to these needs by the nature of innovation and the course of the innovation process (p-value 0.083; rs = 0.361). The nature of innovation, in addition to the needs of citizens, is determined by the success of innovation processes in other municipalities (p-value 0.083; rs = 0.361). Initiating elements in the innovation process of local public services are local government employees (0.003; rs 0.637), whose inspiration is once again found in already successfully implemented innovation in local public services of other municipalities in Slovakia and abroad. The conclusion can therefore be deduced that local governments, concurrent with employee initiative, will monitor the needs of their citizens and implement the mechanisms of innovation of local public services in their own development strategy which will result in innovation of local public services based on the needs of citizens (p-values of 0.074, 0.003, 0.013, respectively 0.053; rs = 0.389; 0.637; 0.511, respectively 0.400).
The analysis tested the research presumption in the form of research questions about the growth of the cost-effectiveness of local public services through their electronization as a capability

benefit of electronization. The results of analysis of the costs and benefits of electronization of local public services in Košice document the cost savings of the provision of services by means of electronization to the sum of 267,744 € which will be achieved in the fifth year of the project of electronization of services. Electronization should therefore increase the cost-effectiveness of service provision with regard to the cost savings on the service provider side. On the service provider side, the electronization project should, in addition to financial savings, also bring time savings of 20%. The results of CBA analysis also document the benefits on the part of consumers of electronic public services in the form of savings on administrative fees of 50% and time savings also at 50%.

The problem of achieving real benefits of the electronization of public services as declared by CBA analysis and thus the limitation of the implementation of ICT in public services may be the non-systematic selection of services which are the subject of electronization. During the decision-making process, as to which services will be electrified by the city, the city did not survey ex-ante the preferences of the residents. Electronization of services was launched in April 2016 as a result of a long period of programme and methodological changes, resulting in significant time delays of the project. It is therefore difficult to estimate the development of utilization of each service. Another limitation of the implementation of ICT in public services in Slovakia is low public awareness of the possibilities of using electronic public services and low motivation of employees to initiate change in the provision of public services.

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THE GOOGLE STORY – WHAT CAN BE LEARNED ABOUT COMPANY FROM THE FIRST PAGE OF THE GOOGLE SEARCH

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Abstract

Story is a complex system of symbols that gives sense to things and events and represents norms, experience and explanations of reality. It is a traditional and powerful tool of knowledge sharing. Opposite to explicit proofs, story gives a message certain context and bypasses defence mechanisms that filter which message we accept and which not. These days, Internet is the powerful tool of communication and as such it is an important carrier of stories. In our survey we wanted to find out which stories about chosen successful companies are given by the simple Google search. We collected stories from the first page of the Google search on the company. Then we analysed them and based on the analysis created complex story (narrative) about the company. The paper discusses results of this survey.

Keywords: organization, story, storytelling, narrative

JEL Classification: M10

1.INTRODUCTION

Story is a complex system of symbols that gives sense to things and events and represents norms, experience and explanations of reality. Apposite to explicit proofs, story gives a message certain context. Internet is the powerful tool of communication and as such it is an important carrier of stories. In the survey presented in this paper we tried to find out what stories can be found about organisations by simple Google search.
Four successful organisations from different fields were chosen – Walmart, Google, Arup and UBS. Names of companies were searched by Google. Stories about companies provided by the first page of Google search were collected, and analysed. Based on this analysis the complex story (narrative) about organisation provided by the first page of Google search was created.
The paper discusses results of this survey. The survey was a qualitative survey and its results were analyzed by the grounded theory which is a qualitative method.

2.STORY, NARRATIVE AND STORYTELLING

The literature on storytelling works with words story and narrative. Often they are used as synonyms; some authors see difference between them. Story can be defined as a report or account of a matter; statement or allegation (dictionary, 2017), or as an account of incidents or events; a statement regarding the facts pertinent to a situation in question (merriam-webster, 2017). Cambridge dictionary sees story as a description, either true or imagined, of a connected series of events (dictionary.cambridge, 2017).
Narrative is a story or account of events, experiences, or the like, whether true or fictitious; the art, technique, or process of narrating, or of telling a story (dictionary, 2017). It is also understood as something that is narrated (merriam-webster, 2017) or story or a description of a series of events or a particular way of explaining or understanding events (dictionary.cambridge, 2017).

A story describes a sequence of actions and experiences done or undergone by a certain number of people, whether real or imaginary. These people are presented either in situations that change or as reacting to such change. In turn, these changes reveal hidden aspects of the situation and the people involved, and engender a new predicament which calls for thought, action, or both. This response to the new situation leads the story toward its conclusions (Ricoeur, 2010, p.150). As Hardy (1968) writes, we dream in narrative, daydream in narrative, remember, anticipate, hope, despair, believe, doubt, plan, revise, criticize, gossip, learn, hate and love in narrative. Narrative has an ability to communicate and assess values, and the interpretation of those values summon human action (Cragan & Shields, 1998). Stories are memorable, easy to understand, and establish a common ground with others that create credibility. Narratives also create a sense of empathy from a cognitive and emotional position to help us understand the experiences and world views of others (Lämsä &Sintonen, 2006).

For Cheryl and Carr (2011) stories are objects that are put into "play" within an organization, thus creating, connecting and disconnecting relationships. Storytelling is at the heart of human communication (Bruner, 1986, 1990, 1991) as it allows storytellers to frame and reframe their experiences as well as to establish coherence (Linde, 1993) and temporal order (Czarniawska, 1997).

Stories act as the vehicle through which social actors come to understand their world. The recounting and listening to stories has been instrumental in the evolution of mankind and a means through which learning and development has taken place for millennia (Allan et al., 2002). It is also through storytelling that meaning is created and identities are established within human relationships (Weick, 2001).

It is through stories that we are able to share the assumptions held about our world as well as their underpinning beliefs. Politicians, artists, philosophers and playwrights have successfully crafted stories throughout the centuries for the purpose of transferring knowledge, eliciting emotive feelings and persuading others (Grisham, 2006).

Storytelling in organisations is usually seen from the perspective of the structuring of the text. People like Czarniawska (1998), Boje (1991) and Gabriel (2000) look at stories in organisations as if they are dealing with texts in a literary sense (van Boeschoten, 2011). Allcorn and Stein (2016) argue that storytelling is a vital qualitative method to help us understand and explain organisational life. Storytelling gives us access to the breadth and depth of workplace experience, what Diamond (1993) calls the "unconscious life of organizations", a world ruled as much as by the irrational, dark side of human nature as by rationality and enlightened self-interest (Allcorn & Stein, 2015). Storytelling also helps people and groups to heal when harmful organisational and leadership dysfunctions arise. Stories bear witness to painful events; create a shared moment with a listener (Allcorn, Stein, 2016).

In organizations, stories told and sold can be regarded as both transitional objects and quasi-objects. Stories are quite clearly artefacts. They are also "material" in a process that at times "seems" to have a life of its own (Cheryl, Carr, 2011). For Horowitz (2004), there are a number of transitional objects used to form the story.

Some within this discourse on stories distinguish between stories and narratives (e.g. Boje, 2001; Gabriel, 2000), while others (e.g. Polkinghorne, 1988) make no such distinction. Gabriel (2000) stated that "not all narratives are stories: in particular, factual or descriptive accounts of events that aspire at objectivity rather than emotional effect must not be treated as stories" (p. 5). In other words, Wal-Mart's set of policies and procedures is not a story – it is a narrative. But, such narratives gather emotion as they roll around inside and outside an organization. The telling and selling of a narrative creates a story (Cheryl, Carr, 2011).

Boje (2001) created the concept of the antenarrative. First, story is "ante" to narrative; it is antenarrative. A "narrative" is something that is narrated, i.e. "story". Story is an account of incidents or events, but narrative comes after and adds "plot" and "coherence" to the story line

(Boje, 2001, pp. 1-2). By definition, the act of narration and of storytelling could take on a different interpretation depending upon which set of intellectual lenses one is viewing and hearing the narrative or story.
Storytelling is natural, innocent and often unacknowledged (McAdams, 1997), yet it can be used to exert power, manipulate, distort and abuse (Gabriel, 2004; Lapp and Carr, 2008), contributing to the complex social and power dynamics in organizations. Many stories are beyond the control of outside actors as sense making and storytelling are open-ended processes with endless possibilities of interpretation (Reissner, 2008). Nevertheless, sense making and storytelling are influenced – in constructive or abusive ways – by a multitude of other stories that exist in the social actor's social and organizational environment; the dynamics behind this interaction of stories remain ill understood, however.
Cheryl and Carr (2011) make distinction between storytelling and storyselling. Storytelling is more about telling the whole story while storyselling is firmly about exploring the motivations for telling the story and gaining acceptance of the listener. Storytelling and storyselling work together, inseparably. For, if not for storyselling, who would listen? (Cheryl, Carr, 2011). Storytelling is a fundamental activity in organisations that is inextricably linked to power (Gabriel, 2008). Whatever the intention of the story, power is often inherent in storytelling. Foucalt (1977, p.217) understands stories as the vigilance of intersecting gases. The power to story is hegemonic at the micro level – very subtle, taken-for-granted, and even softly spoken stories told by others and eve to ourselves that scribe a meaning onto our existence that can be imprisoning. It is not whose story is best, mine or those of others in organizations, but who has the power to make his (or her) story stick as one that others will choose to live by or in (White, 2009).People tell stories to enact an account, or ideology of themselves and their community (Browning, 1991).
Reissner and Du Toit (2011) also argue that by telling one's story, the storyteller tries to sell it to the audience, either with an innocent agenda or some other agenda in mind. A skilled narrator has the ability to manipulate others and leave them questioning their own truths. The challenge is to identify the agenda behind a story and to interpret it accordingly (Reissner, & Du Toit, 2011).

3.SURVEY

The review of literature shows that narratives and stories bring huge amount of information about the world around us. Opposite the explicit data, stories include context in which data (and information) is explained. As such, they are carriers of complex message about everything, organisations including.
The objective of our survey was to identify and analyse stories about chosen companies available on the Internet. Then based on these different individual stories create the bigger complex story (narrative), the Internet gives about the company.

4.METODOLOGY

The survey consists of theoretical research (review of existing literature) and empirical part. The methodology used for the review of the literature was as usual for this type of theoretical research. We collected described and evaluated different approaches and different ideas on stories, narratives and storytelling. The data used are secondary data collected from traditional and electronic media. The paper pays attention to both historical approaches and the latest approaches in the field. Methods used for the review of the literature include typical methods of theoretical work, e.g., methods that allow interlinking separated pieces of knowledge like

analysis and synthesis, comparison, induction, deduction, abstraction, generalisation and critical thinking. The theoretical part of the article offers different options on how to understand stories, narratives and storytelling.

The review of literature showed that the terminology concerning stories, narratives and storytelling is not homogenous, e.g. different authors understand terminology we work with differently. The objective of our survey and paper is to analyse individual stories on organizations on the Internet and identify the complex story (narrative) they tell about the organization. For this purpose, Boje's concept (Boje, 2001), Gabriel's (Gabriel, 2000) and Cheryl - Carr's approaches that offer different names for simple and more complex stories turned out to be convenient (Cheryl, Carr, 2011). We decided for Boje's concept. In our survey and this paper we understand story as an account of incidents or events and narrative as a more complex entity that comes after and adds "coherence" to the story line (Boje, 2001, pp. 1-2). Or as explained by dictionary.cambridge.org narrative is a particular way of explaining or understanding events (dictionary.cambridge, 2017). Individual stories provide us with fragments of data about organisation. Together, they create complex information, the narrative.

The objective of our survey and paper is to analyse individual stories on organizations on the Internet and identify the complex story (narrative) they provide about the organization. The organization is searched through Google.com page in the form "name company", e.g. "Google company, Arup company". This allows separating links about company from links about its products. The first page of links available on the company is used. Individual stories are collected from the first page of these links then read and analyzed.

Analysis was done by the Grounded theory (Glaser, & Strauss, 1967). Grounded theory was chose as it enables to search for and conceptualize patterns and structures. The substantive area of our survey is stories about analyzed organizations.

Data collected by analysis were open coded and categories of data provided by stories were identified. Selective coding followed. Theoretical sampling was not done as creation of theory was not the purpose of our survey.

In our survey, we wanted to review successful but different organizations. There are many ways how to achieve this objective. Size, field, financial results, geography, type of ownership and many other criteria may be used. We decided to differentiate organizations based on the methodology of management model created by Birkinshaw, and Goddard (2009).

Management model is a the choices made by a company's top executives regarding how they define objectives, motivate effort, coordinate activities and allocate resources; in other words, how they define the work of management. Inspired by changes in the expectations of their employees, new technological capabilities and the offerings of emerging competitors, some companies are discovering that a distinctive management model can itself be a key driver of its competitiveness (Birkinshaw, & Goddard, 2009). Birkinshaw, and Goddard (2009) offer classification of organisations to four management models, each convenient for different situation and different type of market.

The planning model operates with narrow short-term objectives, clearly defined management processes and strict hierarchical decision making. The Quest Model works with clearly defined objectives but management processes and decision making is delegated to employees. E.g. employees are told what to do, but not how to do it. The scientific model is just opposite; managerial processes and decision making are clearly defined but employees are free to decide on objectives. The fourth model is a discovery model where managerial processes, decision making and objectives are loose.

Different model is convenient for different situation. Planning model is convenient for mature businesses operating in stable environment. Quest model is good for established growing companies in competitive markets. Scientific model is recommended for human-capital-

intensive business, such as professional services or research and development organizations. Discovery model can be found in early-stage business operating in highly uncertain, fast-changing environment; or established business seeking to rejuvenate itself (Birkinshaw, & Goddard, 2009).
We chose one company for each model. The company is classified to certain model either by Birkinshaw (2010) or the public information available on the organisation allows to allocate it to one of models. Organisations were chosen as follows: Walmark (planning model), UBS (quest model), Arup (scientific model) and Google (discovery model).

5.STORIES AND THEIR ANALYSIS

Walmart
The Walmart survey was done on 5.1.2017 at 11:15-11:45. The first page of Google search offered 8 links; four of them were links to corporate web page (walmart.com).

Tab. 1 – List of links. Walmart Source: author

	Link/Address
1.	**Walmart Corporate - We save people money so they can live better.** http://corporate.walmart.com/
2.	**Our Story - Walmart** http://corporate.walmart.com/our-story
3.	**Company Facts - Walmart** **http://corporate.walmart.com/newsroom/company-facts**
4.	**Our Business - Walmart** http://corporate.walmart.com/our-story/our-business
5.	**Wal Mart Stores Inc (WMT.N) Company Profile | Reuters.com** http://www.reuters.com/finance/stocks/companyProfile?symbol=WMT.N
6.	**Wal-Mart Stores on the Forbes Global 2000 List** http://www.forbes.com/forbes/welcome/?toURL=http://www.forbes.com/companies/wal-mart-stores/&refURL=https://www.google.cz/&referrer=https://www.google.cz/
7.	**WMT - Wal-Mart Company Profile - CNNMoney.com** http://money.cnn.com/quote/profile/profile.html?symb=WMT
8.	**Wal-Mart Stores Inc. - The New York Times** http://www.nytimes.com/topic/company/walmart-stores-inc

Links were opened and the text on the first page of the web page was open coded. Open coding brought 50 categories. Selective coding limited these categories to 8 categories.

Tab. 2 – Walmart Categories after Open Coding Source: author

Category	Times
Customers – serving, protective approach	10
Being a leader to others	6
Being a good employer	6
Being the largest company (Nb. of employers, revenue, global)	6
Involved in charity	3
Settling legal and other conflicts	2
Innovative	2
Oriented to performance	1

The strongest category after selective coding is customers, care for customers, customer serving. Corporate motto "We save people money so that they could live better" was actually the first link that appeared on the Google search. Let's give few other examples: "We've made it our mission to give more people access to a better life" (corporate.walmart, 2017a) or "Walmart announces plans to serve last minute holiday shoppers" (corporate.walmart, 2017b). Second highest score is shared by three categories. Category being leaders to others is expressed through "leadership through services" (corporate.walmart, 2017a) or "growing American jobs" (corporate.walmart, 2017a). Category being a good employer is represented by "In his free time this truck driver takes to the skies" (blog.walmart, 2017) or "Walmart associates are the heart of our business" (corporate.walmart, 2017c). The third category being the largest company is represented by "Walmart earned $485.7 billion in revenue in 2014, which outpaced No. 2 Exxon Mobil by $103 billion" or if "Walmart were a country, its sales would rank it 28th in the world in GDP. That's right behind Norway and ahead of Austria" (Fortune, 2017).
The next category is charity. It is represented by Walmart Foundation e.g."$250,000 towards relief and recovery efforts in Tennessee wildfires". Category settling legal and other problems shows that Walmart also "settles discrimination suit over benefits for same-sex spouses (Nytimes, 2017) or "Across China, Walmart faces labor unrest as authorities stand aside" (Nytimes, 2017).
Category innovativeness shows that or Walmark innovativeness seems to be important but not easy - "Our story – innovative thinking" (corporate.walmart, 2017a) or "as we look forward to innovating our business for the next 50 years, we're committed to nothing less than transforming the future of commerce." (corporate.walmart, 2017a). On the other hand Walmart CEO Doug McMillon says he has a tough challenge ahead of him: "If you want hard, try to take a 52-year-old business that's this size and change it. That's hard."(Fortune, 1017).

Arup
The Arup survey was done on 5.1.2017 at 16:00 – 16:50. The first page of Google search offered 9 links; three of them were corporate web pages (arup.com, aruplab.com) and one LinkedIn profile.

Tab. 3 – List of links. Arup Source: author

	Link/Address
1.	**Home | Arup | A global firm of consulting engineers, designers ... http://www.arup.com/**
2.	**About us | Arup | A global firm of consulting engineers, designers ... http://www.arup.com/about_us**
3.	**Arup | LinkedIn https://www.linkedin.com/company/arup**
4.	**ARUP Laboratories | https://www.aruplab.com/**
5.	**Arup Reviews | Glassdoor https://www.glassdoor.com/Reviews/Arup-Reviews-E31809.htm**
6.	**Arup Salaries | Glassdoor https://www.glassdoor.com/Salary/Arup-Salaries-E31809.htm**
7.	**Arup Group Limited: Private Company Information - Bloomberg http://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapId=5502900**
8.	**How Arup Became The Go-To Firm for Architecture's Most Ambitious ... http://www.archdaily.com/428945/how-arup-became-the-go-to-firm-for-architecture-s-most-ambitious-projects**
9.	**ARUP GROUP LIMITED: quotes & news - Google Finance https://www.google.com/finance?cid=1047199**

Open coding brought 119 categories. Selective coding limited them to 12 categories.

Tab. 4 – Arup Categories after Open Coding Source: author

Category	Times
Innovative, changing world for better	32
Distinctive culture	25
Good people, experts, multidisciplinarity	12
Interesting projects	9
Global, multinational	4
Lower pay (compared to competition)	5
Type of ownership	4
Long working hours	4
Structured rules of advancement and payment	4
Good HR	4
Internal competitiveness	1
Education	1

Leading category is innovativeness, changing world for better. As examples “We shape a better world” or “Our specialists discuss how air travel can be transformed into a more human experience” (Arup, 2017a) can be given.

Second strongest category is Arup's distinctive culture. This category can be represented by "Founded in 1946 with an enduring set of values, our unique trust ownership fosters a distinctive culture and an intellectual independence that encourages collaborative working."(LinkedIn, 2017a) or "Great culture, good people" (Glassdoor, 2017a). "This unconventional approach to design springs in part from Arup's ownership structure. The firm is owned in trust on behalf of its staff. The result is an independence of spirit that is reflected in the firm's work, and in its dedicated pursuit of technical excellence." (Arup, 2017b).
The next category is good people, experts, multidisciplinarity – e.g. "Getting to work alongside very bright people" (Arup, 2017b) or "Arup brings together broad-minded individuals from a wide range of disciplines and encourages them to look beyond the constraints of their own specialism. " (Arup, 2017b).
Resources also mention interesting projects – "Arup is the creative force at the heart of many of the world's most prominent projects in the built environment and across industry." (LinkedIn, 2017a). The company is global, multinational – "We are truly global. From 90 offices in 35 countries, our 12,000 planners, designers, engineers and consultants deliver innovative projects across the world with creativity and passion" (LinkedIn, 2017a).
Three types of complains repeated – on salaries lower then with competition, long working hours and structured rules of advancement and payment – "Promotions are pretty much based on duration of work (you get one approx. every 2/3 years) and their pay is low compared to others (at least for my field) to the point of being near uncompetitive." (Glassdoor, 2017a).

Google
The Google survey was done on 6.1.2017 at 9:50 – 11:50. The first page of Google search offered 10 links, three of them were corporate web pages (google.com, reviews.greatplacetowork.com/google-inc, abc.xyz).
Tab. 5 – List of links. Google Source: author

	Link/Address
1.	**Company – Google** **https://www.google.com/about/company/**
2.	**Our culture – Company – Google** **https://www.google.com/about/company/facts/culture/**
3.	**Google Inc. - Great Place to Work Reviews** **http://reviews.greatplacetowork.com/google-inc**
4.	**Google bought a company to improve Hangouts call quality - Engadget** **https://www.engadget.com/2017/01/05/google-bought-a-company-to-improve-hangouts-call-quality/**
5.	**Company Profile and Job Information for Google - The Balance** **https://www.thebalance.com/google-overview-company-culture-and-history-2071320**
6.	**Alphabet** **https://abc.xyz/**
7.	**Alphabet Inc. - The New York Times** **http://www.nytimes.com/topic/company/alphabet-inc**
8.	**Google on the Forbes World's Most Valuable Brands List** **http://www.forbes.com/companies/google/**
9.	**Company Profile and Job Information for Google - The Balance** **https://www.thebalance.com/google-overview-company-culture-and-history-2071320**

Open coding brought 126 categories. Selective coding limited them to 13 categories.

Tab. 6 – Google Categories after Open Coding Source: author

Category	Times
Good employer	57
Strong corporate culture	30
Information related services	23
Employing creative and innovative people	11
Solving legal litigations and ethical affairs	8
Ethical business model	9
Ecology oriented organisation	6
Innovative organisation	5
Multinational, global organisation	4
Philanthropic organisation	3
Ownership	1
Valuable brand	1

The leading category of Google is good employer. It can be demonstrated by "We provide a generous healthcare experience for all Googlers and their families" (Great place to work, 2017) or "On Fortune magazine's list of the best companies to work for, Google ranked first in 2007, 2008 and 2012 and fourth in 2009 and 2010.

Second category was strong corporate culture – "We strive to maintain the open culture often associated with startups, in which everyone is a hands-on contributor and feels comfortable sharing ideas and opinions. In our weekly all-hands ("TGIF") meetings-not to mention over email or in the cafe-Googlers ask questions "(Google, 2017) or "We maintain an open culture where everyone feels comfortable contributing ideas and sharing opinions" (Great place to work, 2017).

Third category is description of Google core business, for example "We are a technology company aiming to organize the world's information and make it universally accessible and useful" (Great place to work, 2017) or "Google, Inc. focuses on improving the ways people connect with information" (Forbes, 2017).

The next category employing innovative and creative people can be represented by "We're looking for people of all backgrounds and experiences who aren't afraid to bring the hard questions and roll up their sleeves to build the answers". (Great place to work, 2017).

Three interesting categories follow one another. Company is solving legal litigations and ethical affairs but has ethical business model – "You can "make money without doing evil." (Google, 2017). It is also strongly ecology oriented.

UBS

UBS survey was done on 9.1.2017 at 16:19 – 17:15. The first page of Google search offered 10 links, three of them were corporate web pages (ubs.com/global/en/about_ubs/about_us.html, ubs.com/us/en.html, ubs.com/us/en/homepage/
ubs-onesource.html), one LinkedIn corporate profile.

Tab. 7 – List of links. UBS Source: author

	Link/Address
1.	**About us | UBS Global topics** https://www.ubs.com/global/en/about_ubs/about_us.html
2.	**Our financial services in your country | UBS United States** https://www.ubs.com/us/en.html
3.	**UBS One Source (Corporate Stock Plans) | UBS United States** https://www.ubs.com/us/en/homepage/ubs-onesource.html
4.	**UBS on the Forbes Global 2000 List** http://www.forbes.com/companies/ubs/
5.	**UBS | LinkedIn** https://www.linkedin.com/company/ubs
6.	**UBS Group AG (UBS) Company Profile | Reuters.com** http://www.reuters.com/finance/stocks/companyProfile?symbol=UBS
7.	**UBS Group AG (USA): NYSE:UBS quotes & news - Google Finance** https://www.google.com/finance?cid=285054868296789
8.	**UBS AG: Private Company Information - Bloomberg** http://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapId=286513440
9.	**UBS Definition | Investopedia** http://www.investopedia.com/terms/u/ubs.asp

Open coding brought 121 categories. Selective coding limited them to 10.

Tab. 4 – UBS Categories after Open Coding Source: author

Category	Times
Core business	67
Global and multinational company	18
Expert advices	8
Corporate responsibility, philanthropy, building community	6
History	5
Unethical behaviour (scandals – 19)	3
Retail banking	3
Attractive employer	3
Swiss company	2

The leading category is core business of UBS – investment banking, wealth management, personnel and corporate banking and asset management – for example "UBS works with private clients, institutions and corporations around the world to help answer some of life's questions – whether through expert wealth management advice, investment banking and asset management expertise, or general banking advice in Switzerland." (LinkedIn, 2017b) or "UBS AG provides financial advice and solutions to private, institutional, and corporate clients worldwide, as well as private clients in Switzerland. The company operates through five segments: Wealth Management, Wealth Management Americas, Personal & Corporate Banking, Asset Management, and Investment Bank." (Bloomberg, 2017).

The second most typical category is global and multinational company – "Headquartered in Zurich and Basel, the UBS Group is a global firm providing financial services to private, corporate and institutional clients." (UBS, 2017) or "The Company provides a range of financial services, including advisory services, underwriting, financing, market-making, asset management and brokerage on a global level." (Reuters, 2017).
The next category is expert advice for example "UBS offers high net worth and affluent individuals around the world a complete range of tailored advice and investment services." Or "UBS provides advisory services, research, and access to global capital markets to corporate and institutional clients." (UBS, 2017).
UBS is a company with a history, its origins can be traced to 1854 – "The UBS Group's historical roots stretch back more than a century." (UBS, 2017), it is an attractive employer.

6.NARRATIVES

Putting together individual stories about four successful companies we get a complex story (narrative).
Narrative on Walmark told by the first page of the Google search shows large, global strongly customer oriented organisation. Customer is understood as the one, who should be served, and helped. Company adopts protective approach to customers and local communities. Walmart also tries to serve as a leader to the global community even in issues different then their businesses. Walmart presents as a good employer. Walmart wants to be innovative which may be difficult – it is big, global, with strong traditional approach supported by the major shareholder the Walton family (approximately 50% of shares).
Narrative about Arup shows highly innovative multinational global organisations whose mission is to change world for better. The company has distinctive culture based on cooperation of different specialisations, flexibility, environment protection, sustainability, human approach to employees and humanity in general. Arup works on interesting and challenging projects. Even though extremely good employer, resources indicate problems with long working hours, lower salaries and rigid rules of promotion and payment.
Narrative about Google shows global high tech company with innovative employees and specific democratic corporate culture that influences all corporate activities including ethically oriented business model and strong focus on environment protection. Google is evaluated as one of best employers globally, due to the corporate culture, specific corporate environment and unusual corporate benefits. On the other hand legal litigations (High-Tech Employee Antitrust Litigation) and ethical affairs (tax avoiding strategy) open space for criticism.
Narrative about UBS shows the company in financial sector focused on wealth management, investment banking, retail and commercial banking services and asset management. It is a global and multicultural organization that provides its clients with expert advices. It is involved in corporate responsibility, philanthropy, building community. UBS has historical roots and regularly has problems with ethical and legal issues (especially the holocaust scandal damaged corporate image a lot). UBS is an attractive employer.

7.DISCUSION

Advanced ICT tools offer us new ways how to store and transform data. Many pieces of data that used to be stored in various separated recording systems are now simply accessible on line and can be achieved by simple goggle search. It is necessary to have in mind that when we goggle the term we do not get information or knowledge but only data. To create information

or knowledge, context must be added. Context can be added by combining different pieces of data, e.g. by creating narrative based on separated stories.
Our small survey showed then when individual separated stories are put together they create more complex entity with higher informative potential. This finding is fully compliable with ideas of Boje (2001) who writes that story is an account of incidents or events, but narrative comes after and adds "plot" and "coherence" to the story line. It also correspondents with the point of Rudrum (2006) who argues that narrative should be defined in terms of its use instead of in terms of representation or what constitutes narrative is the representation of a series or sequence of events (Rudrum, 2005). It also corresponds with Cheryl and Carr's idea that the telling and selling of a narrative creates a story (Cheryl, Carr, 2011) thou they use terms story and narrative in opposite way then Boje and Rudrum and then used in our survey. On the other hand Gabriel (2000) does not agree with this approach as "in particular, factual or descriptive accounts of events that aspire at objectivity rather than emotional effect must not be treated as stories".

8.CONCLUSIONS

The survey and analysis of stories on four successful companies – Walmart, Google, Arup and UBS shows power and potential of the Internet as a carrier of stories. The survey included only first pages of Google search on chosen companies but it gave very distinctive and complex information about all organisations. Final narratives based on analysis of available stories differ from organisation to organisation. Narrative on Walmart shows strong global customer oriented organisation with customer protective tendency. Narrative on Arup shows highly innovative multinational global organisations trying to improve world and life of local communities. Google narrative shows global high tech company with innovative employees and specific democratic corporate culture. UBS narrative shows self-confident company in financial sector burdened with ethical scandals. Walmart, Arup and Google narratives also point out at legal and ethical problems of analysed companies.
Although final narratives give good picture on surveyed organisations, the survey and the method that was used have their limits. Storytelling is a natural way of communication and knowledge sharing but we still do not understand how stories actually work. Storytellers and listeners influence stories and the process of their telling and listening by their personality, experience, values, etc. Due to this, storytelling is always individual and subjective. E.g. even though we did all the reading, understanding, and coding of stories as precisely as we could, it still reflects our personal specifics. We do not think that if the survey was done by different researcher the final narratives would be totally different but we know that of course they would be different. But on the other hand, subjectivity is the problem of any qualitative research.
The literature review showed that the topic of storytelling in the relation to management, business and entrepreneurship has not been researched as it deserves. In future we intend to research the topic of stories, narratives and storytelling in management and business deeper and in more complex way.

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SUSTAINABILITY-ORIENTED EU TAXES: REVENUE POTENTIAL OF CCCTB

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Abstract

One of the most serious criticism of the status que with respect to the EU budget represents the lack of the link between the EU policy and the system of own resources. Non-existence of the link between reaching smart, sustainable and inclusive growth and EU budget is resulting into the existence of sustainability gaps in the European Union. The research revealed that the introduction of CCCTB could contribute to the decrease of two thirds of existent sustainability gaps. To research a CCCTB revenue potential, the model based on surcharge system was designed. The system expects replacement of VAT-base own resource by the transfer of a part of the corporate tax revenues from CCCTB raised on national level to the EU budget. The results of the research show that CCCTB-based own resource would be able to replace VAT-based own resource fully, with the only exemption, which is Cyprus.

Keywords: Sustainability, EU system of own resources, CCCTB, European Union, budget

JEL Classification: H25, H61

1.INTRODUCTION

After the long history of unsuccessful harmonization efforts in the area of corporate taxation, the European Commission introduced in 2001 four possible harmonization models of corporate taxation. One of them represented the suggestion of Common Consolidated Corporate Tax Base system (hereinafter as CCCTB), which was at the end selected as a long-term strategy for the harmonization scheme in the area of corporate taxation. To design the system, European Commission established in a working group in 2004. The task of the group was to establish a common definition of the tax base for corporations with European activities, to design the basic tax principles, structure of common consolidated tax base and the apportionment mechanism. Even though the draft of the text of the directive was finished already in 2008, the public discussion after its publication shown that there are still areas, which need detailed definitions and therefore the draft were sent back to working group to amend the text.

In connection with the change in Commissionaire responsible for taxation, CCCTB was granted the highest priority and the final draft of CCCTB directive was published in March 2011. It is necessary to mention, that the implementation of the CCCTB is connected not only to the grouping for taxation purposes and consolidation but also to the problem of the tax-sharing mechanism, which has raised much discussion. The directive proposal suggests the allocation formula – i.e. the consolidated tax base should be shared among the members of the group based on micro factors. That new allocation rule would have an impact on EU Member States' budgets and therefore turned out to be the most difficult part of the negotiation of the CCCTB Directive. Therefore, CCCTB has been a subject of many studies aimed at the simulation of budgetary impacts on individual EU Member States as well as on welfare and the basic macroeconomic indicators – e.g. (Nerudová and Solilová, 2015; Solilová and Nerudová, 2016; Spengel et al. 2014). However, in relation to the discussion on the reform of EU budget and searching for the new own resources was not discussed so much. The aim of this paper is to research the revenue potential of mandatory CCCTB implementation in the EU28 and the

possible replacement of VAT-based own resource by CCCTB-based own resource. This paper presents the results of the research within the cross-disciplianry H2020 EU project FairTax No. 649439, "Revisioning the ´Fiscal EU´: Fair, Sustainable, and Coordinated Tax and Social Policies".

2.THEORETICAL BACKGROUND

Taking into account lack of the link between the EU policy and system of own resources, which can be considered as one of the most serious criticism of current status quo, the most relevant benefit EU taxes can bring in that connection, represents the fact, that they may help to decrease the existing sustainability gaps in tax systems in the EU, as stated by (Krenek, Schratzenstaller, 2016) and (Schratzenstaller et al., 2016). EU taxes can serve as the tools for reaching smart, sustainable and inclusive growth as set by Europe 2020 Strategy. Sustainability gaps were in details defined by (Schrazenstaller et al., 2016) as increasing weight of taxes on labor in overall taxation, decreasing progressivity of tax systems, decreasing importance of Pigovian taxes, intense company tax competition and tax compliance and tax fraud.
Obligatory implementation of CCCTB or CCTB (i.e. common corporate tax base) as suggested by the Action plan of the European Commission for fair and efficient corporate taxation in the European Union4 can effectively help to decrease some of the sustainability gaps. CCCTB implementation in the form of directive (i.e. obligatory implementation) should help to establish fair tax competition – i.e. to decrease the sustainability gap in the area of tax competition. Firstly, harmonization of the rules for the tax base construction will erase the differences between the nominal and effective corporate tax rates (see below stated Table 1). Therefore, all the companies subjected to CCCTB system will have symmetric (same) information about the effective (nominal) tax rate. This situation may prevent harmful effects arising in situation when the companies have asymmetric information stemming from the inequality between the nominal and effective corporate tax rate.

Tab. 1 – Nominal and effective corporate tax rates in the EU in 2014. Source: Spengel, Endres, Finke and Heckemeyer (2014).

Country	**Corporate tax rates in %**	**Effective average tax rate in %**	**Country**	**Corporate tax rates in %**	**Effective average tax rate in %**
CZ	**19.0**	**16.7**	IT	30.9	24.0
AT	25.0	23.0	LV	15.0	14.3
BE	34.0	26.7	LT	15.0	13.6
CY	12.5	15.2	LU	29.2	25.5
EE	21.0	16.5	MT	35.0	32.2
FI	20.0	18.4	NL	25.0	22.6
FR	38.9	39.4	PT	30.0	27.1
DE	31.0	28.2	SK	22.0	19.4
EL	26.0	24.1	SI	17.0	15.5
IE	12.5	14.4	ES	35.3	32.6

Secondly, the latest development in the area of company taxation shows, that obligatory CCCTB (resp. CCTB) is understood as a tool for the fight with tax evasion and tax fraud. Closing the existent loopholes between the national corporate taxation systems through the

[4] 17th June, 2015

implementation of the unified rules (i.e. CCTB), represent very effective tool, how to decrease base erosion and profit shifting. Therefore, CCTB implementation can significantly contribute to the decrease of the sustainability gap in the area of tax fraud. Moreover, completing of the second implementation step (i.e. CCCTB) will have significant impact on tax-planning strategies, for due to the establishment of the consolidation regime, it will not be possible for companies to apply tax-planning strategies through transfer pricing any more.

Finally, the introduction of CCCTB would also contribute to the decrease of tax compliance gap. The draft of the CCCTB directive establishes the institute of one – stop – shop. This means that the CCCTB group (comprising members from different tax jurisdictions) is represented by "single tax payer" and is administrated by "principal tax authority". The system of one – stop – shop will lead to significant decrease of compliance costs of taxation for the taxpayer, as well to as to decrease in administrative costs for the tax administration.

Taking into the account the fact that as states (European Commission, 2015), CCCTB implementation represent one of the important tools how to prevent base erosion and profit shifting, CCCTB can indirectly contribute also to the decrease in the weight of labour taxation on overall taxation. When the corporate tax bases are not eroded by tax-planning and the value added is taxed in the country, where it has been generated, than the additional tax revenue could create the space for the decrease in taxation of labour. Therefore, CCCTB implementation can effectively contribute to the decrease of 4 out of 6 sustainability gaps defined by (Schratzenstaller et all., 2016).

CCCTB as a possible candidate on new own resource of the EU budget has not been discussed in the literature yet. However, there can be found the discussion on European Union Corporate Income Tax (hereinafter as EUCIT). As mention (Cattoir, 2004), developing of EUCIT firstly requires a definition of a common (consolidated) tax base. According to him, the base should be applied obligatory to all companies or to defined group of companies and he expects the application of formulary apportionment. The author predicts that the tax base of the EU corporate income tax would be relatively limited and unpredictable. He concludes that EU corporate income tax could not be used as the main or only resource of the EU and it would probably need to be complemented by other resources. (Begg et all., 2008) mentions that even EUCIT is being viable option for own resource, it represent much smaller tax base than value added tax and is more volatile over the economic cycle. According to him, EUCIT represents the option that is likely to be credible longer term and subject to agreement of a common consolidated tax base. (Heinemann, Mohl nad Osterloh, 2008) are discussing the pros and cons of EU tax as an candidate on own resource of EU budget, mentioning that the important feature is the design of the tax-based system of own resources. (Cattoir, 2009) states that EUCIT can bring important revenues (the author takes into account total corporate income tax revenues in the EU amounting to 3 % of GDP in 2008), but its susceptibility to the business cycle requires to keep a robust system such as residual GNI-based resource. (Schratzenstaller, 2013) expects that EUCIT of less than 2 % on the national corporate income tax base could generate EUR 15 bn.

It is necessary to mention that when considering EUCIT as an own resource of EU budget, very important role plays the design of the tax-based system of own resources, as mention (Heinemann, Mohl nad Osterloh, 2008). The possible design of EU-tax based system of own resources was research by (Raddatz, Schick, 2003). The authors are discussing three possible designs. Under so-called linked system, the tax would be levied on EU level (i.e. full harmonization – harmonization of tax bases as well as tax rates) with direct participation of EU on the tax revenues. Second system called surcharge system would require only the harmonization of tax bases and the EU would be levying surcharge in addition to the existent national tax rates (i.e. non-harmonized). Finally, so-called separation system would allow EU to introduced a specific tax, which is not applied by any of the EU Member States. This paper

works with the design of CCCTB-based own resource, which is based on surcharge system. However, the system does not expect a surcharge on the top of the different national corporate tax rates. The system expects replacement of VAT-base own resource (resp. GNI-based own resource) by the transfer of part of the corporate tax revenues from CCCTB raised on national level to the EU budget.

3.CALCULATION METHODOLOGY

To research the revenue potential of CCCTB the information on companies in the EU comprised in Amadeus database was used. The update no. 2552 from December 2015 was used in order to gain the relevant data. The empirical analysis is based on similar assumptions and methodology as used by (Nerudová, Solilová, 2014), (Nerudová, Solilová, 2015) and (Solilová, Nerudová, 2016). In order to simulate the allocation of tax bases in individual EU Member States after the obligatory implementation of CCCTB, it was necessary to gain the data of companies, which are fulfilling two-layer cumulative condition comprised in CCCTB directive proposal (i.e. at least 50.01 % of voting rights and more than 75 % of ownership of the capital) conditioning the subjection to consolidation and group taxation scheme. Based on this we have gained the dataset of 2,155,072 EU companies fulfilling the above described condition.
Following, the dataset of companies was divided into two groups. First group comprised 1,123,927 subsidiaries resident in individual EU Member States and second group comprised 1,031,145 parent companies resident in individual EU Member States. Further, in order to apply formulary apportionment for the sharing of the group tax bases comprised in the CCCTB proposal (see equation 1), the information on different financial indicators had to be gained – i.e. information on total sales, payroll, number of employees and total assets. The formula can be expressed as following:

$$shareX = \left(\frac{1}{3} \frac{S^X}{S^{grup}} + \frac{1}{3} \left(\frac{1}{2} \frac{P^X}{P^{group}} + \frac{1}{2} \frac{E^X}{E^{group}} \right) + \frac{1}{3} \frac{A^X}{A^{group}} \right) * CCCTB \qquad (1)$$

where S represents total sales, P is payroll, E stands for number of employees and A represents total assets.
It is necessary to mention, that information on some of the financial indicators are often missing in Amadeus database as well as in Bankscope database. In order not to eliminate the entities with missing information from the dataset, in accordance with (Nerudová & Solilová, 2014), we have applied three methods for missing data imputation – regression, imputation and Monte Carlo method to impute the missing data with the aim to research the most suitable method for missing data imputation in every Member State (i.e. the method which is distorting the allocation of the group tax bases across the EU Member States the least). It was necessary to perform this test separately for each individual Member States, for the character of missing data and the proportion of missing data on overall data are influencing the suitability of the each of methods.

Firstly, the regression method was applied to impute the missing data in case of all individual member states. The below stated equations represent the linear regression model, which was employed to estimate the missing data - number of employees, sales and payroll. The model can be expressed following:

$$No.Employees_imputed = koeficient\beta_0 + TFA * koeficinet\beta_1 \quad (2)$$

$$Operating_revenue = koeficient\beta_0 + TFA * koeficinet\beta_1 \quad (3)$$

$$Payroll = koeficient\beta_0 + No.Employees_imputed * koeficinet\beta_1 \quad (4)$$

As the independent variables in the model were used tangible fixed assets (TFA), for the estimation of number of employees (No.Emplyees_imputed) and sales (Operating_revenue), and the number of employees for the estimation of payroll (Payroll).
The above stated model was also used for the estimation of missing data through Bayesian model using an adaptive Metropolis-Hastings algorithm – i.e. Monte Carlo method, which uses likelihood models including univariate normal linear regression with a distribution argument in the form of var (i.e. variances based on variables). Monte Carlo method is primarily designed for fitting regression models; therefore regression specification is the same as in previous method (regression). Once regression specification was performed, the adaptive random-walk through Metropolis-Hastings algorithm was applied to obtain Markov Chain Monte Carlo correlation (MCMC), which assumes that the missing data are random. To obtain reproducible results the random-number used were set based on the default setting (i.e. default burn-in period of 2,500 iterations and the default MCMC sample size of 10,000 iterations). Following, we have performed multivariate regression. In addition, by default, 95% equal-tailed credible intervals are reported.
Third method, which was applied in case of all individual member states represents single imputation method. This method imputes the missing data by probable values. The missing information on sales was added by the information on recorded tangible fixed assets (TFA_reported) and the ratio of average operational revenues (AOperR) to average tangible fixed assets (ATFA) in case of companies from the same industry sector. The relation is expressed by following equation:

$$Operating_revenue = \left(AOperR \div ATFA\right) * TFA_reported \quad (5)$$

The missing data on number of employees was added through the application of the information on recorded fixed tangible assets (TFA_reported) and the ratio of average number of employees (ANoE) to average tangible fixed assets (ATFA) in case of companies from the same industry sector. The relation is expressed by following equation:

$$No.Employees_imputed = \left(ANoE \div ATFA\right) * TFA_reported \quad (6)$$

The missing data on payroll was added through the application of the imputed number of employees (No.Employees_imputed) and the ratio of average payroll (Apayr) to average number of employees (ANoE) in case of companies from the same industry sector. The relation is expressed by following equation:

$$Payroll = \left(APayr / ANoE\right) * No.Employees_imputed \quad (7)$$

And finally, the sensitivity analysis was performed in order to find out the most suitable method for missing data imputation (for details see appendix). Based on the results, we have decided to impute the missing data through the above stated regression model in case all of individual Member States with the exception of United Kingdom, for this method does not allow to impute the data with the smallest deviation from the real data. In case of the United Kingdom Monte Carlo method was applied as it turned up as the method imputing the missing data with the smallest deviation from the real data.

4.REVENUE POTENTIAL OF CCCTB

As was already mentioned above, considering a CCCTB-based own resource, we are expecting the variation of surcharge system defined by (Raddatz, Schick, 2003). On the contrary to their defined system, we do not expect application of a EU surcharge to the national corporate tax rate, but instead of this, we expect part of the corporate tax revenues, arising from CCCTB system in each member State to be a contribution paid to EU budget to replace VAT own resource contributions. The situation is showed in following table 2.

Tab. 2 – CCCTB revenue potential in case of VAT-based own resource replacement. Source: Amadeus database and own calculations

	CCCTB mil EUR	nominal tax rate 2015	CCCTB tax yield mil EUR	VAT own resource mil. EUR	% to reach current contribution from CCCTB tax base	% to reach current contribution from CCCTB tax yield
Austria	15 151.33	25.00	3 787.83	453.00	2.99	11.96
Belgium	19 803.89	34.00	6 733.32	508.60	2.57	7.55
Bulgaria	3 156.42	10.00	315.64	58.70	1.86	18.60
Croatia	4 632.63	20.00	926.53	63.00	1.36	6.80
Cyprus	43.53	12.50	5.44	23.00	52.84	422.72
Czech Republic	9 357.75	19.00	1 777.97	183.80	1.96	10.34
Denmark	19 154.84	23.50	4 501.39	279.50	1.46	6.21
Estonia	5 123.47	20.00	1 024.69	25.70	0.50	2.51
Finland	7 360.38	20.00	1 472.08	270.50	3.68	18.38
France	78 895.64	38.90	30 690.40	2956.40	3.75	9.63
Germany	50 457.67	31.00	15 641.88	3698.70	7.33	23.65
Greece	1 777.18	29.00	515.38	286.00	16.09	55.49
Hungary	5 879.28	20.90	1 228.77	118.10	2.01	9.61
Ireland	6 635.53	12.50	829.44	203.20	3.06	24.50
Italy	56 663.80	31.30	17 735.77	1760.10	3.11	9.92
Latvia	1 854.47	15.00	278.17	32.50	1.75	11.68
Lithuania	1 206.39	15.00	180.96	40.30	3.34	22.27
Luxembourg	3 963.59	29.20	1 157.37	38.50	0.97	3.33
Malta	252.16	35.00	88.26	10.60	4.20	12.01
Netherlands	75 266.62	25.00	18 816.65	818.60	1.09	4.35
Poland	16 265.76	19.00	3 090.50	445.10	2.74	14.40

Portugal	6 834.10	29.50	2 016.06	242.30	3.55	12.02
Romania	10 491.01	16.00	1 678.56	161.30	1.54	9.61
Slovakia	3 683.40	22.00	810.35	69.00	1.87	8.51
Slovenia	755.45	17.00	128.43	52.80	6.99	41.11
Spain	40 745.02	33.40	13 608.84	1382.00	3.39	10.16
Sweden	40 095.25	22.00	8 820.96	553.10	1.38	6.27
United Kingdom	325 455.31	20.00	65 091.06	2932.90	0.90	4.51
Total	**810 961.89**		**202 952.69**	17667.30		

As can be seen, companies legible for CCCTB system could generate the tax base of EUR 810,962 mil in the whole EU (contrary to the EUR 15 bn expected by (Scratzenstaller, 2013) in case of EUCIT). To reach the current amount of VAT-based national contributions, Member States would have to remit part of their tax revenues from CCCTB. The portion remitted to EU budget would be lowest in case of UK (4.51 %) and highest in case of Greece (55.49 %). The special category represents Cyprus. As can be seen from the Table 4, Cyprus is able to generate only EUR 5.44 mil from CCCTB, while its VAT-based contribution amounts to EUR 23 mil. Therefore it is obvious, that in case of Cyprus, revenues from CCCTB could not replace VAT-based own resource. The reason for this is the fact, that formulary apportionment (see equation 1), allocates the group tax bases according to the different factors than the residency of the member of the group. As is obvious from the Table 4, Cyprus belongs to low-tax jurisdiction in the European Union and is used in tax planning of the companies, which means that very often the company even being resident in Cyprus, does not have any economic presence in Cyprus. Therefore, when being a member of CCCTB group, the tax base is not allocated according to the country of the residency of the taxpayers, but according to factors as assets, sales, number of employees or amount of wages (i.e. that if there is no economic presence in the country, the tax base allocated equals to zero).
Table 2 also simulates, how would have to be "EU surcharge" to fully replace VAT-based own resource. Otherwise, how much from the nominal national corporate tax rate in fact would be the national contribution into the EU budget. The rate varies from 0.9 % in case of United Kingdom to 16.09 % in case of Greece. Again, special category represents Cyprus, where the surcharge would have to be 52.84 %, which means that current nominal tax rate is not able to raise enough revenues to fully replace the contribution paid as VAT-based own resource.

5.CONCLUSION

One of the most serious criticism of the current status que with respect to the EU budget represents the lack of the link between the EU policy and the system of own resources. Non-existence of the link between reaching smart, sustainable and inclusive growth and EU budget is resulting into the existence of sustainability gaps in the European Union as increasing weight on labour taxation, decreasing progressivity of tax systems, decreasing importance of Pigovian taxes, intense company tax competition and tax compliance and tax fraud. Introduction of EU taxes can represent the efficient toll how on one hand establish the link between Europe 2020 Strategy and EU budget, and on the other hand how to decrease or close the existent sustainability gaps.
The research revealed that the introduction of CCCTB could contribute to the decrease of sustainability gap in the form of intense company tax competition (through erasing the difference between nominal and effective corporate tax rates), tax fraud (through closing the existent loopholes between national corporate taxation systems through unified rules) and tax

compliance (through the concept of one – stop – shop). Indirectly, CCCTB can also contribute to the decrease of the weight on labour taxation by decreasing base erosion and profit shifting and creating the space for decrease of labour taxation.

In order to research the revenue potential of CCCTB, we have calculated the national tax bases, which would be allocated to the EU Member States after the CCCTB implementation, based on the allocation formula comprised in the draft of the directive. Using the Amadeus database, we have identified 2,155,072 EU companies legible for entering into CCCTB system. The missing information on some financial indicators necessary for the application of allocation formula was added into the dataset by the application of the methods for missing data imputation. The sensitivity analysis revealed that the most suitable method in case of UK represents adaptive Metropolis-Hastings algorithm, while in case of the rest of EU Member States the regression.

Our model on the estimation of the revenue potential is based on CCCTB-based own resource designed as surcharge system. However, the system does not expect a surcharge on the top of the different national corporate tax rates. The system expects replacement of VAT-base own resource by the transfer of a part of the corporate tax revenues from CCCTB raised on national level to the EU budget.

The results of the research show that companies legible for CCCTB system could generate the tax base of EUR 810,962 mil in the whole EU. With respect to the VAT-based own resource replacement, the research revealed, that the portion remitted to EU budget would be lowest in case of UK (4.51 %) and highest in case of Greece (55.49 %). However, Cyprus is able to generate only EUR 5.44 mil from CCCTB, while its VAT-based contribution amounts to EUR 23 mil. Therefore, it is obvious, that in case of Cyprus, revenues from CCCTB could not replace VAT-based own resource.

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RELATION BETWEEN STRATEGY AND FINANCE

Neumaierová Inka, Neumaier Ivan

Abstract

The article aim is to point out the connection (mutual conditionality) of the firm`s strategy and finance. The aggregated statistical data show (prove), except financial performance differences across sectors, differences within particular sectors too. It appears, that in every sector exists the group of excellent firms having outstanding financial performance as a result of better strategic decisions related to investments and their financing.

Keywords: Strategy, Finance, Financial Performance

JEL Classification: M200

1.INTRODUCTION

Sometimes it seems as if strategy and finance, these two worlds, built in parallel, do not understand one another. In our paper we will discuss their relationship and stress that one cannot do without the other. We take in account axiom: proper strategy leads to a higher financial performance.
The core of decision-making for a financial manager who is responsible for an enterprise's investment decisions, as well as for a strategist who invents innovations for the business model, is to focus on the interests of the shareholders and, by extension, all the stakeholders. Both the financial manager and the strategist are expected to improve the enterprise's market value.

2.THEORETICAL BACKGROUND

First we define the role of strategy, finance and their point of contact. A plethora of respected books have been written on corporate finance, as well as a similar number of excellent publications on strategy. Of these we can name, for example, the books by Brealey and Myers (2014), Grant (2010), and Wit and Meyer (2014).
In their books, the financiers discuss investments and financial decisions, and manage the value of an enterprise through long-term and short-term planning. Strategists place stress on how an enterprise intends to make money in the future, and try to invent new innovative business models so they can compete in a dynamically changing environment.
The difficulty consist in insufficiently accented mutual conditionality of strategy and finances. The fact that right strategy leads to the higher performance, we can consider as an axiom. Strategy has impact on finance and vice versa.

2.1.Strategy fundamentals

A strategy is directing investments by the owner of the capital in order to achieve his/her vision. It is not only that a strategy without finances does not have much chance of success. It is about improving the quality of allocation of investment through calculating its net present value and selecting a strategic scenario. The core of a strategy is closely linked to two basic financial questions concerning investment and financial decision-making. The consequences of alternative strategies help in the exploration of financial planning models.

Here it is interesting to recall Porter's idea (Magretta, 2012) that investment must be directed so as to enable the creation, in a unique way, of unique value for its selected customers. It is emphasized that a good strategy leads to excellent financial performance. This means that an enterprise must achieve better results than the sector average.
Understanding the situation of the enterprise means examining the needs of the enterprise from the outside (customer satisfaction, quality from the perspective of external customers, market position) and the needs from the inside (employee satisfaction, quality from the perspective of internal costs, fluctuations) (Liker & Meier, 2016).
Global strategy experts propose five distinct approaches to strategy (classical, adaptive, visionary, shaping, and renewal) and place emphasis on selection of appropriate archetype of strategy.
The objective of strategy is to identify and exploit sources of competitive advantage. This does not only mean competitive advantage of the sector, but also inside it. Grant (2010) emphasizes that successful strategies combine efforts to reduce costs, to differentiate products and narrow specialization. In today's world, this is considered of key importance for building a unique position in a sector.

2.2.The role of finance

The financial manager is not only a specialist staff position in an enterprise. This position something akin to a channel due to the role of finance. It involves the monitoring of all events in the enterprise in the form of value, a holistic rather than specialized overview. This channel overview is essential for decision-making on the future strategic direction of the enterprise.
The basic task of the financial manager relates to two fundamental decisions (Brealey & Myers & Allen, 2014). These are investment decisions as to whether and how to make an investment (this also includes the dividend policy, i.e. the decision whether to pay a dividend instead of making an investment) and financial decisions as to how to finance this investment. The financial manager is expected to improve the enterprise's market value.
Financial managers do not make those decisions alone. They are part of a team working for the top management, which includes the managers of other departments, the production manager, the marketing manager, etc.
Al-Laham and Welge (2012) describe how pure financial planning evolved into strategic planning and strategic management as the instability of the corporate environment and the complexity of enterprises increased. Strategic planning means grasping the long-term time frame and a high degree of uncertainty, and so the degree of detail is therefore low and forecast data only roughly structured. This involves a change in corporate capacity and the building of new potentials for the success of the enterprise, which is the responsibility of the top management of the enterprise.
The financial plan includes the plans of sales, production, investments, inventory, work, etc. One output of financial planning is the planning financial statements expressing the strategy (income statement, balance sheet, cash flow statement).
Through strategic planning a strategy is developed that is then executed by the strategic management (Koch & Schreyögg, 2007). The strategy is carry out according to various aggregation levels (functional, business, corporate, supra-corporate) and according to the level of organization (functional separation, internal unit, enterprise, alliance) (Wit & Meyer, 2014). This cannot be done by other means than through value expression.

2.3.The juncture between strategy and finance

Strategy is building the potential for the success of an enterprise. The potential for success is developed through competitive advantage. Good investment decisions assume knowledge of the competitive advantage of the enterprise. Strategy seeks a competitive advantage and finance quantifies it. This is the juncture between strategy and finance.
Strategy and finance are constantly intertwined. At the beginning, there is a vision of what position the enterprise wants to achieve in which market. Multiple paths (strategies) usually lead to this, of which it is necessary to select the most promising and, in terms of the development of the value of the enterprise, most beneficial. Selecting the best strategy envisages the quantification of future benefits for the capital providers, their capital expenditures and the calculation of the net present value (NPV) of the individual strategies. At this stage there is no need to go into great detail. A brief financial plan is sufficient. It is only after the selection of the strategy with the highest NPV that it is elaborated in a detailed financial plan.
Figure 1 shows the intertwining of strategy and finance. The grey-colored fields are the domain of finance.

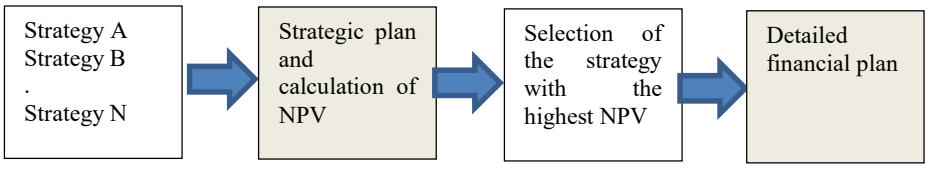


Fig. 1 - Strategy and finance. Source: Authors

The NPV calculation includes a risk estimate. One of the possible tools is financial analysis. The roots of risk may help us expose selected financial indicators, such as the size of the production power, indebtedness and liquidity. Financial indicators also play an irreplaceable role when comparing the parameters of the strategy against competitors in the industry.
Attention should be paid to selecting the type of financial analysis. As emphasized above, financial analysis must address not only the analysis of the profitability of investments, but also their risk. For this purpose it appears most appropriate to use the INFA pyramid indicator set (Neumaier & Neumaierová, 2002), which meets all the aforesaid requirements and connects the application of financial controlling to the application of risk controlling.
It also offers the possibility to take into account the different degrees of analyticity required by the strategic and detailed financial plan. It is therefore an excellent "connector" between finance and strategy. In a brief financial analysis applied to the brief (strategic) financial plan, synthetic indicators from the top of the pyramid decomposition are used. In addition, this also enables comparisons with sector data. In the next phase, when the detailed financial plan is applied, it is possible to achieve a deeper analytical insight through the use of other financial indicators from the lower floors of the pyramid decomposition. Compatibility of the approach to both plans with varying degrees of analyticity is guaranteed.

3.RESEARCH METHODOLOGY

There are three approaches to studying the relationship of strategy and finance. The first one examines through case studies profile corporate strategies and the resulting financial performance (Johnson, G. Whittington, R., Scholes, K., & D. Angwin Regner, P., 2014). Its advantage is the possibility of a detailed insight into each individual business cases. Its disadvantage is the difficulty of generalization. Representativeness of the sample surveyed

enterprises in terms of its size and characteristics (industry, size, ownership...) it is difficult to prime.
The second approach enables to explore linking strategy and finance, follow up on the previous ones and prerequisite to create a management simulator for the tested enterprise. There are set corporate policies and created strategic scenarios and tested their impact on financial performance. With this approach, we have experience INFA (Neumaier & Neumaierová, 2015), but is not the subject of this article. It is possible to preserve the advantages of approach to case studies and eliminate their disadvantages if the simulator is based on aggregated sectoral data. The disadvantage of simulators is the difficulty validation of the results of experimentation.
The third approach of finding the point of contact between strategy and finance is based on secondary data - aggregated statistical data to ensure representativeness (in many cases represent a census). The advantage is that the results are generalizable. The disadvantage is that they cannot cover the specifics of individual problems and individual enterprises. We will use this approach in our article, and we will examine differences in the performance of a group of excellent enterprises (enterprises forming value) within selected sectors system using financial indicators INFA.

4.DATA

A sector is made up of a group of enterprises that manufacture products with many characteristics in common. Sector data can be obtained in the CZ-NACE classification, which is a breakdown of enterprises by activity. An enterprise competes within its sector.
We show sector differences in performance with an example of the situation **in aggregation CZ-NACE D Manufacturing in the period 2007 - 2016**. The performance of each sector of course shows different modes of behaviour over time, however a further analysis of this is beyond the scope of this paper.
On the MIT website, you can find the application of INFA financial analysis to sectors, on the one hand to three-digit CZ-NACE groups in the manufacturing industry in the Panorama of the Manufacturing Industry of the Czech Republic 2015 publication (MIT, 2016), and to two CZ-NACE groups for non-financial enterprises in the document Financial Analysis of the Business Sphere for the First to Fourth Quarter of 2015 (MIT, 2016). Both databases have strengths resulting from their primary data sources. The three-digit grouping that appears in the Panorama of the Manufacturing Industry contains data from financial statements in greater detail, but only for the manufacturing industry. Data represent all firms of sector with 0 or more employees. The data from the Financial Analysis of the Business Sphere are for the second level, CZ-NACE divisions, meaning they are not as detailed, but are more recent (are available earlier), and are for all sectors of non-financial enterprises, not only for the manufacturing industry. Data represent large firms and part of medium sized enterprices.

5.FINDINGS

Enterprises of aggregation CZ-NACE D Manufacturing, we have summarized into categories Aggregation total, best companies, ie. Companies forming value for its owners and other businesses. The data source is the Financial analysis of the Business Sphere (MIT, 2016).
The quality of the investment decisions of best firm (creating value) enterprises. It is possible to evaluate this in terms of the production power achieved (ROA = Profit before interest and taxes / Assets). From Table 1 it can be seen that the individual groups of firms show different ability to create ROA.

Decisions regarding the method of financing of enterprises. It is apparent from the share of equity in assets, respectively the financial leverage (debt ratio). Table 2 shows the obtained values of the indicator share of equity to assets (E / A) for each group of enterprises.
Consequences of the aforesaid two decisions are the resulting rate of equity appreciation (ROE = Net income / equity), but also the level of risk generated (re = size of the alternative cost of equity). It is precisely these two factors that determine the final capacity to generate economic profit (Economic Value Added = (ROE - re)*Equity). For the sake of comparison, the tables show their relative similarity (EVA/Equity), the so-called spread (ROE - re). Spread values are shown in Table 3.

Tab. 1 – ROA CZ-NACE D Manufacturing. Source: MIT CR, calculation authors

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total	11,58%	8,81%	5,02%	7,23%	6,73%	7,98%	7,03%	9,98%	10,96%	10,47%
Best firms	19,31%	17,75%	17,57%	15,98%	13,91%	18,13%	13,89%	14,94%	17,45%	15,32%
Others	1,21%	-0,76%	-0,20%	1,37%	0,90%	1,33%	1,15%	2,77%	2,05%	0,67%

Tab. 2 – E/A CZ-NACE D Manufacturing. Source: MIT CR, calculation authors

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total	52,19%	52,06%	52,56%	51,38%	49,15%	52,21%	52,65%	52,76%	53,45%	53,36%
Best firms	58,35%	59,84%	58,51%	56,48%	53,70%	52,61%	58,03%	56,74%	57,77%	57,32%
Others	43,94%	43,72%	50,09%	47,97%	45,46%	51,95%	48,04%	46,97%	47,51%	45,34%

Tab. 3 – Spread CZ-NACE D Manufacturing. Source: MIT CR, calculation authors

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total	4,54%	-0,29%	-9,00%	-2,03%	-2,60%	-0,31%	-1,49%	4,16%	5,56%	6,14%
Best firms	15,94%	13,41%	13,39%	13,77%	6,58%	19,47%	11,79%	14,18%	16,62%	14,69%
Others	-15,76%	-20,39%	-19,87%	-14,49%	-7,86%	-13,43%	-15,23%	-13,42%	-12,93%	-15,70%

Table 4 shows the differences of selected indicators values between group of best firms (generating the value) and a group of other firms (not forming value). The average difference values spreads is 28.89 percent points, ROA 15.37 percent points and E/A 9.84 percent points. Firms to reach value creation (positive spread) have on average by 15 percent points higher indicator ROA and by 10 percent points higher the value of E/A.

Tab. 4 – Value differences (percent points). Source: MIT CR, calculation authors

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
ROA	18,09	18,51	17,77	14,61	13,00	16,80	12,74	12,17	15,40	14,65
E/A	14,41	16,11	8,42	8,52	8,24	0,66	9,99	9,77	10,27	11,98
Spread	31,70	33,81	33,26	28,26	14,44	32,89	27,03	27,60	29,55	30,39

We decided to statistically explore the binding of spread (variable y) ROA (variable x1), and E/A (variable x2). Table 5 shows evaluation results of Model 1: y = c + a*x1 +b*x2. Model 1 must be rejected. As an important variable came only indicator ROA.

Tab. 5 – Model 1. Source: MIT CR, calculation authors

	Coeff.	p-value	
Const.	0,0323	0,7624	Refuse
ROA	1,6836	0,0403	Accept
E/A	-0,0227	0,9535	Refuse
R-squared		0,4833	Refuse
Test for normality of residual		0,0102	Refuse
White's test for heteroskedasticity		0,3749	Accept

We assembled model 2: y = c + a*x1. Evaluation of model is in Table 6. Model 2 is better than model 1, but the model is to be rejected too.

Tab. 6 – Model 2. Source: MIT CR, calculation authors

	Coeff.	p-value	
Const.	0,0314	0,7497	Refuse
ROA	1,6749	0,0257	Accept
R-squared		0,4830	Refuse
Test for normality of residual		0,0103	Refuse
White's test for heteroskedasticity		0,3199	Accept

The problem of model 2 is outlying value of spread in 2011 and therefore we decided to assemble Model 3, which is a model 2 without the outliers. The results are in Table 7. The Model 3 has a low value of p-values for the constant and variable, the coefficient of determination is 86%, the errors are normally distributed and homoskedascitity is secured. The model can be accepted.

Tab. 7 – Model 3. Source: MIT CR, calculation authors

	Coeff.	p-value	
Const.	0,1443	0,0006	Accept
ROA	1,0275	0,0003	Accept
R-squared		0,8642	Accept
Test for normality of residual		0,3325	Accept
White's test for heteroskedasticity		0,4101	Accept

6.CONCLUSION

Finance and Strategy addresses two fundamental decisions: This is an investment decision on whether and how to make investment and financing decisions, as this investment should be financed. Based on data from Financial analysis, we calculated the difference between the value of a group of companies generating and not generating a value indicator spread (distribution of firms in the group generating and not generating value), ROA (representing the impact of investment decisions) and E/A indicator (representing the financial decision). From a statistical assessment came as relevant for value creation indicator ROA. It shows that the priority for value creation is investment decision. Financial decision is secondary and depends on the investment decision.

The investment decision is about how big pie EBIT create financial assets and about how the pie is divided between owners, creditors and the state. On this principle is based methodology of the Financial analysis INFA.

Finance and strategy are not two separate worlds. They are linked by knowledge of competitive advantage. The exploitation of competitive advantage through strategy enables an enterprise to increase its market value and achieve good financial health and the satisfaction of stakeholders constituting the business coalition.

It is a common phenomenon that when attempting to link finance and strategy in a particular enterprise, analysts face the problem of how to grasp this connection. To quantify the benefits of a strategy, it is very useful to use the unique INFA pyramidal system.

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FACTORS AFFECTING THE QUALITY OF GENERAL INFORMATION WEBSITES FOR YOUNG GENERATION, CASE IN VIETNAM

Ngoc Tuan Anh Bui, Nguyen Thi Hong

Abstract

The main objective of this study is to identify and analyze the factors affecting the quality of the general information website for young people, especially in Ho Chi Minh city, Vietnam. The findings help the website administrator to take measures to monitor and adjust the factors influencing the quality of the general information website to improve competitiveness in comparison with competitors as well as to attract readers. Based on the theoretical website quality model Webqual 4.0 and some previous research, and combined with exploratory research in HCM City, the subject came up with theoretical models and scales for the concept study. Research carried out with samples N = 200 who regularly visit general information website to assess the scale and test theoretical models. The results showed that satisfactory scales after some adjustments, appropriate theoretical model assumptions are accepted. The factors affecting the quality of general information websites in the Ho Chi Minh City are: (1) information, (2) revisit a site. Also according to the research results of the study showed that there is no difference in the assessment of the quality of the visitor groups by gender, age, and occupation.

Keywords: Customer satisfaction, new website, website quality, new criteria.

JEL classification: M15

1.INTRODUCTION

1.1 Problem discussion

In the process of globalization, regionalization is taking place quickly, then the exchange of information between countries is becoming more rapid. The electronic newspaper played a large part in the process of exchange of information and contributing to the process of globalization. That's accompanying website also appear to contribute little to make people around the world can receive the news together, talking to each other at the same time and the gap of space between that form of reading newspapers through the website to become a new trend for the convenience and timeliness.

In fact, today in Vietnam, the needs of the people using the internet Vietnam increasing in both quantity and quality. According to the survey of the Department of E-Commerce and Information Technology (MOIT), the survey results showed that 32% of survey respondents have Internet access time from 5-7 hours / day and 26 % access time from 3-5 hours / day. In it, the main purpose of the Vietnam Internet access is to read the newspaper, watch the news. That was the opportunity and also a challenge for the established businesses of the website. Perhaps because of competition and because of irresistible trend of electronics, including information released most of the articles from the paper and more information can update separately. Along with the rapid development of technology connections to help accelerate the download speed, the number of websites also bloomed everywhere, transmit information in any form that the traditional supply of newspapers pair. You may recall that the current website is

the convergence of the newspaper (text), alarm sound (audio) and the broadcasters (video). Web surfers not only be updated as news writing, but can hear a lot of radio stations and television viewing on the website. Besides, it helps the reader can easily search for themselves the necessary information and also as a bridge between readers and enterprise. However, the current situation is far from the purpose, the website included a lack of information-oriented, quality, inaccurate information, or for the purpose of appropriating the personal information of users on the website there is a higher frequency than other types of media. Therefore, the evaluation of the quality of the site to cater for the transmission of information, management and brand development of business is needed and thereby make the best management practices and solutions to improve site quality.

1.2 Research question

What are the factors affecting the quality of general information websites for young people?

1.3 Purpose of this study

The main objective of this study to identify the factors influencing the quality of general information websites for young people. This study also aims to understand young people's satisfaction of this sites. In addition, the finding of this study might provide helpful basic understanding satisfaction toward general information website of young consumers, it will help the Enterprises having more effective business plan targeting young people based on their need, what they want and what affect their decision using these sites.

1.4 Limitation

There are some limitations in this study. First, the sample is taken from particular location (Ho Chi Minh city). Secondly, the sample size might not present for ecological fashion consumption.

2. LITERATURE REVIEW

2.1 Theoretical background

Electronic information site is aggregated news sites in various fields of life. It is not self-produced content and information posted on the electronic newspaper, which must get information from press agencies or web host (under copyright agreements under the cooperation between the two parties). General information sites include 2 types: first, including the pages of the press agency news as Elderly, Vietnamese newspaper, Times, ...; secondly, it is not belong to press agencies news such as 24h, Channel 14, tinmoi, Baomoi, ... [2]. In terms of form, electronic information synthesis has many similarities with the interface electronic media as well as the form of presentation, designing the newsletter. Some synthetic site where the news of the day from major newspapers to readers keep track of breaking news means daily or hourly.
"Youth" does not have a specific definition. The majority, "youth" is used to refer to a group of people in the same age group. And the range of this age group are different concepts depending on the region, each researching different context. But in fact, referring to "youth", people usually understand that this is an age group with young people and have the same distinct characteristics based on age groups such as they are young, always love somethings new ... In

this study "youth" related to only target group of young people, aged from 15 to 27 years old, who often spend time to access internet to search and collect information.
In the theory, quality models are usually based on a set of characteristics, which are subdivided into sub-characteristics. However, ISO/IEC 25010 refers to the quality of a generic software product, and thus should be considered only as a framework to be tailored to the specific class of systems under consideration (Polillo, 2012a, 2012b). In particular, according to Polillo (2012b), Herrera et al. (2010) and Orehovacki et al. (2012), web sites have peculiar characteristics that make them different from other software products, and so that it requires a specific quality model and suitable quality assessment methods. In fact, as highlighted in Polillo (2012a, 2012b), in web sites information architecture and content are more important than data management and algorithmic computation; furthermore, the purpose of web sites is often communication or service, rather then support to routine or complex tasks; finally, web sites are usually continuously evolved, because visitors expect that contents are always up-to-date, and services constantly enriched and improved.
Website quality is becoming more important than ever. With the fast growing number of Internet users, many scholars have focused their research on website quality in providing news content, increased product choice and information, interaction, personal experience. The community (Barnes & Hinton, 2007). However, in order to evaluate the quality of the website, it depends on the perceived quality of the user's service resulting in satisfaction, the intention to return to the website and become loyal readers of the website.
One of the typical models for measuring overall perceived quality on shopping sites is the SITEQUAL model by Yoo and Donthu (2001). This model consists of nine observation variables with four components: Ease of use, (2) Design, (3) Processing speed, and (4) Safety (Security). In particular, quality and design factors related to image quality and color of the website. In addition, processing speed and security are important factors for Internet users. Research applied on six retail sites like Gap, Best Buy, eBay, Amazon and Wal - Mart has shown that two easy to use and secure elements significantly affect the overall quality of the website. Go back and buy. In general, four elements ease of use, design, processing speed and security have a significant correlation to the overall quality of the Website. However, the SITEQUAL model does not measure the quality of information while the website is a news service, so the quality of the information is a very important component, so this scale is not suitable for measuring quality of the website.
Meanwhile, Jeong and Lambert (2001) have developed a conceptual framework for the quality of information on web pages by applying three elements of information quality: perceived usefulness, ease of use (Davis, 1989) and feel accessibility (Culnan, 1985). Researchers also apply behavioral theory (Ajzen, 1993) to explain the structure as the overall result of three elements of the quality of information and an indicator of voluntary customer exposure to the site. Web. The results obtained in this study mentioned above three elements of information quality are combined with the information needs and attitudes that will affect the user's intentions to return to continued use. a website.
In another study by Yang et al. (2005), using two conceptual platforms - information quality and quality information system presented on web portals. The six basic elements of quality of information and quality systems are defined as the usefulness of the content, the adequacy of the information, usability, accessibility, security / Interactive. Experimental data analysis revealed that all six factors significantly affected the quality of the overall user experience, in which two factors significantly affected user satisfaction with the portal. The web is interactive and usable, and these two factors have the greatest impact on overall quality of service. Only a few proposals consider, in addition to objectively measurable characteristics, also subjective dimensions, such as user experience (Herrera et al., 2010; Orehovacki et al., 2012), user satisfaction (Sampson and Manouselis, 2004; Olsina et al., 2008; Polites et al., 2012), or site

appearance (Liu et al., 2009), which play, however, an important role in the success of a web site. Finally, some models and evaluation methodologies focus on usability only – see for instance Ivory (2003), or just on one specific aspect of web design, such as navigation (Abrahão et al., 2003)

The web quality model of Lowry, Vance, Moody, Beckman, and Read (2008) has 6 dimensions: Responsiveness, competence, quality of information, empathy, web assistance and callback systems. The Structural Equation Modeling analysis was adopted to establish the factorial validity of their model. However, some of their 6 dimensions cannot be implemented easily for assessing web quality, for example, competence or empathy. Sun and Lin (2009) proposed 3 quality dimensions and 12 criteria to evaluate the competitive advantages of on-line shopping sites. Then, they employed the fuzzy TOPSIS method to determine the weights of different criteria for the online shopping websites, therefore the results were significantly influenced by the experts who evaluate the websites.

The EtailQ model developed by Wolfinbarger & Gilly (2003) consists of 14 observation variables with 4 components: (1) Design (2) Customer Service (3) Reliability and (4) security. This is a reliable scale for evaluating website quality. However, similar to SITEQUAL, EtailQ also does not have information quality measurement elements, so this scale is also inappropriate for measuring the quality of website services.

Another quality electronic model is WEBQUAL introduced by Barnes & Vidgen in 2000. WEBQUAL is one of the quality scale website based on the perception of website users. WEBQUAL 1.0 is the first version developed by Barnes & Vidgen at the UK Business School. However, WEBQUAL 1.0 only focuses on measuring the quality of information without paying attention to the quality of interactive website. Therefore, WEBQUAL 2.0 was born to overcome this disadvantage. Therefore, WEBQUAL 3.0 has inherited both advantages of the two versions. Along with the continuous improvement in reliability, WEBQUAL 3.0 has been upgraded to WEBQUAL 3.0 with 22 variables and 5 components: Design, Convenience, Information, Reliability, empathetic.

WebQual has undergone several iterations in category preparation and question items. The latest version is WebQual 4.0 which uses three categories (usability, information and service interaction) of measurement with 22 items of questions plus one question to measure overall quality related to IPA method as suggested by Liu et al. (2014) and Chen (2013). Usability category based on user understanding in web, including ease of navigation, suitable design and picture which presented to user. Information category based on a review of information systems in general. This category relates to quality of website content, that is proprietary information for user's purpose, such as accuracy, format and relevance of information. Service interaction category is related to interaction of user perception when involved deeply with website (Barnes and Vidgen, 2002).

Another study was conducted by Madu and Madu (2002). By synthesizing the major factors affecting the quality of the site from the existing literature, Madu & Madu (2002) proposed 15 factors affecting the substance The number of websites for virtual activities including performance, features, structure, aesthetics, reliability, storage, maintenance, security and system responsiveness, products / service, Web hosting policies, reputation, assurance, and empathy. Two researchers Madu & Madu (2002) argue that site features, in which repeated user access performance increases, will affect actual shoppers, which is also true. A major factor affecting the quality of the website.

2.2 The proposed research model

From the practical conditions of internet usage and access levels on current web pages, and on the theoretical basis of the relevant research models, the author suggests a model of research. Rescue is a combination of Webqual 4.0 and Madu & Madu (2002).
WebQual 4.0 is a method of evaluating the quality of web site, which has been repeatedly developed in the studies of Loiacono, Watson and Goodhue (2002), Kaynama & Black (2000) Different areas, including Internet bookstores and Internet auction sites. The Webqual model has been applied at bookstores: Amazon, BOL, and Internet kiosks. In addition to the five basic components of the Webqual 4.0 model of e-services described above. According to research by Madu & Madu (2002) will affect the quality of the website.
Combining and matching the models and results of previous researchers' work in combination with the expert consultation and the results of the pilot study, the formal research model is as follows:

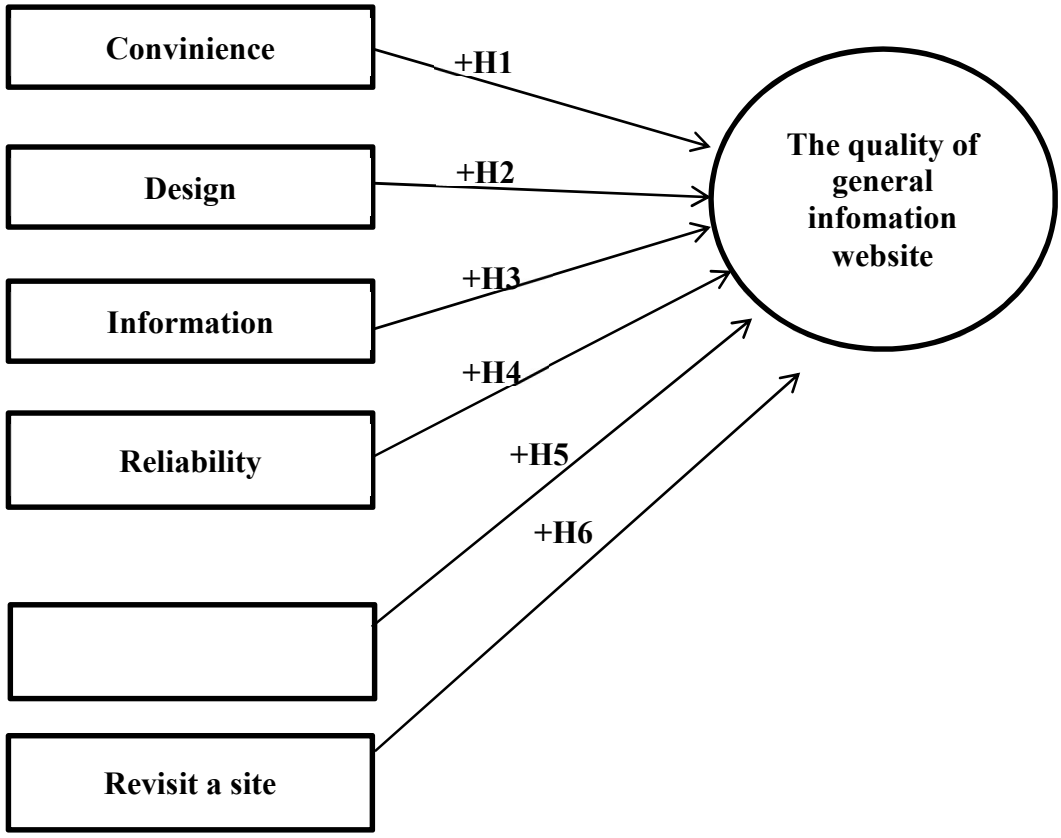


Figure 2.4. The proposed research model

2.2.1. Convenience
Convenience is defined as: "The extent to which people believe that using a particular system is simple and quick" (Davis, 1989). In addition, many studies (Sanchez-Franco & Roldan, 2005; Shang, Chen, and Shen, 2004; Yang et al., 2005) identified other factors Each of the

convenience, such as site structure, user interface and easy navigation. The navigation functions mentioned are the easy way for users to find information in the website. For this reason, navigation plays an important role in providing quality website services. The performance of websites that relate to the convenience of use is considered one of the key factors that make customers return to the site (Madu & Madu, 2002). The evaluation criteria of convenience are related to the effectiveness of navigation on a web site as hyperlinks, which are easily accessible from the home page; Clear website structure; And easy search media (Yang et al., 2005). Therefore, we have the following hypothesis:

Hypothesis H1: The convenience has a positive effect on the quality of the website for readers, meaning that increasing the level of convenience will increase the quality of the website.

2.2.2. Design

Many studies have shown that the design attributes relate to web interface and visual design (Sanchez-Franco & Roldan, 2005; Shang, et al., 2004. Yang et al., 2005). They point out that design attributes are one of the most important elements of the quality of website service. In the study of (Yoo & Donthu, 2001), the design attribute of the SITEQUAL model is to measure the quality of online shopping sites. However, Kaynama & Black (2000) also used a design element to measure the aesthetics of the website's interface.

One study found that overall site design was also directly affected by user perception (Spiliopoulou, 2000). Users expect to be using aesthetically pleasing services and they will be more satisfied when the service environment is highly aesthetic, regardless of the physical settings or online settings (Hall & Hanna, 2004; Vilnai - Yavets & Rafaeli, 2006). To assess the aesthetically relevant criteria will be closely related to the types and sizes of fonts, clarity and readability (Madu & Madu, 2002), as well as image quality High resolution, using the layout layout appropriate on a website.

Hypothesis H2: Design has a positive effect on website quality for the reader, meaning that better design will increase the quality of the website.

2.2.3. Information

The quality of information has repeatedly been mentioned in research papers, which is one of the important aspects of web site quality (Liu et al.,2014; Chen, 2014, Lowry, Vance, Moody, Beckman, and Read, 2008; Ho & Lee, 2007). Some studies on the quality of information (Polillo ,2012a, 2012b, Yang et al., 2005) emphasize the importance of relevance and usefulness of content, completeness and accuracy of information. Information provided on the site must be formal and sufficient source, originating in order to provide the reader with useful content. Information content directly affects the perception and usefulness evaluation of a website through user (Spiliopoulou, 2000). Researchers point out that providing adequate information will strongly influence the online buying behavior of potential customers. The website needs to provide sufficient information to facilitate the user's understanding of the product / service; it affects purchasing decisions, such as detailed product descriptions, pricing information, transparency As well as additional services including contact company information, and links to relevant websites (Yang et al., 2006). If online consumers feel a useful web site, they will be more satisfied and have a positive attitude towards the site (Jeong & Lambert, 2001). Criteria for assessing the usefulness of information include the full, varied, clear, accurate, timely, and reliable information (Jeong & Lambert, 2001; Madu & Madu, 2002, Yang et al., 2005).

Hypothesis H3: Information has a positive effect on the quality of the website for readers, meaning that better quality of information will increase the quality of the website.

2.2.4. Reliability

Reliability is defined as a willing user willing to accept persuasion in an online interaction based on their positive expectations with online channels (Kimery & McCard, 2002). When you feel a highly secure web site, readers are more likely to be willing to accept online systems (Ong, Lai, and Wang, 2004). So trust has become more and more important not only in web development, but also as an important ingredient for building relationships with web users. However, both belief and quality are important, in relation to the quality of the website. In this respect, Fogg and Tseng (1999) point out that "Reliability indicates a positive belief in perception, confidence and confidence within a person, object, or process". Furthermore, McKnight et al (2002) asserted that "site quality has the greatest impact on user trust and trust in the use of web sites." Accordingly, research hypothesizes that:

Hypothesis H4: Reliability has a positive effect on the quality of the website for the reader, meaning that increasing trust will increase the quality of the website.

2.2.5. Empathetic

Empathy has many different definitions that cover a range of emotional states including caring for others and having the desire to help them; Experience emotions that match the emotions of others; Distinguish what others are thinking or feeling from others; And there is a similarity between ourselves and others.

In the specialized literature, some documents have proved that the empathy of users with websites positively influences the quality of perception. In the electronic media industry, empathy involves the attention of the individual and is always available for questions or comments from readers on a website (Yang, 2001) and Lowry et al. (2007) have shown that empathy has a positive impact on enhancing the credibility and trust of a website. Flavia'n and Gurrea (2008) also argue that empathy has a huge impact on the access of readers to web pages. Not only that, empathy can save time and even improve communication on the web.

Hypothesis H5: Empathy has a positive effect on website quality for readers, meaning that increasing the level of empathy will increase the quality of the website.

2.2.6. Revisit a site

According to researchers pointing out that quality of service and user satisfaction are important predictors that affect the intention of visiting a website, it is also an indicator of loyalty. Into the user's site. Many web site quality studies are devoted to developing frameworks that point out that quality of service perceives websites affecting the repetition of users on websites (Ho & Lee, 2007). Wolfinbarger & Gilly, 2003; Yang et al., 2005; Zeithaml et al., 2002). An empirical study using a web-based satisfaction survey derived from site quality was identified as a strong indicator of intentional behavior (Jeong et al., 2003). In an approach to grasp the relationship between customer perceptions of service quality, customer satisfaction, and behavioral intentions (especially intentions for reuse), Udo, Bagchi, and KIRS (2008) developed the SERVPERF scale based on the SERVQUAL scale approach (Parasuraman et al., 1988).

Hypothesis H6: Maintaining the reader has a positive effect on the quality of the website for the reader, meaning that increasing the retention of the reader increases the quality of the website.

3. METHODOLOGY

The purpose of this step is to measure the factors that affect the quality of the website and thereby validate the proposed theoretical model and associated hypotheses. Verification of scales, models, and hypotheses is performed in the following steps: Preliminary verification using Cronbach's Alpha reliability coefficient, EFA exploratory factor analysis, and multivariable regression.

This study consists of two steps: preliminary research and formal research. Preliminary research was conducted through a qualitative research methodology that was used on a sample of about 10 people who used the site and used in-depth interviews with subjects aged 18-35. Study conducted in June/2016.

The formal study was conducted through quantitative research. This research aims to test the scale and model of research. The study was conducted through a formal questionnaire with direct interview techniques for young readers aged 18 to 35 who live in the Ho Chi Minh City area, regularly reading the site. In addition, the survey subjects do not discriminate male / female and occupation. The study was conducted in June 2016. Samples were chosen by random method with the expected sample size of n = 200.

In the study of this topic, the scale was constructed on the basis of theories of factors affecting the quality of the website along with their measurements in internationally published research studies. These scales are aggregated from a variety of studies and adapted and adapted to the Vietnamese market visitor based on the results of qualitative research with in-depth interview techniques. Frequent website visit.

The conceptual scale will use prior research scales with adaptations to fit the research situation. After eliminating and supplementing the observation variables, the scale of the factors affecting the quality of the website used for the study was 25 observations measuring six components as follows:

Table 3.1: Scales have been added, edited

Variables	The statements measure the concepts
Convenience (Barnes & Vidgen, 2000)	I feel the website name is easy to remember
	My interaction with the website is easy
	I feel easy to know how to access the website
	I feel the website is easy to use
Design (Barnes & Vidgen, 2000)	Website has attractive interface.
	The design of the website is relevant to the type of news website
	Website is more distinctive, more prominent than other websites
	Website made for me interesting experience
Information (Barnes & Vidgen, 2000)	Website provides accurate, honest and reliable information
	Information on the X website expresses its own views, independent
	Website provides timely, timely information
	Website provides full information related to the event
	Website provides easy to understand information
	The informational website always indicates the origin of the citation
	Information is presented with the appropriate layout
Reliability	Website has good reputation
	I feel safe to visit

Variables	The statements measure the concepts
(Barnes & Vidgen, 2000)	Personal information is kept confidential when accessing the website
	Website offers the service as promised
Empathetic (Barnes & Vidgen, 2000)	Website support selection of categories that I interest.
	Website convey the sense of community
	Website makes it easy to contact the Editor
	The website gives the visitor the opportunity to freely express their opinions about the postings
Revisit a site (Madu & Madu, 2002)	I have, and will continue to access information on the website.
	I will introduce the site to many others
	I will prioritize the use of the site when relevant information is needed

4. RESULT

4.1 Descriptive Statistics for demographics

With an expected sample size of n = 200, chosen according to convenient method, initially 200 samples were emitted. Within 30 days of the survey, the result was 150 valid samples, 50 samples were rejected because the respondents had never visited the website and did not complete information and information. exactly.
Gender: Among the 150 surveyed respondents, the proportion of males and females varied equally, male 51% and female 49%.
Age: Most of the respondents are between 18 and 25 years of age. The proportion of people aged 18-25 is 77%, followed by the group of people aged between 25 and 30, which accounts for 18%, with the remaining 30% to 35%.
Occupation: Student occupies the highest rate of 58%; The next is the office staff 33%; Student 4%; Other 5%.
Most visited websites: Kenh14.vn is the most visited site among young people with 32.5%; Next up is Zing.vn, which accounts for 21.9% and the third highest hit site is Ngoisao.net 14.6%. In addition, Yan.vn and Yeah1.com also accounted for a significant 12.6% and 10.6% respectively. Left, the number of visitors to Bestie.vn, Saostar and other news sites are very low because these new pages are born, so the number of readers perceived and approaching is not high.

4.2 Factor Analysis and Reliability Test

4.2.1 Reliability Analysis (Cronbach Alpha - α)

The Cronbach Alpha coefficient of the empirical factor factor was 0.293 <0.6, so the empathic factor was not accepted. DCS = 0.238, DC2 = 0.187, DC3 = 0.128 and DC4 = 0.075, which look at the Cronbach's Alpha if Item Deleted column if we remove any variables. All observations do not make Cronbach Alpha> 0.6 so all variables in this scale are not satisfactory.

Variables	Symbol	Number of observation variables	Reliability (α)
Convenience	TL	4	.793
Design	TK	4	.705
Information	TT	6	.845
Reliability	TC	4	.680
Revisit a site	DTND	3	.638
The quality of website	CL	3	.609

Thus, through the tool Cronbach Alpha, the author removed a sympathetic factor. All remaining variables with a confidence scale continued to be included in the EFA factor analysis.

4.2.2 Exploratory Factor Analysis (EFA)

Results of factor analysis: The three observable variables are TL1, TT5, TC4, TK1, TK2, TK3 and TK4 respectively in EFA runs. The results of the final EFA analysis showed that KMO = 0.843 was satisfactory, at the Eigenvalue value = 1.036 with the factorial method with Varimax rotation, which allowed for the calculation of 4 components from 13 observation variables and the variance of accumulation Was 66,096%. This is the required variance (> 50%).

Rotated Component Matrixa

	Component			
	1	2	3	4
TT2	.864			
TT3	.773			
TT4	.663			
TT1	.612			
TT6	.546			
TL3		.795		
TL4		.789		
TL2		.770		
DTND1			.756	
DTND3			.717	
DTND2			.711	
TC3				.863
TC2				.658

The four factors extracted include:
- (F1) The information includes variables TT1, TT2, TT3, TT4, TT6.
- (F2) Convenience includes variables TL2, TL3, TL4
- (F3) User retention includes variables DTND1, DTND2, DTND3
- (F4) Reliability includes variables TC2, TC3

4.3 Regression analysis

Theoretical model presented with 6 research factors, after analysis Cronbach Alpha and EFA only four factors left. The dependent variable of the model is the quality of the website, the independent variables include (F1) Information, (F2) Convenience, (F3) User retention, (F4) Reliability.

The variables included in the regression analysis are factorized by factorizing the averages of the observed variables of that factor. The variables in the linear multiple regression model are explained in Table 4.1.

Table 4.1: Scale has been added, edited
Coefficientsa

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.464	.256		1.813	.072		
F1	.480	.056	.559	8.541	.000	.563	1.775
F2	.030	.050	.036	.606	.546	.666	1.501
F3	.396	.061	.360	6.531	.000	.794	1.260
F4	.011	.053	.011	.206	.837	.809	1.237

Table 4.1 shows two statistically significant assurance variables with a 95% confidence interval: (F1) Information and (F3) User retention. The two variables were not statistically significant (F2) Convenience and (F4) Reliability.
After running the regression model with the Enter method, the adjusted R2 coefficient = 0.641 showed that 64.1% of the variation of the dependent variable (the level of reader satisfaction) was explained. By independent variables, or in other words, the model explains well the observed data. Validation of model fit, multi-collinearity, and stability of variance of error were not violated.
The regression model predicts the effect of factors on the quality of the site for youth as follows:
Quality = 0.464 + 0.480 * Update + 0.396 * User feedback
Explain the meaning of the regression coefficients:
This model explained that 64.1% of variation in quality was due to independent variables in the model, while the remaining 35.9% variation was explained by variables other than the model. The regression coefficient of each variable in the regression model reflects the effect of each factor on the quality of the site. If the higher the value, the stronger the impact. Thus, it is possible to rank in order from strong to weak factors affecting the quality of information as follows: Information (0.480); Retention of the reader (0.396).

Table 4.2: Synthesis of hypothesis testing results with significance level of 5%

	Hypothesis	Result
H3	Information has a positive impact on the quality of the website for readers, meaning that the better the quality of information will increase the quality of the website.	Accepted
H6	Maintaining the reader has a positive effect on the quality of the website for the reader, meaning that increasing the retention of the reader will increase the quality of the website.	Accepted

5. CONCLUSION

The paper has constructed a model for measuring the factors that affect the quality of the website with three factors and 11 variables. The results of the practical application of the management of news websites show that the factors that affect readers' satisfaction are the information factor and the retention of the reader.

When considering the information element in terms of specific aspects of the information, two aspects of "information are presented with appropriate layouts" and "information on websites express their own, independent views". Highly rated, while the aspect of "low-level" event-relevant information, particularly the "accurate, honest and reliable information" Are underestimated.

When considering the user retention factor, the user is most satisfied with the "*I have been, will and will continue to access information on the website*", followed by "*I will introduce the site to many others*" and "*I will prioritize the use of the site when relevant information is required*" to achieve the lowest satisfaction. But in general, all three aspects of the reader are pleased and appreciated using the web.

When investigating deeply with some young parrticipants, although website access is now widespread and used extensively on mobile devices, the content on the website remains a decisive factor in Attract young people. Featured pages, highlighted by young readers, play the role of "independent, independent viewpoints." Page Yeah1, Yan is the electronic information site rooted in YanTV online channel, mainly entertainment content. But while Yeah1.com extends to life issues and funny videos, Yan.vn brings more celebrity news and information to meet the needs of young people, Knowledge in life skills.

This result shows that the quality of information needs to be improved in each aspect:

"Website provides accurate, truthful and reliable information" is underestimated, so in order to improve this aspect, attention should be paid to the posting of articles, selectivity, and access to information only from the main sources. It should be synthesized from various sources to create a complete, quality news information of the site.

The aspect assessed by the user is relatively good: "The website provides a full range of event-related information," so it is important to reinforce, improve and provide more information about events that have been or are happening.

This article also provides two suggestions for website administrators.

For the current webmasters: Managers must constantly maintain a good amount of information and meet the expectations of their readers. In addition, managers can learn the positive elements that make up the quality of web pages through the results of the author's open questions survey. What are the striking elements of a website such as: eye-catching interface design; Information is always up-to-date, suitable for young people; Attractive images; Quality Video Directory .... According to research results show that these factors are mostly applied on the three most visited sites are youth today such as Kenh14.vn, Zing.vn, Ngoisao.net. From there, it can be recommended that managers, administrators of news websites should adjust the way of organization, design, content to apply to the website accordingly.

For future site administrators: For website preparation builders, administrators can build a converging website full of positive elements that users appreciate as the above author, the What makes quality a website can be used to build and design a new website. In addition, the investors and website management in the future are planning to build a website in general or website in particular, the elements that make up the quality of the website is now oriented and is The basis for a new site can inherit and promote more, building reputation as well as trust of visitors since the launch of the site.

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THE EFFECT OF WORKING CAPITAL ON FIRM PERFOMANCE: NEW EVIDENCES FROM SEAFOODS COMPANIES IN VIETNAM

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Abstract

This study use REM model (random effects model) with the dependent variable is the return on assets (ROA), and the independent variables are accounts receivable turnover (AR), accounts payable turnover (AP), inventories turnover (INV) and working capital cycle (WCC) respectively. In addition, we also control for the size of the company (SIZE), the debt ratio (LEV) and revenue growth (SGROW). We collect data from audited and announced financial statements of the listed seafood companies on Ho Chi Minh Stock Exchange (HOSE) and Ha Noi Stock Exchange (HNX). The research period is from 2007 to 2015. Our empirical results suggest that working capital has affect on the performance of the listed seafood companies in Vietnam. Moreover, we find a possitive relationship between the rotation accounts receivable, accounts payable turnover, inventory turnover, working capital turnover and profitability ratio of total assets. Finally, we find out that LEV and SGROW have a negative impact on ROA while the relatonship between SIZE and perfomance is not significant.

Key words: Working Capital Management; cash conversion cycle; profitability.

JEL codes: G3, G32

1. INTRODUCTION

Working capital is an important issue that managers considerably concern to ensure countinous production activities. Therefore, some questions such as whether the volatility of working capital affects all aspects of manufacturing, buisness companies or not, and how to adjust working capital is suitable to every company are always a challenge for both academic and practical perpesctives. There are several papers that analyze the relationship between working capital and operational efficiency of the firms such as Long, Malizt and Ravid (1993), Shin and Shoenen (1998), Rehanman and Nars (2007). Most importantly, the prior studies have pointed out that the working capital confidently affect firm perfomance. However, different study period, space and input data of each study lead to heterogeneous results when implementing the analysis of working capital's adjustment for optimizing the performance of a company.

We conduct the study in Vietnam for the following reasons. Firstly, Vietnam is completely suitable for development of expolitation and aquaculture due to its geographical advantage with over 3260km coastline and ecological diversity. Vietnamese seafood industry also undergoes a long transitional period into a market economy to adapt for dynamic international environment, increase export capacity and improvement of new technology. Overall, it can not be denied that Vietnam could develop the fishery sector all over country. However, with some limitation of ecological characteristics of lowland areas in the Mekong Delta and the Red River Delta, marine aquaculture industry could not be attained throughly. Consequently, this should be a huge opportuniy for Vietnam.

Prior empirical findings document an influental role of working capital on profitability of the firms. Nevertheless, no study has specifically analyzed this relationship in the fishery sector in Vietnam, one of the leading industries in the process of international economic integration.

Thus, we conducted a study on the impact of working capital on performance of seafood companies listed on the stock market of Vietnam.
The remainder of the paper is organized as follows: Section 2 reviews literatures; Section 3 involves with research methodology; Section 4 provides emperical results and section 5 concludes

2. LITERATURE REVIEW

2.1 Working Capital Management

The concept of working capital.
Working capital refers to current assets used in the operations of the company, including all short-term assets such as cash, short-term investments, accounts receivable and inventory. Furtheremore, according to finance theory, working capital is also determined by the dominant part of the total long-term capital against total assets or the differences between current assets and current liabilities.
Nobanee (2009) stated that the working capital can be measured based on the duration of an operating cycle, cash conversion cycle (CCC) and net trade cycle when comparing to the traditional measure which are current ratio and quick ratio. However, these methods are not effectively considered of payable accounts, receivable accounts and inventory. Therefore, Nobanee (2009) proposed a more accurate method to calculate the efficiency of working capital cycle by optimizing inventory, receivables, payables and minimizing the opportunity cost.
Working capital Management
Nobanee (2009) suggested that the optimal efficiency of working capital management is based on the principle which is making receivable rotation as soon as possible and delaying payable accounts. In order to fulfill this principle, it should be based on the traditional concept of the operating cycle, the cash conversion cycle, and net trade cycle. He outlined a general formula for optimizing business cycles as follows:
Optimal Operating Cycle = Optimal Inventory Conversion Period + Optimal Receivable Collection Period (1)
Optimal Operating Cycle = (Optimal Inventory / Cost of Goods Sold)*365 + (Optimal Recivables / Sales)*365 (2)

Moreover, effective working capital management reflects in CCC, which is the period of money in working capital or the period between expenditure for working capital and the sale of its. The shorter of CCC means production and business activities are more effective.

Cash management
Cash management can be defined as a period from paying to suppliers and getting back money after selling final products. However, CCC focuses on length of financial cash flows involved in the operation cycle and ignore the amount of capital when products move through the cash conversion cycle. Cash conversion cycle and net trade cycle can be shortened by reducing the time the money insidely attached the working capital (Chiou et al., 2006).
Shin and Soenen (1998) examnine the relationship between measurements of cash conversion cycle and corporate profit, and they figure out highly singificant negative relationship. This implies that managers can create value for their shareholders by reducing the cash conversion cycle at a reasonable minimum level.

Receivable Accounts Management
Receivable account management has a close relationship with the trade-off between profitability and risk. In more detailed, if the company does not perform credit sales, it could lose opportunities to grow up its revenue. on the other hand, if this company abuses the tool, the cost for receivable accounts and risks of doubtful debts raise, so the uncertainty of irrecoverable debt also rise. Therefore, companies should have appropriate credit policies. In addition, managers need to pay much attention to customers who have deferred regurlarly and set necessary solutions to recovery the debts.

Inventory Management
As well as receivable accounts, inventory levels significantly depend on sales. However, while the receivables are structured after having the basic sales, inventories have to be formed before that. This is the fundamental difference and the necessity to predict sales before building the targeted inventory level. Additionally, errors from building inventory levels can easily lead to loss of revenue or excess expenses, so inventory management becomes a difficult mission for the company's executives.

Payable accounts management
Account payables, which are as important as working capital, provide a financing source of company. The increase in misappropriate funds from suppliers or payment in advance from buyers will reduce cost pressures and borrowings from banks. Administration in payable accounts intimately relates to cash management, and this leads to stable supply of raw materials as well as increases the company's reputation. Furthermore, account payables are considered as a source of cheap financing because suppliers rarely charge on this account. However, commercial loans are expenditure as a result of not being discounted when purchasing goods by cash. Nobanee and AlHajjar (2009) document that carrying cost and increase in delayed payments increase account payables while reduce in opportunity cost of short-term borrowing decrease the account payables.

2.2 The firm performance

One of the most difficult aspects of the company is to have an effective business production, so the best way which a financial analyst often perform is to measure the profit possibility in the present and in the past based on accounting data. Nevertheless, there are many business opportunities forced companies to sacrifice current benefits in order to achieve betterment in the future. For example, a new product requires a large initial costs and early profits from this product are not quite high. Thus, the current profit may reflect inaccurate real profitability in the future, and another problem for calculating profitability based on the accounting data is that it ignores risks. That will lead to wrong conclusion that two companies having the same current profit also have same financial effect although a company has a higher risk level than that of another. In addition, this measure does not give us a standard for comparison.
In order to estimate the performance of a company, we firstly consider the profitability of the company. This is not only the result of using a set of physical assets and financial assets, but also economic principal to maintain capital for companies and ensure payment of loan. In the previous studies on the relationship between performance and working capital management, there are many different ratios used for the purpose of determining the profitability a company:
- Total operating profit (GOP)
GOP = Gross operating profit - Total operating expenses
- Rate of Return operation (NOP)
NOP = (Net sales - Cost of goods sold) / (Total assets financial assets)

- Rate of return on assets (ROA)
ROA = Net profit / Average Total Assets
In their study, the authors used ROA ratio to represent the profitability and performance of a company because this ratio is a measure of good financial condition. Moreover, the index is calculated on the used amount of assets to support business operations, so it determines whether the company can generate a net profit margin is big enough on their own property. When using ROA ratio as a measure of comparison, it should be compared with this ratio in previous years or with it of similar companies.

3. METHODOLOGY RESEARCH

3.1 Research model

We used three models for this paper which are pooled regression model (OLS), fixed effect model (FEM) and random-effects model (REM). Moreover, we also adopt Likelihood to check whether OLS model is suitable or not. If OLS model is inappropriate, we then follow Husman to apply FEM model or REM one.

3.2 Data

We collect data from financial statements audited and published on the highly reliable sources from 2007 to 2015. The final sample includes 128 observations from 17 seafood companies. 14 of 17 firms are listed on HOSE and 3 of 17 firms are listed on HNX. .

3.3 Hypothesis research, research models and variables.

Based on previous studies of Raheman and Nasr (2007), when analyzing the effect of working capital to the performance of a company, we chose ROA ratio as a dependent variable, while receivable turnover ratio, payable turnover ratio, inventory turnover ratio and working capital cycle are independent variables. We also include control variables such as firm size, debt ratio, growth rate of sales. In order to examnine the level of the impact of working capital on the performance of fishery companies listed on vietnamese stock market, we proposed a following hypotheses:
Hypothesis H0: There is no relationship between the receivable turnover ratio and performance of the seafood companies listed in the vietnamese stock exchange.
Hypothesis H1: There is no relationship between the payable turnover ratio and performance of the seafood companies listed in the vietnamese stock exchange.
Hypothesis H2: There is no relationship between the inventory turnover ratio and performance of the seafood companies listed in the vietnamese stock exchange.
Hypothesis H3: There is no relationship between the working capital cylce and performance of the seafood companies listed in the vietnamese stock exchange.

Model 1
ROA ratio shows that net profit per one unit of asset, reflecting the possibility of using resources to generate profit (Naceur, 2003). Although the ratio is unlikely a coefficient to assess performance of a company, but in terms of performance evaluation relating to cost and asset management in order to create an optimal profit then it deserves to be a concern. Mathuva (2010), Uchenna, Mary and Okelue (2013), Raheman and Nasr (2007) also use this ratio is a dependent variable. Therefore, we choose ROA ratio as a dependent variable to estimate the

effect of the working capital on the performance of the seafood companies in vietnamese stock market.

In this model, we use accounts receivable turnover ratio as an independent variable which means how many rounds of the company's receivable accounts in one cycle, and it is calculated by using the following formulas:

If that the account receivable turnover is small means the company capital is occupied capital, so the company's cash position declines, and low liquidity rate causes the company not to be active in financing capital sources for production. On the other hand, if accounts receivable turnover is high, the higher liquidity position and firms have active ability to finance their increasing working capital. Mathuva (2010) suggests that the average collection period variable considers a number of days of accounts receivable turnover ratio. Moreover, the result showed that an increase in average collection period and a decrease in accounts receivable turnover ratio both reduce corporate profits.

In addition, we also use some control variables such as firm size, debt ratio and growth of revenue. Calculation method of these variables are based on research of Raheman and Nasr (2007).

Company size variable (SIZE) is calculated by taking the logarithm of the total assets of a company.

- Leverage ratio variable (LEV) is the result of total debt divided by total assets of the company.
- Rate of revenue growth variable (SGROW) is measured by net sales in year 1 minus one in year 0 then divide net sales in year 0.

Model 2

In model 2, we replaced AR into AP, and AP ratio is the reflection coefficient of a business cycle, and number rounds of AP. Indeed, the higher factor proves that this company does not use capital tie-up of other companies. Conversely, the coefficient is smaller shows that longer of appropriate capital is, so the company's investment in low short-term assets leading to higher profits. However, longer payment period also has advantages and limitations. Nobanee (2011) finds out that extending the time of payment will affect the company's reputation, so affect the profitability of the company. Similarly to accounts receivable turnover ratio, accounts payable turnover is also placed on same sources of references for the calculation is by taking net sales divided by the average of payable accounts:

Model 3

In model 3, the independent variable is the inventory turnover ratio (INV) which is the number of times average inventory rotarory in the business cycle.

Inventories play an important role in the working capital management that managers are often interested in. Maintaining a reasonable level of inventory helps firms to avoid increase in inventory costs as well as effect on the quality of products. Specifically, the food preservation of the fishery sector for a long period requires a lot of money, so it makes product costs rise considerably and erode profits. However, low level in inventory is not an effective method, because this would not guarantee the company's production when market demand goes up dramatically. It can not be denied that company’s market share and the company's profits is negatively affected.

Model 4

In model 4, the working capital cycle (VLD) is an independent variable. Working capital cycle starts from putting money to buy raw materials for the production process, and money is converted into inputs for the production course of the company. After the production process, finished products are formed and launched into consumer markets. Finally, the terminal of a

working capital cycle is that output goods are exchanged into cash, also means that when the company sold products and obtained some forms of capital in the original currency with a added value.
In particular, the average working capital is calculated as the average short-term assets of the company:

4. RESULTS AND DISCUSSION

4.1 Descriptive Statistics

Statistical table shows the average value, minimum value, maximum value, standard deviation of variables in this study. All data is calculated from the balance sheets and audited income statements.

Table 4.1: Descriptive Statistics for variables.

	Mean	Median	Max	Min	Std. Dev.	Obs
ROA	0.0422	0.0378	0.1970	(0.3904)	0.0678	128
AR	8.3698	7.1649	34.3472	0.3272	5.9790	128
AP	24.3668	16.9022	196.6934	1.5512	29.4846	128
INV	4.6258	4.5034	12.3407	0.2173	2.9015	128
VLD	1.9346	1.7643	5.9268	0.1178	1.1349	128
SIZE	5.8127	5.8114	7.1974	4.6181	0.5010	128
LEV	0.5682	0.5807	0.9434	0.0656	0.2090	128
SGROW	0.0978	0.0728	1.7481	(0.6862)	0.3716	128

Source: Author's calculations.

The total number of observations are 128, and most standard deviation values in the model are lower than the average. Thus, this result shows that the data matches with the pattern, it is able to apply the regression model in order to estimate statistical values.

Test the correlation between variables
Normally, independent variables are no linear relationship, that rules are violated is a multicollinearity phenomenon. Thus, the multi-collinear is a phenomenon which independent variables in the model are interdependent and demonstrate functional form. Therefore, when this phenomenon occurs, it looses the meaning of the research model and the deviations of the results.

Table 4. 2: Correlation Matrix between variables.

	ROA	AR	AP	INV	VLD	SIZE	LEV	SGROW
ROA	1.00							
AR	0.2759	1.00						
AP	0.2024	0.4600	1.00					
INV	0.4839	0.4108	0.3085	1.00				
VLD	0.3324	0.6211	0.3685	0.8051	1.00			
SIZE	0.0604	-0.2587	-0.1687	-0.2424	-0.2060	1.00		
LEV	-0.3578	0.0499	-0.1817	-0.2891	0.0689	0.1077	1.00	
SGROW	0.2578	0.2065	0.1037	0.3897	0.4041	0.1615	0.0837	1.00

Source: Author's calculations.

We established the correlation matrix between variables in four models in order to review whether variables in each model have multicollinearity or not. In the theory, if the correlation between the two variables is above 0.4, it means there is a multicollinearity. The existence of multicollinearity in the model can lead to deviations from theoretical ideas to practical verification, so the statistical significance of the study fade. It can be seen that the correlation between the variables in all four models studied were less than 0.4, so there is no multicollinearity phenomenon. However, in order to ensure that outcome, an additional measure to detect multicollinearity is Variance inflation factor (VIF) and 1 / VIF:

Table 4. 3: The results of VIF in four models.

			VIF		1/VIF	
	FEM	REM	FEM	REM	FEM	REM
Model 1	0.44	0.19	1.80	1.23	0.56	0.81
Model 2	0.43	0.15	1.77	1.18	0.57	0.85
Model 3	0.46	0.22	1.86	1.28	0.54	0.78
Model 4	0.45	0.19	1.81	1.24	0.55	0.81

Source: Author's calculations.

Results of Table 4.3 show that the 1/ VIF ratios of four models in two methods FEM and REM (we do not consider the OLS model because this model is no multicollinearity phenomenon based on the theory) fluctuated from 0.54 to 0.85. This indicates that there is no multicollinearity phenomenon of the four models above. Kurawa and Kabarra (2014) supposed that multicollinearity occurs when the value of coefficient of 1 / VIF is less than 0.2. Thus, the correlation matrix and magnification factor can be concluded that there is no multicollinearity phenomenon in four models studied.

A correlation matrix also noted a negative correlation between debt ratio and ROA. This implies that when the company's debt increased, there will be a raise in interest expenses, a decrease in liquidity ability, making the company's risk increased, while profit of the company reduces. On the one hand, company size and growth is positively correlated with ROA ratio, suggesting that expansion of company and higher revenue will increase the company's profitability.

Regarding to the correlation between the independent variables, there is a high positive correlation between AR, AP, INV and VLD, with the numbers are 0.62, 0.37 and 0.8 respectively. This is well explained because the three variables AR, AP and INV are representing for receivable accounts, payable accounts and inventory which working capital is directly affect on these elements; so when the upgrade of three variables made the increase in working capital turnover. However, the coefficients of 1 / VIF in two methods FEM and REM are 0.51 and 0.57 respectively, that means although there is a high correlation between variables it does not exist multicollinearity phenomenon.

Model selection

Due to the variety of purpose of research, industry research, and data input, every study will apply a suitable model. In order to ensure research results matching the reality, we run the data on all three models OLS, FEM and REM. First, we used the Likelihood Ratio test to check whether the OLS model should be applied or not:

Hypothesis:

- H0: OLS Model is consistent (all constants are equal).
- H1: OLS Model is not consistent (at least a constant is not equal).

Table 4. 4 Results from Likelihood Ratio test.

	Model 1		Model 2		Model 3		Model 4	
Effects Test	Statistic	Prob.	Statistic	Prob.	Statistic	Prob.	Statistic	Prob.
Cross-section F	3.6364	0	4.3526	0	3.3757	0.0001	3.4858	0.0001
Cross-section Chi-square	52.3305	0	60.5227	0	49.2126	0	50.5389	0

Source: Author compiled

After using Likelihood Ratio test, p-value results all showed less than 0.5, so we should reject the hypothesis H0 which means the OLS model is inconsistent. Because of not choosing OLS model, we then use the Hausman Test to check between FEM and REM models to choose more suitable model.

Hypothesis:
- H0: There is no correlation between explanatory variables and random components.
- H1: There is a correlation between explanatory variables and random components.

Table 4.5: The test results Hausman Test

Correlated Random Effects - Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	4	1.0000

Source: Accredited by the author.

After doing the Hausman Test, all four models had the same results as shown in Table 4.5, and p-value results are greater than 0.05 which means we accept the hypothesis H0. In detailed, there is no correlation between explanatory variables and random components, so the REM model is suitable for our research.

Analysis model.

After applying the Likelihood Ratio test and Husman Test, REM model is the most appropriate of the three test models. Nevertheless, in order to ensure the reliability of the results from using the model REM, before analyzing the model we conduct an additional inspection of pattern defects, such as autocorrelation phenomena. Based on the results obtained from REM model, we used Durbin - Waston Stat (d) to check whether the phenomenon of autocorrelation in four models exists not.

According to the theory:
- If 1 <d <3, it can be concluded that the model has no autocorrelation.
- If 0 <d <1, it can be concluded that the model has a positive autocorrelation.
- If 3 <d <4, it can be concluded that the model has a negative autocorrelation.

Table 4.6: Results from Durbin - Waston Stat research in four models.

Model	Durbin-Watson stat (d)
Model 1	1.7860
Model 2	1.8085
Model 3	1.8967
Model 4	1.8358

Source: Accredited by the author.

Table 4.6 shows that d of four models are in the range from 1 to 3, that is no existence of correlation phenomena between variables in models.

Model 1's estimate Results.

From the results of the regression model (Table 4.7), p-value of intercept is signifcant (0.0089 <0.05), accounts receivable turnover positively correlated with ROA. This is consistent with the theory and with research by the authors as Raheman and Nasr (2007), Mathuva (2010) and the study of a number of other authors.

This result again confirmed that when an increase in account receivable turnover ratio reduces the average collection period. Consequently, the rate of return on total assets of the business will imrpove. In order to explain to this result, it was found that the rise in accounts receivable turnover ratio leads to reductions in accounts receivable relatively to revenues. Indeed, it means that the enterprise's capital is less occupied by customers, and its cash is not deposited in accounts; the liquidity of the company increased as the result of the growth of cash on hand. Moreover, the company does not encounter difficulties related to working capital in order to invest in a new business cycle, making the process of production and business activity of the company smoothly. on the other hand, when the accounts receivable turnover decreased, it means the company is occupied its capital, its cash decreased, its liquidity ability also reduced, and the production process of the company was interrupted. All these things make company's production efficiency and business activities decreased, so the reduction in revenue, profit, and ROA occur.

Table 4.7: Regression results in model 1.

	C	AR	SIZE	LEV	SGROW
Coefficient	-0.0494	0.0030	0.0249	-0.1435	0.0322
t-Statistic	0.4847	2.6582 **	1.4326	-4.0177 *	2.4047 **
R-squared	0.2124				
Prob(F-statistic)	0.0000				
Durbin-Watson stat	1.7860				

(*), (**),(***) Denotes significance at 1%, 5% and 10%

Source: Author's calculations

Model 2's estimate Results

The regression results in model 2 (Table 4.8) shows that the p-value of accounts payable turnover has statistical meaning compared with the level of significance alpha (0.0378 <0.05). From that, it can be seen that there is a positive relationship between AP ratio and ROA ratio, and this is also consistent to the research of Raheman and Nasr (2007) concluding that lessening the number of days in payable accounts head to the growth of company's profits. The reason is when receiving credit payment from suppliers, this company is able to save money for circulation in the production process. However, constituting capital also gives not only good points but also drawbacks, so managers should be careful to use this term.

Table 4.8: Regression results in model 2.

	C	AP	SIZE	LEV	SGROW
Coefficient	0.0066	0.0003	0.0175	-0.1367	0.0376
t-Statistic	0.0366	2.0993 ***	0.5829	-3.4817 **	4.7906 *
R-squared	0.1805				
Prob(F-statistic)	0.0000				
Durbin-Watson stat	1.8084				

(*),(**), (***) Denotes significance at 1%, 5% and 10%
Source: Author's calculations.

Model 3's estimate Results

From the regression results in model 3, there is a possitive relationship between inventory turnover positive and ROA. This is consistent with Chatterjee (2012), but it inconsistent to the results of other several studies like Mathuva (2010). Furtheremore, this result implies that if other factors are constant, inventory turnover increased one row make 0.008925 units raise in ROA.

Table 4.9: Results 3 regression models.

	C	INV	SIZE	LEV	SGROW
Coefficient	-0.1316	0.0009	0.0324	-0.1013	0.0154
t-Statistic	-0.6916	2.2592 **	1.0809	-4.004 *	2.2416 **
R-squared	0.2407				
Prob(F-statistic)	0.0000				
Durbin-Watson stat	1.8967				

(*),(**) Denotes significance at 1% and 5%
Source: Author's calculations

Estimate results of the model 4

According to the model results, working capital turnover had a possitive impact on ROA. This fits with studies of Raheman and Nasr (2007), because working capital directly related to receivable accounts, payable accounts, and inventory. Thus, if other factors were statistically significant, working capital cycle also has statistically meaning, with the p- value is smaller than alpha significance level (0.0327 <0.05).

Table 4.10: Regression results of model 4.

	C	VLD	SIZE	LEV	SGROW
Coefficient	-0.0823	0.0200	0.0285	-0.1443	0.0192
t-Statistic	-0.4211	2.1602 **	0.9171	-4.4639 *	3.0580 **
R-squared	0.2194				
Prob(F-statistic)	0.0000				
Durbin-Watson stat	1.8358				

(*), (**) Denotes significance at 1% and 5%
Source: Author's calculations

The control variables

Table 4.11: P- value results of control variables.

	Model 1	Model 2	Model 3	Mode 4
SIZE	0.1545	0.5610	0.2818	0.3609
LEV	0.0001*	0.0007*	0.0001*	0.00035*
SGROW	0.0177**	0.00023*	0.0268**	0.0027**

*, ** Symbols represent the level of significance of 1%, 5% respectively.
Source: Author compiled.

Table 4.11 shows that among three control variables, the SIZE variable has no statistical significance in all four models (its p-value is larger than the significance level of 5%). Therefore, the increase or reduction of company size do not affect the ROA ratio.
On the other hand, debt ratio have an significantly negative effect on ROA ratio. When the debt ratio goes up, it makes interest expense increased, companies would hace difficulties in raising capital for production and business, especially the cheap capital because of default risk, psychological fears from investors and creditors. To conclude, this considerably influence on the company's operations, and business production may be interrupted due to lack of investment, leading to the decrease in revenues and profitability of the business. Thus, in order to improve their profitability, businesses need to reduce the debt ratio to an optimal level to have advantages of outside capital for production, but also to maintain the liquidity probability for ensuring borrowing payment. Revenue growth rates had a statistical significance and had an possitive impact on ROA. When the company achieved high revenue would lead to the growth in revenue, so the return rate on assets increased understandably.

5. CONCLUSION

The research indicates that there is a positive correlation between the account receivables turnover and ROA ratio. The meaning of the increase in accounts receivable turnover ratio is a reduction in average receivable period and increase in ROA. This implies that in order to improve the performance of companies, managers should implement policies to reduce the average collection period. The empirical results are statistical significance and also relevant to production companies in general and fishery companies listed on Vietnamese stock market in particular. When the company reduces the average collection period, it leads to a higher profit. It can be explained that if the company can collect its debts efficenciently to finance its working capital investment capitals. it could reduce opportunity costs and increase efficiency.
The study also finds out a positive correlation between accounts payable turnover and ROA ratio. Thus, in order to improve their operational efficiency, companies should restrict the occupancy of capital from providers. Although extending of payable payment period has some benefits, but companies should reasonably maintain credit provision from suppliers in order to utilize the source of money effectively. When the company receives trade credit, it gaines the trust from vendors, so it is seen as a form of flexible use of money for rasing bussiness interest. We also figures out the signficiantly possitive relationship between inventory turnover and ROA. Moreover, this implies that in order to improve the company’s performances, managers should implement suitable policies to increase inventory period. There is also a positive correlation between working capital turnover and ROA from the model because the previous correlation of factors related to working capital also have positive impacts on the ROA, so it leads to the result of the working capital cycle also works incontestably on ROA ratio.

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CORPORATE SOCIAL RESPONSIBILITY AND CONSUMER BUYING BEHAVIOR IN EMERGING MARKET: A STUDY IN VIETNAMESE BANKING SECTOR

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Abstract

Consumer's trust has a positive impact on their purchase intention in selecting and favouring products of an enterprise. One of the effective ways in building trust is the corporate social responsibility (CSR) which affects many individuals. Building a responsive image is always the concern of businesses particularly in the banking sector because this sector has many hidden risks to customers. In this paper, empirical study is adopted to explore the effect of the awareness and the perception of consumers in CSR activities on their corporate evaluation and purchase intention in Vietnamese banking sector. The primary data from 257 customers of the banks in Vietnam were analyzed using AMOS. The questionnaire was designed after figuring out the dimensions based on relevant literatures, statistical analysis was conducted and the structural equation modeling (SEM) was established to draw the conclusions of the study. The results show that positive effects of perceived CSR (PE) on trust of CSR (TR), awareness of CSR (AW) on corporate evaluation (CE), corporate ability (CA) on CE. This study is intended to contribute to prove experimentally the effectiveness of CSR activities of enterprises. From this study, the institutions can get the information they need to develop appropriate activities for their business, especially in the banking sector.

Keywords: CSR, perception CSR, consumer responses, awareness CSR, bank industry.

JEL Classification: M14

1.INTRODUCTION

Consumers' interests make companies adopt CSR practices to help increase both shareholder and social values by integrating stakeholder and shareholder interests into company decision making (Detomasi, 2008). Developed countries performed national projects to promote CSR activities among companies (Cramer, 2005). The researchers demonstrated that in emerging countries the companies can get much benefit such as productivity (Sun and Stuebs, 2013), competitive success (Gallardo-Vazquez and Sanchez-Hernandez, 2014) from CSR activities. Companies only invest in CSR when these activities bring benefits because application of CSR required the companies using many resources.

Although some researchers report a positive consumer response towards companies engaged in CSR activities (Pomering and Dolnicar, 2009; Gao, 2009; Parsa et al., 2015), others have found that consumers are not interested in socially responsible practices (Vaaland et al., 2008; Carrigan and Attalla, 2001). Today, corporate image recovery in each of its dimensions is basic for this purpose. Such inconsistent conclusions suggest that CSR research is needed to test a number of hypotheses. Moreover, businesses can build a responsible business image with stakeholders through the implementation of CSR actions. In the financial industry in general and the banking industry in particular, the necessary for building a reliable image is very important. In addition, responsible activities of the banking sector will be the interest to many managers, researchers and consumers because the banking industry play a pivotal role in the

economy. In addition, the CSR study by researchers in Vietnam have once mainly focused on enterprises rather than on banks. Thus, this article is needed to explore the following issues:
(a) effects of customers' awareness of CSR, perceived CSR (PE), trust of CSR (TR), corporate ability on corporate evaluation (CE) and purchase intension (PI);
(b) effect of customers' PE on customers' TR

2.LITERATURE REVIEW AND HYPOTHESIS CONSTRUCTION

2.1.CSR dimensions

As early as 2000, developed countries such as the Netherlands developed national initiatives to promote CSR practices among companies (Cramer, 2005). CSR has a long and diverse history. In the early 1950s, Bowen, was known as "Father of corporate social responsibility" (cf. Carroll 1999, p. 270), proposed a definition of the social responsibilities of businessmen: "It refers to the obligations of businessmen to pursue those policies, to make those decisions, or to follow those lines of action which are desirable in terms of the objectives and values of our society" (Bowen, 1953, p. 6). Two decades after, Dow Votaw (1972) argued that CSR is a set of attributes that has different definitions and approaches.
CSR is still differently difficult to have a unified define that has been accepted by all scholars and managers. Matten and Moon (2004) identify three reasons that explained this conundrum. Firstly, it is relatively compliant application rules that are the spontaneous commitment of firms. Secondly, a plethora of concepts is used synonymously with CSR, and scholars disagree over the extent of their similarity and interchangeability. Secondly, a body of concepts were proposed, but scholars disagree over the coverage of their similarity and interchangeability. Finally, employing CSR activities depended on the specific regional and context approaches.
However, the most often cited definition of CSR is Carroll's model (1979) which designed a four-part conceptualization including economic, legal, ethical, and philanthropic responsibilities. In this study, we use Carroll' model to assess the firm's involvement in CSR. Figure 1 shows the conceptual model of this research.

2.2. CSR and banking sector

The consumers' assistance being dynamic help development of companies may be influenced by CSR initiatives of a company. On the other hands, CSR activities of a company can gain a competitive advantage, not just establishing positive reputation but also strengthening its brand name (Papadopoulos et al., 2011). When using financial services clients always feel risky, therefore banks create a responsive image is one of the ways to build customer's trust. The study is conducted to assess the affect of CSR on making decision of customers in selecting a bank. In addition, financial products and services are widely spread among Vietnamese consumers, and individuals show a great implication in their using service.
The fact that there are many kinds of consumers's assisitance such as speak well of company, willing pay little more to buy company' product, purchase intension (PI), and Corporate Evaluation (CE) and so on. Actually, consumers think on ethical aspects of enterprise when making purchasing decisions as a important purchasing criterion (Auger et al., 2008; Carrigan, Szmigin & Wright, 2004; Creyer & Ross, 1997). The price that consumers are willing to pay for a company's product can be showed that a sign that consumers approve or disapprove of a company (Creyer & Ross, 1997). Nonetheless, negative CSR information has a much stronger effect on the evaluation than positive news (Biehal & Sheinin, 2007; Brown & Dacin, 1997; Marin & Ruiz, 2007; Sen & Bhattacharya, 2001). Actually, consumers tend to assess a company which has similar characteristics with him or her as higher. The more consumers identify

themselves with a company, the more positively they assess it. However, there are many kinds of consumer' support, purchase intension (PI) and Corporate Evaluation (CE) have important roles and impact directly on company. Since, in this study, we concentrated on PI and CE deputising for consumer' response.

2.3.Consumers' Perceived and Trust of CSR

The perception CSR of consumers just shows the interest of consumers to CSR. Responsive behaviours only appear when consumer perceives company implementing CSR activities which conform to characteristic consumers. According to Till and Nowak (2000), it is important to fit the customers, brand and cause. Fit was defined as a perceived link between the company's image, positioning and target market and the cause's image and constituency (Varadarajan and Menon, 1988). When considering greater fit, consumers can feel a positive link between them and companies.
According to Ricks (2005), Sen and Bhattacharya (2001), and Becker-Olsen et al., (2006), when finding out and seeing companies' CSR initiatives through actual actions and media, consumers memorise in short-term which helps to recode in long-term. Therefore, the extend of consumers' perceived impact on support to companies.
H1: Consumers' perceived CSR has a positive impact on consumers' trust of CSR.
H2: Consumers' perceived CSR has a positive impact on consumer responses to CSR which are H2-a) Corporate evaluation and H2-b) Purchase intention.
H3: Consumers' trust of CSR has a positive impact on their responses to CSR which are H3-a) Corporate evaluation and H3-b) Purchase intention.

2.4.Consumers' awareness of CSR

It is difficult to say that all of people concern about CSR or what CSR is. In the other words, consumers generally have a low level of awareness or do not care about CSR (Pomering & Dolnicar, 2009; Sen, Bhattacharya, & Korschun, 2006). However, when consumers are triggered to concern about social and enviromental issues or what CSR is, it can argued that CSR may lead to positive attitudes and stronger behavioral intentions towards buying products from a socially-responsible company (Pomering & Dolnicar, 2009; Sen, et al., 2006). Hence, the communicating CSR activities is essential to enhancing CSR awareness. In particular, companies have to consider communication channels that have efficency, which help to save money and resources of companies. Because communicating ways are not directly controlled by the corporation but the ways play a major role in CSR communication, as does the type of CSR program (namely institutional, as opposed to promotional) (Pirsch, Gupta, & Grau, 2007; Pomering & Dolnicar, 2009). Therefore, it may be said that
H4: Consumers' awareness of CSR has a positive impact on consumers' responses to CSR which are H1-a) Corporate evaluation and H1-b) Purchase intention.
However, there is a major traditional critical debate about CSR. On the other hand, many consumers believed that CSR as Public Relations (PR) is a company' tool to enhance brand name. According to Verschoor (2008), many studies have found a rather paradoxical gap between what companies say they value and what they actually demonstrate by their actions. Futhermore, while seeing time after time CSR activities, consumers's beliefs initially strengthen. Consumers' trust of CSR is generally defined as consumers' expectation that the company, as a sponsor of CSR program, is willing to keep promise and to fulfill obligations with honesty, goodwill, and non-opportunistic motives (Blomqvist, 1997). As a result, consumers' trust CSR play a mediate role between consumers' perceived CSR and their responses to CSR

2.5.Corporate ability

Besides the values of CSR, the ability of bank is also a determinant in selecting the bank. Corporate ability (CA) association related to the quality of products or services imply companies' expertize in managing the existing product or services and meeting the customer needs while on the other side, CA association related to innovation imply the company's ability to develop a new technology and responded to the changing market demand
Corporate ability (CA) refers to consumers' perception of a company's core competitive ability (Prahalad and Hamel, 1994). It includes a firm's expertize in producing or delivering products or services innovatively (Brown and Dacin, 1997) and the "abstract dimensions that may summarize a number of different attributes of a company" (Berens and van Riel, 2004, p. 56). Therefore, we believed that
H5: Corporate ability has a positive impact on consumers' responses which are H5-a) Corporate evaluation and H5-b) Purchase intention.

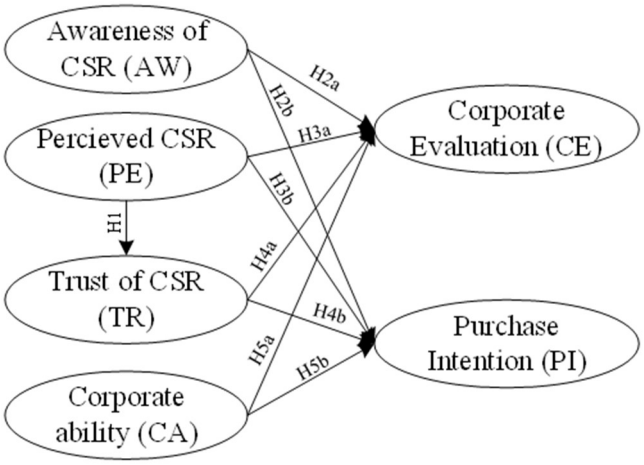


Fig. 1 – Conceptual model

3.METHOD

3.1.Procedure

The research was conducted two phases, a pilot study and a main survey in Ho Chi Minh City. The pilot study was conducted by face-to-face and focus group. Results of pilot study modified the measures which were mainly developed in advanced economies, to make them appropriate for the context of a transitioning market, Vietnam. The main survey was undertaken using face-to-face interviews.

3.2.Sample characteristics

The sample population for this research was composed of the customers of the banks such as JSC Bank for Foreign Trade of Vietnam (Vietcombank – VCB), Vietnam bank for industry and trade (Vietinbank), Bank for Investment and Development of Vietnam (BIDV), Donga Commercial Joint Stock Bank (DAB), Asia Commercial Bank (ACB), Saigon Thuong Tin Commercial Joint-Stock Bank (Sacombank). The survey was conducted in Vietnam including national joint stock commercial banks (VCB, Vietinbank, and BIDV) and the three others (DAB, ACB, and Sacombank). The two groups represent most of major bank in Vietnam. A

total number of 257 questionnaires were acceptable. Some general conclusions that can be drawn from descriptive statistics (see Tab. 1)

Tab. 1 – Descriptive statistics

		Frequency	**Percent**
Gender	Male	122	47.5
	Female	135	52.5
Age	18-25	43	16.7
	26-35	100	38.9
	36-45	67	26.1
	46-55	31	12.1
	>55	16	6.2
Bank	VCB	49	19.1
	Vietinbank	48	18.7
	BIDV	31	12.1
	DAB	44	17.1
	Sacombank	41	16.0
	ACB	44	17.1

3.3.Measurement

All constructs used in research base on prior researches. To measure Perceived CSR construct, we used six items incorporated from Marin et al., (2009), Sen and Bhattacharya, (2001) and Tian et al., (2011). Consumers' trust, including five items, was measured by four items based on Ellen et al., (2006); Osterhus, (1997) and Tian et al., (2011). Consumers' awareness was measured by five items four ordinary items and one reversed item (AW05). All items of consumers' awareness constructs were adopted from Maignan, (2001) and Tian et al., (2011). Corporate Evaluation was measured by four items, which were adopted from Ricks (2005); Weiss et al., (1999) and Tian et al., (2011). All items of corporate ability (CA) were borrowed from Brown and Dacin (1997), Berens et al. (2007), Fatma, M., & Rahman, Z. (2016). Finally, to measure Purchase intention, we used four items scale developed by Berens et al., (2005) and Tian et al., (2011), Fatma, M., & Rahman, Z. (2016).

Five-point Likert scaling (1 strongly disagree and 5 strongly agree) was used for all ordinary items and five-point Likert scaling (5 strongly disagree and 1 strongly agree) was used for all reversed items in this study. The questionnaire was initially prepared in English and then translated into Vietnamese. This procedure was undertaken because many Vietnamese consumers are not able to communicate in English.

3.4.Measurement validation

To assess the measures validation and to investigate the conceptual model and hypotheses, we used CFA and SEM with the data set collected from a sample of 257 Vietnamese consumers in Ho Chi Minh City. The screening process shows that the data exhibited slight deviations from normality. Therefore, maximum likelihood estimation was used (Muthen and Kaplan, 1985).

The final CFA model received an acceptable fit to the data: $\chi^2_{[237]}$ = 366.973 (ρ= 0.000), GFI=0.896, TLI=0.932; CFI=0.941, and RMSEA= 0.046. These findings indicate that the scales measuring Perceived CSR; Trust CSR; Awareness CSR; Corporate ability; Corporate Evaluation; Purchase intention used in this study were unidimensional and the within-method convergent validity was achieved. See Tab.2 for CFA item loadings, composite reliability, and average variance extracted of the scales validated. The correlations between constructs, together with their standard errors, indicate that they were significantly different from unity, thus, supporting the construct discriminant validity (Steenkamp and van Trijp, 1991), (see Tab. 3).

Tab. 2 – Composite reliability, average variance extracted, and standardized CFA factor loading of items

		Factor loading
Perceived CSR: composite reliability rrc=0.834; average variance extracted rave=0.503		
I think X supports pauper in need	PE03	0.664
I think X's socially responsible actions have a significant impact on society	PE04	0.766
I think X company took a lot of effort to be socially responsible	PE05	0.691
I think X contributes to the recovering from the economic crises	PE06	0.797
I felt X is a socially responsiple bank	PE07	0.614
Trust CSR: composite reliability r_{rc}=0.847; average variance extracted r_{ave}=0.581		
I trust X feel morally obligated to help	TR01	0.786
I trust X has a long-term interest in the community	TR02	0.75
I trust X's owners or emploees believe in this cause	TR03	0.708
I trust X wants to make it more comfortable for consumers who care about the CSR to support it	TR04	0.801
Awareness CSR: composite reliability r_{rc}=0.809; average variance extracted r_{ave}=0.514		
Are you aware of any initiative, your banks is involved in, which are aimed at improving the environmental condition.	AW01	0.698
Are you aware of any initiatives your bank is involved in, which are aimed at improving the social conditions in the community.	AW02	0.772
I felt responsiple to support social problems	AW03	0.7
I pay attention to some social issues involving firm's charitable donations	AW04	0.696
Corporate ability: composite reliability r_{rc}=0.85; average variance extracted r_{ave}=0.561		
This bank has expertise in the area of financial services	CA01	0.798
This bank has skills in what they do	CA02	0.696
This bank offers a wide range of financial products	CA03	0.823
This bank satisfy the customer needs	CA04	0.666
Corporate evaluation: composite reliability r_{rc}=0.835; average variance extracted r_{ave}=0.509		

I think X is a trustworthy bank	CE01	0.704
I think X is a successful bank	CE02	0.664
My opinion about X is beneficial bank	CE03	0.744
I think X is an honorable bank that benefits society	CE04	0.738
Purchase intention: composite reliability r_{rc}=0.745; average variance extracted r_{ave}=0.493		
I shall continue considering this one as my main bank/ saving bank in the next few years.	PI01	0.672
I would keep being a customer of this bank/saving bank even if another entity offered better rates.	PI03	0.728
I would recommend this bank if someone asked my advice.	PI04	0.706

Tab. 3 – Correlations between constructs

Correlations			**Correlation**	**SE**
CA	<-->	AW	0.052	0.024
CE	<-->	PI	0.039	0.028
TR	<-->	AW	-0.051	0.033
CA	<-->	CE	0.144	0.03
PE	<-->	TR	0.124	0.037
PE	<-->	AW	0.033	0.026
CA	<-->	PE	0.006	0.025
CE	<-->	PE	0.022	0.028
PI	<-->	PE	0.053	0.029
CA	<-->	TR	0.067	0.032
CE	<-->	TR	0.019	0.035
PI	<-->	TR	0.077	0.036
CE	<-->	AW	0.079	0.028
PI	<-->	AW	0.013	0.026
CA	<-->	PI	0.033	0.025

3.5.Hypothesis testing

Structures model results was display in Tab. 4. The results support to hypothesis H1, H5a (at $p<0.01$), H2a (at $p<0.05$), and H4b (at $p<0.10$). All correlations were shown significant positive correlations. This suggests that the results meet what was expected initially.

Tab. 4 – Unstandardized structural paths in the model

Hypothesis	Structural path			Estimate	S.E.	C.R.	P
H1	TR	<---	PE	0.329	0.094	3.496	***
H2a	CE	<---	AW	0.161	0.076	2.127	0.033
H2a	PI	<---	AW	0.031	0.077	0.404	0.686
H3a	CE	<---	PE	0.038	0.069	0.553	0.58
H3b	PI	<---	PE	0.093	0.072	1.297	0.195
H4a	CE	<---	TR	-0.007	0.054	-0.135	0.892
H4b	PI	<---	TR	0.095	0.057	1.675	0.094
H5a	CE	<---	CA	0.43	0.085	5.04	***
H5b	PI	<---	CA	0.079	0.077	1.031	0.303

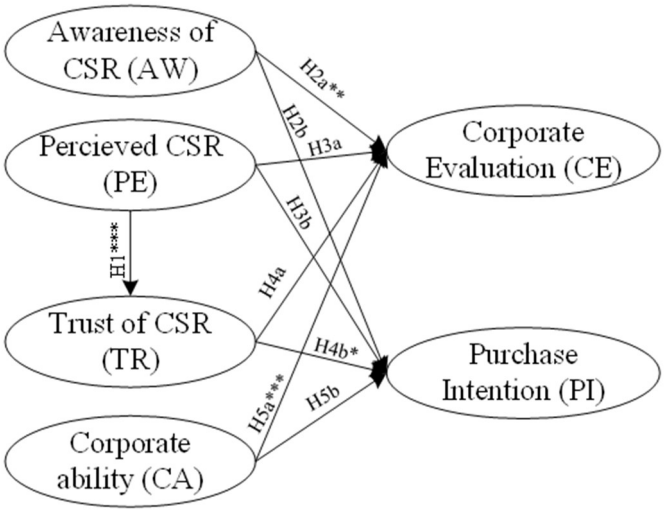


Fig. 2 – Structural equation model results.
ns: Not significance.
***: $p < 0.01$; **$p < 0.05$; *$p < 0.1$.
Notes: Squared multiple correlations; $\chi 2$ (240) = 377.635 (p = 0.022); GFI = 0.894; CFI = 0.938; TLI = 0.938 RMSEA = 0.047

From the results of the analysis in Tab. 4, there are a total of nine hypotheses to be tested with only four hypotheses supported and five other hypotheses not supported. Hypothesis H1 is supported meaning when consumers find that banks are carrying out CSR activities, they believe that those activities are out of the desire to support the community in the long run. The banks are be confidenced when they spend a lot of resources on CSR activities because the customers will be aware of and believe in those activities. The H2a hypothesis is supported by the fact that when consumers are aware and knowledgeable about CSR activities, they will care and appreciate the image of the bank. In other words, the good image about the bank has come to the minds of CSR interested customers. Hypothesis H4 is significant (at $p < 0.1$) also makes it clear that some clients with their trust in CSR activities will have the purchase intention. Finally, the H5a hypothesis is supported, showing that the core values of banks expressed by the capacity of the banks that affects the bank evaluation by consumers. The rest hypotheses are not supported include: H2b, H3a, H3b, H4a and H5b.

4.DISCUSSION AND IMPLICATIONS

Today, consumers require more and more responsible from companies. However, companies have dynamics to practice CSR because companies spend a lot of resources including finance, time, and human. One of the most important motivations is consumer' support.
The results of Hypothesis 1 show that many people believe in the good motives of banks in CSR activities in the Vietnamese market. This can be explained because the banks selected in the study were large banks that having effective performance and annual report. Consist with expectation, the consumers understood the importance of CSR activities and really appreciated the implementation of CSR enterprises (H2a). This result also shows awareness of the customers about socially responsible practices and adds value to the existing literature. Therefore, it presents a useful reference point for investors in their understanding of social responsibility in the banking industry. In the result, Hypothesis H4b clearly demonstrates that the customer with higher confidence in social responsibility levels of banks will have more intension to deal with the banks. This can be explained from the fact that consumers trust banks more, but the significance of this hypothesis is quite low.
Hypothesis H5a showed that credibility of consumers when they appreciate the corporate that has good capacity. However, consumers did not decide to use the services although they are aware of good ability of the banks. This can be explained by the following three main reasons a) Due to the financial market, especially Vietnamese banks are protected by the government through state-owned banks. Thus, the large banks in Vietnam are offering lower interest rates than smaller banks or their service fee is usually higher than the small banks. Then, consumers will choose the banks that having better fees and better interest rates; b) Banks in Vietnam are concentrated to make a profit through credit sector, not through services, that is the reason why their services are similar; c) At present, through the banks many companies paying monthly salary for employees who required to use the service from the same bank. Nowadays, many banks in Vietnam are trying to make a profit from the service segment when the support of the government is less.

5.LIMITATIONS

There are three limitations associated with this research project. Firstly, few hypothesis was supported showed that the concerns on CSR in Vietnam is still low at the moment. Secondly, this study focused on convenient samples from the customers of the six Vietnamese banks which may limit the generalization of the results. Finally, this research does not take other factors including price of product, kinds of product and so on into account affecting support of consumer.

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A REVIEW ON THE INTERRELATION BETWEEN KNOWLEDGE MANAGEMENT AND HUMAN RESOURCE MANAGEMENT

Nguyen Ngoc Tan

Abstract

The purpose of this article is to present a literature review on the positive relationship between knowledge management (KM) and human resources management (HRM), the two factors that can provide competitive advantages for an organization and make it redefine development strategy. The approach of the article is basically conceptual and descriptive. The article deals with the KM and HMR relationship; the way they are interconnected and supplementary for each other.This article is valuable to organization leadership especially those who are chief knowledge officers or HR managers to be well-aware of this relationship in their institutions and to help them to make full use of it to achieve the institution's goals. The article provides chief knowledge officers and HR managers insight into the significant relationship between KM and HRM.

Keywords: knowledge management, human resource management, interrelation.

JEL: M12, M15

1.INTRODUCTION

In the volatile and dynamic world of modern business, the competition grows ever fiercer. It is the pressure of competition that creates a high rate of innovation, shorter life cycle of products, increased service and enhancement of business efficiency. Under this climate, the only factor that serves as source of sustainable competitive advantages for businesses and helps them excel in comparison with their opponents is human resources (HR). Associating with HR, the concepts of knowledge workers and knowledge-driven performance have been introduced and their importance is being increasingly recognized. The two concepts of HR and knowledge management (KM) have gained increasing scholarly attention worldwide, resulting in growing body of studies. This paper will review the definitions of HRM and KM and examine relevant literature to prove the significant interrelation between them. The paper also puts forward recommendations for future studies.

2. KNOWLEDGE MANAGEMENT DEFINED

2.1 Knowledge defined

The study of the nature and grounds of knowledge – epistemology identifies knowledge is a "justified belief". Nonaka and Takeuchi (1995) enhance this definition by stating that "knowledge is a dynamic human process of justifying personal belief toward the 'truth'".
Meanwhile, Plato, based on the features of knowledge, asserted that knowledge originates from data – raw facts and numbers. Data may carry certain information; however, it is of little value for decision making, planning, or any other action. According to Kidwell, Vander Linde, and Johnson (2000), data only have meaning once they are put into context and once the relations between data and context are understood. Drucker (1999) stated that data become information when they bear purpose and relevance; meanwhile, O'Dell, Essaides, and Ostro (1998) describe

knowledge as "Knowledge is information in action". According to Davenport and Prusak (1998), data can only be transformed into information when the following values are added: contextualization, categorization, calculation, correction, and condensement; and information is transformed into knowledge following the process of comparison, consequence, connection, and conversation. The transformation process is demonstrated by Serban and Luan (2002) in the following graph:

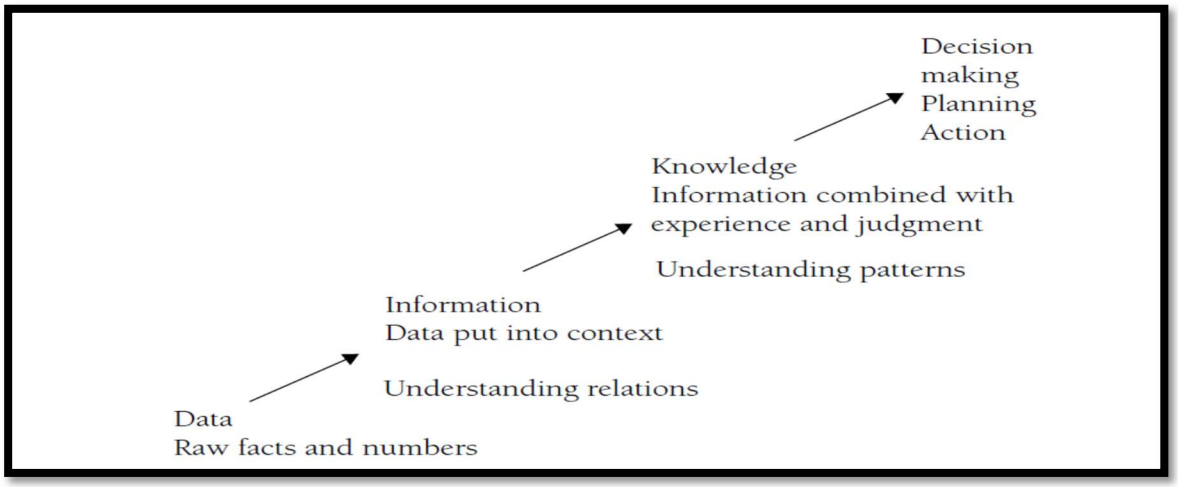


Fig.1 - From Data to Knowledge. Source: (Serban and Luan, 2002)

2.2 Knowledge Taxonomy

The extant literature classifies knowledge in different ways. These include individual vs. collective/group knowledge (Cook and Brown, 1999), tacit vs. explicit (Polanyi, 1958, 1966; Winter, 1987; Nonaka and Takeuchi, 1995), declarative vs. procedural (Anderson, 1981; Quinn, Anderson, and Finkelstein, 1996; Garud, 1997), architectural vs. component (Henderson and Clark, 1990; Matusik and Hill, 1998), and private vs. public knowledge (Matusik and Hill, 1998).

2.2.1 Individual knowledge and collective knowledge

Individual knowledge refers to the knowledge held by individuals. Nonaka and Takeuchi's (1995) said organizational knowledge is 'the capability of a company as a whole to create new knowledge, disseminate it throughout the organization, and embody it in products, services, and systems'

2.2.2 Tacit knowledge and explicit knowledge

Tacit knowledge was defined by Polanyi (1966) as knowledge that is non-verbalizable, intuitive, unarticulated. Tacit knowledge bears context-specific and personal quality, which prevent any effort to formalize and communicate (Nonaka, 1994). By contrast, explicit knowledge is knowledge that can be codified, articulated, and is easy to be communicated through words and numbers, and shared in the form of hard data, formulae, and principles.

2.2.3 Declarative knowledge, procedural knowledge and wisdom

Declarative knowledge (know-what) is knowledge describing facts and events (Anderson, 1981). It can be codified and transmitted without loss of meaning (Garud, 1997). This type of knowledge can be achieved through extensive training and certification (Quinn et al., 1996). Procedural knowledge (know-how) is knowledge about how to perform a task, or the procedures to get a task done. It reflects the abilityto apply the rules of a discipline to complex real-world problems (Quinn et al., 1996).Wisdom (know-why) is knowledge about why things

occur or why things are done in the ways they are done. It is the understanding of the principles and theories underlying something (Garud, 1997).

2.2.4 Component knowledge and architectural knowledge

Component knowledge is the knowledge that relates to 'parts' or 'components', rather than the whole (Matusik and Hill, 1998). Conversely, architectural knowledge is knowledge that relates to the whole. It includes routines and schemas for coordinating the various components of an organization and putting them to productive use. It tends to become embedded in the organization's structure and information-processing procedures (Henderson and Clark, 1990).

2.2.5 Private knowledge and public knowledge

Matusik and Hill (1998) distinguished between private and public knowledge. Private knowledge is unique to a firm, whereas public knowledge is common to many firms.

2.3 Why Knowledge management?

According to Serban & Luan (2002), movement and concept of knowledge management (KM) were forged by corporations in the early 1990s. They believed it to be an organizational systematic effort to synthesize the accumulative knowledge that an institution has. Although KM is a young field, it acquired immense popularity quickly in the business world. Bukowitz and Williams (1999) stated that "knowledgemanagement is a fast-moving field created by the collision of several others, including human resources, organizational development, change management, information technology, brand and reputation management, performance measurement, and evaluation."
Serban & Luan (2002)based the emergence and growth of on: information overload and chaos, information congestion, information and skill segmentation and specialization, workforce mobility and turnover, and competition.These have long been main drivers for improvement and innovation in the business environment.
Technological advance has also attributed to the growth of KM. Though KM does not help define technology, technological developments give support to KM (Hildebrand, 1999; Hayward, 2000.)

2.4 KM defined

According to Gloet and Terziovski (2004), there is no shortage of KM definitions. Depending on the approaches and author's perspectives, the definition of KM is devised accordingly:

Table 1. - KM definitions. Source: Author

No	Authors	KM defined
1	Nonaka and Takeuchi (1995), Wilson and Cattell (2005).	KM is divided into four part viz., knowledge creation, knowledge retrieval, knowledge sharing and knowledge application.
2	Demarest (1997)	Knowledge management consists of five processes: construction, embodiment, dissemination, use, and management.
3	Armistead (1999)	Divides the process of knowledge management into three sub processes: knowledge creation, knowledge transfer, and knowledge embedding.
4	Argote (1999)	Distinguishes between three processes: creating knowledge, retaining knowledge, and transferring knowledge.
5	Darroch (2003)	Knowledge management process consists of three parts: knowledge acquisition, knowledge dissemination, and knowledge utilization.

6	Miller (1999)	Suggests that knowledge management refers to the acquisition of knowledge (capturing); that is, creation, collection, storage, distribution, and application of knowledge.
7	Chen and Chen (2005)	Propose a four-stage model of the knowledge management process that includes knowledge creation, which, in addition to adding new knowledge, includes correction of existing knowledge, knowledge conversion, and knowledge circulation and completion.
8	Chong et al (2006)	Said KM is the synergistic combination of data, which eloquent the skills, expertise and innovative capacity supported by information technology.
9	Meanwhile, Alavi and Leidner (2001)	Defined KM system as an IT based system, which is developed to support and enhance the processes of knowledge creation, storage, retrieval, transfer and application.
10	Diakoulakis et al (2004), Bharadwaj and Saxena (2005), Nowack, et al (2008)	KM is a strategy to manage organizational knowledge assets to support decision making, to enhance competitiveness, and to increase individual capacity for creativity and innovation .This strategy involves people, information, work-flows, best practices, alliances, and communities of practice.
11	Hsu and Shen (2005); Ooi et al. (2010)	Defined KM as a methodological method that enhances the capability of a company to assemble and organize the knowledge in order to improve the decision-making ability and business strategy formulation process.
12	Alrawi (2008)	Knowledge management involves three perspectives emerged, information-based, a technology-based and culture-based.
13	Ho (2009)	KM is result-oriented, process-oriented, technology-oriented, culture-oriented and HR-oriented and supported by four key enablers viz., leadership, culture, technology, and measurement.
14	Hislop (2009)	Describes KM as an umbrella term that captures any deliberate efforts to manage the knowledge of the employees, which can be attained via various methods either directly such as use of particular information communication technologies (ICT) or indirectly through management of social processes and structuring of firms in a particular ways.
15	Plessis (2007),	Defines KM as a planned structure approach to managing creation, sharing, harvesting and leveraging of knowledge as an organizational asset to enhance a company's ability, speed and effectiveness in delivering products or services for the benefit of clients in line with its business strategy.
16	Gloet and Terziovski (2004)	Describe knowledge management as the formalization of and access to experience, knowledge, and expertise that create new capabilities, enable superior performance, encourage innovation, and enhance customer value.

The summary of KM definitions reveals that though various approaches and perspectives are adopted, the authors agree that KM is a structured process of managing knowledge acquisition, knowledge dissemination and knowledge utilization of an organisation aiming at building the employee's capacity, promoting organisational innovation and then organisational performance.

3. HRM DEFINED

HRM is defined in numerous waysfrom simple to complex. Haslinda (2009) asserted that human resources management is the "process of managing human talents to achieve organization's objectives. Fong, Ooi, Tan, Lee and Chong (2011) support this view by describing HRM as the productive use of human resources in achieving the organization's strategic business objectives.

Meanwhile Z. Pawlak (2011) introduced a broader definition of HRM. He believed HRM is a means to implement the personnel function of an organization. Taking into account the interests of both employers and employees, HRMformulates and deploys human resources properly to achieve organisation's objectives.
According to Armstrong & Taylor (2014), human resource management can be defined as a "strategic, integrated and coherent approach to the employment, development, and well-being of the people working in organizations". Boxall and Purcell (2003) defined HRM as "all those activities associated with the management of employment relationships in the firm". Watson (2010) later defined HRM in a more comprehensive way that HRM is managerial utilization of the efforts, knowledge, capabilities and committed behaviors to carry out work tasks in a way which enables the enterprise to continue into the future.
Ivan Svetlik & Eleni Stavrou-Costea (2007) hold that there are two points to remember about HRM: firstly, HRM does not merely manage people; it manages their personal and interpersonal characteristics which are deemed resources, and brings about organizational advantages. Secondly, recruitment and selection are not a pure means to formulate human resources in an organisation, but human resourceis also internally developedby the investment of an organisation into training and nurturing interpersonal and intergroup relations.
By looking into the components of human resource, O'Donnell et al. (2003) said people are often evaluated by the following components: competency, knowledge, know-how, adaptability, network connections and experiences. Among them, Drucker (1999) shares the view that the basic economic resource is no longer capital, natural resource or labor, but knowledge.

3.1 The goals of HRM

As cited in Armstrong & Taylor (2014), the 5 goals of HRM are as follows:

- support the organization in achieving its objectives by developing and implementing human resource (HR) strategies that are integrated with the business strategy (strategic HRM);
- contribute to the development of a high-performance culture
- ensure that the organization has the talented, skilled and engaged people it needs;
- create a positive employment relationship between management and employees and a climate of mutual trust;
- encourage the application of an ethical approach to people management.

Before that, Dyer and Holder (1988) introduced four goals of HRM including contribution, composition, competence and commitment. Guest (1987) suggested that the four goals of HRM were strategic integration, high commitment, high quality and flexibility. And Boxall (2007) proposed that 'the mission of HRM is to support the viability of the firm through stabilizing a cost-effective and socially legitimate system of labor management.'

4. KM and HRM – A POSITIVE CORRELATION

The link between HRM and KM has drawn the attention of researchers, and as a result, there have been many studies conducted in this area. Researchers have investigated, identified and proved the strong correlation between them.
Researchers believed that, for an organization to be knowledge-based there must be a link between HRM and knowledge. This linkage will help enhance the performance, generate the

competitive advantages and lead to the success of the organization. Success will come to an organization if it knows how to incorporate HRM into KM and through HRM practices; it makes knowledge store and share efficiently within the organization. By doing so, the organization can create competent workers which will result in the success of the organization. The rise of knowledge economy has exerted major impacts including the shift from traditional bureaucratic personnel management to HRM over the past few decades. Gloet (2004) is of the opinion that one way for HRM to reinvent itself is through its contribution to effective linkages between human capital management and knowledge management within organizations.
In the knowledge economy where competitive advantage is increasingly based on the successful application of knowledge (Lengnick-Hall & Lengnick-Hall, 2003), the role of HRM needs to expand. The role of HRM is more demanding. It is required to structure organization in the way that can promote knowledge creation and mobilization; to develop an organizational culture and set of HRM policies and practices that harness knowledge and leverage it to meet strategic objectives.
Lengnick-Hall & Lengnick-Hall (2003) said in the knowledge economy, organizations will need HRM that bears a new set of roles that can assist in generating and sustaining organizational capabilities. These new roles include human capital management, knowledge facilitator, relationship builder, and rapid deployment specialist.
Keelan (2003), as cited Quintas (2001), states that KM is about "creating a thriving work and learning environment that fosters the continuous creation, aggregation, use and re-use of organizational and personal knowledge". Organizational knowledge and knowledge management and interconnected and both are largely dependent on human resources. In the present business environment, only by possessing the capability to create new knowledge, does an enterprise has competitive position.
HRM can deal with different aspects; however, the pivotal duty of HRM is that it has to do with the employees. Hence, the role and importance of human resources in knowledge management is undeniable.

Armstrong (2006) list the ways in which HRM can influence KM:

- Help to develop an open culture in which the values and norms emphasize the importance of sharing knowledge.
- Promote a climate of commitment and trust.
- Advise on the design and development of organizations which facilitate knowledge sharing through networks and communities of practice (groups of people who share common concerns about aspects of their work), and teamwork.
- Advise on resourcing policies and provide resourcing services which ensure that valued employees who can contribute to knowledge creation and sharing are attracted and retained.
- Advise on methods of motivating people to share knowledge and rewarding those who do so.
- Help in the development of performance management processes which focus on the development and sharing of knowledge.
- Develop processes of organizational and individual learning which will generate and assist in disseminating knowledge.
- Set up and organize workshops, conferences, seminars and symposia which enable knowledge to be shared on a person-to-person basis.

- In conjunction with IT, develop systems for capturing and, as far as possible, codifying explicit and tacit knowledge.
- Generally, promote the cause of knowledge management with senior managers to encourage them to exert leadership and support knowledge management initiatives.

Jackson et al (2003), in the following chart, show the role of HRM in the linkage with KM in contributing to maintain the competitive advantages of the organization.

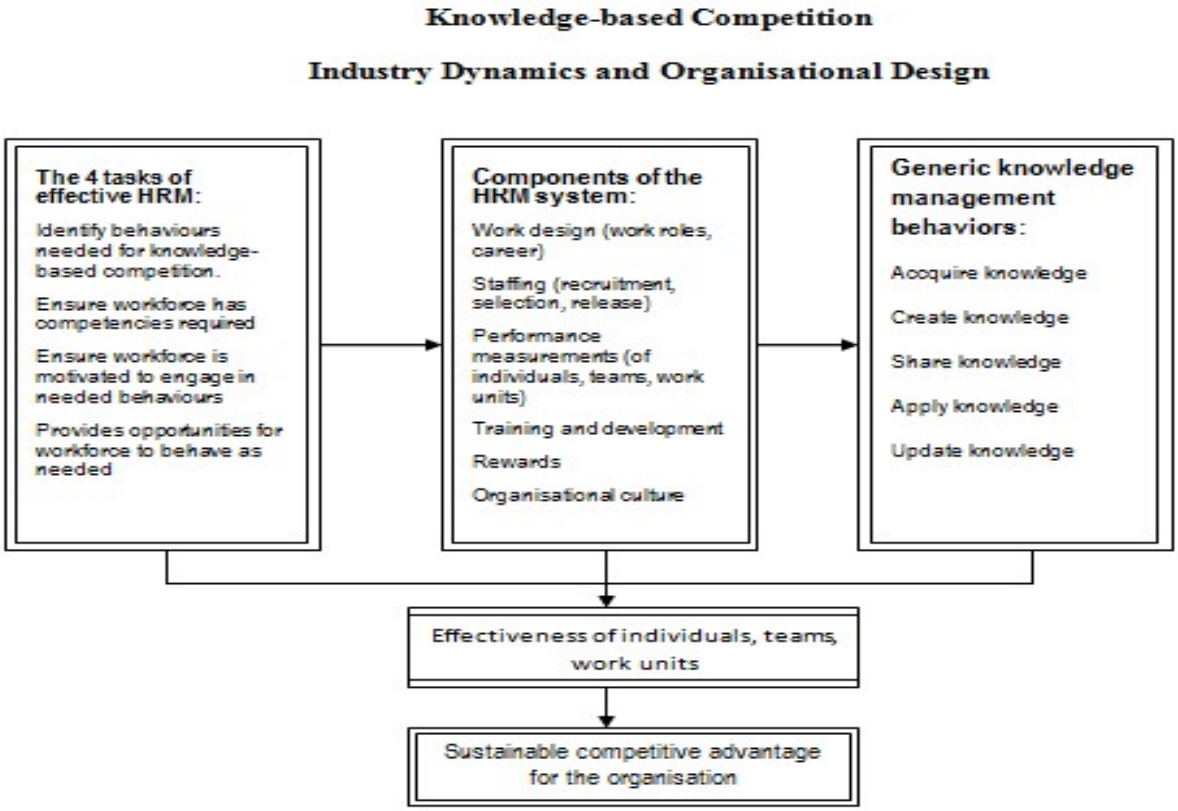


Fig 2. -Human resource management and knowledge management. Source: (Jackson et al, 2003)

From the graph, it can be seen that, all HRM components have their own impact on KM. Together with the increased efficiency of each individual; the whole team and group also contribute to the creation of a sustainable competitive advantage of the business organizations. Researchers have argued that knowledge is dependent on people and that HRM issues including recruitment and selection, education and development, performance management, pay and reward, as well as the creation of a learning culture are essential for managing knowledge within firms (Evans 2003; Carter and Scarbrough 2001; Currie and Kerrin 2003; Hunter et al 2002). A proper knowledge management system can be developed by competent human resources. Employees of an organization are the main means of conveying knowledge, and they should continually improve their qualifications mainly through learning, trainings, coaching and mentoring.

The relation between knowledge management and human resource management is, once again, explained in the figure given below:

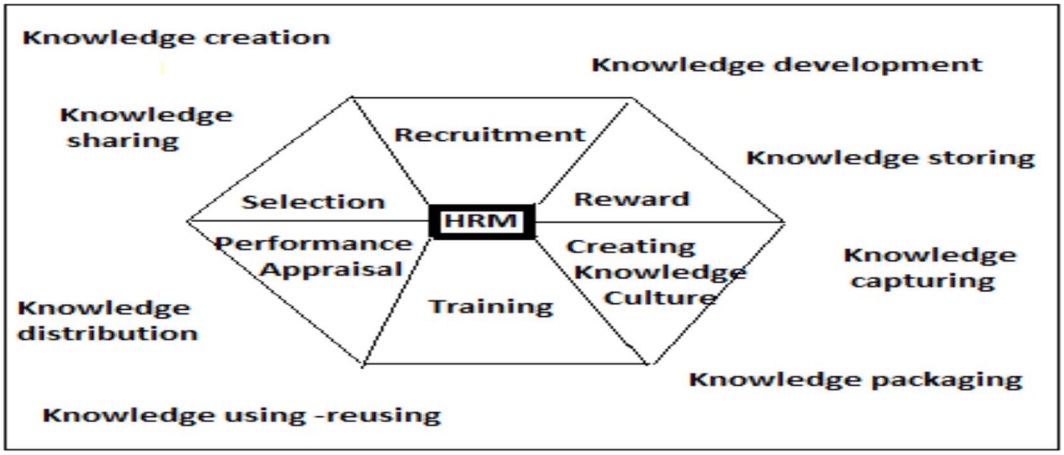


Fig 3. -Knowledge Management and Human Resource Management (HRM): Importance of Integration. Source: (Anupama, M. and Sheeja, K., 2013)

Evans (2003) stated that in order to maximize the opportunities for an improved knowledge management the human resource practitioners need to ensure that each of the practices shown in picture below are consistent with the organizations knowledge goals.

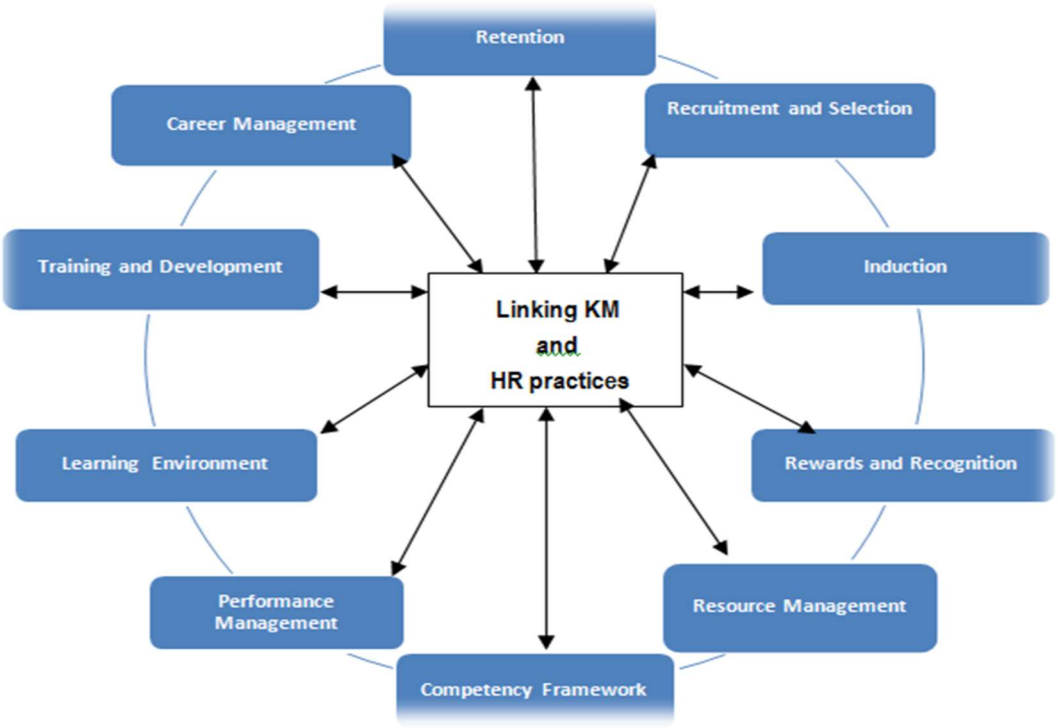


Fig 4. - Linking knowledge management and human resource practices: Source: (Evans, 2003)
Scarbrough & Carter (2000) offered a comprehensive review of the ways in which HRM could be linked to KM.

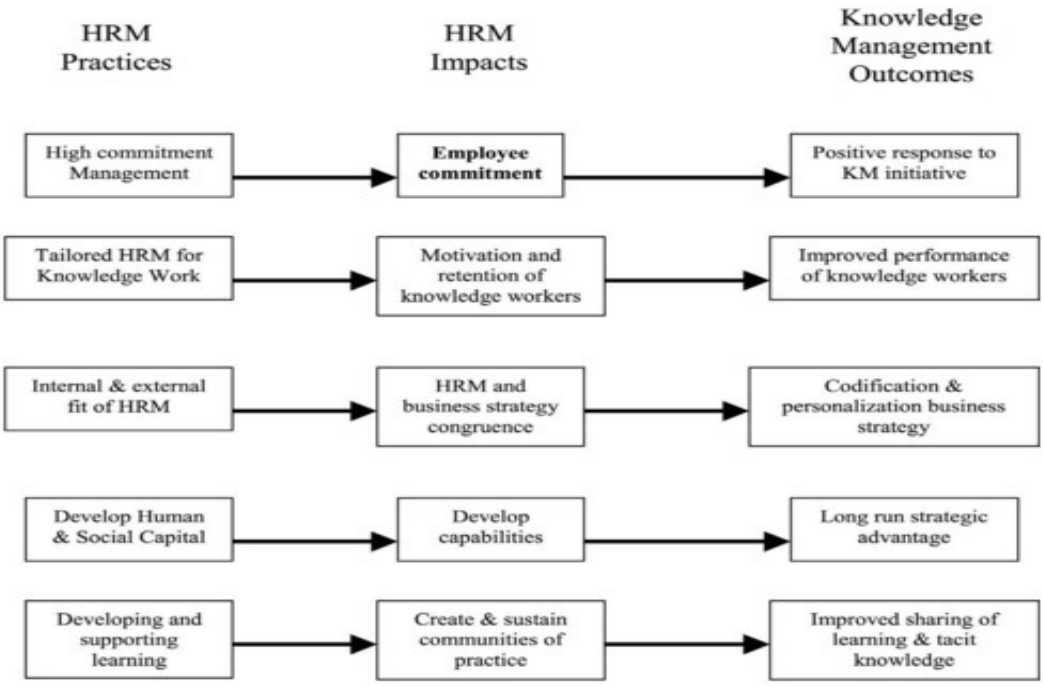


Fig 5. - Comprehensive review of the ways in which HRM could be linked to KM. Source: (Scarbrough and Carter, 2000).

Knowledge is believed to originate and reside in people's mind. It is therefore a "misnomer to say that we manage knowledge. We cannot manage what happens in people's brains, and it is presumptuous to say we can manage people's thought processes" (Koulopoulos & Frappaolo, 2000, p.18). Therefore, HRM, a discipline sharing people-centeredness feature, takes its role in acting as an intermediary and a catalyst. Through HRM practices, knowledge is extracted, mobilized, generalized and shared within the organization to create a dynamic working environment that brings about competitive edges for the organization.

Literature acknowledges that human capital (the combined talents/mindsets, skills and knowledge of employees to provide customer solutions (Saint-Onge, 1996, Stewart, 2001)) has become a pivotal role player in knowledge organizations. To give effect to this role, HR has to perform various roles including that of strategic partner, knowledge facilitator, and HR management expert and change agent.

In order to resolve the staffing needs in a timely manner, HR function must be accustomed to various businesses and processes; acquainted to existing organizational knowledge or skills, informed on the availability and accessibility of the people who possess the required knowledge and where to locate them. This is beyond the mere role of forecasting, staffing, maintenance, training and development. Besides, whenever there is a new move in the organizations' business strategy, HR function will entails advisory role in considering the feasibility of such move based on the inherent knowledge of the internal knowledge base, external knowledge market and the availability of specialized knowledge sources. With that capacity, HR is deemed a strategic partner of KM, a HR expert and a change agent.

It is HR function that reaches people with necessary knowledge and willing to share it. By doing so, HR via its practices must build up an environment of trust, sympathy since "trust can defeat other factors that positively affect the efficiency of knowledge markets. Without trust, knowledge initiatives will fail, regardless of how thoroughly they are supported by technology and rhetoric and even if the survival of the organization depends on effective knowledge

transfer" (Davenport & Prusak, 2000, p. 34). Employee commitment and trust levels are not likely to emerge unless "employees are treated with respect and are provided with job security, a share of the economic benefits, significant opportunities for skills development and substantive participation in decisions" (Porth, McCall & Bausch, 1999, p. 216). Subsequently trust has replaced traditional binding and employment-enforcing contracts, which now need to be reflected in organizational policies and procedures HR needs to understand when, why, where, and how people interact with each other and they should create opportunities to foster empathy and care in organizational relationships. With that capacity, HR is deemed a knowledge facilitator.

Although knowledge management and human resource management are not interchangeable concepts, they are highly inter-related. Knowledge cannot be managed without people and, vice versa. Yahya & Goh (2002) hold that " the focus of KM should rightly be placed on humans themselves, and the impact made by human resource management on KM practices ...The main tasks of HRM are to monitor, measure and intervene in construction, embodiment, dissemination and use of knowledge of employees."

Table 2. Summary of previous studies concerning the interrelationship between KM and HRM

No	Author	Name of the article	Methods	Key findings
1	(Rego, Pinho, Pedrosa, & Pina E. Cunha, 2009)	Barriers and faciliators to knowledge management in university research centres.	Exploratory	People and their interactions in the context of an organizational culture are the crucial ingredients of the knowledge flow. Technology is also an important facilitator, but contrary to what some KM literature suggests, IT is not KM. People and their interactions create knowledge and promote the fl ow of knowledge.
2	(Aziri, Veseli, & Ibraimi, 2005)	Human resources and knowledge management	Review	Human resource management can make an important contribution to knowledge management simply because knowledge is shared between people; it is not just a matter of capturing explicit knowledge through the use of information technology. HR can revise its own systems and practices to ensure that they have a knowledge focus and reinforce the organisation's overall knowledge management goals.
3	(Runar Edvardsson, 2008)	HRM and Knowledge Management	Review	The HRM strategy and the general strategy of a firm make up the general KM strategies. Two were identified in this paper: exploitative strategy and explorative strategy. Both strategies have behaviour effects, which have some impact on the KM process. The exploitative strategy will put greater emphasis on knowledge storage (capturing and packaging knowledge), as well as distributing explicit knowledge via IT solutions. Explorative strategy, on the other hand, places greater weight on knowledge creation, as well as on human interaction to transfer tacit knowledge and use existing knowledge to create new knowledge, i.e. further increased innovation and new working practices.
4	(Tan & Nasurdin, 2011)	Human Resource Management Practices and Organizational Innovation: Assessing the Mediating Role of Knowledge Management Effectiveness	Survey	Training and performance appraisal (2 HR practices), are positively related to knowledge management effectiveness. Knowledge management effectiveness fully mediates the relationship between training and process innovation, training and administrative innovation, and performance appraisal and administrative innovation.
5	(Gloet, 2006)	Knowledge management and the links to HRM: Developing leadership and management capabilities to support sustainability	Conceptual Paper	Through the linkages of KM and HRM practices, the paper provides and suggests means and framework by which organisations can develop leadership and management capabilities to support sustainability across business, environmental and social justice contexts.
6	(Donald Hislop, 2002)	Linking human resource management and Knowledge management via commitment	Review	Show the linkages between KM and HRM by illustrating the fundamenatal centrality of human and social factors in shaping worker's attitudes towards knowledge-sharing initiatives.
7	(Li & Kao Yuan, n.d.)	Managing Knowledge in Human Resource Practices and Innovation Performance	Survey	The study found that human resource practices are positively related to knowledge management. Knowledge management is, in turn, positively related to innovation performance. Further, our results provide evidence that knowledge management plays a mediating role between human resource practices and innovation performance
8	(Chen & Huang, 2009)	Strategic human resource practices and innovation performance – The mediating role of knowledge management capacity	Survey	Findings of the study provide evidence that knowledge management capacity plays a mediating role between strategic human resource practices and innovation performance.

9	(Jimenez-Jimenez & Sanz-Valle, 2012)	Studying the effect of HRM practices on the knowledge management process	Survey	Findings provide evidence of a positive relationship between the adoption of a knowledge-oriented HR system and each of the knowledge management processes, but also show that the HRM practices comprising that system have different effects on the knowledge management processes.
10	(Iqbal, Toulson, & Tweed, n.d.)	The role of HRM practices as benchmarks in knowledge management: An empirical study	Impirical study	The results show that HRM practices and perceived organisational support influence knowledge sharing behaviour and can facilitate the removal of knowledge sharing barriers, thus enhancing asset value.

5. DISCUSSION

If HRM is about managing and developing people; and if people's most valuable resource is knowledge, then HRM and KM are interconnected and interrelated. From this perspective, HRM and KM share common goals and activities especially when forming up teams, groups and work units that require cross-functional cooperation, smooth flow of communication and networking.

By looking at the nature and comparing between KM cycle and HRM practices, we can find those two concepts share a great deal. Knowledge acquisition and knowledge creation is about staffing, recruitment and retaining talented people and about helping them learn and grow as individuals and as professionals. It is also about encouraging employees to participate in professional networks and communities of practice that extend beyond organizational boundaries (Wenger et al., 2002). Meanwhile, knowledge creation is achieved by creating a supportive environment for employees when they are challenged by the organizational problems. They will create knowledge by searching for the problems' solutions and innovate. Knowledge workers and professionals will be motivated by stimulating remuneration and other systems of encouragement. Investment in the training and development of human resources is also a mean of knowledge creation. Knowledge sharing deals with learning, creating a knowledge sharing climate, building trust among employees, establishing of training units which assess and analyze training needs, providing and evaluating training and heading towards learning organizations. Last but not least, knowledge utilization is about the deployment of human resources through remuneration systems, performance appraisal, proper leadership and division of tasks and responsibilities.

This bears managerial implications. Insight into the significant relationship between KM and HRM is valuable to organization leadership especially those who are chief knowledge officers or HR managers to be well-awared of this relationship in their institutions and to help them make full use of it to achieve the institution's goals.

Though the two concepts are not interchangeable, HRM and KM are certainly highly inter-connected. KM is more multifaceted than HRM because it involves managing intellectual property rights and the development and transfer of individual and organizational know-how (Teece, 2000). Nevertheless, knowledge cannot be managed in a void – without people – and the other way around. Therefore, the two disciplines are not only inter-related but also highly interdependent.

6. CONCLUSION

In shorts, harsh competition in contemporary market makes organizations struggle to create and maintain competitive advantages. From the reviewed literatures we can see that competitive edge can come from various sources, however, the major ones are KM and HRM and those sources are inter-connected. KM has increasingly surged to become a leveraging mechanism, providing an important competitive edge within organizations. KM deployment will help support continuous learning within the organization in order to improve the ability to cope with constant changes in the market. Eventually, KM is seen as an intentional approach aimed at eliciting required knowledge from knowledgeable people, sharing it with appropriate people at

the right time and putting that knowledge into action to improve organizational performance. KM is a complex process affected by several variables both within and outside the organization. KM initiatives will fail without the coordinating role of HRM. By bringing into full play the roles of KM and HRM, organization will survive and maintain sustainably its competitive advantages and excel in the market.

7. LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

This is a review article and there is still a need for quantitative research providing quantifiable measurements. The positive relationship between KM and HRM need to be proved in a more specific context.

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FACTORS AFFECTING ENVIRONMENTAL MANAGEMENT ACCOUNTING: A CASE OF COMPANIES IN VIETNAM

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Abstract

This study investigates the influence of corporate characteristics on environmental management accounting (EMA) in Vietnam. The study survey 120 companies and receive 87 complete responses (72.5 per cent response rate). There are four corporate characteristics which are examined: environmental sensitive of industry (IND), company size (SIZE), ownership status (OWN) and EMS adoption (EMSA). Results show that environmentally sensitive industry membership, company size, and ownership status influence the extent of EMA implementation. The findings can assist managers to understand the drivers of EMA, and policymakers to take note of them in encouraging firms to engage in EMA to build environmentally-friendly businesses.

Keywords: Environmental Management Accounting; SME; accounting practices

JEL Classification: Q56

1. INTRODUCTION

Vietnam has shown improvements in environmental performance in the last decade but is ranked as 131 out 135 countries for environmental performance (1 being the best and 135 being the worst) (Hsu et al., 2016). Ts and Quy (2011) point out that the industrialisation and modernization of developing countries like Vietnam can increasingly contribute to environmental pollution at an alarming rate. The neglect of addressing these environmental issues can contribute to the lack of clean water, increased social services and cost, and flooding, traffic congestion, air, noise, water and solid waste pollution. The greatest harm of all is that the environmental pollution can adversely affect human health. Although there are no clear statistics in Vietnam, there is evidence elsewhere across the world that the number of people affected by environmental pollution has been increasing, and this is due to worldwide industrialisation, and particularly relevant to the economically growing Asian continent. In fact over the past two decades, the number of deaths associated with air pollution has increased while due to unsafe water has decreased (Hsu et al., 2016). Especially in developing countries, the urban and rural areas, and industrial parks have not had treatment system for sewage, solid waste, domestic water which has a negative impact on the environment. According to the research conducted by Anh, Kroeze, Bush, & Mol (2010), only 3% of urban sewage was treated (2008), 100% of cities investigated in the study had no focused wastewater treatment systems, and only 20 of 82 industrial parks had wastewater treatment system. Most untreated wastewater in urban areas and industrial parks is discharged directly into rivers, ponds and lakes. Land degradation is also a big problem for Vietnam.

In recent years, many companies which have not had the good policy and consciousness have caused much damage to the environment and even the company itself due to the compensation for the damage. In 2016, Formosa Ha Tinh caused serious sea pollution which causing mass fish death in four provinces in Central region and suffered a loss of $ 500 million. In 2009, Vedan Company caused 80% -90% pollution of Thi Vai River, Dong Nai Province when

directly discharging of untreated wastewater into rivers. As a result, Vedan was fined 267.5 million dong for offense violation and paid 127 billion dong for environmental protection tax. In 2010, Pangrim Neotex was detected not operating wastewater treatment system that discharged directly 2,000-2,200 m^3 of untreated wastewater into the Red River so the company was fined 370 million dong.

A country that is keen to solve the environmental pollution requires appropriate policies and strategies, and environmental accounting is one tool that is designed to reduce the risk of environmental harm, not only for organisations but also for nations (support with a reference here).

Environmental accounting is a useful tool that provides information about environmental activities in companies, for example, helping manage costs of environmental treatment and protection, addressing the consequences of environmental pollution, and quantifying and solving expected external factors. Environmental accounting has developed in many countries around the world, but its application has been still new to Vietnam. Although some production companies in Vietnam has examined environmental issues using environmental accounting tools, many other companies have not (Viere, Schaltegger & Von Enden, 2007).

"EMA is the management of environmental and economic performance through the development and implementation of appropriate environment-related accounting systems and practices. While this may include reporting and auditing in some companies, environmental management accounting typically involves life-cycle costing, full-cost accounting, benefits assessment, and strategic planning for environmental management."

According to UNDSD, (2001) "EMA is the identification, collection, analysis and use of two types of information for internal decision-making: material information on use, flow and disposal of energy, water and raw materials (including waste) and monetary information on cost, profit and savings related to the environment."

Hence, EMA becomes the formation, analysis, and use of financial and nonfinancial information to integrate the company's environmental and economic policies and build a sustainable business.

It can be seen from the above-mentioned concepts that EMA is integral to management accounting. EMA is the management of environmental and economic performance, analysis, and use of physical and monetary information (or financial information, non-financial information) to improve performancce and contribute to the company's decision-making.

This paper will clarify factors affecting EMA from which administrators can plan environmental policies and build their sustainable business strategies in Vietnam.

Therefore, the study will answer two questions in order to meet the above objectives: one, "What extent do enterprises implement environmental management accounting in HCMC?" and two, "Do corporate characteristics influence on the extent of the EMA implement? "

2. LITERATURE REVIEW

2.1 Management Accounting

There are two main accounting systems: financial accounting and management accounting. Financial accounting provides financial information of the business for internal and external in the form of financial statements. Management accounting provides information to the manager in making decisions so that businesses can operate effectively.

"Management accounting is a science that collects, processes, and provides quantitative information about business activities in a specific way. It supports managers in decision-making processes ralating to make planning, organize implementation, inspect, control and evaluate the unit performance."(Nguyen Thi Tien, 2014)

2.2. Environmental accounting system (EAS)

According to the developing the environmental accounting system researcher of the Ministry of Environment Japan (2000), "Environmental Accounting System (EAS) is a business administration mechanism that allows enterprises to measure, analyze and synthesize the costs and effectively environmental protection (in monetary units and physical units) in the business process to improve the natural environment protection effectively and maintain a friendly relationship with the social community on the principle of sustainable development."

2.3. Environmental Management Accounting (EMA)

"Environmental management accounting is the formation, analysis and usage of financial and non-financial information to integrate the enterprise's environmental, economic policies and develop sustainable business," said Matteo Bartolomeo (2000).
Environmental management accounting is examined in two perspectives: accounting work and environmental management work. Environmental management accounting supports internal decision making in business operation with aiming to improve both financial performance and environmental performance. At the same time, EMA also provides common cost information, related-environmental cost information and becomes the basis for providing information to the relevant parties such as banks, financial institutions, environmental management agencies, residential communities...
Environmental management accounting has brought significant benefits to businesses and the community, such as saving costs, improving the competitive ability, satisfying and strenthening stakeholder trust.

2.4. Prior studies

Mokhtar et al., (2016) studied the extent of EMA implementation in Malaysian public listed companies. They hypothesized that environmental sensitivity, scompany size, ownership status, EMS adoption, and the proportion of non-executive directors in the company can influence EMA implementation. The survey questionnaire based on Likert scale was used and sent to 801 chief financial officers of the company. Using 78 usable questionnaires, the study showed that only the company ownership affected the extent of EMA implementation. Authors noted that these companies placed more emphasis on environmental cost than the measurement and integration of environmental information into management accounting system. They also pointed out that publicly listed companies placed more emphasis on complying with environmental regulations rather than using EMA information for performance management, control and report.
Zuriana, Jamil, Mohamed, Muhammad, and Ali (2015) investigated factors and barriers which influence the practice of EMA in Malaysian small medium manufacturing firms. They investigated three types of organizational pressures affecting the EMA implementation; coercive pressures, mimetic pressures and normative pressures. This research has used a survey questionnaire to collect data, and has used a regression model to analyze the correlational relationship. The questionnaires were sent to 350 managers of the companies, but only 32 responses (9%) were collected and used for the analysis that has diminished the validity of findings. Research results however, has indicated that only coercive pressures positively influenced the EMA implementation. The coercive pressures developed by the government have led companies to implement the EMA. The study also showed that the main barrier in the EMA implementation by these manufacturing firms was financial problems. In addition, lack

of environmental knowledge and skills also limited the integration of environmental issues into the accounting system. The financially stressed companies, therefore would find difficult to collect, identify, analyze and evaluate the environmental data effectively.

Namakonzi and Inanga, (2014) explored what actions, if any, manufacturing industries in Uganda were taking to enhance effective environmental management, and the extent to which environmental management accounting (EMA) was applied, as well as economic challenges they face in implementing EMA to achieve effective environmental management in their organisations. The study used quantitative and descriptive statistical methods. The study sent 60 questionnaires and received 30 questionnairesfrom their sampling frame of accountants, management accountants, and financial planners in companies. The usable questionnaire sample included 13 companies in manufacturing industries ranging from construction, plastics, to packaging. Of the 30 companies, 21 companies had ISO 9000/1400 certificate. The majority of companies only had certificate of ISO 9000. The results showed that some of the manufacturing companies in Uganda has implemented EMA. The qualitative analysis of these manufacturing companies' responses showed that they resolved serious environmental problems by adopting internally developed environment policies. These firms also indicated that they had appointed staff members to take responsibility for environmental management with a purpose of achieving an effective environmental management. Those manufacturing companies engaged in EMA have understood the roles and benefits of EMA, were using EMA information to determine and allocate costs related to the environment. Most companies had to bear the cost of reducing pollution, waste management and monitoring, and they did not pay the environmental tax because it was not applied. The study also revealed the challenges facing these companies, and biggest challenge for these companies were the identification, separation and measurement of environmental protection costs; other challenges included difficulties to access with environmental management technology, limitations in knowledge and training, and corruption. These factors are common in most of developing countries which can hinder the achievement of effective environmental management.

Ribeiro and Aibar-Guzman, (2010) examined the factors that influenced EMA practice of companies in Portugal. The study tested three hypotheses: Environmental accounting was related to company size; environmental accounting was related to the implementation of environmental accounting standards; environmental accounting was related to the extent environmental management has been implemented. Sixty two of 205 entities surveyed (30% response rate), responded. The results showed that company size and the extent to which environmental management has been implemented by companies had a positive impact on the implementation of environmental management accounting of companies in Portugal.

Frost and Wilmshurst, (2006) studied the characteristics of industries with environmental sensitivity in the implementation of an EMA. The study identified environmentally sensitive industries as mining and resources, chemicals, and oil and gas. Survey questionnaires were sent to top 500 Australian listed companies. The respondents were CFOs of the companies who had knowledge of issues relating to environmental accounting and environmental issues incorporated in the accounting system. 398 of 420 survey questionnaires were collected, but only 88 usable questionnaires were found. Of them, 42 of 88 surveyed companied operating in industries of environmental sensitivity. The results showed that environmentally sensitive companies were more likely to implement environmental management accounting and disclose environmental information.

Frost and Seamer, (2002) investigated the relationship between the development of environmental management measures and levels of environmental information in the annual report. In addition, the study also examined the extent of information disclosed and management practices. Study data were collected from two sources. The first source was survey questionnaires sent via post office. The second source was annual reports of public entities in

New South Wales from 1996. The survey questionnaires were sent to 137 chief executive officers. 76 of 137 respondents were used. The study results showed that the environmental management measures taken by companies were significantly related to environmental information in annual reports. In addition, the study also revealed that there was no strong relationship between environmental management system and environmental information in annual reports which indicated the environmental information in annual reports associated with management system more closely than the accounting system.

3. RESEARCH METHOD

3.1 Questionnaire Design

This study collected data using a survey questionnaire, and we designed the questionnaire guided by previous relevant studies (Frost and Seamer, 2002, Frost and Wimshurst, 2000, Ribeiro and Aibar-Guzman, 2010, Norsyahida Mokhtar, 2016). The questionnaire has two parts. Part I contains questions about corporate characteristics. Part II contains questions about the extent of EMA implementation by the surveyed firms.
We ran a pilot study using three accounting lecturers and three accountants to check errors and revise relevance of questions. The researchers used their recommendations to modify the survey questionnaire.

3.2 Sample

We sent the survey questionnaires by postto 120 Chief Financial Officers (CFOs) in 120 companies. The survey lasted for three months from April, 2016 to June, 2016. The researchers collected 107 responses (89.2%), with 87 valid responses (81.3%) by using Google Forms to create an online survey form and sending the survey link to the selected businesses through email. Before that, however, we had investigated the situation of the enterpises to ensure having related-environment businesses therein. A list of companies is available from the Business Information Database (https://thongtindoanhnghiep.co/) website and through the alumni of Faculty of Accounting at Ton Duc Thang University who has working at the enterprise to support the survey accomplishment.

4. MEASUREMENT OF VARIABLES

4.1 Dependent Variable – The Extent of EMA Implementation

Based on Mokhtar et al., (2016), we measured the extent of EMA implementation using three perspectives.
(1) Environmental information within management accounting systems (INC),
(2) Stand-alone environmental accounting procedures (STA),
(3) Environmental cost - benefit analysis (ECA).
According to Mokhtar et al., (2016) score of the extent of EMA implementation is calculated by overall mean score of each of the valid observation variables. A high EMAI score has higher extent of EMA implementation.
With EMAI scores, companies are grouped into three social issue life cycle phases: Policy, learning and commitment. The cut-off points are defined carefully to reflect the characteristics of the social issue life cycle theory. And the author emphasized this measure was self-developed and not used in the previous documents, but the procedures were planned carefully to suit the analysis purpose of the research. With the answers to scale of extent of EMA implementation

based on 5-point Likert scale (1-5), companies had mean pscore of 3.6 or greater were classified as Commitment meaning having high extent of EMA implementation, mean score between 2.0 and 3.59 were classified as Learning stage, represent the extent of EMA implementation was in moderation, and mean score less than 2.0 were classified as Policy stage, meaning that the extent of EMA implementation of the company was low. Table 1 shows social issue life cycle phases reflecting values ranging from 1 to 3 as follows:

Tab. 1 – Cut-off Point of Social issue life cycle phase

Social issue life cycle phase	Cut-off Point
Policy = 1 Learning = 2 Commitment = 3	EMAI Score ≤ 2.00 (Low extent) EMAI Score from 2.01 to 3.59 (Moderate extent) EMAI Score ≥ 3.60 (High extent)

4.2 Independent Variables – Corporate characteristics

To examine factors affecting the extent of EMA implementation, corporate characteristics were measured as follows:

Tab. 2 – Measurement of independent variables

Corporate characteristics	Abbreviated	Measure
Environmental sensitive of industry	IND	Sensitive = 1; Less-sensitive = 0
Company size	SIZE	Large = 1; Small and medium = 0
Ownership status	OWN	GLCs = 1; Non-GLCs = 0
EMS adoption	EMSA	Adopted EMS =1; Not adopted EMS =0

- IND: to consider whether companies in such industries affect the environment or not. The respondents were asked to indicate the industry based on the industries which the researchers viewed in the study by N.Mokhtar (2016), Frost and Wilmshurst (2000) including two types, environmentally sensitive (construction, processing industry, manufacturing, chemicals, petroleum, gas distributors, transport and storage, wood manufacturing and textiles) and less environmentally sensitive (trading/services, communications, consumer goods, technology, financing, and real estate).
- SIZE: according to the World Bank, company size is based on the number of employees, the small and medium-sized companies own equal or less than 300 employees meanwhile big companies own more than 300 employees.
- OWN: companied are viewedunder the two forms: Government-linked companies (GLCs) – the state owns all shares or join capital to dominates the company's activities; and, non-GLCs - other types of companies.
- EMSA: considering whether companies adopt environmental management system and whether such system is certified or not, for example, a certificate of environmental testing/quality such as ISO 14001 or 9001:2008.

5.RESULTS

5.1.Principle Components Analysis (PCA) và Cronbach's Alpha

To assess the validity of the scale, the study conducted PCA on 29 observed variables. Since there are only 41 companies in environmentally sensitive industry, only 41 these companies

were included in the analysis. Mokhtar et al., (2016) used factor loading from 0.6 for 35 samples. This study with sample size smaller than 41 samples, the observed variables have factor loading greater than 0.6 and the difference of at least 0.1 in factor loadings between factors were retained. Based on these two criteria, 8 items, INC7, STA2, STA4, STA5, STA9, STA11, ECA2, ECA9 were eliminated.
The PCA was repeated with the remaining 21 observed variables. Table 3 summarizes the results. KMO measure of 0.823 (>0.5) and the Bartlett test of X^2 (210) = 783.173, p = 0.000. Four components with eigenvalues >1 explained 76.581% of the variance. The percentage of the variance is explained as follows: factor 1 (eigenvalue = 12.007) explained 57.176% of the variance, factor 2 (eigenvalue = 1.822) explained 8.677% of the variance, factor 3 (eigenvalue = 1.250) explained 5.951% of the variance and factor 4 (eigenvalue = 1.003) explained 4.777% of the variance. The factors loadings for most items were above 0.6. All 21 observed variables were retained. The reliability of these measures demonstrated a high level of reliability, with Cronbach's alpha value above 0.8.

Tab. 3 – PCA (rotated component matrix) for EMAI scale. Source: own processing in SPSS 20.0

Items	Factor loadings*			
	1	2	3	4
INC1 Costing system	0.796			
INC2 Budgeting system	0.768			
INC3 Capital budgeting and expenditure	0.770			
INC4 Investment appraisal	0.728			
INC5 Performance measurement and appraisal	0.704			
INC6 Internal reporting	0.763			
STA1 Waste, emissions and effluents	0.739			
STA6 Pollution	0.751			
STA7 Land remediation	0.775			
STA8 Environmental contingent liabilities	0.702			
STA10 Compliance costs of environmental regulations	0.770			
ECA8 Site contamination	0.669			
ECA3 Recyclable containers/packaging		0.782		
ECA4 Waste management		0.774		
ECA5 pollution minimization		0.850		
INC8 Purchasing policy			0.756	
ECA6 Environmental contingent liabilities			0.838	
ECA7 Environmental compliance			0.797	
INC9 Plant maintenance				0.616
STA3 Energy usage				0.765
ECA1 Energy efficiency				0.804
Eigenvalue	12.007	1.822	1.250	1.003
Percentage of variance explained	57.176	8.677	5.951	4.777
*Values less than 0.6 were eliminated				

5.2 Characteristics of responding companies

Table 4 shows the characteristics of the responding companies. Of total 87 responding companies used, 41 companies (47.1%) are in environmentally sensitive industries, 46 companies (52.9%) are in environmentally less sensitive industries. Regarding company size, small companies with the number of employees 10 through 50 were 31 companies (35.6%),

medium companies with the number of employees 50 through 300 were 38 companies (43.7%), and large companies with the number of employees above 300 were 18 companies (20.7%). Regarding ownership status, 71 companies (81.6%) were non-GLCs and 16 were GLCs (21.8%). It can be seen that the majority of companies did not adopt EMS and only 19 companies adopt EMS (21.8%), of which 9 companies (10.3%) have it certified ISO 14001, 5 companies (5.7%) have it certified ISO 9001: 2005 and 3 companies (3.4%) have it certified HACCP/ISO 22000.

Tab. 4 – Characteristics of responding companies. Source: own processing in SPSS 20.0

N=87	Frequency	Percentage
Environmentally sensitive industry (IND): Environmentally sensitive Less environmentally sensitive	 41 46	 47% 53%
Company size (SIZE): Small and medium Large	 69 18	 79.3% 20.7%
Ownership status (OWN): GLCs Non-GLCs	 16 71	 18.4% 81.6%
Adoption of EMS (EMSA): With certificate None	 19 68	 21.8% 78.2%

5.2.The Extent of EMA Implementation

Table 5 summarizes descriptive statistics of 21 observed variables for extent of EMA implementation. Overall mean 2.60 shows the extent of EMA implementation of companies is not high. Analysis of cost - environmental benefit (mean = 2.55), stand-alone environmental accounting procedures (mean = 2.64) and information within existing MASs (mean = 2.60) are quite low. It can be seen that companies have not paid much attention to environmental issues. company managers paid much attention to financial figures and they have not really paid attention to the importance of environmental issues in their decision making.

Energy usage (STA3) (mean = 2.45) and an analysis of cost - benefit to lead to energy efficiency (ECA1) (mean = 2.82) show the energy consumption is always present in the business and production of companies, and improving energy efficiency can save costs (Frost and Wilmshurst, 2000, cited in N. Mokhtar led, 2016). In addition, the implementation of cost – benefit analysis of environmental compliance (ECA7) (mean = 2.38) seems to identify companies are more likely to implement environmental protection according to regulations, laws issued for the purpose to protect the company's business. In today's economic market, if companies fail to comply and detected, they can lead to litigation and negative situations affecting the ability of continual operation of the company. Accordingly, companies implement procedures to comply with environmental regulations (STA10) (mean = 2.98); pollution

(STA6) (mean = 2.72); Waste, emissions and effluents (STA1) (mean = 2.64); analysis of cost - benefit for waste management (ECA4) (mean = 2.62); pollution minimization (ECA5) (mean = 2.70). However, the accounting procedures for land remediation (STA7) (mean = 2.45) and analysis of cost - benefit for site contamination (ECA8) (mean = 2.18) are low. This may be due to lack of environmental regulations and laws or the fact that companies have their reasons why they less implemented.

Tab. 5 – Descriptive Statistics for the Extent of EMA Implementation Source: own processing in SPSS 20.0

Items (N= 87)		Mean	SD
Overall Mean Score		*2.60*	*0.783*
Inclusion of environmental information within existing MASs		*2.60*	*0.973*
INC1	Costing system	2.57	1.197
INC2	Budgeting system	2.56	1.273
INC3	Capital budgeting and expenditure	2.60	1.224
INC4	Investment appraisal	2.62	1.278
INC5	Performance measurement	2.59	1.137
INC6	Internal reporting	2.51	1.170
INC8	Purchasing policy	2.37	1.173
INC9	Plant maintenance	2.78	1.233
Stand-alone environmental accounting procedures		*2.64*	*0.839*
STA1	Waste, emissions and effluents	2.64	1.141
STA3	Energy usage	2.45	1.076
STA6	Pollution	2.72	1.178
STA7	Land remediation	2.45	1.179
STA8	Environmental contingent liabilities	2.63	1.132
STA10	Compliance costs of environmental regulations	2.98	1.141
Environmental cost-benefit analysis		*2.55*	*0.789*
ECA1	Energy efficiency	2.82	1.234
ECA3	Recyclable containers/packaging	2.69	1.251
ECA4	Waste management	2.62	1.222
ECA5	Pollution minimization	2.70	1.304
ECA6	Environmental contingent liabilities	2.47	1.021
ECA7	Environment compliance	2.38	1.102
ECA8	Site contamination	2.18	1.029
*Each item was scored on a 5-point Likert-scale from 1 (Never) to 5 (Very often).			

5.4 Corporate characteristics and Extent of EMA Implementation

Independent samples t -test was conducted for each variable to test hypothesis. If sig. of t-test was ≤ 0.05 (reliability of 95%, the sig. level of 5%), allow support for H0, otherwise reject. Table 6 presents the results of testing.

The results in Table 6 shows:

H01: Companies in environmentally sensitive industries are more unlikely to implement a higher extent of EMA than those in environmentally less sensitive industries.
Table 6 shows the mean of environmentally sensitive companies higher environmentally less sensitive companies. Moreover, sig. of t-test is less than 0.05 (p = 0.000), suggesting that there

is a difference between the extent of EMA implementation of environmentally sensitive companies and environmentally less sensitive companies. H01 is rejected, and H1 is accepted. Accordingly, Companies in environmentally sensitive industries are more likely to implement a higher extent of EMA than those in environmentally less sensitive industries. This is contrary to the findings of the study by Mokhtar et al., (2016) but in line with the study results by Frost & Wilmshurst, (2006).

H02: Large companies are more unlikely to implement a higher extent of EMA than small and medium companies.
Although the mean of large companies is higher than small and medium companies, the sig. of t-test is greater than 0.05 (p = 0.209). Therefore, it can not be confirmed that large companies are more likely to implement a higher extent of EMA than small and medium companies, H02: Large companies are more unlikely to implement a higher extent of EMA than small and medium companies is accepted. This coincides with the study results by Mokhtar et al., (2016).

H03: GLCs are more unlikely to implement a higher extent of EMA than non-GLCs.
As expected, GLCs have a higher extent of EMA implementation than non- GLCs. At the significance level of 5%, sig. of test t-test is greater than 0.05 (p= 0.001). H03 is rejected, H3 is accepted. This result is also in line with the study by Mokhtar et al., (2016) that ownership status the company affected the extent of EMA implementation.

H04: Companies that have adopted EMS are more unlikely to implement a higher extent of EMA than those that have not.
Companies that adopted EMS have a higher mean than companies that have not, and when considering sig. of t-test ($p<0.05$, $p = 0.000$) also shows clearly that the Companies that have adopted EMS have a higher extent of EMA implementation. H04 is rejected, H4 is accepted. This is contrary to the findings by Mokhtar et al., (2016)
Tab. 6 – Corporate characteristics and the extent of EMA implementation Source: own processing in SPSS 20.0

		Levene's test		t-test	
Variables	Mean	F	P	t	p
Environmentally sensitive industry					
Less sensitive	2.30	2976.993	0.000	5.595	0.000
Sensitive	2.91				
Company size					
Small and medium	2.47	6.426	0.013	-1.294	0.209
Large	3.23				
Ownership status					
Non-GLCs	2.39	17.843	0.000	-3.923	0.001
GLCs	2.45				
EMS Adoption					
Do not adopt EMS	2.33	28.140	0.000	-5.352	0.000
Adopt EMS	3.51				

5. CONCLUSIONS

Through the evaluation of main contributions and limitations of the study, the author selected and inherited the appropriate factors, evaluated and adjusted factors unconsistent with the context of the research, then built theoretical backgrounds and research model, as well as scale

for research concepts to apply and investigate the factors affecting EMA in companies in Vietnam.

This study identified a number of factors affecting the EMA implementation. The results of the study showed that:

- Companies in environmentally sensitive industries are more likely to implement a higher extent of EMA than those in environmentally less sensitive industries. This suggests that industries have impact on planning environmental management policies.
- GLCs are more likely to implement a higher extent of EMA than non-GLCs.
- Companies that have adopted EMS are more likely to implement a higher extent of EMA than those that have not.
- Company size does not affect the EMA implementation.

The study contributes to the limited number of materials of EMA in the developing countries in general and Vietnam in particular. For companies, the results of this study provide them with insights on EMA implementation. While countries in the world are increasingly focusing on aspects of sustainable development, environment and economy become the most important measure. Moreover, in a game running on the brand, failure to identify the environmental information will be a barrier to decision making, and brings the risk of reputation, prestige and profit for companies. Companies that engaged in industries with high environmental sensitivity need to pay more attention to integrate environmental information into their activities. For companies and financial institutions supplying services, although their operations may impact less on the environment, they can contribute their roles in responsibilities to environment and community through the provision funds for young people to participate in green technology, creating campaigns for environmental day (for example, recycling contest, urban aesthetic month).

However, the results obtained in the study should be interpreted within certain limitations. First, the small sample size can affect the generalization and the analysis conducted. Second, all data were collected in a specific period meaning that the results reflect the situation at a particular time. Thus, the results should be interpreted with caution. In the future, the survey time of the study should be extended to consider the bias, at the same time, the respondents should be expanded, probably senior management as CFOs, CEOs or staff of various departments when the concept of sustainable development becomes pervasive.

Appendix A

(Source: Corporate Characteristics and Environmental Management Accounting (EMA) Implamentation: Evidence from Malaysian Public Listed Companies (PLCs), N.Mokhtar,2016, Appendix A, page 20)

Items	
Inclusion of environmental information in existing MASs (INC)	
INC1	Costing system
INC2	Budgeting system
INC3	Capital budgeting and expenditure
INC4	Investment appraisal
INC5	Performance measurement and appraisal
INC6	Internal reporting mechanisms
INC7	Risk assessment
INC8	Purchasing poicy
INC9	Plant maintenance
Stand-alone environmental accounting procedures (STA)	
STA1	Waste, emissions and effluents

STA2	Raw material usage
STA3	Energy usage
STA4	Recycled materials usage
STA5	Returnable packaging/containers
STA6	Pollution
STA7	Land remediation
STA8	Environmental contingent liabilities
STA9	Life cycle cost analysis in product development
STA10	Compliance costs of environmental regulations
STA11	Environmental costs in production costs
Environmental cost-benefit analysis (ECA)	
ECA1	Energy efficiency
ECA2	By-product use
ECA3	Recyclable containers/packaging
ECA4	Waste management
ECA5	Pollution minimization
ECA6	Environmental contingent liabilities
ECA7	Environmental compliance
ECA8	Site contamination
ECA9	Site clean-up

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IMPACT OF GRI-G4 COMPLIANCE ON FIRM PERFORMANCE: AN EMPIRICAL STUDY ON SUSTAINABILITY REPORTING IN GERMAN AND FRENCH FIRMS

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Abstract

GRI-G4 guidelines have been issued since 2013 and have attracted more and more companies to apply in preparing sustainable reports. Due to significant increases in G4 compliances, the paper focuses on examining whether there are relations between GRI-G4 compliance and firm performance. The impact of GRI-G4 compliances on firm performance will be tested according to companies' conformity. Compliance of GRI-G4 guidelines are divided into compliance and non-compliance status. Companies that apply core and comprehensive guidance are considered as compliant companies, otherwise are seen as non-compliance. Adherent status is collected from GRI database and data of 141 German and French companies are gathered from firms' annual reports. Regression is applied to test the connection between compliance status and firm performance. Firm performance is treated as dependent variables and is indicated by ROE and ROA. Independent variable is GRI compliance which has two values, 1 for compliance, and 0 for non-application. Control variables such as firm size, firm age, sales growth and leverage are also included in the formula for the examination. The research finds significant results on negative relationship between G4 compliance and firm performance in German firms. However, there was no connection in these two variables in French firms and in all observations in the sample.

Keywords: GRI G4, ROE, ROA, Compliance

JEL Classification: Q56

1.INTRODUCTION

Sustainable reporting recently gains much attention from firms with the major reason for sustainable development and economic growth. Although many conflicts impacts have been revealed between firm performance and corporate social responsibility activities in past and current researches, many countries now require corporations to provide compulsory sustainable reports. While the requirement have received the support from many organizations, significant numbers of corporations faces difficulties in implementing CSR programs and in preparing CSR reports. In order to overcome these obstacles, many guidelines have been issued to give detail instructions on how firm disclosed sustainable activities. GRI-G4, one of the popular and prestige guidelines, which has been issued since 2013, has attracted more and more companies to apply in preparing sustainable reports. Due to significant increases in G4 compliances, the paper focuses on examining whether there are relations between GRI-G4 compliance and firm performance. This topic is relevant due to current issues on global environmental changes and social problems occurrence worldwide. Profit organizations, as part of the society, play a role in resolving environmental issues and achieving better society (Frederick, 2006). As a result, companies are increasingly implementing corporate social responsibility programs, and considering their corporate sustainability performance to be able to set close relationships with environments and societies (Nicolau, 2008). These actions are expected to improve social and environment issues, and boost human's well-being. Although it is increasingly necessary for

companies to engage in these activities, the other purpose of making profit of these businesses cannot be neglected. Therefore, examining the influence of society-and-environment-oriented activities, which can revealed from G4 application, on the firm financial performance is important issue.
This research is structured into four sections. The first section summarizes the literatures which also become sources for hypotheses development. Next, research design, database and samples selection are revealed in section two. Section three provides empirical results and outcome discussion. And the last section briefly concludes previous analysis and discussion.

2.LITERATURE REVIEW

2.1.Sustainability reporting and relevant theories

According to stakeholder theory, organizations operates in same society with many other groups, therefore, it cannot be neglected the influences of organizations' operations on the others. Base on this theory, Freeman (1984) states firms' activities impact not only on firms themselves, but also on other stakeholders, therefore, firms should orient their actions, activities and decision making base on both interest of shareholders and other stakeholders such as customers, employees, suppliers and communities. This theory has close link to sustainable reporting due to their same concerns about impacts on stakeholders and society at large. Sustainability reporting requires companies to disclose information about firms' activities relating to environmental, social, governance measured aspects, and how firms deal with risks arising from these activities (Ballou, Heitger, and Landes, 2006). With this requirement, firms can affirm their position on corporate social responsibility performance which can lead firms to good business practices compliances. This, therefore, can enhance the perception from the stakeholders on firms' performance and transparency which in turn can assure for the positive relationship between firms and stakeholders.
Sustainability reporting can also be enlightened through legitimacy theory (Gray et al., 1995). In line with legitimacy theory, it is believed that there is a hidden commitment for firm to be responsible for its society. With the reporting content regarding to economic, environmental and social perspectives, sustainability reports can illustrate for the consistency with the commitment of enhancing society value system. This can improve the reputation of firm in the society and motivate firm to implement this focus in company strategy for sustainable development. Both legitimacy and stakeholder theories involve the relation between firm and other bodies, however, stakeholder theory focuses on firm's stakeholders while legitimacy concentrates on society at large.
Last but not least, neo-institutional theory can be seen as another relevant theory for sustainability reporting. Neo- institutional theory stated that firm's image, policies, and trust are significantly impacted by its culture and history (Scott and Meyer, 1994). Based on Neo-institutional theory, Di Maggio and Powell (1983) affirm that it is necessary for firms to react to environmental expectations with consistent manners. These, according to them, can be achieved by obtaining authority for companies and other political perspectives; reacting to uncertainty in a typical approach and, connecting to a firm's professionalization. With main aim on enhancing environmental, social information disclosures in firms, sustainability reporting needs the underlying inspiration of the theory to meet the homogenizing goal in reporting.

2.2.Sustainability reporting and firm performance

Although previous studies have been done in sustainable development fields, our understanding of the effect of social activities on financial performance is still uncertain, with research results being mixed. Bird et al, (2007) suggested that social activities can increase firm value by positively impacting on cost saving, firm reputation, and regulatory cost avoidance. As for environmental purposes, Dowell et al., (2000) found the positive relationship between implementation of global environmental standards and firm value. Nevertheless, according to Friedman (1970), the main purpose of firm is to enhance its shareholders' wealth; hence, activities that ineffectively impact on the firm current resources will harm the firm performance. In addition to the positive or negative results on the relationships between corporate sustainability and firm performance, some studies have failed to find the relationship (Margolis and Walsh, 2003). Ray et al, (2004) suggested the major reason for these different results is because of financial performance being influenced by so many variables, and inconsistencies in measuring corporate social responsibility. Given this, it is worthwhile to test the relationship between corporate sustainability and financial performance.

Corporate sustainability concerns about many different perspectives, however, the focus aspect of this research is on corporate sustainable reporting. Transparency in sustainable reports can provides opportunities for firm's development in which economic growth is maintained as a high level, and firm resources are effectively used. Requirement on disclosures create not only more opportunities but also more challenges and rules for enterprises. Currently, more countries and organizations have required companies and members to comply with mandatory sustainability reports. This can be seen as one way to aware firm and make firm react to the impact of firms activities on environmental and social issues.

Although sustainable reporting regulations have been issued, impact of these disclosures presently still mixed. Positive relations are found in researches of Porter and Linde (1995) who state that compliant costs can be compensated by benefits obtained from the compliance. In consistent with Porter and Linde, Berry and Rondinelli (1998) confirm regulatory expenses will be less for firm that pay more attention on environmental issues, and this may lead to more opportunities for firm because of current demand for cleaner products. These results can relieve many concerns previously regarding to cost issues in conforming sustainable reporting requirements. Besides, Clarkson et al. (2011) find that the longer time firms try to enhance their environmental performance, the better economic benefits, and the more efficient resources usage firms can achieve. Along with positive results, negative and mixed outcomes are found, for instance, Freedman and Jaggi (1988) argue that firms spending much on investment in pollution prevention tend to reveal bad financial performance. In addition, Wu et al. (2010) find the negative relation between environmental disclosures and firm performance. In the mean time, Qiu et al. (2014) find no connection.

In previous research, sustainable disclosures are measured based on score by analyzing contents of firms' sustainable reports. These analyses, of course, can be subjectively impacted by authors' opinions, which then may influence on the quality of the research outcome. In this research, score indication is not applied to evaluate the disclosure performance. The paper based on GRI- G4 guideline and GRI database to collect the compliance status of firms. Then the relationship between the adherent status and firm performance are tested. This can mitigate the subjective in calculating points for the score system. GRI-G4 guideline is used in this research due to the significant number of firms followed after a short time of issuing. In addition, G4 can be seen as an updated guideline due to the enhancement from previous versions of GRI.

In the light of mentioned theories, sustainability reporting can be considered as a mean to perform the firms' commitment with stakeholders and society regarding to environmental and social issues. Once sustainable reporting achieves outstanding performance, it can reveal high responsibility of firm to other parties, and can assure for sustainable development. This in turn

can enhance firm's reputation and images. Base on this argument and with research question concerning about whether there is connection between GRI-G4 compliance and firm economic performance, this research assumes that firm which adheres to G4 guidelines disclosures can enhance it economic performance.
Hypothesis 1: Compliance with G4 guidelines in preparing sustainability reporting has a positive impact on firm performance.

2.3.Control variables and firm performance

The first control variable to be considered in this research is firm size. Although relationship between firm size and firm performance was tested in many studies, the results on the impact of these two variables are still mixed. Singh and Whittington (1975); Serrasqueiro and MacasNunes (2008) argue that large firm size would have higher performance as large firm has more advantages in dealing with clients and suppliers, in developing market share, and in utilizing economic scale. Rajan and Zingales (1995) also suggest that large firms have well-organization and good performance, which in turn enables them to issue equity at fair prices, reduce reliance on debt. On the other hand, Yang and Chen (2009) advise that small firm is easier to react with economic changes environment due to flexible firm structure. This study assumes that there is a positive relation between firm size and firm performance as bigger size seems to have more resources to take economic advantages and economic scale.
Firm age is the second control variable, which is believed to be aligned with knowledge, abilities, skills and reputation (Agarwal & Gort, 2002). Most of studies suggested that the age of firm is positive related with its performance due to its ability to perform better over time (Ericson & Pakes, 1995), or to enhance reputation (Baker & Kennedy, 2002). Coad et al. (2013) find that firms enhance with age due to the increasing in productivity, profits, lower debt ratios, and higher equity ratios. Therefore, firm age is expected to affect positively on firm performance.
Third variable is firm leverage. According to trade-off theory, there is an optimal debt ratio at which firm can maximize value by using debt. The first advantage of debt is tax deductibility on interest payment. In addition, using debt can lessen the agency conflict as the borrowing can limit the free cash flow available in the business. Therefore, managers have no incentive to use cash inefficiently and riskily (Jensen and Meckling, 1976). As a result, debt usage has been considered as internal governance mean to control managers' self-interest (Grossman and Hart, 1980). Nonetheless, if debt is highly acquired, firm can face costs of financial distress which may adversely impact on firm performance (Modigliani and Miller, 1963). Moreover, agency cost instead of being saved, now can emerge the conflict on the interests between shareholders and debt holders (Jensen and Meckling, 1976). Based on these theories, the research assume that the higher level of debt, the riskier firms enter, therefore, leverage is assumed to have negative impact on firm performance.
Last but not least, sales growth is implementing in the model to test the relation with firm performance. Mixed results are found in previous studies when examining the relationship between sales growth and profitability. For example, Hoy (1992) affirms that concentrating on high growth may be adversely or minimally impact on firm profitability. In the mean time, Chandler and Jensen (1992) find no connection among these variables. Although different outcomes have been provided, it is likely believe that sales growth can reveal for the sustainable competitive advantages and profitability (Markman, 2002). MacMillan and Day (1987) also consider quick growth as a mean to improve profitability in new firms due to they can based on evidence that new firms become more profitable when they penetrate markets faster. In consistent with the supporters for this relation, this paper assumes that there is a positive connection between sales growth and firm performance.

3.RESEARCH DESIGN

3.1.Data collection

GRI G4 was issued in 2013, and in this year, only 19 firms in the Europe declared to be in accordance with G4. The figure in 2014 increased to 391, and in 2015 was 829 firms. The significant rise in compliance status within three year raises the attention in carrying out further research regarding to G4 adherence. This research focuses on German and French firms as more companies in these two countries have applied G4 in comparison to these other nations. Even though there was just one Germany firm that complied with G4 in 2014, in 2014, there were 42 firms in both German and France, and in 2015 there were 116 firms which included 45 German and 71 French firms. As observations in 2013 and 2014 are quite low, the paper concentrates on the data in 2015 to test the relationship. Compliance status is classified in to GRI-G4 and Non- GRI. The compliant firms are firms that prepare sustainable reports base on G4 guidelines, while Non- GRI prepared the report without referring to GRI guideline. This research does not take into account the compliance with GRI –G1 to G3 as G4 is developed base on previous versions, hence, it still has some consistency in disclosures requirements. Further research, which can consider the level of adherence, will be carried out to investigate the impact of the guidelines changes on firm performance.
The adherent statuses are collected from GRI databases. With GRI-G4 and Non-GRI, there are 153 firms and these are chosen companies for the research. Financial information of these companies is collected from firms' annual reports. During the collection, some companies, which are subsidiaries of other group, have different currencies with the other examining companies. Therefore, these companies are removed and there were 141 observations in this research.

3.2.Variables Measurements

Firm performance indicators will include return on equity (ROE) and return on assets (ROA). ROE is calculated by taking net income divided by equity, and ROA equals net income divided by total assets. These two measures have been used in many researches (Al-Najjar, 2014; Chen, 2010). All figures are taken for financial year of 2015.
For compliance status, there are two types of compliance: GRI-G4 and Non- GRI. Therefore, the paper use dummy variable to represent for the status. Value of 1 applies for firms that are in accordance with G4 guidelines and value of 0 implements for firms which do not use GRI guidelines in preparing sustainability reports.
The first two control variables are measured by taking logarithm of total assets (Al-Najjar, 2014) and difference between current year and the founded year (Coad et al., 2013) respectively for firm size and firm age. For firm leverage, the paper base on research Michaelas et al (1999) to take leverage as debt-to-assets ratio. The last control variable is calculated by taken changes of sales in two continuous years to divide by sales of earlier year.

3.3.Research Methods

Descriptive statistics method is used in order to describe basic features of the data. They provide simple summaries about the sample through minimum, maximum and standard deviation value of variables. Then, correlation coefficient analysis is performed before running multiple regression analysis. If there is correlation between independent, the condition of multi-collinear exists which can produce problems in interpreting the coefficients of the variables as several

variables are providing duplicate information. Correlation coefficients express the degree or strength of the linear relationship between two random variables. Therefore, correlation coefficient analysis should be conducted in order to test the relationship between independent and dependent variables, and multi-collinear through correlation coefficient. A correlation coefficient of +1 indicates that two variables are perfectly related in a positive linear sense; a correlation coefficient of -1 indicates that two variables are perfectly related in a negative linear sense, and a correlation coefficient of 0 indicates that there is no linear relationship between the two variables. Multi-collinear is a condition where independent variables are strongly correlated with each other. Tabachnick and Fidell (2001) suggest to think carefully when include two variables which have a correlation of 0.7 or more in the same analysis, as multi-collinear may exist when correlation equals 0.7 or above.
This study uses multiple regression to test the hypothesized relationship. The study would like to find out the relation between one dependent variable and more than one independent variable. Moreover, independent and dependent variables in this study were all numerical; hence, multiple regression is an appropriate method for examining the hypothesized relationships above. In addition, cross-sectional regression is applied to test the relations between dependent and independent variables in each country.

In this study, the equation forms are formulated as follow:
$Performance_i = \beta_0 + \beta_1 Compliance_i + \beta_2 Leverage_i + \beta_3 Size_i + \beta_4 Age_i + \beta_5 Growth_i + \varepsilon$
As firm performance is measure by ROE and ROA, hence, there are two models as followed:
(1): $ROE_i = \beta_0 + \beta_1 Compliance_i + \beta_2 Leverage_i + \beta_3 Size_i + \beta_4 Age_i + \beta_5 Growth_i + \varepsilon$
(2): $ROA_i = \beta_0 + \beta_1 Compliance_i + \beta_2 Leverage_i + \beta_3 Size_i + \beta_4 Age_i + \beta_5 Growth_i + \varepsilon$
With: $i_{1 \text{ to } 141}$ is as number of observations
β_0 is as constant; $\beta_{1,2,3,4,5}$ are as estimated coefficients of the explanatory variables,
ε is as error term.

Tab. 1 - List of variable measures and expected impact on firm performance.

Variables	**Description**	**Expected effects**
ROA	Net income/Total assets	
ROE	Net income/Total equity	
Compliance	1 if comply with G4, otherwise 0	Positive effect
Leverage	Total Debt/Total assets	Negative effect
Firm size	Logarithm of total assets	Positive effect
Firm age	Difference between current year and founded year	Positive effect
Sales growth	$(Sales_1 – Sales_0)/ Sales_0$	Positive effect

4.Research Results and Discussion

4.1.Descriptive statistics and correlation analysis

Tab. 2 - Descriptive statistics for all firms

Variables	Observations	Minimum	Maximum	Mean	Std. Deviation
ROE	141	-51.27%	102.22%	10.02%	1.42%
ROA	141	-24.62%	22.10%	3.40%	0.44%
Compliance	141	0	1	0.44	0.04
Firm size	141	1.89	6.30	3.91	0.07

Firm age	141	4	384	77.85	6.26
Leverage	141	23.08%	274.96%	65.89%	2.18%
Sales growth	141	-48.33%	5185%	48.91%	36.75%

Table 2 (appendix) presents characteristics for the variables employed in testing. The description illustrates high difference between minimum and maximum value of variables, which then indicates the high variability of variables' values. Most of significant high rate of ROE were due to firms' negative equity value. The negative value in these cases were lower than the loss of firms in that years, therefore, in the databases, maximum ROE reaches 102.2%, however, this does not reveal a good profitability of firms. The description results also illustrate a high level of using debt in the observations. The average debt ratio is 66% and maximum leverage ratio is 275%. The maximum value in leverage is because of form accumulated loss was huge which lead to a high negative equity. Average firm age is 77 or 78 years with the range from 4 to 385. This result show a considerable variance in the firm age, while some companies are very young, the others have a really long history.

Tab. 3 - Correlation matrix.

		ROE	ROA	Leverage	Growth	Age	Size	Compliance
ROE	Cor.	1						
ROA	Cor.	.423*	1					
	Sig.	.000						
Leverage	Cor.	.105	-.270*	1				
	Sig.	.217	.001					
Growth	Cor.	.088	.182*	-.075	1			
	Sig.	.298	.031	.378				
Age	Cor.	-.058	.032	-.007	-.091	1		
	Sig.	.494	707	.378	.0283			
Size	Cor.	-.017	-.150	.242*	-.189*	.139	1	
	Sig.	.843	.077	.004	.025	.101		
Compliance	Cor.	-.059	-.102	-.027	-.077	.054	.284*	1
	Sig.	.0490	.230	.750	.367	.534	.001	

* Correlation is significant

Table 3 (appendix) provides the correlation analysis among dependent and independent variables that used in all regressions. It can be seen from table 3 that no correlation exceeds 0.7 which indicates no multi-collinear problems in the models. According to the results in table 3, in the relationship with ROA, it is negative significant with leverage and positive significant with growth. As for ROE, there is no connection between variables. This result is partly consistent with the hypothesis 1 as mentioned above. As for the associates among independent variables, it can be observed that firm size has positive relation with leverage and compliance, but negative impact on sales growth. This can be interpreted that the larger the firm is, the higher usage of debt, the better compliance performance and lower growth rate of sales are.

4.2.Empirical findings and discussion

Tab. 4 - Empirical results all variables

	ROE		ROA	
	Coefficient (β)	P value	Coefficient (β)	P value
Compliance Status				
All Companies	-0.015	0.622	-0.009	0.305
German	-0.909***	0.002	-0.027***	0.003
French	0.045	0.346	-0.002	0.918
Firm Age				
All Companies	0.000	0.595	0.000	0.505
German	0.000	0.174	0.000	0.222
French	0.000	0.536	0.000	0.705
Firm Size				
All Companies	-0.002	0.928	-0.003	0.629
German	0.019	0.272	0.008	0.156
French	0.005	0.859	-0.004	0.659
Leverage				
All Companies	0.073	0.208	-0.052***	0.004
German	-0.206***	0.014	-0.135***	0.000
French	0.128*	0.082	-0.035	0.123
Sales Growth				
All Companies	0.003	0.316	0.002*	0.066
German	0.120	0.237	0.040	0.214
French	0.004	0.338	0.002	0.104

* Significance at the 10% level.

*** Significance at the 1% level.

In table 4, the observed sign (β) is negative which indicates the negative relationship between compliance status and firm performance in German firms. The relationship is significant in German firms for both firm performance measures ROA and ROE. This means that firms complying with G4 guidelines to prepare sustainability report tend to have worse profitability than firms that did not follow the guidelines. This result is not consistent with hypothesis 1 which expects the positive relation between these variables. Furthermore, when testing the connection between firm profitability and G4 compliance performance for all observations which include French and German firms, and separately testing for French firms, the relationship is not significant. Therefore, results for firm performance linkage with G4 compliance status are mixed according to this research. The results are consistent with previous such as Freedman and Jaggi (1988), Wu et al. (2010), and Qiu et al. (2014). The possible reason for the adverse outcomes can be these are the years that firms start to comply with the

requirements on mandatory sustainability disclosures; therefore, the compliance costs may be exceed the benefits receiving from these activities in short-term. Argument of Freedman and Jaggi (1988) referring to spending much on investment in pollution may lead to bad financial performance can be suitable with this explanation. Further research should be carried out later when firms apply the compulsory regulation for several years. At that time, the research will investigate whether firms, which apply the mandatory disclosures prerequisites for a long time, experience positive connection between financial outcomes and compliance performance or not.

For control variables, firm size and firm age have no effect on firm performance. This is not what is expected from first sense. With leverage, the high debt in capital structure tends to lead to unfavorable economic results in German and in all observations sample. However, while in Germany, debt ratio reveals the significant connection with both ROE and ROA, in the whole sample, the significance is just exposed with ROA. As illustrated in the descriptive analysis, debt leverage in the sample in quite high, therefore, the financial distress costs may exceed the tax saving when using debt in these companies. Nevertheless this justification cannot apply for French firms as with similar high debt rate, the result shows the positive connection between the variables. It may be said that the different impact may due to the different in the company cultures, business relation and nation's policy regarding to raising capital. The last control variable, sales growth only has positive relation with ROA when testing in all firms sample. This is party consistent with the assumption indicated in the literature review part.

This research is expected to provide an understanding of the relationship between corporate sustainability which, is revealed from GRI-G4 compliance status, and firm financial performance. These findings potentially have important implications for firms, stakeholders, and government policy making and standards setters. Firms may learn the influence of G4 application, so that it can adjust the implementing process to have better and more efficient impacts which can gain both social and profit aims. Base on G4 guidelines and firms sustainability reports, stakeholders may have clearer perception on what firm has done relating to sustainable activities which in turn, can lead to the consensus between company and its stakeholders in attempting companies' goals. For government and standards setters, this research should provide deeper understanding on what firms take effort to perform, and on how these efforts affect their financial performance. Upon this, they can assist and encourage firms to follow sustainability development by making more appropriate and supporting policies.

5.CONCLUSION

The sustainability reporting has received considerable attention due to their importance for the economic health of companies and society at large. With the trigger of mandatory requirement on sustainable disclosures, this study confirms the important role of sustainability reporting by testing association between GRI G4 compliance status and firm performance.

This study indicates significant negative relation between adherent status and the performance. The result just applies for German firms and is irrelevant to French firms and to the sample with all observations. Among control variable, only Leverage and Growth have significant influences on firm performance respectively. Nevertheless, similar to compliance status, the significant impacts are not revealed for all groups of samples. While leverage has mixed results, sales growth only has major influence with ROA in the whole sample.

The research tests for the connection between sustainability reporting compliance and firm performance in two countries in the Europe. The results show considerable differences in the variable linkages in these countries. In addition, the research has just done in 2015. Therefore, further research can be carried for more countries with time series data for a range of 3 or 5

years to understand more about the influence of sustainability reporting on listed companies, and the expectation is to find more consistent outcomes in bigger samples.

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CHINA'S GREEN FINANCIAL SYSTEM: IMPLICATIONS FOR ITS ECONOMIC GROWTH

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Abstract

Following Bai et al. (2013), Xian and Liping (2015), and Hart et al. (2016), this paper aims to prove that the Chinese government is instrumental in furthering green finance. The expansion of a green financial system has been essentially associated with other underlying and constant reorganizations in China's financial system, i.e. reinforcing capital markets, moving from managerial interventional actions to market controlling instruments and transforming implicit guarantees into explicit ones. We attempt to address these increasing aspects by elaborating on the fact that, to considerably enhance its environment, China should count on more successful clean up endeavors and demand fiscal, taxation and financial inducement procedures to improve resource distribution and arrange that the economic, energy and transportation arrangements be both cleaner and greener. We develop primary empirical research for our principal case study that determines that China should experience domestic green finance tasks and have a key function in clarifying whether the world satisfy the climate challenge via its functions in foreign investment and backing.

Keywords: China, green financial system, foreign investment, capital markets

JEL Classification: F3, O16, P33

1. INTRODUCTION

In this paper we are planning to prove that the expansion of a green financial system has been essentially associated with other underlying and constant reorganizations in China's financial system, i.e. reinforcing capital markets, moving from managerial interventional actions to market controlling instruments and transforming implicit guarantees into explicit ones. Green finance should concentrate not only on certain domains, e.g. clean energy, low-carbon means of transport and energy-efficient constructions, but also supply financial backing to industrial reorganization (Agarwal & Kwan, 2017; Ionescu, 2016; Machan & Chesher, 2016; Popescu Ljungholm, 2016; Swinkels & Xu, 2017), the energy efficiency of established companies and green pollution supervision. Setting up a green financial system is aimed at furnishing the long-run expenditure (McBee, 2017; Grant, 2016; Fabre, 2017; Chapman, 2017) to satisfy the advancement requirement of the sound and prosperous real economy. Endeavors should be directed to purposefully advance direct financing markets comprising stocks, bonds and derivatives – all green. Chinese government intrusion in green finance might count on market-oriented instruments consisting of fiscal discount interest, structural reserve ratio, diversified venture capital ratios and the enhancement of environmental protection data exposure to regulate the green financial market so that it has its functions in price determination, data selection and risk management. (Xian and Liping, 2015)

2. THEORETICAL BACKGROUND

To considerably enhance its environment, China should count on more successful clean up endeavors and demand fiscal, taxation and financial inducement procedures to improve

resource distribution (Zogning, 2017; Shaefer, Wu, & Edin, 2017; Friedman & Gerstein, 2017) and arrange that the economic, energy and transportation arrangements be both cleaner and greener. To satisfy the environmental tasks it confronts, China should establish a green finance system to direct public funds in the direction of green undertakings that back the objective of increasing social welfare. China's green banking system should be constituted at distinct administrative levels (Bolton, 2016; Kantarelis, 2016; Mihăilă, 2016a, b; Popescu & Bițoiu, 2016) to supply steady organizational backing for the development of green credit. Setting up a green banking system that is supported by a system of green banks and eco-finance departments of commercial banks and initiating novel and groundbreaking financing patterns considerably improve the upgrading and economies of scope of environmental credit, which assists in diminishing financing expenses and the proportion of non-performing loans. (The Green Finance Task Force, 2015)

3. METHOD AND EMPIRICAL DATA

Our main aim is to show that China has made outstanding endeavors to diminish domestic emissions. We analyze data presented in Figures 1–8 and make estimations related to the manner Chinese leaders have set up a novel pattern of financial stimulants intended to surpass clean energy market incentive proposals to tackle particular market malfunctions in clean energy finance. Even when there are satisfactory market request indications for clean energy, distinct technologies and companies still may pass unnoticed, especially if they develop cutting-edge technologies (Dixon, 2016; Layard, 2016; Nica, Manole, & Potcovaru, 2016; Popescu, Comănescu, & Sabie, 2016) that do not have a clear-cut route history of commercial market favorable outcome, being perceived as speculative financings in private capital markets. China has been examining approaches to decrease the risks and transaction expenses related to such investments. China should experience domestic green finance tasks and have a key function in clarifying whether the world satisfy the climate challenge via its functions in foreign investment and backing. Lacking policy intervention, its foreign investments may slope "brown" (with regard to fossil-fuel-intensive energy setup) instead of "green" (in relation to a low-carbon pollution expectation). (Hart, Ogden, and Sims Gallagher, 2016)

4. ANALYSIS AND RESULTS

Our study aims to contribute to the literature on China's green financial system by emphasizing that a significant interest in China is how bank strategies and management may be greened to further sustainable advancement (greening the banking sector is instrumental in attainment sustainable advancement). Green finance has been established to enhance sustainable advancement and to put forward economic growth for the financial sphere. Green finance concerns various financial services and goods supplied by financial entities for sustainable advancement. Notwithstanding having set up internal green schemes in accordance with the national credit strategy, the unquestionable assessment of a bank's environmental operation investigates the concrete effects generated by its transactions to all intents and purposes. A lot of them have initiated incorporating green risks into the credit risk management, but several prominent banks have preemptively furthered green proposals in their lending schemes. Endeavors from Chinese banks, government, and civil society should be made to speed up the greening mechanisms of Chinese banking by tackling the difficult tasks and taking advantages of chances. The absence of openness in information exposure makes it hard for individuals to tell the difference (Friedman, Friedman, & Friedman, 2016; Machan, 2016a, b; Peters, 2016a, b; Shin, 2017) whether loans of particular banks are beyond doubt green and it impacts the thorough grasp of banks' operation in green financing. The Chinese government is instrumental

in furthering green finance. Few requirements of industry-oriented green credit scheme have been advanced, making it hard for banks to assess firms' operation regarding industrial environmental criteria. (Bai, Faure, and Liu, 2013) (Figures 1–4)

By setting up a green bank at the domestic level, the Chinese government might announce and unambiguously indicate to individuals and capital markets its steadfastness in handling and cutting down pollution and advancing a green economy (Chapman, 2016; Laratta & Nakagawa, 2016; Nel, & le Roux, 2017; Popescu, Ciurlău, & Bițoiu, 2016), which may improve individuals' belief in China's subsequent environmental schemes and risk choice for green proposals and assist in directing more public funds and resources in the direction of the green sector. China's green bond schemes are chiefly concentrated on limiting actions as compulsory information disclosures and green effect reviews. As a result of present constraints determined by laws and guidelines, green sector funds are mainly constituted as contractual and closed enterprises. China's green sectors are not very able at financing via the stock market. (The Green Finance Task Force, 2015) (Figures 5–8)

China has weakened the function of the greenback in a trade-weighted foreign-exchange basket. The yuan has fallen down to an eight-year decline in opposition to the dollar. The importance of the basket is assessed on a yearly basis and revised at the suitable moment. The new structure comprises exchange rates of China's chief trading partners. The yuan is planned for its most immoderate twelve-monthly drop against the greenback in the past two decades. The yuan's devaluation as opposed to the dollar has been mainly impacted by the latter's strength. The market should concern its operation not in favor of the basket while the economy keeps steady growth. (Fig. 1)



Fig. 1 What devaluation?
Sources: Thomson Reuters, Bank for International Settlements, *The Economist*, and our estimations

China continues its strategy of investing 2.5tn yuan into renewable power generation while it persists in moving from coal power in the direction of cleaner fuels. Established renewable power capacity is instrumental for half of electricity generation. The investment indicates China's sustained emphasis on hampering the utilization of fossil fuels, furthering its economic growth, while it strengthens its campaign on pollution. Worries regarding the social and economic expenses of air pollution have boosted as the northern regions have striven against harmful smog. (Fig. 2)

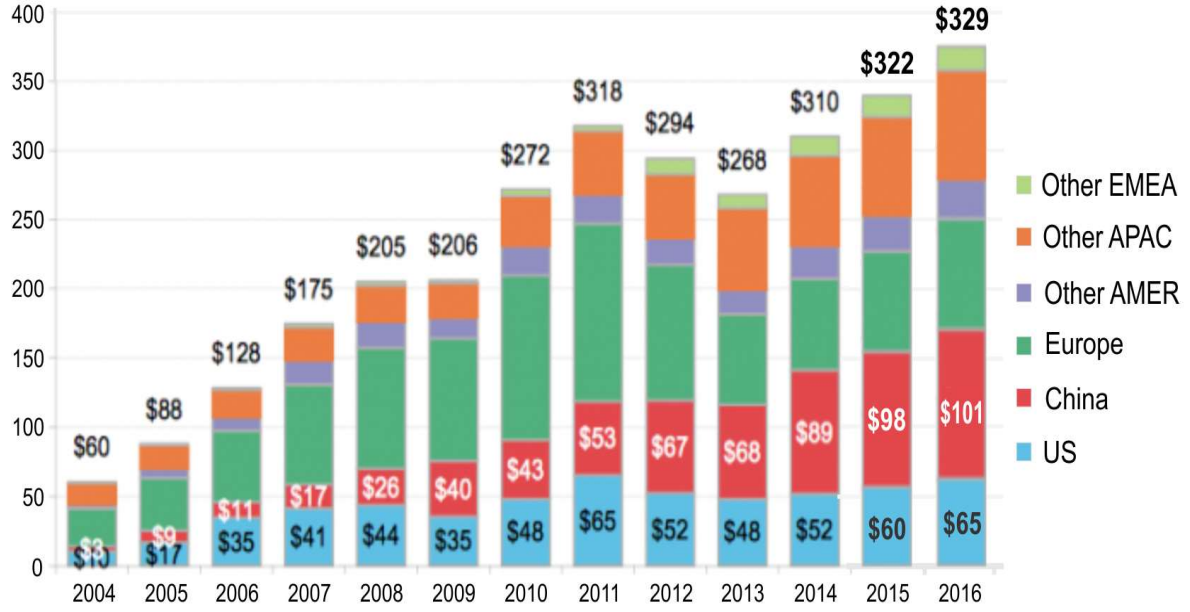


Fig. 2 Total new investment in clean energy by country or region ($bn)
Sources: Bloomberg New Energy Finance (2014) and our estimations

The Chinese economy increased by 6.49% year-on-year in 2016, that powerful growth being backed by consumer expenses, more relevant government costs, and booming bank lending. Since 1990, it is the less significant full-year expansion but the government's aim series of 6.5 to 7%, because consumption and investment advancement diminished. GDP Annual Growth Rate has been around 9.76% during the past decades. (Fig. 3)

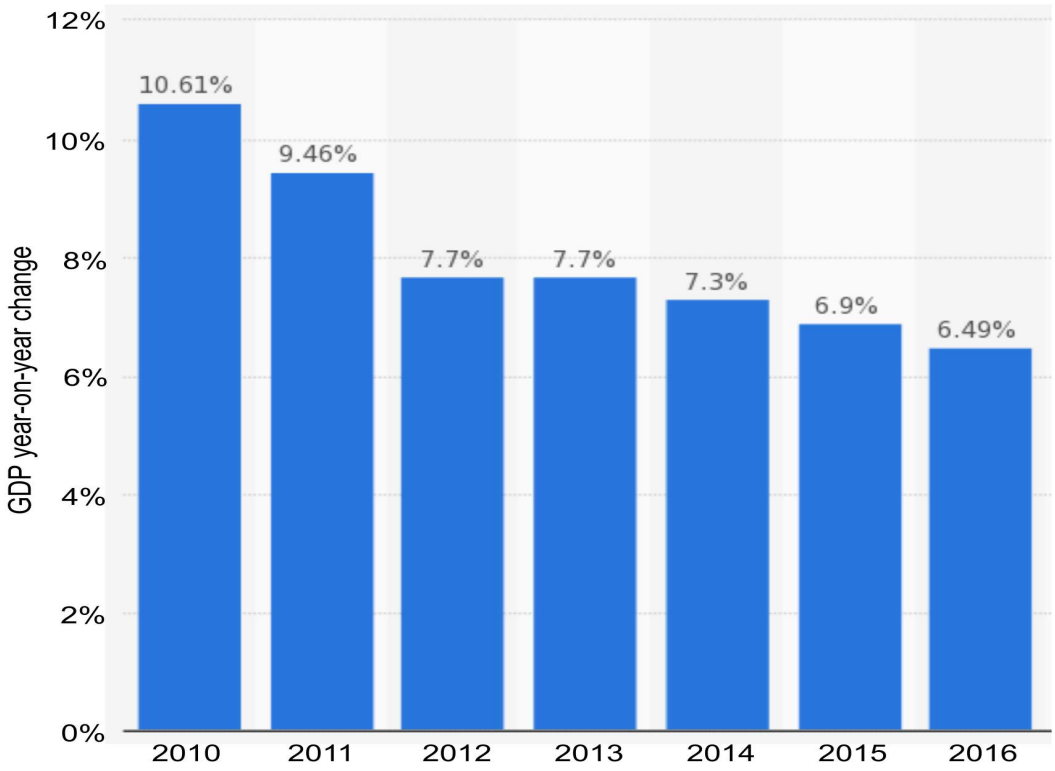


Fig. 3 China: Growth rate of real gross domestic product (GDP)
Source: IMF/Statista (2016)

In China, banks are in an increasing temporization with regulators regarding the level of provisions they should make to support in case of loan defaults while adverse debts go on rocketing. Institutions are demanded to preserve provisions of not less than 150% of non-performing loans, but the most important banks have insisted on more unrestricting regulations via a combination of public politicization and private insubordination. After a massive credit rise, the impressive quantity of non-performing loans increased twofold between 2014 and 2016, arriving at Rmb1.4tn. As China has come close to an economic downturn, credit growth is nevertheless expanding. (Fig. 4)

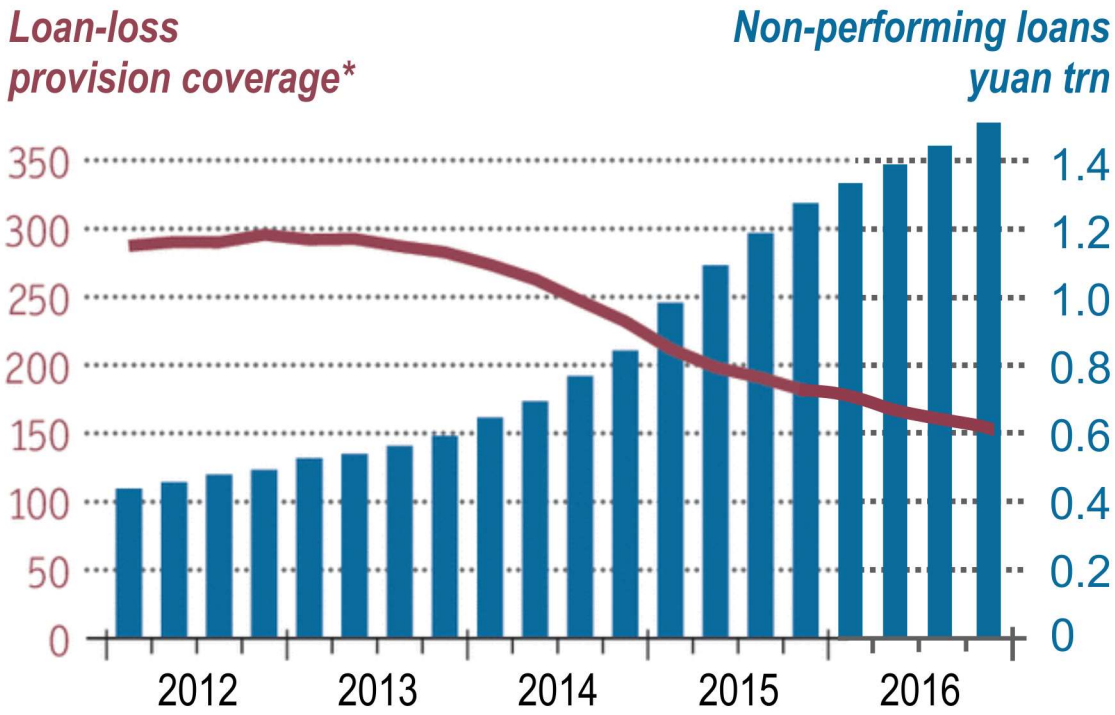


Fig. 4 Great hole of China: Chinese banks
* Ratio of loan-loss provision to non-performing loans
Sources: China Banking Regulatory Commission, *The Economist*, and our estimations

China's entire debt exceeded twofold its gross domestic product (GDP) in 2015 (debt connections between the state and industry may be catastrophic), expanding to about 250% of GDP as a result of its recurrent utilization inexpensive credit to trigger slowing growth, releasing a huge, debt-fuelled spending carousal. The most bothersome risks prevail in the non-financial corporate sphere, where the debt-to-GDP ratio is more than 150%. Such firms are generally state-owned ones that borrowed greatly from government-supported banks. (Fig. 5)

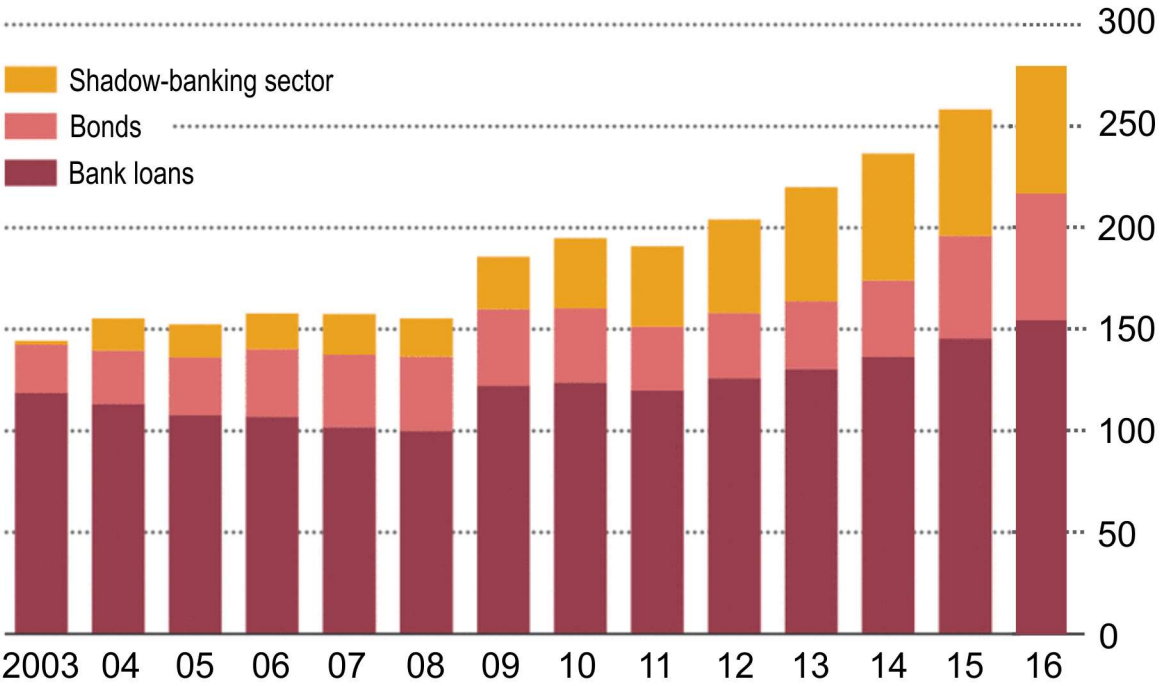


Fig. 5 China's total debt by type, as % of GDP
Sources: People's Bank of China, National Bureau of Statistics, ChinaBond, BIS, *The Economist*, and our estimations

Clean-energy investment has been diminished significantly lately, staying at the same level as last year, while Europe and China both have reduced backing for wind and solar farms. A rise in expenditure for relevant offshore wind schemes was experienced at the beginning of 2016. Governments in the most significant markets for renewables have cut down subvention for groundbreaking schemes, indicating a drop in the expense of photovoltaics and wind turbines. The most extensive downturn in investment is a sign of the decreasing expense of capital for renewables, which enables investors to set up the equivalent power generation strength for a smaller amount of cash. (Fig. 6)

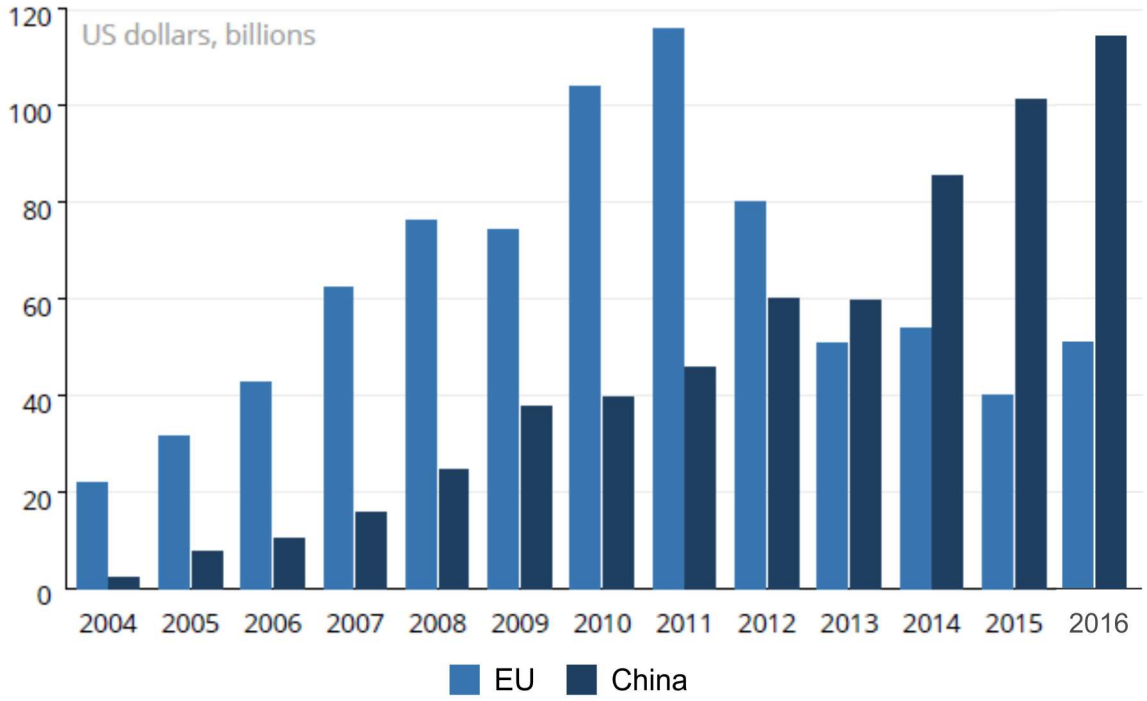


Fig. 6 Clean energy investment in the EU and China
Sources: Bloomberg New Energy Finance and our estimations

In 2016, China boosted its overseas investment in renewables by 60%, its scheme for renewable energy being a significant determinant of its massive rise in such an investment. China spent about $200 billion in clean energy in 2015 and 2016. Although renewables are increasing in frequency, the proportion of coal in the energy mix is still pretty important, being instrumental in climate change and choking smog. By increasing the amount of clean energy nationally, China has set up the necessary economies of scale to sell abroad inexpensive clean energy goods and services. (Fig. 7)

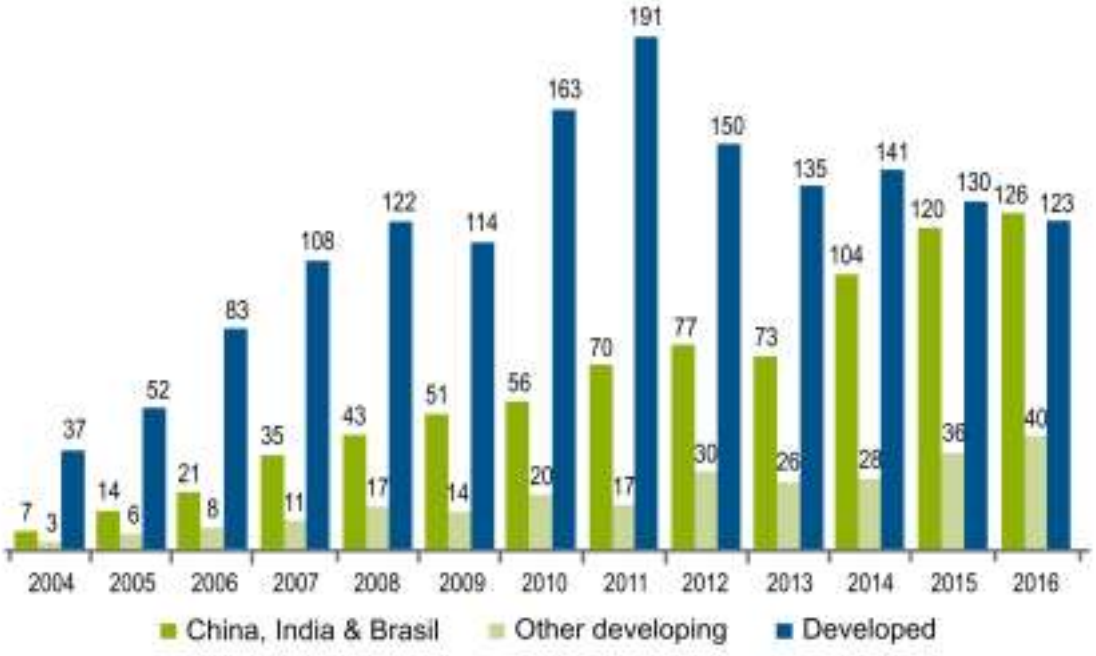


Fig. 7 Global new investment in renewable energy ($bn)
Sources: UNEP, Bloomberg New Energy Finance, and our estimations

China has curbed on establishing innovative wide-ranging schemes and moved in the direction of assimilating the strength they activated. Capital spending undertakings reached $29.9bn in 2016, because developers in Europe and China use proficiently bigger turbines and enhanced economics. China's foreign investment in renewable energy schemes increased in 2016 by 60% to $32 billion, indicating its preeminence in the worldwide market for clean energy. China aims to spend $361 billion into renewables in the next few years, essential to its shift away from coal power. (Fig. 8)

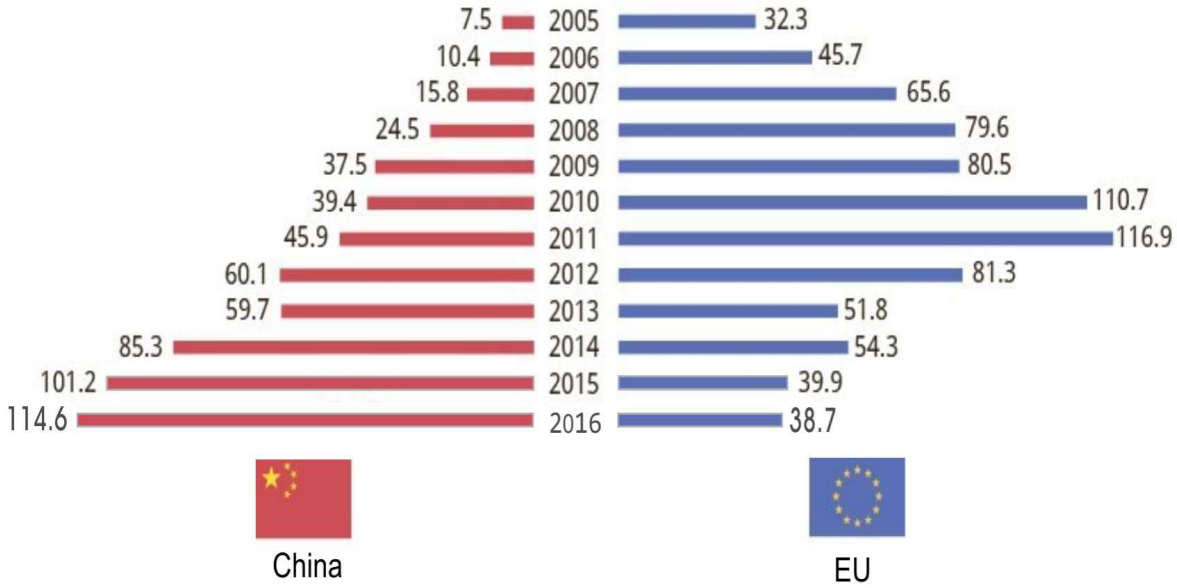


Fig. 8 Clean energy investment: China and EU*
* Total investment in clean energy, $bn
Sources: BNEF, Xinhuanet, and our estimations

5. DISCUSSION AND PRACTICAL IMPLICATIONS

We observe that in comparison with examples of effective investment approaches that put forward sustainable economic growth and advancement via cleaner energy, adjustment, and climate strength, the Chinese government lacks all-encompassing technical regulations or schemes administering its foreign development investments or assistance to circumvent detrimental investment results. We highlight that the absence of foreign investment instructions has activated apprehensions that China might persist to make green investments nationally and brown ones overseas. As a result, pollution-intensive heavy industries have been influenced by overcapacity in China, being governed by state-owned companies with stable local government connections (Friedman, Friedman, & Leverton, 2016; Lee, 2016; Nica, Manole, & Brișcariu, 2016; Popescu & Predescu, 2016), access to inexpensive capital, and a propensity to influence those benefits to maintain their plants operating notwithstanding the capacity of the market to consume what is produced. (Hart, Ogden, and Sims Gallagher, 2016)

6. CONCLUSIONS, LIMITATIONS, AND FURTHER DIRECTIONS

We conclude that establishing an emission pricing and a trading system is an underlying institutional cutting edge and reorganization in the sphere of China's green protection. Chinese banks should advance a coherent and consonant set of criteria and procedures for assessing green components encompassing pollution and ecological impacts and sustainable use of resources by loan candidates or proposals. Our limitations in showing that extremely polluting sectors constitute an important proportion of China's main stock indices and represent a significant volume of passive investments are generated by the lack of access to recent and relevant data. Further research should insist on proving that China's current accounting system is unproductive in successfully assessing the environmental expenses originating from the progression of an undertaking or corporate performance (Androniceanu & Drăgulănescu, 2016; Andrei et al., 2016; Androniceanu, 2014; Androniceanu & Drăgulănescu, 2012; Becerra-Alonso, Androniceanu, & Georgescu, 2016), which brings about an important undervaluation of the environmental expenses of investment, business-related and scheme decision making. (The Green Finance Task Force, 2015)

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TECHNICAL EFFICIENCY IN THE CZECH AND SLOVAK BANKING INDUSTRY: A COMPARISON OF THREE APPROACHES FOR SELECTION OF VARIABLES

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Abstract

The aim of the paper is to measure the technical efficiency in the Czech and Slovak banking industry using three approaches for the banks' inputs and outputs selection. It is applied the non-parametric Data Envelopment Analysis model, input-oriented model with constant and variable return to scale with three general approaches. In order to conduct a DEA analysis estimation, inputs and outputs need to be defined. We simultaneously adopted asset-oriented intermediation approach, production and profit-oriented intermediation approach. The results show that when we compared the average overall technical efficiency during the whole period, the only marginal differences was registered in the average efficiency under each approach. The efficiency of the Czech banking sector was higher than in the Slovak banking industry under all approaches.

Keywords: Data Envelopment Analysis, asset-oriented intermediation approach, production approach, profit-oriented intermediation approach, return to scale

JEL Classification: G21

1.INTRODUCTION

The measurement of efficiency deals with the relationship between inputs and outputs. Efficiency is measured as relative efficiency, it means that it calculates how bank use inputs to produce outputs with respect to other banks in the data set. The significance of measurement of banking efficiency is related to the impact that an efficient financial system has on the microeconomic and macroeconomic level. Efficiency assessment of banking sectors has a strong effect on the performance of economy. The developing of economy and society is consequence of the strong banking system. One of the most important issues in banking efficiency investigation is measuring the technical efficiency (Shafiee et al., 2013). Technical efficiency is the ability of the firm to maximize outputs from a given set of inputs (Farrell, 1957). In order to conduct a Data Envelopment Analysis estimation, inputs and outputs need to be defined. The main approaches for selection of inputs and outputs were developed. However, in the empirical literature, there is no consensus of the definition of banks' inputs and outputs for the banking efficiency measurement. The most contentious variable is the total deposits, whether this variable is input or output of the bank. Several approaches for definition of banks' inputs and outputs have been developed and used in the measurement of banking efficiency.
The aim of the paper is to measure the technical efficiency in the Czech and Slovak banking industry using three approaches for the banks' inputs and outputs selection. In this paper we applied the non-parametric Data Envelopment Analysis (DEA) model, input-oriented model with constant and variable return to scale with three general approaches. We simultaneously adopted the asset-oriented intermediation approach, production and profit-oriented intermediation approach. As Ahm and Le (2014) and Boďa and Zimková (2015) mentioned that each approach has the different main perspective. The asset-oriented intermediation approach considers the commercial bank as a financial intermediary and is consistent with the

macroeconomic view of commercial banks. The production approach takes the commercial bank as a service producer aiming at minimizing operating costs and is in line with the microeconomic standpoint. The profit-oriented intermediation approach takes the commercial bank as a firm that maximize profit.
The outline of the paper is organized as follows. Next chapter presented empirical literature review regarding the selection of inputs and outputs and literature review of the results of efficiency in the Czech and Slovak banking industry. In section 3, we describe the methodology. The empirical analysis and results is presented in Section 4 and finally, we conclude the paper with the suggestions for future research in Section 5.

2.REVIEW OF EMPIRICAL LITERATURE

2.1.Selection of Inputs and Outputs

First, it is necessary to define used inputs and outputs for the empirical estimation of the efficiency. Several major approaches were developed in the empirical literature that define the relationship of inputs and outputs in the behavior of financial institutions. Firstly, an intermediation approach was introduced by Sealey and Lindley (1977). This approach suggests that the main purpose of banks is to transform their liabilities (deposits) into assets (loans). Banks are characterized as financial intermediaries (Ahm and Le, 2014). There are two orientations in the applications of the intermediation approach regarding the measures of the intermediation factors: the asset-oriented and profit-oriented approach. The asset-oriented intermediation approach employs the value of intermediated funds as measures, which is in line with the model of Sealey and Lindley (1977). Berger and Humphrey (1997) showed that under this approach, banks are considered only as financial intermediaries between liability holders and those who receive bank funds. Loans and other assets are considered to be bank outputs; deposits and other liabilities are inputs to the intermediation process.
Profit-oriented intermediation approach was defined by Berger and Mester (2003), who reported that it can help capture the objective of maximizing profits by including costs and revenues. The profit-oriented approach employs the financial income measures due to the specific interest in cost and revenue relationship (Ahn and Le, 2014). Boďa and Zimková (2015) described that the profit-oriented approach attempts to capture final monetary effects of financial intermediation, in which interest expenses and/or non-interest expenses are found as inputs and interest income and/or non-interest income are used as outputs. Such a specification retains the minimizing feature of inputs and the maximizing feature of outputs.
The next approach is the production approach which was pioneered in study of Benston (1965). Under this approach, banks are characterized as service producers aiming at minimizing operating costs (Ahn and Le, 2014). Inputs under this approach include only physical variable such as labor, premises and fixed assets, space or information system and their associated costs. Interest expenses are excluded from this approach since the main focus is on operating processes. Outputs are defined in terms of what a bank that incurs operating costs, referring to all banking services. The output factors could include deposits, loans and securities.
Other modification of production approach is the user costs approach developed by Hancock (1985). As showed Boďa and Zimková (2015) deposits are specified as both inputs and outputs of the cost/profit function of a bank. Hancock (1991) specified that demand deposits would be classified as outputs, while time deposits would be classified as inputs. Banks are defined as producers of financial services with the aim to minimize the user costs of liabilities and assets, or maximize the economic return (Ahn and Le, 2014).
The value-added approach considers that all liability and asset categories to have some output characteristics. The categories having substantial value added were employed as the important

outputs. Others were treated as representing mainly either unimportant outputs, intermediate products, or inputs, depending on the specifics of the category. The value-added approach explicitly uses operating cost data (Berger and Humphrey, 1997). As Boďa and Zimková (2015) described that the application of this approach requires a more sensitive analysis of individual processes that are carried out by the commercial banks under evaluation.

2.2.Efficiency of the Czech and Slovak Banking Sector

Empirical analysis of the efficiency in the Czech and Slovak commercial banks exist several and we refer to some of them. Most empirical studies evaluated banking efficiency in the 1990s and researchers estimated the effect of privatization. For example, Weill (2003), Bonin et al. (2005), Matoušek and Taci (2005), Fries and Taci (2005), Grigorian and Manole (2006) and Baruník and Soták (2010) found that private banks were more efficient than state-owned banks. This topic is not the subject of this paper, therefore we do not deal with this studies.
Some empirical studies e.g. Yildirim and Philippatos (2007), Matoušek (2008), Mamatzakis et al. (2008) and Brissimis et al. (2010) examined the banking efficiency in several European countries and the Czech and Slovak banking sectors were included in panel data. Also Stavárek and Polouček (2004) estimated efficiency and profitability in selected banking sectors. Authors found that the Czech were on average evaluated as the most efficient. Also, Stavárek (2005) who estimated commercial banks efficiency in Visegrad countries (Czech Republic, Hungary, Poland, Slovakia) before joining the EU found that the Czech banking sector was the most efficient. Also, Melecký and Staníčková (2012) evaluated the banking sector of the Czech Republic as highly efficient. These findings were confirmed also by Kočišová (2014) who found the Czech banks were more cost, revenue and profit efficient than Slovak ones during the period 2009-2013. Weill (2007) found that the Czech banking sector was more efficient than other CEE countries. Svitálková (2014) concluded that one of the best performance had Czech banking sector and the banking sector in Slovakia had the worst performance of measured counties. Stavárek and Řepková (2012) found that average banking efficiency increased in the Czech Republic. Although the results of Andries and Cocris (2010) showed that banks in the Czech Republic were inefficient from the perspective of costs.
Stavárek and Šulganová (2009) estimated banking efficiency in Slovakia employing the parametric approach in the 2001–2005 period. Researchers found that the average efficiency increased. Also, Palečková (2015) found the increased in the average efficiency of the Slovak commercial banks. Zimková (2014) estimated the technical efficiency of the banking institutions in Slovakia in 2012 and found that more than half of institutions were found technically efficient. On contrary, Rossi et al. (2005) investigated that the banking systems of Slovakia showed significant levels of cost and profit inefficiency, indicating that on average banks operate far above (below) from the cost (profit) efficient frontiers. Also, Iršová and Havránek (2011) found a low value of the average cost and profit efficiency Slovakia in the years 1995–2006. Also, Řepková and Miglietti (2013) estimated the cost and profit efficiency of the Slovak commercial banks and they found that the average cost and profit efficiency was decreasing in the Slovak banking sector during the period 2003–2012.

3.METHODOLOGY

DEA is a method for measurement of the relative efficiency of Decision-Making Units (DMU), using the same multiple inputs and to produce multiple outputs. In recent years, this method is becoming increasingly popular to measure effectiveness in the service sector (e.g. financial services, health services (e.g. Stefko et al. 2016) education, transport (e.g. Klieštik 2009),

telecommunication, hotel services), but also in the agricultural sector, mining, automobile industry and so on.
DEA is used to establish a best practice group of units and to determine which units are inefficient compared to best practice groups as well as to show the magnitude of the inefficiencies present. From the set of available data, via the DEA models can be identified:

1. The efficient frontier,
2. Efficiency score of each DMU,
3. Projection on the efficiency frontier for each inefficient DMU.

In this study the units of analysis are banks. Consider n banks (DMU_j, $j=1,2,...,n$), each consumes m different inputs (x_{ij}, $i=1,2,...,m$) to produce s different outputs (y_{rj}, $r=1,2,...,s$). The matrix of inputs is marked as follows $X = \{x_{ij}, i=1,2,\ldots,m; j=1,2,\ldots,n\}$ and the matrix of outputs $Y = \{y_{rj}, r=1,2,\ldots,s; j=1,2,\ldots,n\}$. Since the used inputs and produced outputs have for each bank another level of significance, they have different weights. The advantage of DEA models is that the weights of used inputs and produced outputs are result of the solving optimization of linear programming problem and aren't allocated on the basis of subjective perception.
DEA models, input or output oriented, allow calculating with constant or variable return to the scale. The input-oriented models bring recommendation for inefficient units to achieve efficiency in form of reduction on the input side. Output-oriented models required to achieve efficiency increase on the output side. The model with the constant return to the scale assumption is called CCR (Charnes, Cooper and Rhodes) model. The assumption of constant return to scale can be accepted only if the DMUs operate under condition of their optimal size. Imperfect competition, financial constraints, control steps and other factors are conductive to the fact that DMUs don't operate under their optimal size. Therefore, to overcome this problem has been developed DEA model, which allows calculating with variable returns to scale. This model is called a BCC model (Banker, Charnes, Cooper). The BCC model measures technical efficiency as the convexity constraint ensures that the composite unit is of similar scale size as the unit being measured. It means that an inefficient DMU is only benchmarked against DMUs (banks) of a similar size. The efficiency of a particular DMU_q can be obtained by solving the linear programming programs. Input-oriented model with slack variables, which assumes variable return to scale (BCC model), can be defined as follow (Cooper, Seiford, and Tone, 2007):

Min $$\theta_q - \varepsilon\left[\sum_{i=1}^{m} s_i^- + \sum_{r=1}^{s} s_r^+\right] \quad (1)$$

Subject to $$\sum_{j=1}^{n} x_{ij}\lambda_j + s_i^- = \theta_q x_{iq}$$

$$\sum_{j=1}^{n} y_{rj}\lambda_j - s_r^+ = y_{rq}$$

$$\sum_{j=1}^{n} \lambda_j = 1$$

$$\lambda_j; s_i^-; s_r^+ \geq 0$$

Where θ_q is technical efficiency of DMU_q, ε is non-Archimedean constant (10^{-6}or 10^{-8}), s_r^+ and s_i^- are input or output slacks, y_{rq} is produced amounts of r^{th} output (r=1,2,...,s) for DMU_q, x_{iq} is consumed amounts of i^{th} input (i=1,2,...,m) for DMU_q, y_{rj} is produced amounts of r^{th} output (r=1,2,...,s) for DMU_j (j=*1, 2,...,*n), x_{ij} is consumed amounts of i^{th} input (i = 1,2,...,m) for DMU_j (j=*1, 2,...,*n), λ_j is weight assigned to the DMU_j (j=1,2,…,n).
Performing a DEA analysis, in fact, requires solving of n linear programming problems of the above form, one for each DMU. DMU_q is termed fully technical efficient if and only if the optimal value θ_q=1 and all the slack variables are equal to zero. In this case, we can talk about the Pareto-Koopmans efficiency. If θ_q=1but slack variables aren't equal to zero we can talk about the "pseudo-efficiency". If the slack variables are equal to zero but θ_q<1 then the value θ_q signalises the technical inefficiency. This inefficiency can be eliminated by proportional (radial) reduction in all inputs of DMU_q by (1–θ_q)100% and thus achieve the shift on the efficiency frontier. If the slack variables aren't equal to zero and θ_q<1, to achieve technical efficiency is necessary also the non-radial shift expressed by slack variables.
The efficiency calculated by CCR models is often called the overall technical efficiency. The overall efficiency of DMU_q can be decomposed into pure technical efficiency (calculated by BCC model) and scale efficiency (SE). The decomposition of overall technical efficiency is possible according to following formula (Cooper, Seiford, and Tone, 2007):

$$CCR_q = BCC_q \cdot SE_q \qquad (2)$$

One component of CCR efficiency is scale efficiency (SE). If SE is equal to one, this means that bank is operating under conditions of constant return to scale, which means, that the bank operates at the most efficient scale size. If SE is less than one, this means that the bank operates under conditions of variable return to scale, so there is scale inefficiency for bank, which could be calculated as the difference between one and the value of SE.
If the bank operates under the conditions of increasing return to scale (form the point of view of the input-oriented DEA model) it can be considered as too big bank. The fact, that the bank is too big means that bank is scale inefficient because under the given inputs could be achieved higher outputs. On the other hand, the bank could be considered as too small when operates under the conditions of decreasing return to scale. In case of too small bank the scale inefficiency was due to too high level of outputs at a given level of inputs.

4.EMPIRICAL ANALYSIS AND RESULTS

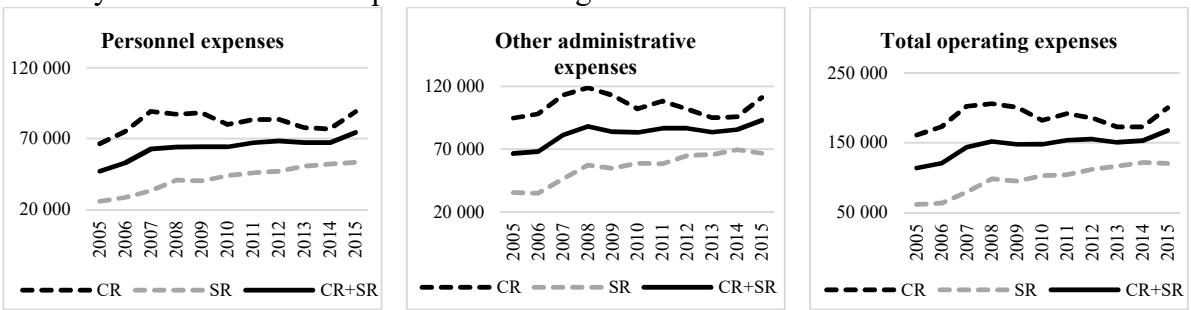
In our research, we have focused on the evaluation of the efficiency of domestic commercial banks. The foreign-controlled subsidiaries and foreign controlled branches operated in the area of Czech Republic and Slovakia were not evaluated. The analysis is based on the data of domestic banks, which comprises more than 75% of total banking assets in their country. We evaluated efficiency only of universal commercial banks; the specialised banks (e.g. central banks, mortgage banks or savings banks) were not involved in the data set. The number of analysed banks in each year moved from 21 to 24.
We evaluated the relative technical efficiency of Czech and Slovak domestic commercial banks during the period from 2005 to 2015. The reason why not to used older data was, that in 2004 the financial institutions started to adjust their financial statements, accounting systems and methodology of accounting according to the Basel II rules.

The term "relative" efficiency refers to achieved efficiency of evaluated production unit (bank) within the group of evaluated production units and of the criteria used (input and output variables according to apply approach). In our analysis, we compared the relative efficiency of each from analysed banks and also the average efficiency of banks in two banking sectors separately according to bank headquarters to one of the countries (the Czech Republic, or Slovakia). For evaluation of relative efficiency were used three basic approaches for modelling the banking process – production, asset-oriented and profit-oriented intermediation approach.
We decided to use all three approaches to our analysis. We would like to use production approach for measurement cost efficiency of the banks, asset-oriented intermediation approach, as the dominated research in banking area for measurement the economic viability of the banks, and profit-oriented intermediation approach, for evaluating the efficiency of costs and revenues management. After a survey of a number of similar studies, we decided to use the set of inputs and outputs presented in Table 1 for all approaches for evaluating relative efficiency. For all three approaches, the data were extracted from banks´ end-of-year unconsolidated balance sheets and income statements based on international accounting standards. All data were reported in EUR as the reference currency. The data in national currencies (Česká koruna – CZK, Slovenská koruna – SKK), were converted by using the official exchange rates of the national central bank from 31.12.20XX in selected year. Depending on approach there were chosen input and output variables used in the evaluation of relative efficiency through the DEA. As we know that the optimal value of input and output variables in DEA models should be lower than number of analysed banks divided by 3, and increasing number of variables led to the increase of average efficiency, we have decided to use 4 variables in each approach.

Tab. 1 – Input and output variables between 2005 and 2015 (in thousands of EUR). Source: Authors´ calculations

		Personnel expenses	Other administrative expenses	Total operating expenses	Total deposits	Total loans	Net interest income	Interest expenses	Interest income	Non-interest income
CR	Minimum	724	693	1 417	12 680	10 953	1 054	107	1 241	18
	Maximum	325 752	431 055	740 018	29 517 173	19 703 646	1 141 907	760 669	1 437 174	560 013
	Average	81 166	104 147	185 313	7 141 255	4 770 602	259 380	105 573	364 905	128 932
	St. deviation	95 611	120 362	214 977	8 597 015	5 445 479	320 251	145 777	440 237	161 306
SR	Minimum	1 850	1 817	3 905	108 108	34 507	2 667	2 473	5 277	449
	Maximum	117 080	160 178	268 760	11 062 984	9 536 299	469 081	221 704	590 419	156 040
	Average	41 713	55 641	97 354	3 494 474	2 902 942	134 907	55 937	190 843	50 775
	St. deviation	36 534	47 647	83 650	3 141 049	2 716 064	134 453	52 042	172 612	49 994
CR+SR	Minimum	724	693	1 417	12 680	10 953	1 054	107	1 241	18
	Maximum	325 752	431 055	740 018	29 517 173	19 703 646	1 141 907	760 669	1 437 174	560 013
	Average	63 819	82 765	146 584	5 535 273	3 946 779	204 753	83 722	288 448	94 523
	St. deviation	77 903	98 295	175 404	6 989 029	4 545 069	262 589	116 839	358 663	130 831

Descriptive statistics and development of average values of all input and output variables used in the analysis are given in Tab. 1 and Fig. 1. As can be seen in the table, the Czech banking (CR) sector had higher volatility and can be considered bigger than the Slovak (SR) one. The tendency of variables´ development can be regarded as the same.



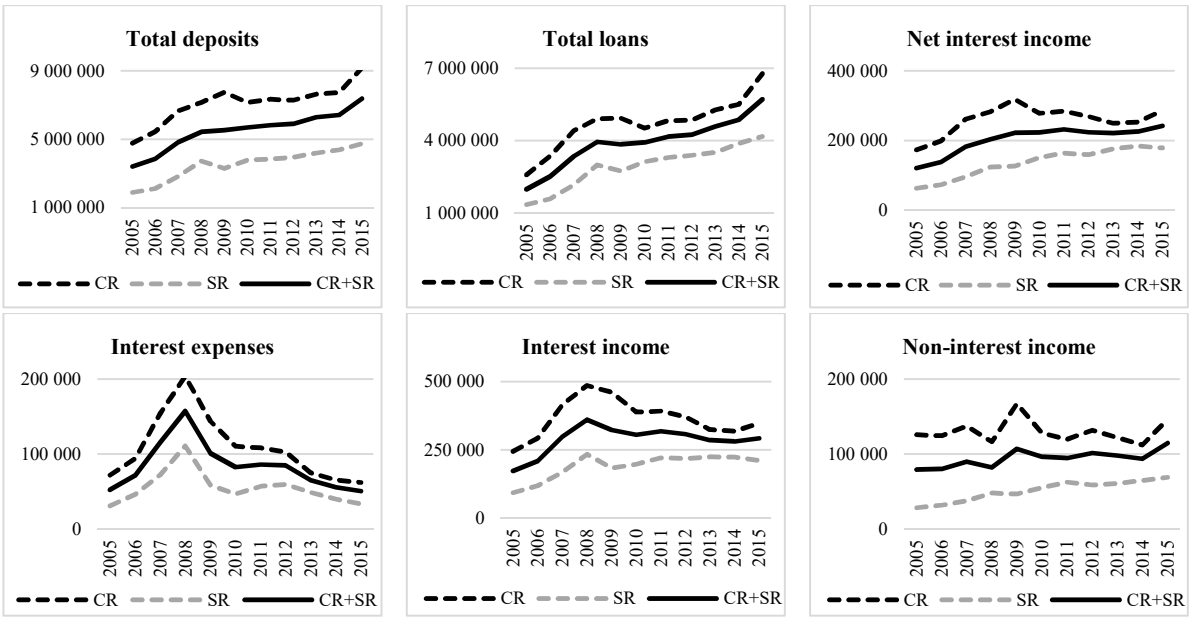


Fig. 1 – Development of average values of input and output variables (in thousands of EUR). Source: Authors´ calculations

In case of asset-oriented intermediation approach (AOIA) we used two inputs (x_{ij}; i=1,2), and two outputs (y_{rj}; r=1,2). The input variables (x_{ij}) were:

- Labour (PC) – (x_{1j}) – measured by the personnel costs, covered wages an all associated expenses.
- Total deposits (TD) – (x_{2j}) – measured by the total deposits received from clients and other credit institutions.

As the output variables (y_{rj}) were determined:

- Total loans to clients and other credit institutions (TL) – (y_{1j}).
- Net interest income (NETII) – (y_{2j}) – expressed as the difference between interest incomes and interest expenses. The reason for choosing NETII place net fee and commission income was that NETII formed nearly 80% of bank´s gross revenues in 2015, as Slovak and Czech banking sectors still prefer interest rate policy before the fee policy.

For the profit-oriented intermediation approach (POIA), for each bank were selected two inputs (two main types of costs) and two outputs (two main sources of revenues). The input variables (x_{ij}) were:

- Interest and related expenses (IE) – (x_{1j}).
- Total operating expenses (TOE) – (x_{2j}) – calculated as a sum of personal cost and other operating expenses.

The output variables (y_{rj}) were:

- Interest income (II) – (y_{1j}).
- Non-interest income (NII) – (y_{2j}).

For the production approach (PA), for each bank (DMU_j) were selected two inputs (x_{ij}; i=1,2) and two outputs (y_{rj}; r=1,2). The input variables (x_{ij}) were:

- Personal costs (PC) – (x_{1j}).
- Other administrative expenses (OAE) – (x_{2j}) – were represented by operating expenses without personal costs.

As the output variables (y_{rj}) were determined:
- Total deposits (TD) – (y_{1j}).
- Total loans (TL) – (y_{2j}).

Following the described methodology, we evaluated efficiency of all banks in the estimation set and calculated efficiency scores by running separate programs for the CCR input-oriented model and for the BCC input-oriented model. We pooled the cross-country data and use them to define a common best-practice efficiency frontier. This allowed us to focus on determining relative differences in efficiency across banks. The average efficiency scores were evaluated separately on the "national" and "international" level. In case of "international" approach the average efficiency scores were calculated from data of all banks.
Three types of average efficiency scores (overall technical efficiency, pure technical efficiency and scale efficiency) were calculated in case of asset-oriented intermediation approach (AOIA), profit-oriented intermediation approach (POIA) and production approach (PA). The results are recorded in Tab. 2.

Tab. 2 – Results of the application of DEA models. Source: Authors´ calculations

		CCR model			BCC model			SE		
		AOIA	POIA	PA	AOIA	POIA	PA	AOIA	POIA	PA
Czech Republic	2005	0.80986	0.89521	0.65814	0.93032	0.95341	0.87348	0.87132	0.93774	0.76313
	2006	0.82113	0.84345	0.54145	0.92699	0.90954	0.79124	0.88674	0.93195	0.74098
	2007	0.82681	0.87950	0.66821	0.99155	0.93593	0.91724	0.83365	0.94190	0.73490
	2008	0.88574	0.88651	0.68482	0.96655	0.95353	0.91099	0.91427	0.93160	0.76076
	2009	0.91424	0.82148	0.81127	0.97671	0.90190	0.93679	0.93659	0.91335	0.87202
	2010	0.86338	0.83096	0.78747	0.96686	0.90340	0.93760	0.89054	0.91333	0.84577
	2011	0.84593	0.73156	0.69244	0.97270	0.85122	0.87499	0.86816	0.85049	0.78310
	2012	0.81995	0.75591	0.73903	0.92526	0.85053	0.86038	0.88525	0.86933	0.85430
	2013	0.85922	0.72899	0.81326	0.95844	0.85868	0.89132	0.89785	0.84338	0.91137
	2014	0.84314	0.77862	0.73094	0.95421	0.86524	0.86866	0.88558	0.89735	0.85179
	2015	0.87857	0.70041	0.76914	0.93388	0.85465	0.84080	0.94250	0.82397	0.92382
Slovak Republic	2005	0.74276	0.72169	0.65764	0.85255	0.78109	0.76273	0.87023	0.92724	0.87009
	2006	0.76229	0.81856	0.47756	0.83120	0.86874	0.60726	0.91872	0.94644	0.83195
	2007	0.79313	0.78094	0.64980	0.88577	0.87946	0.80744	0.90259	0.89339	0.83750
	2008	0.81536	0.85365	0.66272	0.86911	0.90664	0.79919	0.93785	0.94382	0.84933
	2009	0.88630	0.73896	0.72324	0.93763	0.81889	0.79999	0.94356	0.90848	0.91584
	2010	0.89766	0.81086	0.80572	0.94067	0.83855	0.84060	0.94761	0.96825	0.95798
	2011	0.91210	0.79356	0.78092	0.93375	0.83306	0.84106	0.97057	0.95279	0.93135
	2012	0.90147	0.72351	0.79672	0.93724	0.77902	0.84050	0.95590	0.93263	0.94921
	2013	0.89328	0.74077	0.69728	0.94608	0.81311	0.75565	0.93887	0.91167	0.92759
	2014	0.88744	0.77108	0.69740	0.93904	0.81985	0.79226	0.93798	0.93801	0.89423
	2015	0.85763	0.71346	0.73251	0.93788	0.81159	0.79107	0.91541	0.88119	0.93435
Total	2005	0.77791	0.81258	0.65790	0.89329	0.87135	0.82074	0.87080	0.93274	0.81406
	2006	0.79311	0.83160	0.51103	0.88137	0.89011	0.70363	0.90197	0.93885	0.78430
	2007	0.81077	0.83256	0.65944	0.94118	0.90904	0.86495	0.86648	0.91880	0.78376
	2008	0.85055	0.87008	0.67377	0.91783	0.93008	0.85509	0.92606	0.93771	0.80505
	2009	0.90027	0.78022	0.76725	0.95717	0.86039	0.86839	0.94007	0.91091	0.89393
	2010	0.87828	0.82222	0.79541	0.95547	0.87520	0.89543	0.91535	0.93721	0.89456
	2011	0.87470	0.75852	0.73091	0.95577	0.84332	0.86024	0.91268	0.89497	0.84755
	2012	0.85392	0.74241	0.76307	0.93025	0.82073	0.85210	0.91469	0.89570	0.89385
	2013	0.87255	0.73360	0.76788	0.95360	0.84085	0.83823	0.91390	0.87010	0.91772
	2014	0.86047	0.77567	0.71782	0.94827	0.84748	0.83877	0.90608	0.91326	0.86840
	2015	0.87000	0.70575	0.75416	0.93551	0.83704	0.82046	0.93142	0.84738	0.92813

Under the asset-oriented intermediation approach, the average overall technical efficiency (measured by CCR model) during the whole analysed period was 84.93%. The average CCR efficiency in the whole sample moved from 77.79% in 2005 to 90.03% in 2009. The overall

technical efficiency of individual banks reached values from 36.95% to 100%. When we look at banking sectors separately, we can see that in case of Slovak banking sector the level of overall technical efficiency during the whole evaluated period was lower than in case of Czech banks. The number of banks in Slovak banking sector is lower than in the Czech banking industry. Another differences are in size of banking industry, Slovak banking sector registered lower degree of financial intermediation as well as the value of total assets then the Czech banking sector. The average CCR efficiency in Czech banking sector was 85.16%, the minimal average value (80.99%) was recorded in 2005, maximal value (91.42%) in 2009. In Slovak banking sector the average efficiency moved from 74.28% (in 2005) to 91.21% (in 2011), where the average efficiency during the whole analysed period was 84.99%. As can be seen from the results in Table 2, the development of average efficiency can be divided into some phases. In case of "international" approach and in case of Czech banking sector, there was positive move of efficiency frontier since 2005 to 2009. During the period 2009-2012 there can be seen the negative movement of efficiency frontier, and after 2012 the development of overall technical efficiency can be considered as stable. In case of Slovak banking sector the development of efficiency frontier can be divided two main phases. Since 2005 to 2011 there can be seen the positive movement of efficiency frontier, and on the other hand since 2011 till now the efficiency frontier recorded a negative shift. The negative shift of the efficiency frontier after 2009 can be influenced by the financial crisis, which hit banking sectors all around the world gradually since 2008. Most of commercial banks registered the decrease in total loans and net interest income. The later turn from positive to negative movement of efficiency frontier in case of Slovakia could be influenced by the adoption of Euro as the national currency in 2009, which should have positive impact on the level of efficiency through the minimisation of exchange rate risk. The average efficiency in BCC model indicated that the evaluated banks in the production of their outputs needed an average only 93.36% of the used inputs. The average BCC efficiency in the whole sample moved from 88.14% in 2006 to 95.72% in 2009. The pure technical efficiency of individual banks reached values from 48.03% to 100%. When we look at banking sectors separately, we can see that in case of Slovak banking sector the level of pure technical efficiency during the whole period was lower than in case of Czech banks. The average BCC efficiency in Czech banking sector was 95.49%, the minimal average value (92.53%) was recorded in 2012, maximal value (99.16%) in 2007. In Slovak banking sector the average efficiency moved from 83.12% (in 2006) to 94.61% (in 2013), where the average pure technical efficiency during the analysed period was 91.01%. Most of the banks operated under conditions of variable return to scale, mainly under conditions of decreasing return to scale. As can be seen, the banks suffered from scale inefficiency, which reached the average value 9.05% under this approach. The DEA models showed that the reason for the inefficiency of Czech and Slovak commercial banks is mainly the excess of client deposits on the balance sheet of banks. Thus, the excess of deposits reflected negatively to net interest income by increasing interest costs of banks.

Under the profit-oriented intermediation approach, the average overall technical efficiency (measured by CCR model) during the whole analysed period was 78.77%. The average CCR efficiency in whole sample moved from 70.58% in 2015 to 87.01% in 2008. The overall technical efficiency of individual banks reached values from 17.8% to 100%. When we look at banking sectors separately, we can see that in case of Slovak banking sector the level of overall technical efficiency during the whole evaluated period was lower than in case of Czech banks. The average CCR efficiency in Czech banking sector was 80.48%, the minimal average value (70.44%) was recorded in 2015, maximal value (89.52%) in 2005. In Slovak banking sector the average efficiency moved from 71.35% (in 2015) to 85.37% (in 2008), where the average efficiency during the whole analysed period was 76.97%. As can be seen from the results in Table 2, the development of average efficiency can be divided into two main phases. In case of

"international" approach, but also in case of Slovak and Czech banking sector separately, there was positive move of efficiency frontier since 2005 to 2008. Then, since 2008 till now there can be seen the negative movement of efficiency frontier. The average efficiency in BCC model indicated that the evaluated banks in the production of their outputs (revenues) needed an average only 86.6% of the used inputs (costs). The average BCC efficiency in whole sample moved from 82.07% in 2012 to 93.01% in 2008. The pure technical efficiency of individual banks reached values from 47.49% to 100%. When we look at banking sectors separately, we can see that in case of Slovak banking sector the level of pure technical efficiency during the whole period was lower than in case of Czech banks. The average BCC efficiency in Czech banking sector was 89.44%, the minimal average value (85.05%) was recorded in 2012, maximal value (95.35%) in 2005. In Slovak banking sector the average efficiency moved from 77.90% (in 2012) to 90.66% (in 2008), where the average pure technical efficiency during the analysed period was 83.18%. Most of the banks operated under conditions of variable return to scale, mainly under conditions of increasing return to scale. As can be seen, the banks suffered from scale inefficiency, which reached the average value 9.11% under this approach.
Under the production approach, the average overall technical efficiency (measured by CCR model) during the whole analysed period was 70.90%. The average CCR efficiency in whole sample moved from 51.10% in 2006 to 79.54% in 2010. The overall technical efficiency of individual banks reached values from 17.66% to 100%. When we look at banking sectors separately, we can see that in case of Slovak banking sector the level of overall technical efficiency during the whole evaluated period was lower than in case of Czech banks. The average CCR efficiency in Czech banking sector was 71.78%, the minimal average value (54.15%) was recorded in 2004, maximal value (81.33%) in 2013. In Slovak banking sector the average efficiency moved from 47.76% (in 2006) to 80.57% (in 2010), where the average efficiency during the whole analysed period was 69.83%. The average efficiency in BCC model indicated that the evaluated banks in the production of their outputs needed an average only 83.80% of the used inputs. The average BCC efficiency in whole sample moved from 70.36% in 2006 to 89.54% in 2010. The pure technical efficiency of individual banks reached values from 29.05% to 100%. When we look at banking sectors separately, we can see that in case of Slovak banking sector (78.53%) the level of pure technical efficiency during the whole period was lower than in case of Czech banks (88.21%). Most of the banks operated under conditions of variable return to scale, mainly under conditions of decreasing return to scale. As can be seen the banks suffered from scale inefficiency, which reached the average value 14.26% under this approach.

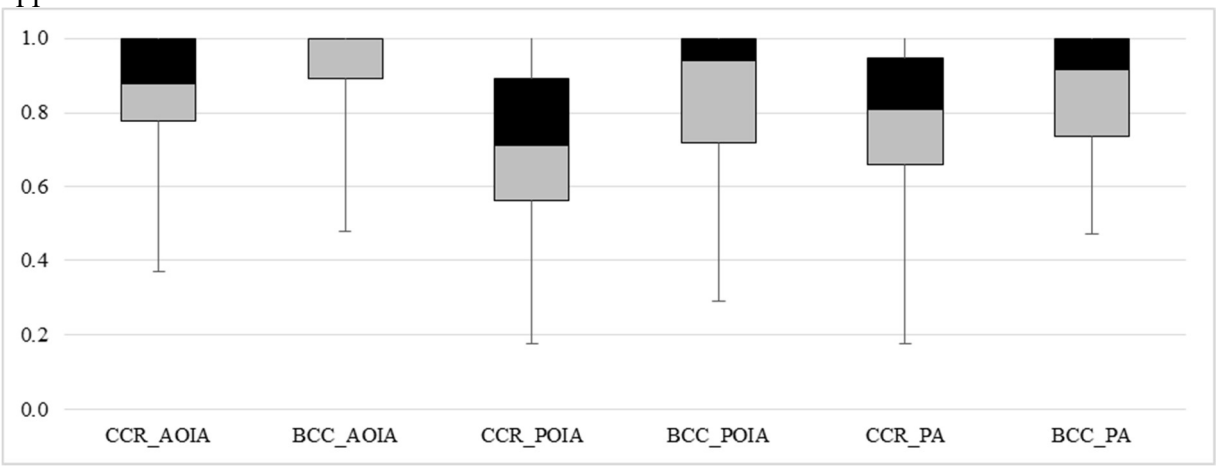


Fig. 2 – Boxplot analysis of technical efficiency under different approaches. Source: Authors´ calculations

In last part of our analysis, we try to compare our results through the boxplot analysis (Fig. 2). As can be seen in the case of CCR models, the values of efficiency were skewed towards lower values, which reflected by moving the median values (horizontal line in the rectangle a restrictive value of 25th percentile and 75th percentile) down. The gap between the median value and the 25th percentile value was smaller than the gap between the median value and the 75th percentile value. According to BCC models, the values were wed towards higher values, where the gap between the median value and the 25th percentile value was bigger than the gap between the median value and the 75th percentile value. The highest level of volatility was observed in profit-oriented intermediation approach under the assumption of a constant return to scale (CCR_POIA) and production approach under the assumption of a constant return to scale (CCR_PA). Under the assumption of a variable return to scale, the volatility of efficiencies was lower.
The level of efficiency was also compared by the correlation analysis, the Pearson correlation coefficient was used. On the basis of results and according to the classification prepared by Cohen (1988), we can say, that in every one approach (asset-oriented intermediation approach, profit-oriented intermediation approach, and production approach) there existed a strong positive correlation between model under the assumption of constant and variable return to scale. This is due to a fact, that bank which was overall technical efficient (calculated by CCR model) it was also pure technical efficient (calculated by BCC model) under the same approach. When we compare results between different approaches, we can see that there existed trivial negative correlation between CCR_AOIA and BCC_POIA and between CCR_AOIA and BCC_PA. The trivial but positive correlation was found out between CCR_POIA and BCC_PA. Between other approaches, CCR_POIA and BCC_AOIA, CCR_PA and BCC_AOIA, CCR_PA and BCC_POID, there existed positive small correlation. The results of correlation analysis between different approaches signalise, that if the bank was efficient in management of its cost used for production of outputs like deposit and loans, it must be also efficient in the process of transformation deposits used like inputs to loans on the output side. Of if the bank was efficient in management of its cost used for production of outputs like deposit and loans, it must be also efficient in transformation of its cost to its revenues.

5.CONCLUSSION AND DISCUSSION

The aim of the paper was to measure the technical efficiency in the Czech and Slovak banking industry using three approaches for the banks' inputs and outputs selection. We applied the non-parametric Data Envelopment Analysis (DEA) model, especially input-oriented model with constant and variable return to scale. We simultaneously used the asset-oriented intermediation approach, production and profit-oriented intermediation approach.
When we analysed the development of average efficiency, we can see, in case of the Czech banking sector, that the positive development of efficiency during the 2005-2008 period was compensated by the decrease in efficiency frontier since 2009 to 2012. After 2012 the development of overall efficiency was stable in the Czech banking industry. In case of Slovak banking sector the development of efficiency frontier was positive since 2005 to 2011, and on the other hand since 2011 till 2015 the efficiency frontier registered a negative shift that can be influenced by the financial crisis. Also Anayiotos et al. (2010) suggested that the banking efficiency in the Czech Republic and Slovakia decreased during the pre-crisis boom and also fell during the crisis.
The result of the technical efficiency determined that the efficiency of the Slovak banking sector was lower than in case of Czech banks under all approaches. These findings were supported by the results of Weill (2007), Melecký and Staníčková (2012), Kočišová (2014) or Svitálková (2014) who indicated the banking sector of the Czech Republic as highly efficient. We found

that most of the banks operated under conditions of variable return to scale, mainly under conditions of decreasing return to scale. Therefore banks suffered from scale inefficiency, especially the Czech commercial banks.

When we compared the average overall technical efficiency during the whole period we found only marginal differences in the average efficiency under each approach. Namely under the asset-oriented intermediation approach the average efficiency was 84.93% (measured by CCR model) and 93.36 (in BCC model), under the profit-oriented intermediation approach was 78.77% (CCR model) and 86.6% (in case of BCC model) and finally under the production approach was 70.90% (CCR model) and 83.8% (in model with variable return to scale). Also Boďa and Zimková (2015) who compared three approached, found that general impressions of the efficiency status of individual banks as obtained within the three approaches were similar in most cases.

Next, we compared the results through the boxplot analysis and found that the highest level of volatility was observed in profit-oriented intermediation approach under the assumption of constant return to scale and production approach under the assumption of constant return to scale. Under the assumption of variable return to scale, the volatility of efficiencies was lower.

The level of efficiency was also compared by the correlation analysis. When we compare results between different approaches, we can see that if the bank was efficient in management of its cost used for production of outputs like deposit and loans, it must be also efficient in the process of transformation deposits used like inputs to loans on the output side and conversely.

For the future research, we can try to analyse what was the reasons for movements in efficiency frontier during the analysed period by using Malmquist index. We can also analyse the determinants which influence the development of efficiency in Czech and Slovak banking sector since 2005 to 2015. The idea for the future research could be also done analysis on the level of individual banks according to different approaches and try to suggest how inefficient banks can manage their input or output variables to reach the efficiency frontier.

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INNOVATION ACTIVITIES FROM THE SPATIAL PERSPECTIVE: WHAT ARE THE MOST INNOVATIVE REGIONS IN THE CZECH REPUBLIC?

Pászto Vít, Vaculík Marek, Švarcová Barbora

Abstract

Innovations are crucial for an enterprise economic growth. Innovations help to create new job opportunities and increase the competitiveness of the market which results in benefits for costumers and profit for the enterprises. In the global economy today, it is necessary for enterprises to employ any kind of innovations, unless they stop to be competitive. From the regional or national point of view, it is important to monitor and evaluate an individual innovation activity of enterprises, since the sum of their activities represents an overall situation in a region or nation. In this paper, the authors used fifth (2008-2010) and sixth period (2010-2012) of Community Innovation Survey dataset, referring to various innovation activities of surveyed enterprises in the Czech Republic, in order to describe the spatio-temporal pattern of the innovation activities in the country.

Keywords: innovations, spatial distribution, Czech Republic, spatio-temporal comparison

JEL Classification: O3

1.INTRODUCTION

Innovations are in well-established enterprises very important and allow further development, growth and increase of the enterprises' competitiveness within the current globalized market economy. Chesbrough (2003) puts it that "Companies that don't innovate die." Innovation is one of the most cited and prominent drivers determining firm performance and survival (e.g. Geroski, Machin & van Reenen, 1993; Kleinknecht, Oostendorp & Pradhan, 1997). What drives the success of firms' innovation efforts has extensively been investigated. Firm size, age, experience with R&D and innovation projects, the existence of an R&D department, or interfirm collaboration (comprehensive overview in Dahlander & Gann, 2010) are deemed the most important factors leading to successful innovation outcomes. Generally, the innovation is a continuous and unending process in every aspect of entrepreneurship.

Innovations are interwoven with the risk that invested capital into innovation techniques would not have meet enterprise's expectations, or there would not be enough additional financial (or human) resources to accomplish innovation implementation. Innovations are closely related to research and development (R&D), which could be conducted internally by an enterprise itself, or externally through cooperation with universities, research institutions or laboratories.

The goal of the innovation is to create a brand new product, service, or production/organizational process; or at least to significantly improve, renovate or remake it in order to be capitalized on the market. This implies the key prerequisite – a market must simply need it (Maryville, 1992). The enhancement of the innovation process and/or experimentation is vital for sustaining competitive advantage. On the other hand, Von Hippel (1988) states that a little is known about how firms formulate their expectations of profit from innovation. Since then, some authors described firms' (or national economies) benefits gained by an innovation process in various ways (e.g. Black & Lynch, 2004; Katila, 2002; Katila & Ajuha, 2002;

Magnusson, 2003). Nevertheless, the innovation is undisputedly considered as a key to growth and long-term success.
This paper deals with the Community Innovation Survey datasets for the Czech Republic from two periods (2008 to 2010, and 2010 to 2012), which is carried out by all EU member states. Using the dataset, the authors analyze the spatial distribution of innovation activities at the most detailed level available, i.e. the Local Administrative Units 1 (LAU1) in the Czech Republic, as well as their temporal changes between the two periods. The emphasis is put mainly on the general geographical aspects of the innovations, whether the high-performing innovative companies are geographically concentrated, following any spatial pattern, or not at all. According to de Smith, Goodchild & Longley (2007), maps have been the primary means to store and communicate spatial data. Objects (firms) and their attributes (innovation measures) can be readily depicted, and the human eye can quickly discern patterns and anomalies in a well-designed map (de Smith, Goodchild & Longley, 2007).
The main research question could be formulated as follows: Are there any clusters of highly innovating LAU1 units, or are they rather dispersed? What regions are innovative in the Czech Republic? To tackle these questions, the authors use innovation score index (non-spatial method) and visual analysis of a map representation of the innovations together with the distribution ellipses (spatial methods).

2.THEORETICAL BACKGROUND

In this section, the authors briefly review the theoretical basis supporting the hypotheses that high-performing innovative firms tend to be concentrated in geographic and industrial clusters rather than being isolated. Furthermore, geographical aspects of innovations are described as well.

2.1.Industry clusters

The idea of the benefits of industry clustering embodied mainly in positive agglomeration externalities serving as a catalyst for economic growth has been around for a very long time (Marshall, 1920). In some cases, the geography itself presents obvious natural advantages that result in cluster formation. That is mainly a case of primary sector of the economy including agriculture, fishing, mining and forestry.
When firms locate in a cluster, firms can benefit from a pool of skilled workers and expertise, making it easier to hire new workers when labor demand increases and facilitating better matching of workers to jobs (Berliant, Reed & Wang, 2006). The agglomeration also makes easier access to various ancillary services which in turn lower the costs even further. Reduction of transportation costs is also evident, as it stems from the co-location of customers and suppliers. Moreover, Porter (1998) indicates that the possibility of local outsourcing enables companies to reduce production costs by maintaining leaner inventories. Generally, strong cluster produces more economic growth of the region (Krugman, 1991).

2.2.Knowledge spillovers

One of the most important and discussed effects of agglomeration are knowledge spillovers when non-market interaction becomes a positive externality. However, these interactions are decreasing significantly with increasing spatial distances among the specific knowledge sources and companies. The possibility of sharing information or know-how is a function of the distance as knowledge spillovers operate at the smallest spatial scales (Carlino & Kerr, 2014). Their effects rapidly decay with distance (Henderson, 2007), that is why companies operating in

specific industry domains are located near each other and close to universities and scientific centers in order to have access to new knowledge.

2.3.Public policy

Recent years, decision-makers have got actively involved in the design and implementation process of various innovation support systems on regional, national and even EU level (Ďuricová, 2015). But as the empirical evidence shows (Carlino, Chatterjee & Hunt, 2007) the problem of creating the whole ecosystems underlying clusters of innovation is too complex for any targeted policy interventions. At the same time, there is a valid claim of entrepreneurs to ease the administrative and regulatory barriers to their activities (along with e.g. R&D tax cuts, high-quality education systems, and functioning infrastructure).

2.4.Geographical aspects

According to Gregory et al. (2011) spatial characteristics of entrepreneurship that creates businesses in high-technology industries are in the interest of economic geographers because of its presumed importance to innovation and regional economic growth. Gregory et al. (2011) conclude that much still remains unknown about the relationship of entrepreneurship to place and space. It supported by the fact that studies examining the spatial distribution of innovation activities are rare (Fornahl and Brenner 2009). Therefore, a great potential lies in research about a local context relation to the formation of firms, or how different businesses contribute to local economies.
Nowadays, economic geographers focus mainly on the research and development processes (in which innovations are embedded), on spillover effects and on the spatial variations in productivity that may result from differential geographies of innovation (Feldmann, 2000). Although the impact of innovation is important at the country level, Asheim & Gertler (2005) argues that most research continues to focus on the region.
Methods and techniques for analyzing economic data with a spatial component in a quantitative way are being named as spatial econometrics. Basic concepts of spatial econometrics are described to a great extent in Anselin (1988), Pace & LeSage (2009), Paelinck & Klaassen (1979), or Haining (2003). It is also fruitful to analyze the complex (geo)datasets with the use of methods based on multidimensional statistics (e.g. principal component analysis, correlation analysis, clustering, etc.). Examples of such methods applications dealing with geographical data can be found in Marek, Pászto & Tuček (2015b).

3.METHODOLOGY

In this chapter, the authors provide information about data used in the study, measures that were grouped from the original dataset values, and main methods applied to acquire desired results.

3.1.Data

For this study, empirical information is taken from the sixth and seventh round of the Community Innovation Survey (CIS) campaign. CIS uses harmonized questionnaire for all EU members states and as such presents unique and reliable source of data regarding innovation activities of enterprises of different size, age, and industry (Fig. 2). Specifically, the authors have available two datasets covering the Czech Republic from 2008-2010 (CIS 2010) and 2010-2012 (CIS 2012). The main advantage of the CIS is the long-term experience with methodological issues related to the innovation activities using revised version of the Oslo

Manual 2005 (OECD, 2005). In the dataset, there is information about technical types of innovation (product and process) as well as on the long underestimated findings on non-technical innovations (marketing and organizational).
Data for CIS 2010 were gathered in 2011 by a questionnaire sent to all enterprises with ten or more employees, stratified by size and economic activity. In total 5,151 responses, representing 21 % of the total statistical population, were received with 83% return rate of useful answers. For CIS 2012 (gathered in 2013), the total number of responses was 5,449, representing 22 % of the total statistical population, with 80% return rate of useful answers.

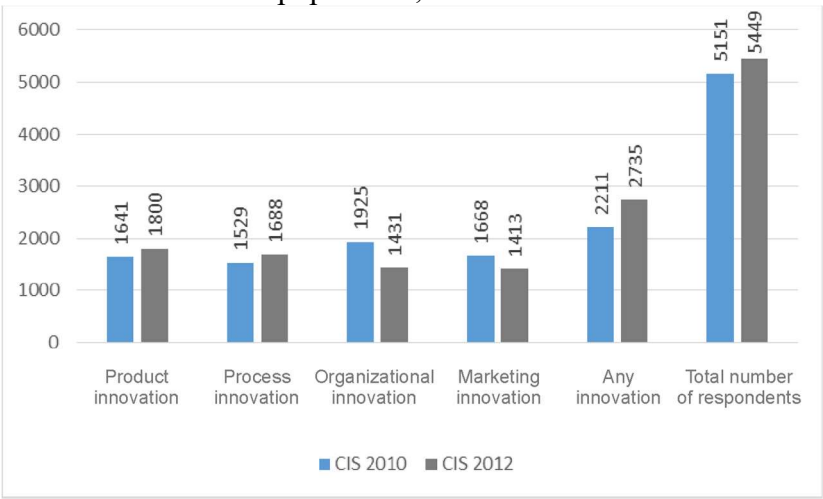


Fig. 1 – Overview of basic innovation types in CIS datasets. Source: CIS, authors

In Figure 1, the overview of basic innovation types of CIS respondents is depicted. It is clear that there was an increase in a number of firms carrying on any type of innovation in the CIS 2012. In CIS 2010, 43 % of respondents participated in innovation activity of any kind, while in CIS 2012 exactly a half of respondents reported innovation activities. It is the question whether the overall situation around the economic crisis at the time pushed enterprises towards innovations, or not. Looking at the specific innovation categories, it is evident that enterprises innovated more in products and processes in the later observed period (CIS 2012) that in 2008-2010 (CIS 2010); and vice versa.
Figure 2 shows the sector composition of all respondents. Most of the enterprises classified themselves as being a low-tech industry. This corresponds with the overall Czech industry orientation. It is interesting to see a relatively high increase of knowledge services (around 200 firms) and low-knowledge services (around 130 firms) classes between the two CIS periods. Nevertheless, it is important to keep in mind the "randomness" of the CIS data sampling. The rest of the classes remained more or less the same.

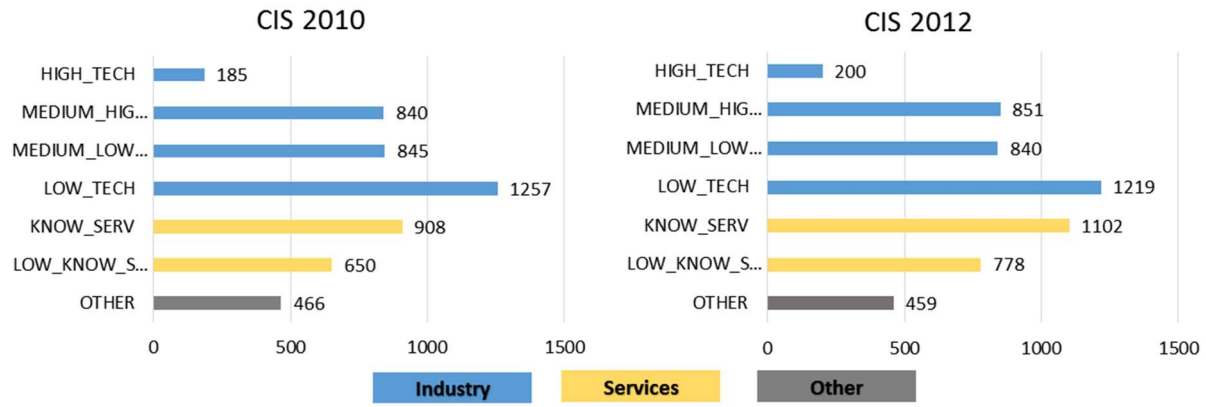


Fig. 2 – Economic sectors composition of CIS respondents. Source: CIS, authors

The main constraint of using CIS, as highlighted by Armbuster et al. (2008), regards the three years' time lag which can lead to incorrect results due to different life/cycle of innovation and consequently delayed benefit for enterprises. Anyway, given the sample of 5,151 and 5,449 firms, this disadvantage is rather blurred by the sample volume itself. The CIS offers the most comprehensive data regarding the range of enterprises surveyed (Frenz & Ietto-Gillies, 2009). The value of the CIS campaigns proves a number of research papers based on the CIS dataset (e.g. Battisti & Stoneman, 2010; Hashi & Stojčić, 2013; Evangelista et al., 2001; Aralica, Račić & Radić, 2008; Meroño-Cerdán & López-Nicolás, 2017).
From a geospatial perspective, it is always beneficiary having data at the most detailed level in the sense of geographical scale. Although the CIS survey is realized at the firm-level, the resulting data set is anonymized. Thus, it is not possible to identify an individual subject for its accurate localization. The Czech Statistical Office offers CIS data at the LAU1 level as the most accurate spatial unit to be mapped. Anyway, 5,151 respondents in CIS 2010, 5,449 respondents in CIS 2012 respectively, would be very sparsely dispersed throughout the Czech Republic when displayed at firms' original locations. Therefore, a LAU1 level is satisfactory for the study. In total, there are 77 LAU1 districts in the Czech Republic, and all of them are represented in both CIS datasets.

3.2.Measures

To obtain a full picture of the innovation activity of the Czech firms, four different types of measures were used: (1) technical innovation, (2) non-technical innovation, (3) radical innovation, and (4) R&D intensity. These four measures belong to two broader groups of innovation measures. The first one relates to the investments in the innovation process and is measured by the inputs utilized in the innovation process (in this case R&D investments). The second group of measures focuses on the final output of the innovative work e.g. new products and/or processes introduced.
Technical innovation (a) is a composite binary variable merging information on product and process innovations. In CIS the product innovation is the market introduction of a new or significantly improved good or service with respect to its capabilities, user-friendliness, components or sub-systems. It must be new to the respondent but not necessarily to their market. The process innovation, on the other hand, is the implementation of a new or significantly improved production process, distribution method, or supporting activity.
Non-technical innovation (b) is again a composite binary variable consisting of organizational and marketing innovations. The organizational innovation is a new organizational method in respondents' business practices (including knowledge management), workplace organization or external relations that have not been previously used. It must be the result of strategic decisions taken by management excluding mergers and acquisitions. The marketing innovation is the implementation of a new marketing concept or strategy that differs significantly from respondent' existing marketing methods and which has not been used before. It requires significant changes in product design or packaging, product placement, product promotion or pricing excluding seasonal, regular and other routine changes in market methods.
Radical innovation (c) is a binary variable referring to a new or significantly improved product (good or service) introduced during CIS campaigns which were new-to-the-market (it may have already been available in other markets). Radical or sometimes called disruptive innovation encompass higher order innovations that have an enormous market potential, and that comprise technological advances so significant that no increase in scale, efficiency, or design can make older technologies competitive (Tushman & Anderson 1986). In our context, we use this measure as a clear indicator of highly innovative activities of a firm.

And finally, R&D intensity (d) represents the extent of R&D activities crucial for capturing an innovativeness of individual companies. Many studies demonstrated a clear positive impact of these activities on business performance measured as the number of new products to market and financial terms. We calculated the variable as a proportion of total R&D costs on turnover of the companies within LAU 1 districts.

3.3.Methodological workflow

In this paper, descriptive statistics in combination with basic geospatial methods was used. Firstly, it was necessary to prepare dataset with calculated measures for consequent join with the spatial information (LAU1 graphical layer). As both non-graphical (table with measures) and graphical (spatial representation of LAU1 districts) part of the data contains the unique LAU1 codes, it was possible to join them together. Once joined data were available in GIS (Geographical Information System, namely ArcGIS for Desktop 10.x) software, the next step was to explore the spatial distribution of firms' innovations via visual analytics procedure (map-making and interpretation, see e.g. Marek, Tuček & Pászto, 2015a). In addition to that, geographic distribution was measured using standard deviation ellipse. This method measures the trend for a set of points or areas by calculating the standard distance separately in the x- and y-directions (for more details see Ebdon, 1988, or Mitchell, 2005). The ellipse can reveal if the distribution of features is elongated and hence has a particular orientation (Mitchell, 2005). Therefore, it is possible to anticipate the overall spatial trend of innovations. In other words, it allows prediction of possible diffusion direction of innovations.
Presented approach for overall innovation evaluation stems from a method used originally by Adams (2011) for determining the distribution of innovation activity in the UK. The concentration of innovative activities is determined by proportions at the level of LAU1 district. First, scores S for each LAU1 district (i) across a range $q=\{a, b, c, d\}$ of abovementioned innovation measures (q), are calculated as follows:

$$S_{iq} = \frac{I_{iq}}{R_i} \quad (1)$$

Where for each LAU1 district I_{iq} is the number of companies from LAU1 district i registering any level of activity in innovation measure q, and R_i is the total number of respondents R from given LAU1 district i.
Then the scores S_{iq} (1) are ranked, the LAU1 districts that comprise the upper decile of each innovation measure are identified. So, districts with concentrated innovative activity are those that appear at the top of a list of rankings which are based on the proportions of respondents active in a series of innovation measures on the total number of respondents in a given district. Each time a LAU1 district appears in upper decile of the innovation measure rankings receives one point. The final ranking of LAU1 districts (innovation score) is made in order to see whether there are any LAU1 districts consistently appearing in the upper decile of innovation measures.
Resulting maps with final innovation scores are complemented by four maps per CIS period highlighting upper decile of individual measures (a, b, c, d). Furthermore, the final innovation score maps contain underlying base map showing the overall ratio of firms' innovations in a LAU1 district and a total number of respondents. As a synthesis, one complex map was made to provide a comprehensive picture of the spatial and temporal development of the innovation activities.

4.RESULTS

As the aim of the paper lies in the spatial description of enterprises innovation activities in the regions of the Czech Republic, following text supplemented with figures captures the main findings of the visual analysis.

4.1.CIS 2010

Individual measures are displayed in Figure 3, where only those LAU1 districts ranked in upper decile are depicted. At first glance, there is no distinct pattern of innovations' spatial concentration. Ideally, all high-performing LAU1 districts (those in the first decile of the ranking) would be grouped into one or two spatial clusters.

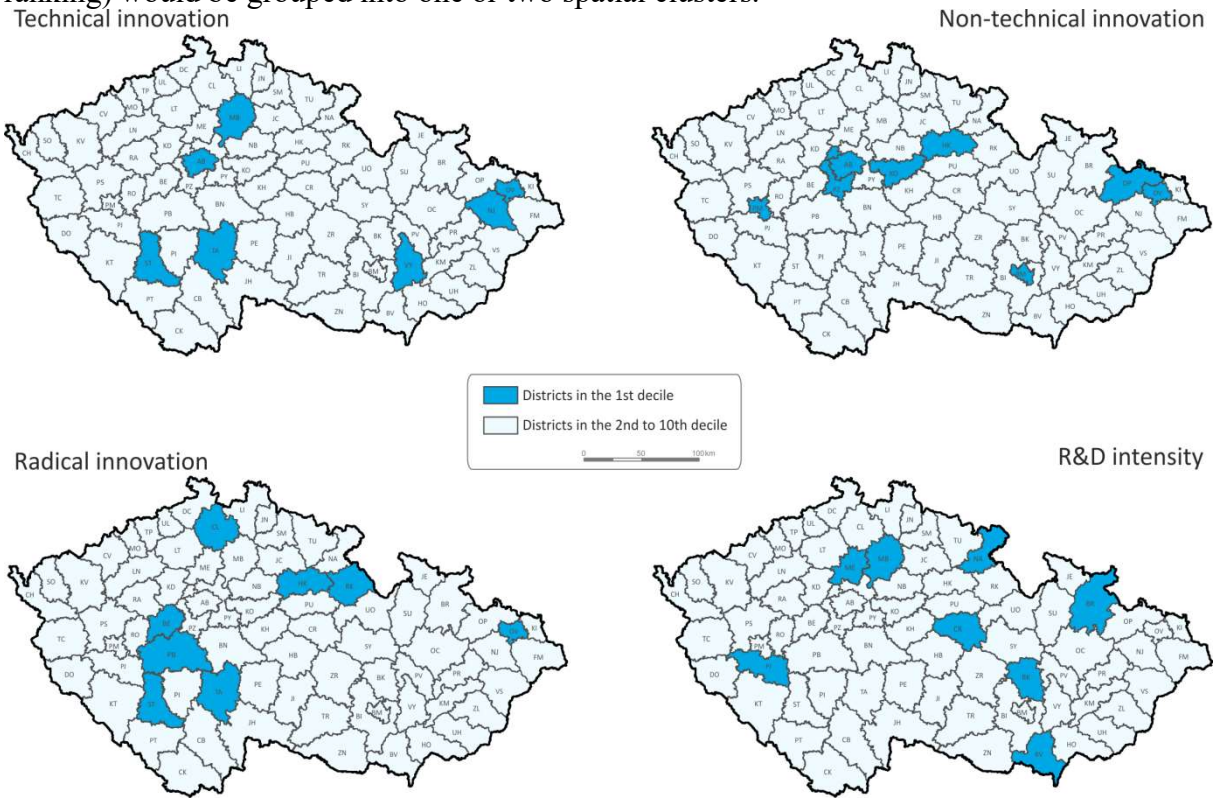


Fig. 3 – Spatial distribution of LAU1 districts ranked in the upper decile according to individual measures (CIS 2010). Source: CIS, authors

When looking at technical innovations, it can be seen in which LAU1 districts the most of these innovations took place. Two districts, in the north-western part of the Czech Republic, are centers of high-tech and automotive industry. Thus, it is supposed that high ratio of technical innovations is the result of piled-up firms multiplication effect. Another two districts in the eastern part of the Czech Republic, in this case, the only adjacent, are associated with heavy industry, and again it is probably the driving force for technical innovations.
The spatial pattern of non-technical innovations shows higher concentration, especially in the central part of the Czech Republic. This line-pattern includes the capital city of Prague and Hradec Králové (county seat). Also, other Czech big cities (Brno, Pilsen, Ostrava) are present in the upper decile of non-technical innovations. As these are mainly organizational and marketing innovations and companies in large cities are more likely from tertiary or higher sector of the economy, it is the most probably the reason for their ranking.

Districts with the highest ranking in radical innovation measure are located outside the most populated regions (except the Ostrava district on the east). It is the question, whether the firms in these districts are striving to introduce a greater amount of radical innovations in order to increase their competitiveness, or the reason is completely different.
Spatial distribution of research and development (R&D) intensity shows no distinct spatial pattern. It is interesting that any of the 1st decile districts is a seat of "traditional" university, although being in proximity to university centers in neighboring districts. Surprisingly, there are districts with a high ratio of R&D in purely rural regions at the country borders (north-eastern and south part of the Czech Republic).

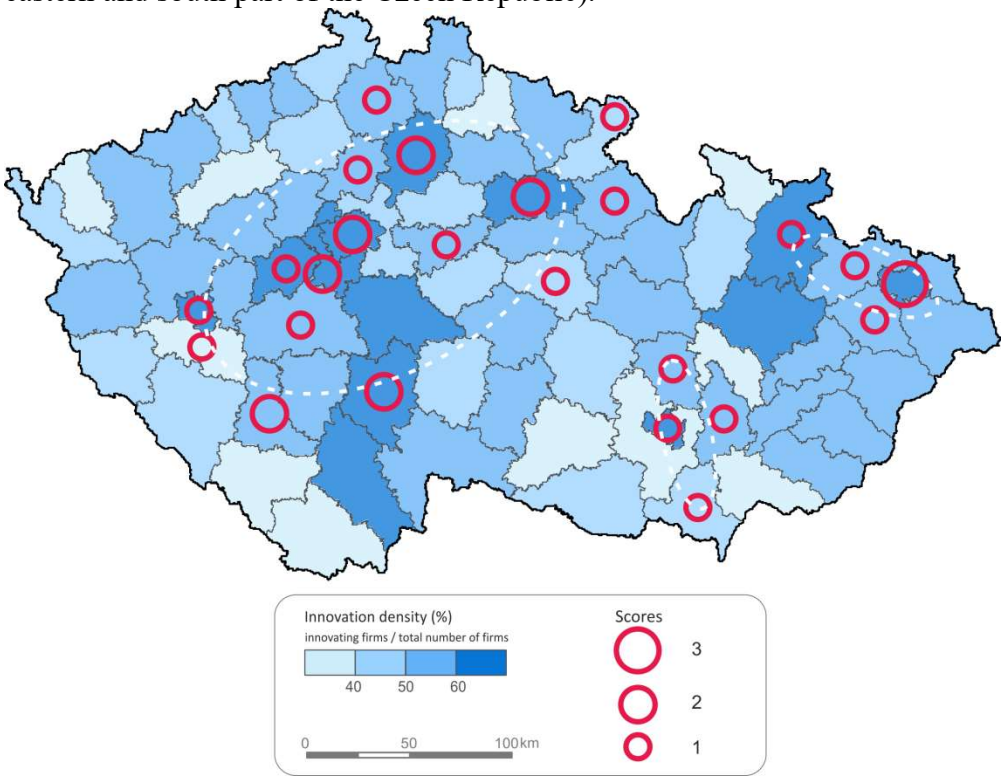


Fig. 4 – Innovation scores of LAU1 districts; base map depicts the innovation density ratio (CIS 2010). Source: CIS, authors
Figure 4 displays a map with the innovation scores, which was calculated on the basis of the individual measures (Fig. 3). This allows identifying regions with clustered districts by the innovation. The greatest cluster is surrounding the capital city of Prague in western-central part of the Czech Republic. The overall spatial trend is south-western and is supported by the standard deviation ellipse (white dashed line). The ellipse spatially delimits features (in this case LAU1 districts) by the standard deviation of their location. In other words, LAU1 districts outside the ellipse tend to have a weak spatial relationship with those within the ellipse. This may be interpreted as a "service area" of innovations' diffusion. Analogically, for the other two groups of LAU1 districts (eastern half of the country).
As a base map, innovation density was calculated and depicted. Innovation density is expressed as the percentage of innovating firms and a total number of firms (respondents). It is clear that 11 out of 13 LAU1 districts with more than 60 % innovation density ratio fall into ellipses (or, at least, are "touched" by the ellipse). The remaining two districts appear to be highly innovative but not ranked into upper decile.

4.2.CIS 2012

Similarly to the previous sub-chapter, individual measures are displayed in Figure 5. In comparison with CIS 2010, the spatial distribution of 1st decile firms is even more dispersed. The two-member cluster was formed only in three cases – non-technical innovation, radical innovation and R&D intensity measure (one cluster per each measure). In the case of technical innovation, there are no adjacent 1st decile-ranked districts. It is quite hard to find the link between technical innovation and space/place. Five districts lie in a neighborhood of the major cities (Prague, Brno, Liberec, Zlín and Ostrava), so potentially the technical innovations are tied with the agglomerations. Any of the traditional industrial regions is included in the 1st decile.

Regarding the non-technical innovation, there is one cluster formed on the west of the country. It interesting to see, that the majority of the 1st decile districts in this category are located in the borderland. From this point of view, it seems that greatest amount of non-technical activities were carried out in the rural border regions (of course with some exceptions, e.g. district in the very northeast part of the Czech Republic, which is urban area).

Spatial distribution of the 1st decile districts radical innovation appears to be somewhere in between the previous two – there are districts with proximity to major cities and districts lying in rural areas as well; or its combination, i.e. districts in proximity of larger cities and being rural at the same time (for instance Plzeň-jih).

Finally, the spatial configuration of districts in the 1st decile of R&D intensity measure confirms to some extent the assumption of very close research cooperation between firms and local universities. All four biggest cities, namely Prague, Brno, Ostrava, and Plzeň, are ranked to be in the 1st decile of the R&D intensity.

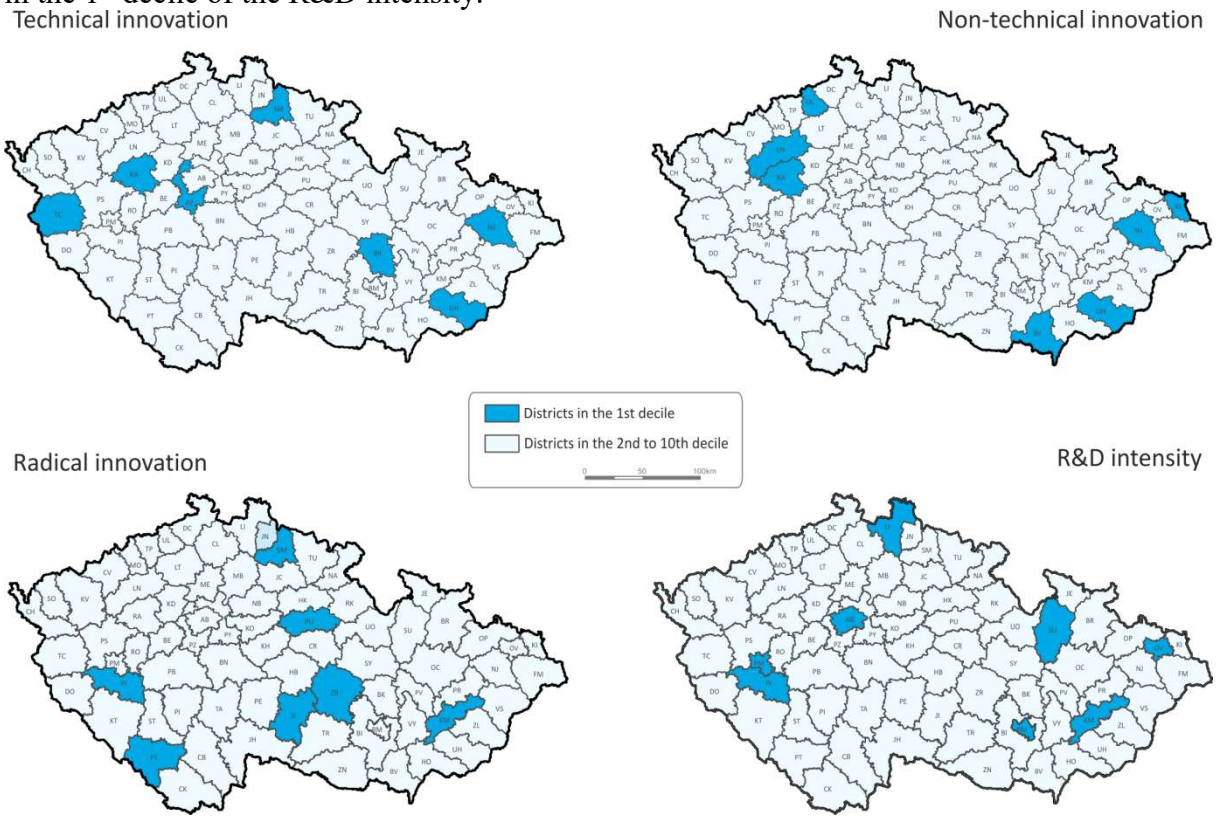


Fig. 5 – Spatial distribution of LAU1 districts ranked in the upper decile according to individual measures (CIS 2012). Source: CIS, authors

As the individual measures were spatially dispersed throughout the Czech Republic, consequently the maximum innovation score were two points – meaning that LAU1 district appeared in the 1st decile only twice (Fig. 6). From Figure 6, it is evident, how highly-innovating districts are spread across the country with three main clustered regions. Standard deviation ellipses highlight those regions. The first one is located western from Prague with the virtual center in Rakovník district. Districts containing Prague and Plzeň, as the biggest cities in this region, are included in this group. The second group of districts reaching the 1st decile at least once is in the southeastern part of the Czech Republic around the city of Brno. Similarly to previous CIS, the significant amount of innovations was carried out in districts around Ostrava (the third identified group). Although this region has been over a long period affected by structural economic problems (e.g. unemployment) due to a heavy industrial orientation, innovations seem to be an important feature of its economy. The rest of the districts in the Czech Republic did not form an innovative region.
Innovation density (in Figure 6 displayed as a base/background map) reveals how firms are active in the innovation process in the sense of percentages. Only one district, Kolín, with the ratio of 60 % and more of innovating firms was not ranked in the 1st decile (therefore not being scored). Despite the fact that the most of the surveyed firms reported some kind of innovation in the district, any of it was of great significance. Generally, the worst scenario is the combination of low innovation density and zero scores. It is possible to find such district in the inner peripheries of the country and on the borders.

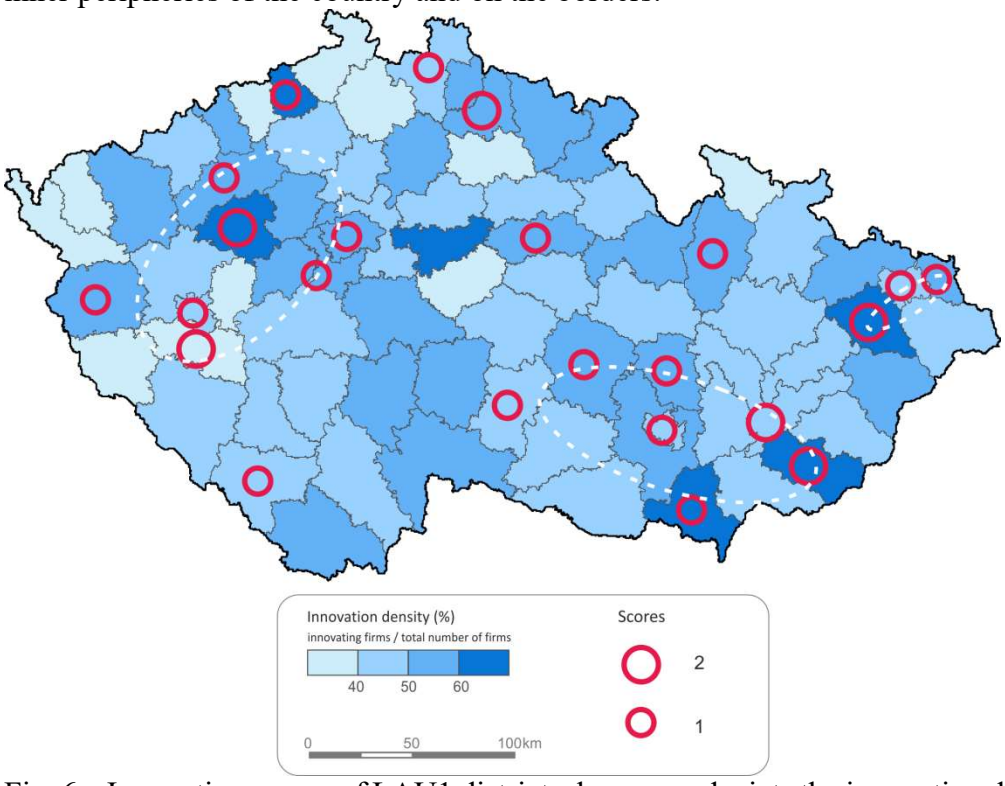


Fig. 6 – Innovation scores of LAU1 districts; base map depicts the innovation density ratio (CIS 2012). Source: CIS, authors

4.3.CIS results synthesis

To obtain a complex view on the whole CIS period analyzed in this paper, comprehensive map was made (Fig. 7). In Figure 7, all the mapping results from the previous section are displayed together. This allows evaluation of overall situation on the field of innovations over the whole CIS period analyzed in this paper.

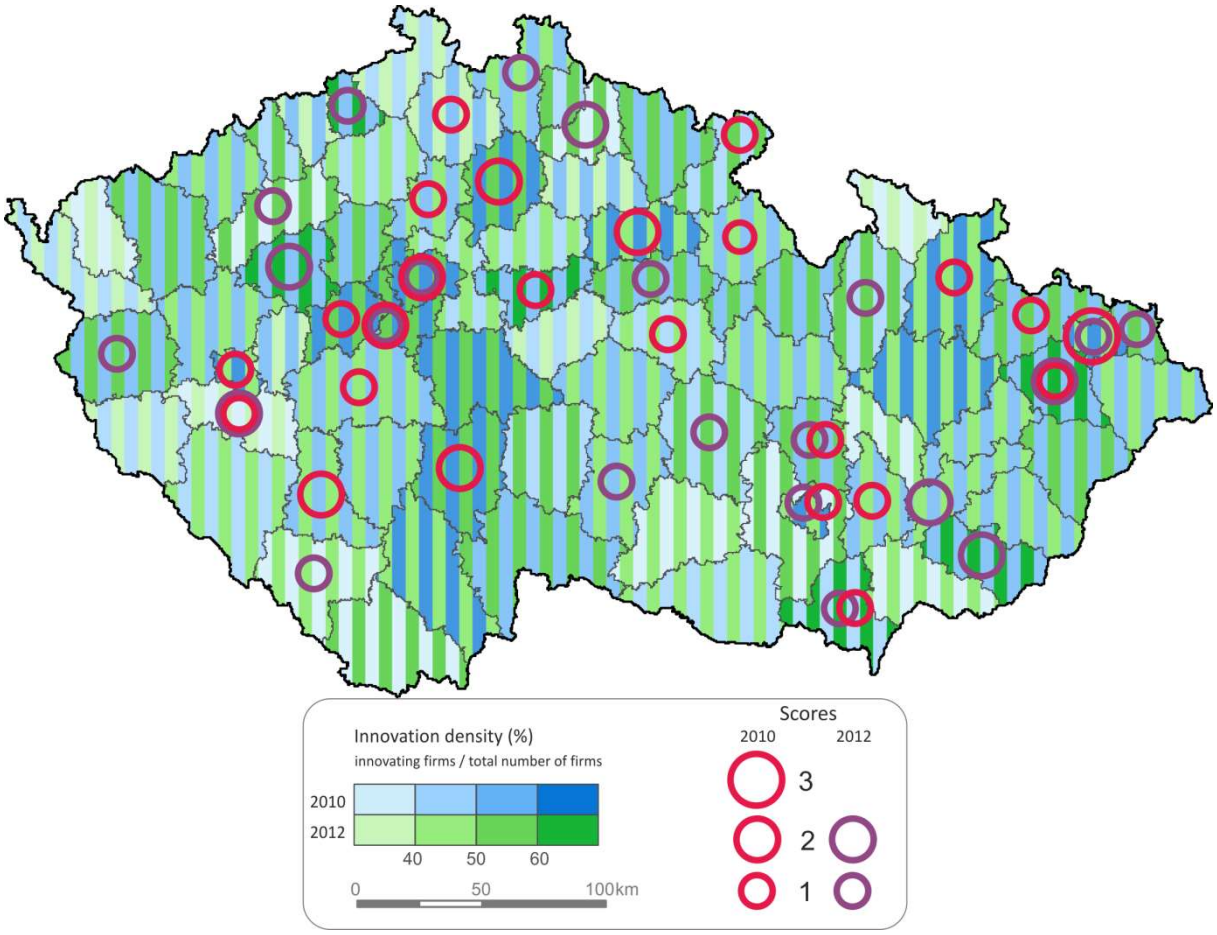


Fig. 7 – Innovation scores of LAU1 districts and a base map depicting the innovation density ratio of both CIS 2010 and CIS 2012 campaigns. Source: CIS, authors

Geographically, low innovative regions (those with no district ranked in upper decile and with low innovation density ratio) are located mainly (1) in the borderlands, (2) in rural areas, and (3) in mountainous areas. Obviously, there are some exceptions, but these are geographically more or less isolated. It is interesting to notice "a gap" separating the large cluster in the western-central part from the other two small ones. This gap exactly follows the inner borders of the Czech Republic dividing the country into two historical parts – Bohemia on the west and Moravia on the east. The gap could be described as inner periphery of the Czech Republic with a significant proportion of rural district. This corresponds with the results recent studies aim at the rural areas (e.g. Pászto, et al., 2016; Perlín, Kučerová & Kučera, 2010). Another specific example of a low-innovative region is in western borderlands. Although this region is in touch with the Germany, there is no evidence from CIS survey that these parts of the Czech Republic benefit from this spatial proximity with strong German economy. In fact, it is needless to say that individual in-depth study should be done in order to explore the original cause of it (especially historical reason of the current situation in this borderland region). The authors leave the interpretation of the complex map in Figure 6 on the reader.

5.CONCLUSION AND DISCUSSION

This paper explored the spatial configuration of the innovating firms aggregated to LAU1 districts. Particularly, the stress was put to investigate whether there are highly-innovating regions in the Czech Republic and if so, where they are settled spatially. To do so innovation activities of Czech firms from anonymous firm-level data cross-sectional Community Innovation Survey (CIS) from 2008 to 2012 was used. Building on the industrial cluster,

innovation, and knowledge spillover literature, this study developed and tested a model investigating the patterns of concentration of innovation activities. There is a vast body of literature dealing with innovation alone without insights from the industrial cluster perspective, and spatial aspects. This paper is trying to fill the gap.

The primary results were, from the spatial point of view, that innovation activities are mainly co-located around the biggest Czech cities. These findings are complementary to prior studies on industrial clusters (Ellison & Glaeser, 1997; Audretsch, 1998) that focus mainly on the factors and benefits of agglomeration of industrial sectors, both manufacturing and services. On the other hand, low innovative regions are located mainly (1) in the borderlands, (2) in rural areas, and (3) in mountainous areas. The common denominator for these three groups is their greater distance from the densely populated places. This corresponds with a nowadays well-established concept of distance decay used in economic geography when exploring spatial interactions (e.g. Taylor, 1971; Sheppard, 1984; Ullman, 1980).

This paper serves as an empirical evidence of innovation activities. The authors tried to deliver a spatial information to a reader in the most comprehensive and effective way via visualization techniques. Nevertheless, to some extent, rigorous assessment calculation innovation scores and standard deviation ellipses has been accomplished. The authors showed that both industrial activity and innovation activity follow the same pattern of concentration so that there is a high probability that both of these phenomena are mutually interdependent and influenced by the same forces and factors. On the other hand, there are regions with very weak innovation activities, on which attention should be paid.

Due to the nature of CIS survey methodology (e.g. randomly selected sample, reliability of answers, firms ID anonymization), it is obvious that there is some degree of uncertainty in data. Nevertheless, the bias needs to be accepted since there is no other effective/realistic way how to obtain this kind of data.

In future, the authors strive to explore the further (spatial) relationship between innovation activities and socio-economic data (e.g. demographic, macroeconomic, (un)employment data and so forth). This would allow understanding the prerequisites for innovation activities (both low and high) in the given LAU1 districts. Acquiring the newest data from CIS survey would also contribute much to the research, as the latest period covers innovation activities in the re-start era (2012 to 2014) after the economic crisis. Furthermore, advanced spatial statistical tools (e.g. spatial clustering, local indicators of spatial association, spatial correlation, etc.) could be applied to describe the datasets strictly quantitatively.

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EFFECTS OF THE ADJUSTMENT OF THE MINIMUM WAGE ON LABOUR COSTS AND PUBLIC REVENUES IN THE CZECH REPUBLIC AND SLOVAKIA

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Abstract

The minimum wage represents the lowest level of costs for employees' wages for employers. There are two possible forms of regulation of the minimum wage: The minimum wage determined by law or negotiated by a collective agreement. The Czech Government is empowered to issue the regulations for implementing the Labour Code. The minimum wage is always valorised as a political decision of the specific government.
The aim of this article is to evaluate the effects of minimum wage valorisation on labour costs and public revenues in the Czech Republic and in the Slovak Republic with regard to the development of selected macroeconomic indicators - unemployment and economic growth.
Key foreign studies were studied in order to determine the effects of minimum wage of labour cost, revenues from personal income tax and social and health insurance in the Czech Republic and Slovakia. A comparison is presented by the development of the Kaitz index, real GDP growth rate and unemployment rate an analysis of the effects of these indicators on public revenues in the Czech Republic and Slovakia.
If the minimum wage is too low, employers are tempted to pay undeclared wages; if it is too high, companies incur excessive costs. The number of employees earning the minimum wage in Slovakia is roughly the same as in the Czech Republic. The industries with the highest ratio of low-income employees in the Czech Republic and in the Slovak Republic included accommodation and food service activities and administrative and support service activities. Kaitz index in the Slovak Republic is higher compared to the Czech Republic in the long run. The average labour costs per employee in Slovakia are higher than in the Czech Republic. The Slovak economy is strongly affected by high unemployment rate. The difference between the poverty line and the minimum wage in Slovakia is significantly higher, compared to the Czech Republic. Increasing minimum wage results in increased labour costs, improved social status of most employees and increased revenue on social and health insurance.

Keywords: Health insurance, Kaitz index, Labour costs, Minimum wage, Social insurance

JEL Classification: I13, J30, J50, H24, H55

1.INTRODUCTION

Minimum wage is a very old instrument of protection of social rights of workers. It was created at the end of the 19th century in New Zealand. Ultimately, it was implemented, during the 20th century, in Australia, the United States, Europe and other countries. There are two ways of implementing the minimum wage. One of the ways, which was chosen by the Czech Republic, is to fix the minimum wage by legislation. The other way is to fix the minimum wage by collective agreement (Pernica, 2015, pp. 2337). Minimum wage is governed by the applicable legislation on 22 EU member states. The last EU member to adopt legislation on minimum wage was Germany in 2015 (Spielberger, Schilling, 2014).
Minimum wage serves two key purposes: social-protective and economic-criterion. In the case of the former, it shall protect employees from poverty and ensures equal basic conditions of

wage competition. In the case of the latter, minimum wage creates conditions for income motivation on the part of employees, i.e. to work instead of being unemployed recipients of benefits (Ministry of Labour and Social Affairs of the Czech Republic, 2010). The effectiveness of this instrument is based on the amount. If the minimum wage is too low, the opportunities to use it are reduced; on the other hand, if it is too high it can have negative effects on employment. Contrary to the established practice in developed western economies, many employers in the Czech Republic reduce their labour costs by secretly paying a portion of salary "in cash" (Ministry of Labour and Social Affairs of the Czech Republic, 2016).

The minimum wage represents the lowest level of costs for employees' wages for employers (Kaufman, 2010, 427-453). The Czech Republic has regulated its minimum wage by act no. 262/2006, the Labour Code. The Labour Code stipulates the minimum wage in Section 111 and the guaranteed wage in Section 112. The minimum wage represents the lowest amount of remuneration for work in the basic labour-law relationship and it is independent of the type or work performed. The guaranteed wage is defined generically. Its sum depends how demanding and complex is the work performed (Czech Republic, 2006). Czech legislation does not stipulate any conditions based on which the minimum wage should be valorised. Minimum wages are always valorised as a political decision of the specific government. Between the years 2008 – 2012 the sum of the minimum wage did not increase and remained at the 8,000 CZK level. After the year 2013 there was a significant growth and the minimum wage has risen to the level of 11,000 CZK since the year 2017 (Eurofound, 2016). In 2015 the income poverty threshold was CZK 10,220 (Czech Statistical Office, 2016a).

Many articles and scientific papers exist on the issue of minimum wage. The most of them focus on the correlation between minimum wage and employment. E.g. Card and Krueger are focused on minimum wages and employment in their case study of the fast-food industry in New Jersey and Pennsylvania (Card, Krueger, 1994, pp. 772-793). Their findings were confronted by Neumark and Wascher who published their own study (Neumark, Wascher, 2000, pp. 1362-1396).

A work of authors Pavelka, Skála and Čadil argues that raising the minimum wage has no effect on growth of unemployment rate in the conditions of the Czech economy (Pavelka, Skála, Čadil, 2014, pp. 39).

Other authors have recently published results of research projects on the impact of the minimum wage on labour market performance in the Czech Republic (Fialová, Mysíková, 2009). Interesting results can be found in an article by authors Eriksson and Pytlíková which is focused on firm-level consequences of large minimum-wage increases in the Czech and Slovak Republics which deals with the effects of the adjustment of the minimum wage on companies. The authors concluded that the minimum-wage increases clearly raise firms' average wages (Eriksson, Pytlíková, 2004, pp. 100). The aforementioned jobs barely reflect the effect of the adjustment of minimum wage on the costs incurred by employers.

Authors Uhrová and Skalka concluded that the adjustment of the minimum wage increases the costs incurred by companies, thereby affecting managerial decisions which can this form: (1) adequate increase in the productivity of workers, which probably means higher investment in human capital of workers; (2) increase in productivity of workers, and decrease in number of workers; (3) substitution of capital for work, which is possible only in the long run; and (4) substitution of employment agreements for employment contracts to avoid social security contributions paid by the employer (Uhrová, Skalka, 2016, pp. 188).

There are several questions to be answered. How does quick adjustment of the minimum wage affect labour costs? How does this adjustment affect the revenue from personal income tax and the revenue from social and health insurance? Valorization of the minimum wage has a direct impact on employees who receive a salary. This concerns mainly employees of state and local governments. Valorization of the minimum wage also directly affects the employees, who are

paid by the minimum wage or by guaranteed wage. The Czech and the Slovak Republic belong to the countries with the highest contributions to social and health insurance throughout Europe (Deloitte, 2016). The objective of the article is to evaluate the effects of the adjustment of minimum wage on public revenues from a variety of perspectives. First of all, with regard to selected macroeconomic indicators (average gross salary, unemployment and economic growth). And secondly, in comparison with Slovakia.

2.RESEARCH METHODOLOGY

The political economy approach was applied in this article. Political economy is concerned with the correlation of social, political and economic phenomena. Political decisions affect the process of distribution of economic resources throughout the company and allow parties to gain political power. Typically, right wing parties view the minimum wage negatively and argue that minimum wage reduces employment. On the other hand, left wing parties view the instrument of minimum wage largely positively. They argue that it ensures the protection of social rights of workers and motivates people to work, instead of relying on unemployment benefits. Also, that it reduces the likelihood of cheating with undeclared salaries. The government decree in force in the Czech Republic governs the amount of minimum wage and other lowest amounts of guaranteed wages and the conditions under which they are granted, as well as adverse working conditions which entitle employees to a bonus for adverse working conditions. Legislators have authorised the government via act no. 262/2006, the Labour Act.
In order to evaluate the effects of the government minimum wage policy on labour costs and public revenues, a research was carried out of key foreign studies - the effects of the minimum wage on unemployment, the impact of the minimum wage on labour market performance and the impact of minimum wage changes on management. Furthermore, evaluation was carried out of effects of the development of the minimum wage on labour costs, personal income tax revenue and social and health insurance revenue, both in the Czech Republic and Slovakia. An assessment of the influence of the Kaitz index, the real GDP growth rate and the unemployment rate on personal income tax revenues and revenues from social and health insurance in the Czech Republic and Slovakia was made.

3.LABOUR COSTS

Labour costs represent the costs incurred with employing workers. The main component of labour costs is represented by wages and salaries, as well as statutory social insurance and health insurance payments. Social and health insurance is paid by the employee, as well as the employer. Part of social and health insurance paid by the employee is assessed and paid by the employer on behalf of the employee. The payments of the public health insurance are governed by act no. 592/1992, as amended. Pursuant to Section 2 of this act, the amount of this insurance corresponds to 13.5 % of the basis of assessment which, in the case of employees pursuant to Section 3, is typically the sum of income from employment (wage). One-third (i.e. 4.5 %) is paid by the employee, the remaining two-thirds (i.e. 9 %) are paid by the employer. The social insurance and contribution to the state employment policy are governed by act no. 589/1992, as amended. Pursuant to Section 7, the insurance rate paid by the employer is 25 % of the basis of assessment, of which 2.3 % is to health insurance, 21.5 % is to pension insurance and 1.2 % to the state employment policy; for employees, it is 6.5 % of the basis of assessment (typically from wage).
The Tab. 1 below shows social and health insurance of a full-time employee earning minimum wage of CZK 11,000.

Tab. 1 – Social and health insurance of an employee earning minimum wage of CZK 11,000. Source: Authors' interpretation based on data of Ministry of Labour and Social Affairs of the Czech Republic, 2016

	Employee	Employer
Health insurance (CZK)	495	990
Social insurance (CZK)	715	2750

The Tab. 2 below shows the effects of changes in the minimum wage base rate on social and health insurance payments of an employee with no children who earns the minimum wage.

Tab. 2 – Development of payments of social and health insurance by an employee with no children earning the minimum wage between 2009 and 2016. Source: Authors' interpretation based on data of Ministry of Labour and Social Affairs of the Czech Republic, 2016

Year	Minimum wage CR (CZK/month)	Social insurance CR - employer 25 % (CZK/month)	Social insurance CR - employee 6,5 % (CZK/month)	Medical insurance CR employer 9 % (CZK/month)	Medical insurance CR employee 4,5 % (CZK/month)	Σ labor costs (CZK/month)
2009	8000	2000	520	720	360	10720
2010	8000	2000	520	720	360	10720
2011	8000	2000	520	720	360	10720
2012	8000	2000	520	720	360	10720
2013	8208	2052	534	739	369	10999
2014	8500	2125	553	765	383	11390
2015	9200	2300	598	828	414	12328
2016	9900	2475	644	891	446	13266
2017	11000	2750	715	990	495	14740

Note: In 2013 the minimum wage was calculated as the weighted average of the minimum wage for that year. Data for the year 2018 reflect the expected proposal to increase the monthly minimum age to CZK 12,000.

The increase of costs associated with the adjustment of minimum wage in 2012 and 2017, respectively, represents CZK 4,020 in absolute numbers, which is 37.5 % for employees earning the minimum wage.

The average labour costs in the Czech Republic were CZK 35,759 in 2014 (Czech Statistical Office, 2016b, pp. 315). No newer data are available.

Employers most affected by the adjustment of minimum wage are those who have a high proportion of employees earning wages at rates close, or corresponding, to the minimum wage. The industries with the highest ratio of low-income employees in 2015 included accommodation and food service activities and administrative and support service activities. The situation is illustrated in Fig. 1.

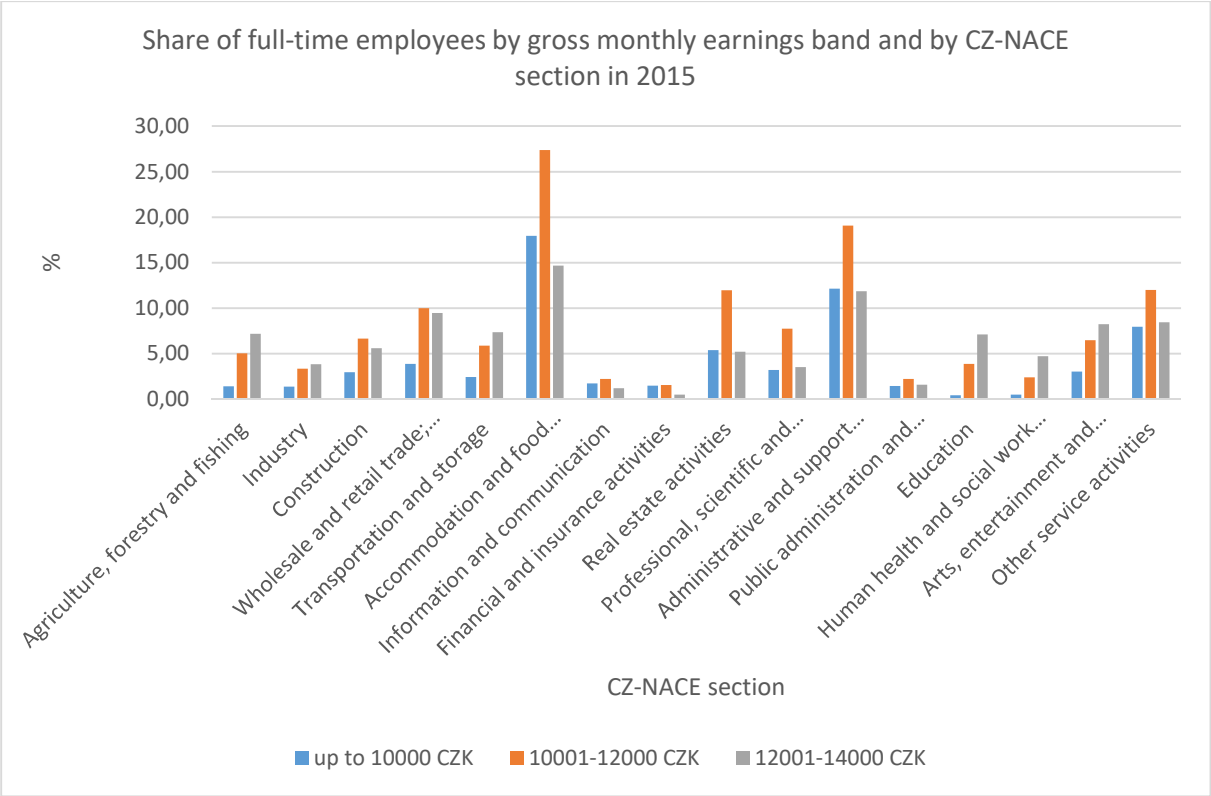


Fig. 1 – Percentage of employees by gross monthly earnings band and by CZ-NACE section in 2015. Source: Authors' interpretation based on the data of Czech Statistical Office, 2016c

As Fig. 1 illustrates, if we take into account all employees remunerated by a gross monthly wage of less than 14,000 CZK, this would account for 60% of employees in the accommodation and food service activities industry. In the case of administrative and support activities this ratio would be approximately 43%.

3.1.Effects of the adjustment of minimum wage on public revenues in the Czech Republic

Employers pay social and health insurance for their employees, as well as their personal income tax assessed in accordance with act no. 586/1992, as amended. Let's consider the simplest situation, i.e. that of a full-time employee who earns the minimum wage and can claim tax abatement at the base rate of CZK 2,070.

Until 31 December 2016 the minimum monthly wage was CZK 9,900. Due to the effects of the basic tax abatement per taxpayer in the amount of CZK 2,070 per month the taxpayer would actually not pay personal income tax. This situation changed when the government decided to adjust the minimum wage to over CZK 10,250 per month, i.e. since 2017. As of 1 January 2017 the advance for income tax for employees earning the minimum wage is CZK 150.

In the Czech Republic, the minimum wage is earned by approximately 3 % of employees. In absolute numbers amounts it is to 110,000 – 120,000 people (Average Earnings Information System, 2016). The percentage of employees earning the minimum wage has remained the same in the long run. If we were to consider that only 110,000 workers earn minimum wage, the state will receive, thanks to the adjustment of minimum wage, additional CZK 200 million in the form of personal income tax annually; as well as extra CZK 650 million in social and health insurance revenues, if we were to compare the years 2016 and 2017.

The Fig. 2 below shows the development of revenues from the payments of social and health insurance for employees and employers compared with the development of the ratio of minimum and average wage (Kaitz index), as well as the trends in unemployment and GDP growth in the Czech Republic between 2008 and 2015.

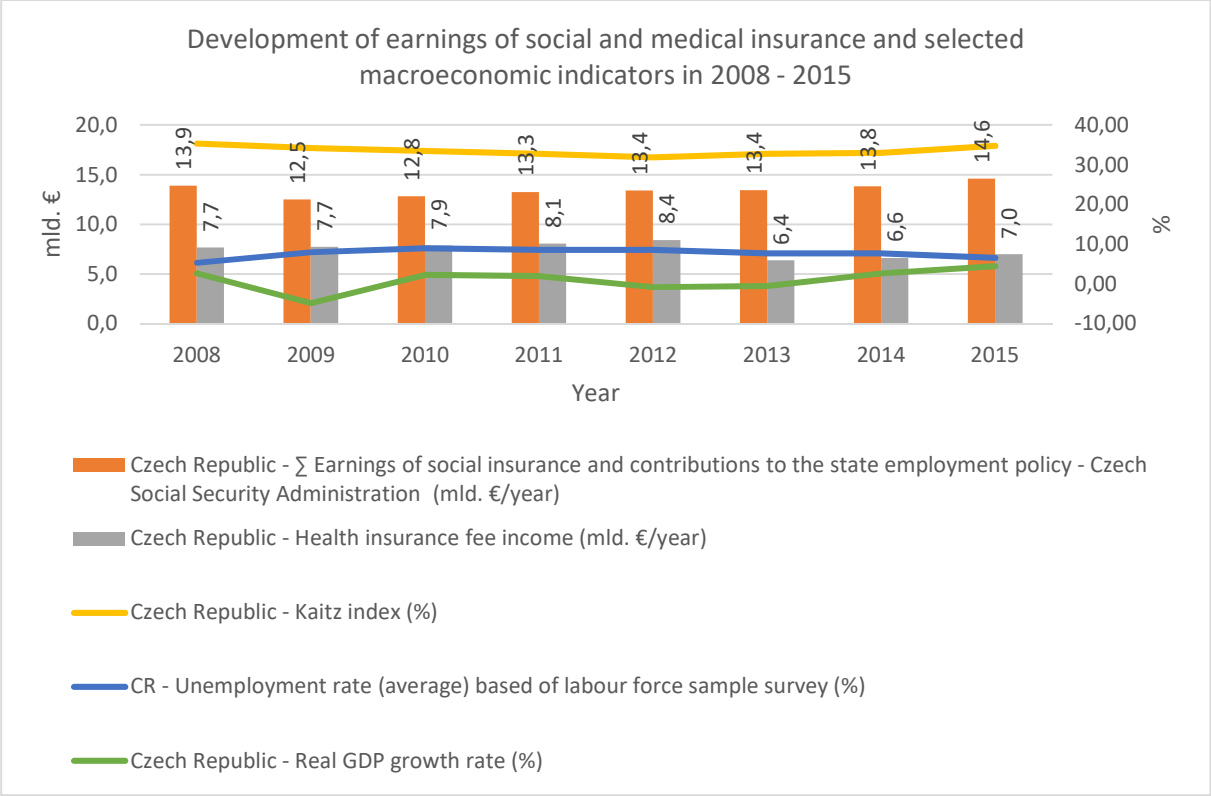


Fig. 2 – Development of revenues from the payments of social and health insurance for employees and employers; development of the Kaitz index, unemployment and GDP growth in the Czech Republic between 2008 and 2015. Source: Authors' interpretation based on the data of Czech Statistical Office, 2017; Czech Social Security Administration, 2016 and Research Institute for Labour and Social Affairs – RILSA, 2016

Commentary: Fig. 2 clearly shows that Kaitz index ratio began to decrease in 2008. A turnaround occurred in 2013, when the new government increased the minimum wage. No significant growth in unemployment has been registered in relation to minimum wage valorisation in the CR. The unemployment rate in the Czech Republic copies (with delay) economic development more generally. Revenues from the payments of social and health insurance have been rising since 2013. This positive result (from the perspective of public revenues) is directly affected by the drop in unemployment and increasing wages.
The adjustment of the minimum wage base rate also means an increase in the respective levels of the guaranteed wage. Salaries of employees in the public sector are increased and pressure exists that the salaries in the private sectors be increased as well.
The adjustment of the minimum wage, as of 1 January 2017, by CZK 1,100 (compared with 2016) should represent an increase in labour costs by CZK 3.5 billion. The revenues from social insurance should increase by approximately CZK 980 million; revenues from health insurance by approximately CZK 420 million (Deník, 2016).

3.2.Comparison with Slovakia

A lot of attention has been paid to the issue of the minimum wage in Slovakia. Unlike the Czech Republic, Slovakia has a special law governing the minimum wage. Pursuant to Section 2 of act no. 663/2007, on the minimum wage, is determined via a government decree "for the respective calendar year". The minimum wage base rate and other rates (guaranteed wage) must

be updated in accordance with the criteria stipulated by the aforementioned act for each calendar year (Pernica, 2016).
Therefore, the effects of the development of the changes in the minimum wage rates on labour costs are more predictable in Slovakia than they are in the Czech Republic.
The Tab. 3 below shows the effects of the changes in the minimum wage base rate on the payments of social and health insurance for a Slovak employee with no children earning the minimum wage.

Tab. 3 – Comparison of the development of the payments of social and health insurance and the personal income tax of an employee earning the minimum wage with no children in the Czech Republic and Slovakia between 2009 and 2016. Source: The authors based their calculations on the information obtained at podnikajte.sk and the Statistical Office of the Slovak Republic

Year	Σ labor costs CR (€/month)	Minimum wage SR (€/month)	Social insurance SR - employer 25,2 % (€/month)	Social insurance SR - employee 9,4 % (€/month)	Medical insurance SR employer 10 % (€/month)	Medical insurance SR employer 4 % (€/month)	Σ labor costs SR (€/month)	Income tax SR (€/month)	Difference labor CR&SR (€/month)
2009	397	296	74,1	27,6	29,6	11,8	399,7	0,0	2,6
2010	397	308	77,2	28,8	30,8	12,3	416,0	0,0	18,9
2011	397	317	79,9	29,8	31,7	12,7	428,6	0,0	31,5
2012	397	327	82,4	30,7	32,7	13,1	442,1	0,0	45,1
2013	407	338	85,1	31,7	33,8	13,5	456,8	0,0	49,5
2014	422	352	88,7	33,1	35,2	14,1	475,9	0,0	54,0
2015	457	380	95,8	35,7	0,0	0,0	475,8	5,2	19,2
2016	491	405	102,3	38,2	7,8	3,1	515,1	9,1	23,8
2017	546	435	109,6	40,9	16,5	6,6	561,1	13,4	15,2

Commentary on Tab. 3: The amounts were converted using the exchange rate EUR 1 = CZK 27.

The increase in the labour costs, as a result of the adjustment of the minimum wage, is slower in Slovakia, due to the regular adjustment of their minimum wage. Based on the comparison of the labour costs of employees earning the minimum wage in the Czech Republic and Slovakia (in euros), the labour costs are much higher in Slovakia in the long run.
In 2015, the average labour costs per employee per hour in Slovakia amounted to EUR 10, which is higher than in the Czech Republic (EUR 9.90 in the same time period) (Eurostat, 2016a). In 2015, the income threshold of an individual in Slovakia was EUR 346.5 (SpravyPravda, 2016). The difference between the poverty line and the minimum wage base rate in Slovakia is significantly higher, compared with the difference between the poverty line and the lowest minimum wage rate in the Czech Republic.
Just like in the Czech Republic, the employers most affected by the adjustment of minimum wage are those who have a high proportion of employees earning wages at rates close, or corresponding, to the minimum wage. The situation is illustrated in Fig. 3.

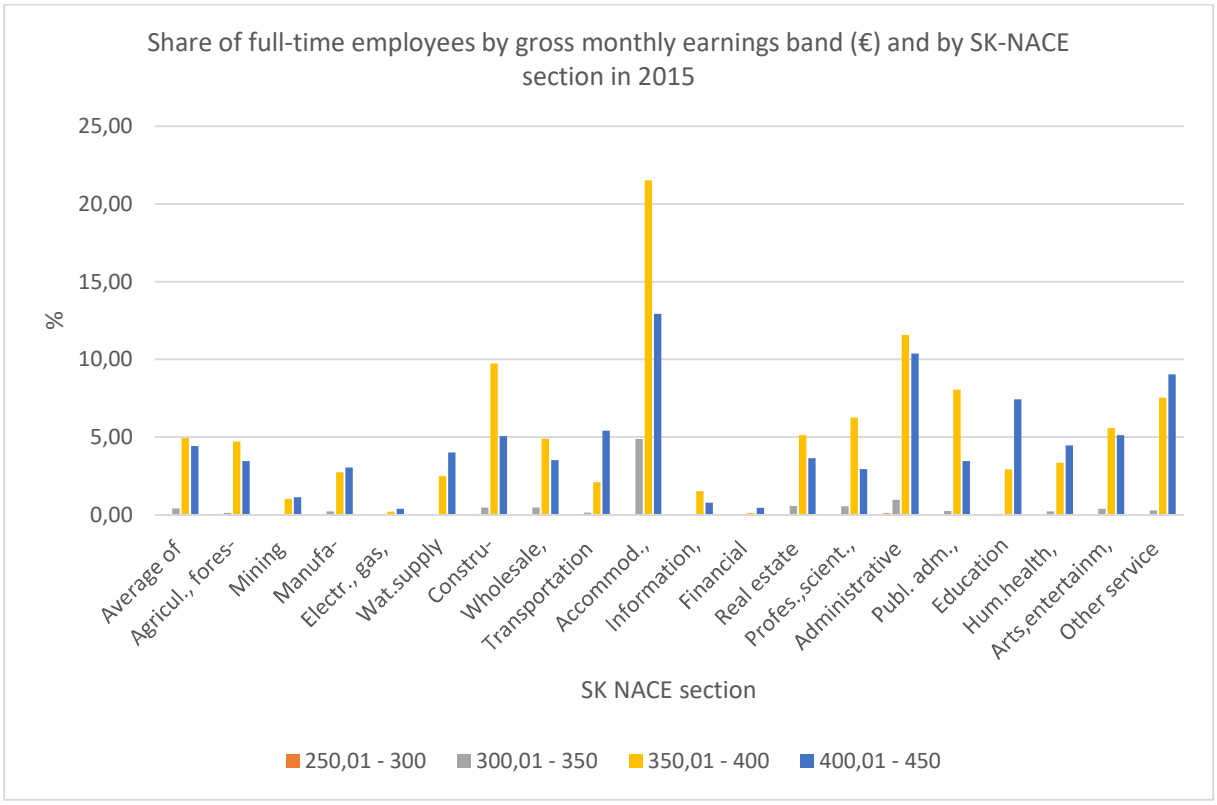


Fig. 3 – Percentage of employees by gross monthly earnings band and by SK-NACE section in 2015. Source: Authors´ interpretation based on the data of Statistical Office of the Slovak Republic, 2016a

Commentary on the Fig. 3: The industries with the highest ratio of low-income employees in 2015 included accommodation and food service activities and administrative and support service activities. These are the same industries as in the case of the Czech Republic. If we take into account all employees remunerated by a gross monthly wage of less than 450 €, this would account for nearly 40 % of employees in the accommodation and food service activities industry. In the case of administrative and support activities this ratio would be approximately 23 %. The percentage of employees earning the gross monthly wage of less than 450 € in the accommodation and food service activities industry and in the case of administrative and support activities is much lower, compared with the Czech Republic.

3.3.Effects of the adjustment of the minimum wage on public revenues in Slovakia

Employers pay social and health insurance, part of which they pay themselves and part of which is deducted from wages along with advance personal income tax. Again, for the purpose of our example, we shall consider the simplest case of a full-time employee with no children who earns the minimum wage.
Until 31 December 2014, the minimum wage base rate in Slovakia was EUR 352. Due to the applicable tax legislation taxpayers would pay no personal income tax. This situation changed effective 2015 when the minimum wage base rate increased to EUR 380 per month, whereupon the employees became obligated to pay an advance tax of EUR 5.20.
The Fig. 4 below shows the development of revenues from the payments of social and health insurance of employees and employers, compared with the development of the ratio between the minimum wage and the average wage (Kaitz index), as well as the trends in terms of unemployment and GDP growth in Slovakia between 2008 and 2015.

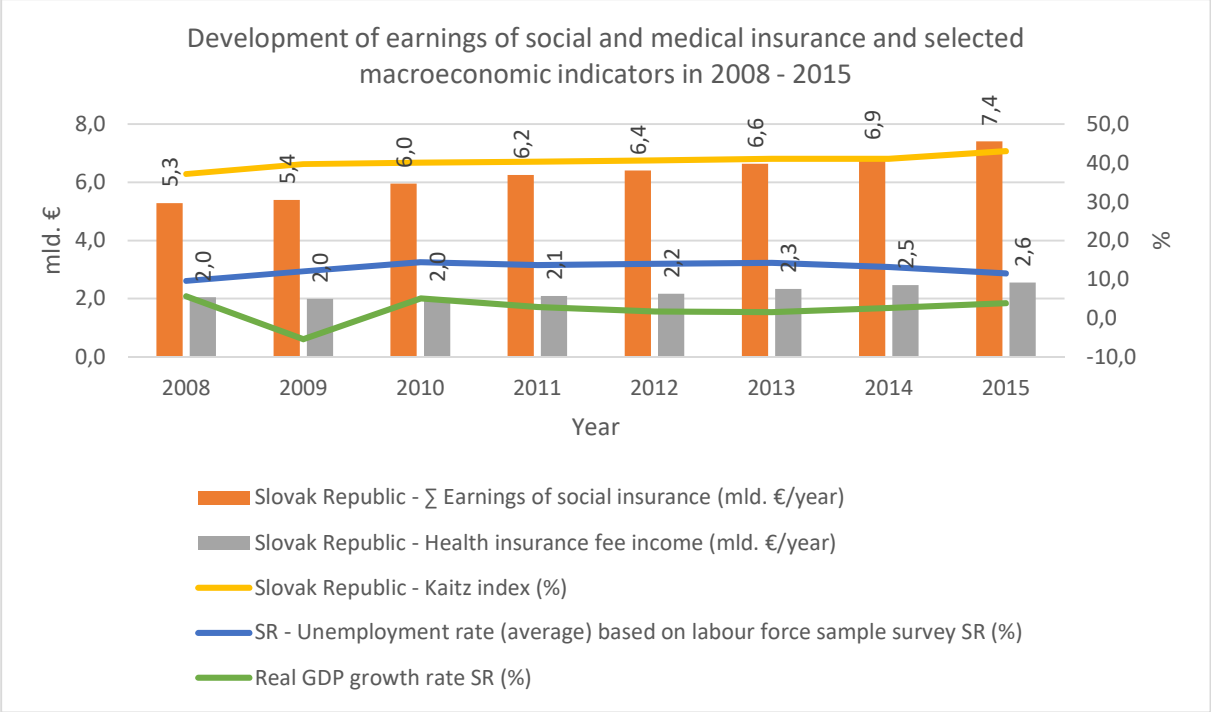


Fig. 4 – Development of revenues from the payments of social and health insurance for employees and employers; development of the Kaitz index, unemployment and GDP growth in Slovakia between 2008 and 2015. Source: Authors' interpretation based on the data of Statistical Office of the Slovak Republic, 2016b

Commentary: During the period in question, the Kaitz index was increasing in Slovakia. In 2010 it exceeded 40 %. This result is affected by the aforementioned continuous significant growth in the minimum wage in Slovakia. The trend in terms of GDP is Slovakia is very similar to that in the Czech Republic. However, the Slovak economy has to deal with high unemployment (nearly double that of the Czech Republic). Since 2010 the revenues from the social and health insurance have been increasing. These payments could be much higher if unemployment was lower and the trend in terms of wages remained the same.
Approximately 113,000 employees earn the minimum wage in Slovakia (VoFinanciach, 2015). Therefore, the number of employees earning the minimum wage in Slovakia is roughly the same as in the Czech Republic. However, the percentage of employees earning the minimum

wage is higher in the case of Slovakia – nearly 5 %. The majority of EU countries the ratio of employees remunerated by less than 105 % of the national minimum wage is according to 2010 data higher in comparison to the Czech Republic, e.g. in Slovenia (19.2 %), Lithuania (13.7 %), Latvia (11.8 %) Luxembourg (10.2 %), Poland (9.9 %), France, Ireland and Croatia (all 9.2 %) (Eurostat, 2010). The minimum wage in the above mentioned states is significantly higher in Euros and in purchasing power in comparison to the Czech Republic (Eurostat, 2016b).

4.DISCUSSION

The objective of the current government is to achieve 40% ratio between the minimum wage and the average gross wage. This objective is included in the policy statement of the government of PM Bohuslav Sobotka and is consistent with the established practice in most European countries (Government of the Czech Republic, 2014).
The prognosis of the Ministry of Labour and Social Affairs of the Czech Republic envisages a 3.3 – 5.7% increase in the average nominal wage in the national economy in 2017. The increase in the monthly minimum wage, from 9,900 CZK, as of 1. 1. 2016 to 11,000 CZK as of 1. 1. 2017, i.e. by 1100 CZK, represents an increase of more than 11 %. As such, this growth of the monthly minimum wage is approximately double that of the predicted growth in the average monthly nominal wage in the Czech economy in 2017. We expect that the Kaitz index in 2017 will reach approximately 38%. This outcome is the same as in 2007.
The Ministry of Labour and Social Affairs of the Czech Republic has introduced another plan to adjust the base rate of the minimum wage to CZK 12,000 as of 2018. The overall labour costs per one full-time employee earning the lowest rate of the minimum wage would increase by CZK 1,340 year on year, which represents more than 9% increase year on year. If we were to consider 110,000 employees earning the lowest rate of the minimum monthly wage who would, at the same time, only claim the base tax abatement per taxpayer, the state would collect extra CZK 250 million in the form of personal income tax from these employees. As long as the conditions would remain unchanged, the extra revenue from social insurance payments would amount to more than CZK 400 million; and almost CZK 180 million from health insurance payments.

5.CONCLUSIONS

The minimum wage instrument is important for employees, employers and the state alike. It has positive effects for the state in terms of tax revenue and contributions to the social and health insurance programs thanks to transparent employment and remuneration of people, as well as reduced expenditures in the form of unemployment benefits.
The number of Slovak employees earning the minimum wage is roughly similar to the Czech Republic. The increase in the labour costs associated with the adjustment of the minimum wage has been slower in Slovakia, mainly due to regular adjustment of the minimum wage. Based on the comparison of the labour costs of employees earning the minimum wage in the Czech Republic and Slovakia (in euros), the labour costs in Slovakia are higher in the long run.
In 2015, the average labour costs per employee per hour in Slovakia amounted to EUR 10, which is higher than in the Czech Republic (EUR 9.90 in the same time period). The employers most affected by the adjustment of the minimum wage are those in the accommodation and food service activities industry and administrative and support activities, in both countries.
The Slovak economy is strongly affected by high unemployment rate (double that of the Czech Republic), which has negative effects on revenue from social and health insurance.
The difference between the poverty line and the minimum wage base rate in Slovakia is significantly higher, compared with the difference between the poverty line and the lowest

minimum wage rate in the Czech Republic. The percentage of Czech and Slovak employees earning the minimum wage, as well as its amount, remains significantly lower compared with other developed EU members. The minimum wage will see further increase in these countries, which will result in increased public revenue.

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ASSESSMENT OF THE COST OF ACQUISITION OF RESIDENTIAL BUILDINGS IN TERMS OF REDUCING THE ENERGY INTENSITY OF THEIR OPERATION

Petráková Zora, Jurigová Martina, Dvorský Ján

Abstract

Constantly increasing energy and heat prices lead us to search for more effective use of technologies that reduce their consumption and hence operating costs during the life cycle of buildings and also reduce the negative effects on environment. In the past, we asked for a particular emphasis on the amount of purchase / investment costs by project assessment. Gradually, we recognize that it is important to monitor the future operating costs and realize that the thermal attributes of building materials, which affect the cost of acquisition of the object, also affect the amount of the operating costs of buildings in the phase of use. One way to reduce operating costs is the thermal insulation of buildings. How is it but with the effectiveness of funds spent? Heating do automatically reduce costs after insulation? What time will it take to get the investment returned and what are the factors that matter? These questions should be asked by the organizations providing / making the rental apartments.

Keywords: energy prices, life cycle of buildings, operating costs

JEL Classification: C150

1.ENERGY MANAGEMENT

The ongoing development of the company is further characterized by rising energy requirements. Energy performance of building is complex, since it depends on several parameters related to the building characteristics, equipment and systems, weather, occupants, and sociological influences (Asadi, Amiri, Mottahedi; 2014). Achievement of reasonable energy consumption is one of the fundamental objectives of energy management. Pressure on energy saving is the greater, the more costs rise for the purchase of energy (heat, electricity, natural gas, coal etc.).

Energy providing companies are facing legal restrictions concerning environmental targets effecting design and operation of their energy services. Thus, optimizing energy services based on sustainable criteria plays a crucial role in providing clean, affordable and profitable business solutions in the energy field (Coss, Rebillard, Verda, Le Corre; 2017).

Efficient and effective city planning in improving the energy performance of residential buildings requires a clear understanding of the influential features (Ma, Cheng, 2016). Household energy consumption has been increasing in the last decades; the residential sector is responsible for about 40% of the total final energy use in Europe (Buratti, Asdrubali, Palladino, Rotili; 2015). Residential buildings consume more than 1/3 of the total energy produced and the energy consumption in Slovak republic (Trávnik, Oboňa, Ivanička, Bollová, Chodasová, Petráková; 1988). The development of the parameters that affect energy prices can shows increasing of their prices, in the near future, will not stop but it will steadily increase. The only way to save energy costs is to reduce their consumption. In an effort to reduce operating costs of buildings, it is a need for rationalization of energy consumption, in particular by reducing the energy intensity of buildings.

Energy saving is an issue that concerns every owner or user of rented apartment. Energy costs are up to 64% to 83% of the total operating costs of buildings.
Continuous increase in energy prices leads people to a more efficient use of technologies that save not just money but it is also friendly to the environment. Selection of the optimal solutions for reducing the energy intensity of buildings is carried out by several aspects of evaluation, including:

- economic aspects - taking into account the amount of start-up costs to the energy saving measure. One of the points is the monitoring period for return on investments made in energy saving measures (Dzikuc, Adamczyk; 2015; Kramoliš, Kopečková, 2013),
- environmental aspects - from the point of its view, the most important is reducing heat consumption in the building that is up to reduce harmful emissions (Cipollone; 2016),
- aspects of performance values - provided that the measures will increase the utility of the object. For example, insulation of the cladding has a positive impact not only on the thermal properties of the facade, but also on its appearance, which will certainly contribute to a better representativeness of the building and thus also to increase its market value.

In the past, importance has been given to assess the amount of the acquisition cost of the building structure. Over time, people began to realize that the amount of investment costs for the acquisition of the structure affecting our future operating costs.
Now, it is a great demand for thermal insulation of houses, apartment buildings because of saving funds for heating, because they are the greater part of operating costs. On the market there are many companies that promote insulation. The government provides subsidies for thermal insulation and thus the renewal of obsolete housing stock. But how is the effectiveness of the funds? Are really heating costs reduced after insulating? After what time are investments returned and under what circumstances does it matter?
European Commission has set clear targets for 2020 regarding energy and environment policy; these targets include 20% cut in greenhouse gas emissions against the 1990 levels. It is believed that adopted strategy has encouraged the renewable energy applications during the last two decades (Al Makky, Alaswad, Gibson, Olabi, 2017; Chastas, Theodosiou, & Bikas, 2016). In this context, Fux, et all. (2013) said, that when designing a building energy system based on renewable energy sources, a major challenge is the suitable sizing of its components.
Thermal energy storage systems incorporated with phase change materials have potential applications to control energy use by building envelopes. However, it is essential to evaluate long-term performance of the phase change materials and cost-effectiveness prior to full-scale implementation (Patel, Gao, Boddu, Stephenson, Kumar; 2017).
In preparation for the construction of the structure, we can affect the future consumption of energy for heating by its architecture and design of optimal shape and correct layout according to the purpose of each room as well as by the design for structures (walls, ceilings, floors, roofs, windows, doors) with good heat and technical characteristics, respectively by correct choice of the materials, because the energy intensity of the whole of the structure directly depends on of their quality and parameters.
Results research show that while increasing the envelope thermal energy performance yields thermal operational energy savings, these can be offset by the additional embodied energy required for supplementary insulation materials and thermally efficient windows. In order to reduce a building's life cycle energy demand, more comprehensive regulations are needed.

These should combine embodied and operational energy and emphasise design strategies (Crawford, Bartak, Stephan, Jensen, 2016).
For comparison, we can use the selected building materials (Tab. 1), in which are technical-economic indicators.

Tab. 1 – Technical and economic indicators of materials. Source: own calculation.

Material used for outer walls (without insulation)	R	Annual heat consumption	The price for heat [€/kWh]	Heating costs for 2016 [€/a]
	[m². K/W]	[kWh/a]		
Porotherm 38	2.84	19 011.82	0.0478	908.76
Termobrik 38	3.5	18 568.40	0.0478	887.57
Heluz 44	4.99	16 369.02	0.0478	782.44
Porotherm 44	3.55	17 989.90	0.0478	859.92
Termobrik 44	4.06	18 084.09	0.0478	864.42

Note: R - thermal resistance of the structure.

In each case we start from the fact that the load-bearing walls are made of a material with a given heat and technical characteristics (R - thermal resistance of the structure, sourced from manufacturers' websites) and economic characteristics (annual heat consumption for heating, the price for heating and heating costs per year).
By comparing the values of the technical parameters of materials (R), we chose to build the supporting masonry variant HELUZ 44, because the value of R reaches the largest number.
With thermal insulation, construction acquires higher thermal resistance, value R increases. We suggest that the thermal technical indicator for insulation - R of each variant meets the minimum value set for very economical houses (R is about 8 m^2 K/W).

2.CALCULATION OF THE HEATING COSTS

Heating costs are the largest part in the operation of the house in the long term. Their amount depends on the economic situation in the country and in the world, and mainly on the design of object. The main input data for calculating the annual cost for heating are necessary heat for heating the heat price.
In the calculation, we compare the cost for each year lifetime of the building – for non-insulated building and insulated building. The result of comparisons is year on year savings funds and total costs for 15 years for heating of insulated and non-insulated building structure.
It is difficult to predict the evolution of prices of heat for long periods, so we derived prices of the heat from prior periods. In the long term, it is clear that data, for certain time periods, repeat; there are certain regularities in the development, which we can use in our forecasts. The development of the prices of heat is needed to model the two alternatives - optimistic (1) pessimistic (2) - for the entire life of the structure.
Choosing a variant of the investment project (acquisition of the structure) must include: defining a set of investment projects for the selection of variants, identifying and defining resources intended for investment projects, determine the costs, which includes the capital budget (identifying investment costs) and the calculation of operational lifetime costs of real estate, but also the cost of a possible liquidation of the property – i.e. life-cycle costs of real estate, determination of benefits, reduce production costs, increase profits or production, respectively for investment in non-productive projects, reduce operating costs, finding ways to

use available financial resources, assessing the effectiveness of individual investment projects, creation of assessment criteria, risk analysis, selection of the optimal alternative of the project (acquisition of property).

3.THE SELECTION OF VARIANTS BY CALCULATING LIFE-CYCLE COSTS OF CONSTRUCTION WORK

Method lifecycle costs – LC is a method for calculating the present value of the cost of acquisition, use and disposal of construction. It is used to search for those alternatives of solutions of the construction, which involve minimal costs of its life cycle. The basic precondition of using this method is that the current and future cost of ownership and use of the construction work are important for investor.
Calculation of life cycle cost of the construction (in our case the insulation of outer walls) is part of the process of selection of the most alternative solutions outer wall of the structure. The calculation of the aggregate life cycle cost for the i - th solution variant of the structure is calculated as the sum of the present values of all life-cycle costs, the cost of construction of the building envelope, insulation of buildings as well as operating costs (for heating). The result of the calculation is a number representing the cost of the life cycle of the property for a certain period of time.
In individual years of operation, we are taking into account the annual cost of heat, annual percentage change in the price of heat and also the inflation of the currency.
According to this method of choosing alternative, the most advantageous variant is that with minimal LC because it represents costs incurred during the period of 15 years.
The recommended procedure in using LC method:

- identify objectives, constraints and solutions variants of construction work,
- accept the basic assumptions for calculating the results of analyses,
- obtain and process the input cost data lifecycle of the construction work,
- LC calculated for each variant of solution to construction work,
- compare all the options in terms of their LC and choose the variant (s) with minimal LC,
- assess uncertainties and risks variants with minimum LC and identify quantifiable impacts and financial constraints,
- according to the results of the previous step, to analyse the susceptibility variants with minimum LC for these changes (sensitivity analysis),
- accept a final decision.

Processing cost data, to be included in the calculation of LC, is based on:

- determine a list of specific cost items which will to be taken into account,
- the actual acquisition cost of items which will be taken into account,
- determine the time at which during the period of use of the construction they will act.

By the sensitivity analysis, we can examine the sensitivity of the optimal alternative to changes in:

- prices used media (base fuel, fuel oil, gas, electricity, solid fuel),
- prices of building materials, structures and systems,
- interest rate, credit policy of banks,

- environmental charges,
- tax burden,
- the length of the examined time horizon,
- life cycle of building materials, structures, etc.

Calculation of aggregate life cycle cost for the i-th solution variant construction work is based on the census of the current values of all life-cycle costs. The current value of the considered loads is calculated to one common time t = 1 the formula:

$$LC = \sum_{t=1}^{t-T} N_t(1+u)^{-t}, \quad (1)$$

where:
LC- a summary of the life cycle cost of construction, for variants i = 1, …, n,
N- number of variants of construction solution,
t- 1,2, …, T,
T- length of life cycle of construction
u- interest rate in absolute terms,
N_t- life cycle costs, attributable to one period t (Kozlovská et al., 2016).

In assessing of the total cost over the useful life cycle should be set uniformly for all comparison variants:

- time horizon,
- the general inflation rate,
- discount and interest rates.

From Table 2 it can be seen that for both alternatives increase in the price of heat based on the most preferred variants of such HELUZ 44.

4.SELECTION OF VARIANT BY CALCULATING THE ECONOMIC EFFICIENCY

Economic efficiency assesses the relationship between the deployed resources and the overall benefit of the client (investor).

Cost benefit analysis is method represents a systematic approach to identifying and measuring the economic benefits and costs of the project (Trávnik et al., 1998).

- **Benefits** of the project represent value increase in output of goods and services that are likely outcome of the project.

- **Costs** represent the amount of consumed resources, which will be used in the project. Project costs and benefits are discounted at a time because of their comparability.

$$\frac{\sum_{t=1}^{n} P_t}{\sum_{t=1}^{n} N_t} \geq 1 \quad * \quad \frac{\sum_{t=1}^{n} P_t(1+k)^{-1}}{\sum_{t=1}^{n} N_t(1+k)^{-1}} \geq 1 \quad (2)$$

where:
P- financial and non-financial measurable benefits of the project,
N- financial and non-financial measurable costs of the project,

k- corporate discount rate,
t- term 1 – n,
n - length of life cycle of investigation,
*taking into account the time factor: $(1 + k)^{-1}$- get the ratio of present values of benefits and costs (Trávnik, et al., 19

Results are in table 2.

Tab. 2 – Calculation of economic efficiency (E) for option 1 and 2. Source: own calculation.

Variant	Investment costs for insulation (I) [€]		Average annual savings (U) [€]		E = U/I	
Alternative	Optimistic	Pessimistic	Optimistic	Pessimistic	Optimistic	Pessimistic
TERMOBRICK 38	10 903.70	10 903.70	322.77	530.34	0.03	0.049
POROTHERM 38	10 903.70	10 903.70	348.98	573.41	0.032	0.053
HELUZ 44	7 808.78	7 808.78	181.41	298.08	0.023	0.038
POROTHERM 44	10 903.70	10 903.70	286.04	470.00	0.026	0.043
TERMOBRICK 44	9 617.69	9 617.69	283.2	465.34	0.029	0.048

The resulting value represents the return of funds spent on the project. In Table 2, we can assess the profitability of E materials used in the two alternatives evolving heat prices. Most preferably is the variant POROTHERM 38 (Optimistic alternative: E = 0.032, Pessimistic alternative: E = 0.053). Least preferred in optimistic alternative is the variant HELUZ 44 (E = 0.023) and in pessimistic alternative is the variant HELUZ 44 too (E = 0.038).

5.THE SELECTION OF VARIANT BY CALCULATING THE RETURN ON INVESTMENT

In determining of the length of the return on investment (I), which in our case represents the cost of insulation can be based on the formula for calculating economic efficiency. For the benefit (U) in our case, we consider the average annual cost savings for heating; we received comparing insulated and non-insulated buildings. The number of years return on investment (NI) is calculated by dividing the value of E inverted, that is NI = I / U.

Method indicates the number of years for which investment costs will be returned by using cash flows. If the economic life cycle of the assets is longer than the period of payment, it can be a successful investment. By comparing the variants in this view, the most convenient variant is the one with the shortest time of payment.
The method has static and dynamic variant. Static variant does not reflect the changing value of money due to the time factor. Payment duration T_n can be determined using either a spreadsheet or calculation by the equation:

$$T_{n,j} = \frac{N_{I,i}}{\frac{CF_i}{n}} = \frac{N_{I,i}}{\text{ø}CF_i} \qquad (3)$$

where:
$T_{n,I}$ - the period of payment (recovery) for variations i = 1, ..., n,
$N_{I,i}$ - total investment costs,
øCF_i - average annual flow of money (cash flow) and the variant for a period of economic life,
n - the estimated useful lives of the event (year) (Cipollone, 2016).

While: $N_{I,i} = I_{O,i} + øK_{P,i}$ (4)

where:
$I_{O,I}$ - the cost of acquisition of investments,
$øK_{P,I}$ - average annual working capital needed for its operation (Asadi et al., 2014).

After substituting input information into the formula, we get the return on investment alternatives for both alternatives annual increase in heat prices (Tab. 3). From these outcomes, we see that the materials that were conducted with identical insulation investment costs do not show the same number of years of return on invested funds. This phenomenon is caused by various average annual savings calculated on the basis of protocols of annual demand by the thermal resistance of structures that are different for the different kinds of masonry (Tab. 1).

Tab. 3 – Calculation of return of investments (NI). Source: own calculation.

Variant	Investment costs (I) [€]		Average annual savings (U) [€]		NI = I/U	
Alternative	First	Second	First	Second	First	Second
TERMOBRICK 38	10 903.70	10 903.70	322.77	530.34	34.00	21.00
POROTHERM 38	10 903.70	10 903.70	348.98	573.41	31.00	19.00
HELUZ 44	7 808.78	7 808.78	181.41	298.08	43.00	26.00
POROTHERM 44	10 903.70	10 903.70	286.04	470.00	38.00	23.00
TERMOBRICK 44	9 617.69	9 617.69	283.2	465.34	34.00	21.00

After calculation using alternatives (1) and (2), we can see a different payback periods. For option (1) the payback period is longer and the optimal variant is POROTHERM 38, because the payback period is the shortest. In the pessimistic rising trend of prices of heating in this method of calculation, we see shorter payback period, and POROTHERM 38 shows a minimum period.

6.CONCLUSION

To achieve the success of the project, it is also necessary to meet the criteria that are at the forefront - quality, time of use value of capital costs and operating costs. The fulfilment of these criteria, we can provide by quality of preparation project.
The basis of value management of the structure is the optimal setting process for the preparation and implementation of the structure, optimal adjustment of the life cycle cost of the structure. The results of our study are identical to the results of studies Kozlov, M., Tazilková, A. & Italian, J. (2016). It is important to strike the appropriate balance between price and quality and between cost and operating costs. The right decision in choosing of the materials and technical solutions will

help us to positively influent and optimize life cycle cost of the structure and also the value of the project as well as the impact on the environment.

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BEHAVIORAL MODEL FOR THE ANALYSIS OF INVESTMENT ACTIVITY OF INDUSTRIAL ENTERPRISE

Pluzhnikov V.G., Kukharenko S.I., Shikina S.A.

Abstract

The influence of the management style of the company on its investment activity based on a behavioral model according to a type of management. Assessment of management style was conducted (based) on the comparison of the level of investment activity at different stages of the life cycle (LCS) of the company. The classification LCS and the method of quantitative evaluation of the integral indicator (Cia). Developed diagnostic and behavioral model of formation of the investment policy of the company within the formulated development strategy. Developed tools allows you to diagnose and determine the investment policy, adequate to the stage of its development in accordance with the formulated strategy and management style.

Keywords: The behavioral model. Investment policy. The natural level of investment activity. The life cycle stage of socio-economic system.

JEL Classification: D12, L29

1.INTRODUCTION

The world's and home practice show that stable and effective work of companies in constantly changing conditions of our outside environment with high level of uncertainty and risk can only be possible through effective management of process strategic development. This management is carried out in accordance with the strategic goals. These goals form the company's investment policy, which reflects the management style (behavior) of the company's management. For a proper study of the attitudes and mechanisms of the decision-making process, it is necessary to take into consideration subjective and psychological aspects of behavioural economics (Gradinaru, 2014).

In modern conditions we feel the need to evaluate the strategic development level of a company in the process of forming its investment policy (Pluzhnikov, Shikina, 2014). The choice of investment policy according to strategic objective of the company is closely connected with a stage of its lifecycle (Shirokova, 2007).

The process itself can be exercised in different variants: exposure of necessities in the course of reaching strategic aims of the company development, defining form and volume of investments, forming and managing the investment policy in accordance with development strategy, managing the development and accomplishment of investment project portfolio (Charaeva, 2010). The investing activities shall provide achievement of long-term goals of the company and are performed according to developed investment policy (Kushelevich, Filonovich, 2004).

Need for forming of investment policy and management according to the declared strategy of the company is obvious, it is caused by limitation of a number of scientific methods of its assessment and control. The management of the companies in practice relies on the accumulated experience and an intuition. How to promote the innovative activities is an important problem for modern

society (Lin et al, 2014). As a result we have a need for development of new approaches for formation of investment policy taking into account such important factor as management style.
Within this article we declare that we understand investment policy as a complex of actions for management of investment activity according to the formulated development strategy of the company. It is demands consideration of the following questions: the choice of strategy at various stages of development of the company; formation of investment policy and control of efficiency of its realization.

2.RESEARCH OBJECTIVES AND HYPOTHESES

Comparing the actual level of investment activity (Cia) with the natural level of investment activity (Cnat) we defined which one of them reflects the type of implemented management. The Natural level of investment activity (Cnat) is determined by the strategic development plan of the company, depending on the stage of the life cycle (LCS).

3.THEORETICAL DECISIONS

3.1.Forming of strategic objectives at various stages of lifecycle (LCS)

For the answer to questions of the first group it is necessary to consider that practice of management of development of the companies has a big variety of classifications of strategy. In order that in them their classification is necessary to be guided. Within this article the is applied following classification of reference strategy given in Tab. 1.

Tab. 1 – Classification of standard strategies

Name of the strategy	Contents
1. Strategy of concentrated growth	Product alteration or changes in market
Strategy of strengthening positions on market	Taking the best positions with this product on the current market
Strategy of market development	The search for the new markets for manufactured products
Strategy of product development	Using the new product for the growth in the acclimated market
2. Strategy of integrated growth	Enlarging of the company by adding new structures
Strategy of backward vertical integration	Growth with the help of acquiring subsidiary structures or intensification of the control over the supplier
Strategy of forward moving vertical integration	Growth with the help of increasing control of the distribution structure and selling products
3. Strategy of diversification	Diversified growth
Strategy of centered diversification	The search and use of additional opportunities for manufacturing new goods through new business
Strategy of horizontal diversification	The search for the growth opportunities on the existing market with the help of new product that demands new technology of manufacturing, different from the previous one

Strategy of conglomerate diversification	Expansion of production volume, which methods have no technological link to already manufactured goods. Creating new goods and selling them on new markets
4. Strategy of reduction	Strategy of forces (resources) regrouping
Strategy of "Harvesting"	Refusing the long-term development in favour of getting max income in short period
Strategy of cease activity	Closing or selling the whole departments or subdivisions
Strategy of cost saving	Cost saving events
Strategy of liquidation	Liquidation of ineffective and futureless business

The offered classification of reference strategy consists of four groups of strategic directions of activities of the company to which they follow in the course of the development (Ivashkovskaya, Yangel, 2007). The important factor influencing forming of the development strategy of the company is the LCS (Miller, Shamsie, 2001).

Each LCS is characterized by a set of unique characteristics. Many researchers give a lot of different sets of characteristics that define the stages of the company development. In this work Greiner model is used as the basis (Greiner, 1989; Lester et al, 2003; Shirokova, 2007). It includes 5 stages: birth, growth, stabilization, stagnation and decline (Fig. 1) (Greiner, 1989). Let's watch how the stages of life cycle company that influence forming of development strategy.

On the "birth" stage the product is created and its creation is based on the innovational ideas as the result of the research activity. Then the modification of the product parameters is happening according to the consumer's demands. On this stage strategies are directed at strengthening market positions and they are characterized by high level of investment activity.

On the "growth" stage the product is already on the market and is acknowledged by the consumers. It can be seen through the significant increase in production volume. The key strategy here is the horizontal and vertical integration strategies. They strengthen the company's positions in the market. In this period companies have to support growth of the production volumes and conduct its quality transformation simultaneously.

On the "stabilization" stage is taking place saturation of the market. At this stage the organization has stable amount of buyers, production technology and distribution of shares on the market. All the main parameters of activity is reaching its peak and then gradually decreasing. The main strategy here is the strategy of cost saving which is characterized by the lowering of the level of investment activity.

On the stage of stabilization the company management team starts to develop new strategy that would help to diversify its activity and to go to the new stage of development. It leads to the increase in investment policy.

On the "stagnation" stage main characteristics are: demand weakens, number of competitors and line of goods decrease, sales results lower, profit declines and cashflow becomes weak too. The main strategy here is the cost-saving strategy. It is defined by the significant weakening of investment activity.

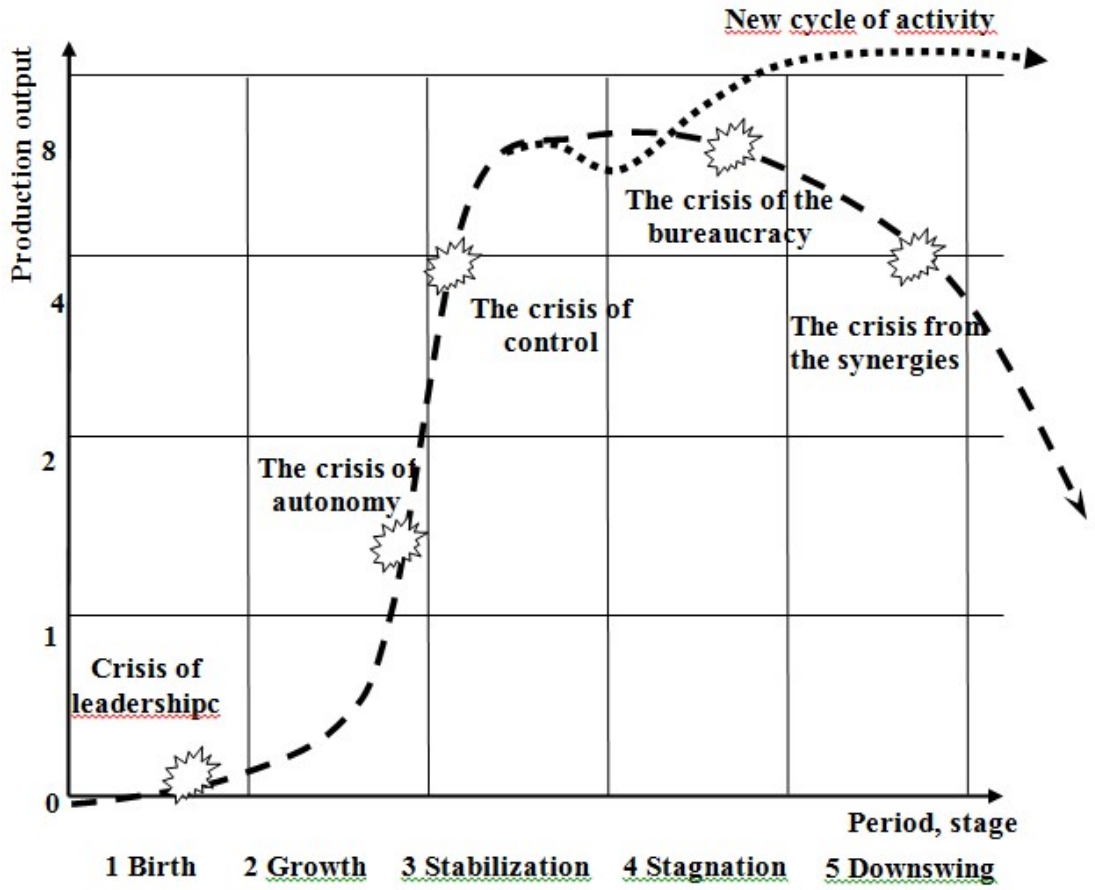


Fig. 1 – Stages of life cycle on Greiner's model

3.2.Determination of the investment policy

We believe that these peculiar properties of company's life cycle must be considered while planning its investment activity (Mueller, 1972). The instrument for realization of the central strategic aim is the investment policy which in its turn is characterized by different options intensity of the investment activity.

Economical literature describes investment activity as the intensity of investment performance which is the dynamic process of investing in its main capital and turnover capital in order to achieve strategic aims for company's development (Young, 2006; Wielhouwer et al, 2000). Within the confines of the offered method we use the quantity evaluation of the level of company's investment activity (Cia) as the ratio between the value growth of the capital contribution (as the result of the investments) and the index of internal development source (Pluzhnikov, Shikina, 2015):

$$C_{ia} = \frac{(\Delta NcA + \Delta CA)}{(NP + Am)}, \quad (1)$$

where Cia – index of investment activity; (ΔNcA+ΔCA) – increment in value of non-circulating and circulating assets in the period under review; (NP+Am) – cash provided by operating activities

in the period under review; NP – net profit in the accounting period; Am – index of amortization in the accounting period.
Index of investment activity Cia is characterized by the evaluation of ratio between value growth of total assets (the result of cashflow from its investment activities) and the value of its internal development sources (the result of operational activities) (Pluzhnikov, Shikina, 2015). Financial activity fulfills the supporting function on balancing the cashflow of investment and operational activity. Therefore, all the types of activity (operational, investing, financial) are being calculated while defining the index of organization's investment activity Cia.
Offered index Cia allows to evaluate the level of company's investment activity in a quantitative form and helps to notice possible errors during forming and management of investment policy.

3.3.Determination of quantitative parameters the stages of lifecycle (lcs)

The intensity of investment activity changes depending on the stage of the life cycle. The number of stages of the life cycle and their names are quite ambiguous because there is no formalized, precise qualitative characteristics of LCS. In the most popular patterns life cycle stages are described by qualitative parameters (Shirokova, 2007). Kriteria for qualitative evaluation of integrated index C_{LC} is shown in the Tab. 2 (Smagin, Shikina, 2012).

Tab. 2 – Criteria of integrated index LCS

	Name of the index	Identification	Shifts of index			
			Birth	Growth	Stabilization	Stagnation
1	Index of increments of assets	I	≥ 4,0	4,0 ÷2,0	1,0÷2,0	< 1,0
2	Number of people (thous of people)	N	≤ 0,1	0,1÷1,0	1,0÷10,0	Declining
3	Total Assets (RUB bn)	TA	≤ 0,02	0,02÷1,5	1,5÷15,0	Declining
4	Sales (RUB bn)	V	≤ 0,06	0,06÷1,5	1,5÷25,0	Declining
5	Enterprise age (years)	A	≤ 3,0	3,0÷10,0	10,0÷20,0	Declining

Each parameter had its own expert estimate by Harrington score. On the basis of scoring each of the indices we define the quantative evaluation of integrated index of life cycle stage using the formula:

$$C_{LC} = \sum_{i=1}^{5} x_i \qquad (2)$$

where: C_{LC} – integrated value LCS; Xi – index of parameter evaluation.

3.4.Determination of parameters natural level investment activity of company

We can divide approximately the range of index Cia according to the type of development stage the company is at, based on the acquired research results. The division will be described in the Tab. 3 (Smagin, Shikina, 2012). It contains the zones which can be described by specific values of investment activity Cnat which defines as "natural level of investment activity".

Tab. 11 – Values of Cnat index on different stages of life cycle.

	Name of Stage	Name of Strategy zone	Cnat index value
1	Birth	forming new business	Cia > 4,0
2	Growth" stage	growth	2,0 < Cia < 4,0
3	Stabilization" stage	cost saving	1,0 ≤ Cia ≤ 2,0
4	Stagnation" stage	liquidation	Cia ≤ 1,0

Range of Cnat index value for different sectors according to sector's characteristic aspects can be different, but functional dependence of Cnat index on life cycle stages is universal.

3.5.Diagnostic model forming of company's investment policy

There are two directions in achieving the strategic aim – gradual and sweeping change. It correlates with natural and specific types of strategic changes in company's activity.
Natural development is understood as gradual character of strategic changes in the course of consistent company's development through carrying out standard strategies and directions of investment policy on different stages of life cycle.
Specific development is understood as interruptive character of strategic changes in the process of radical renewal of business through carrying out strategies that facilitate the diversification of the company's activity.
Usually specific development is carried out on the "stabilization" or "stagnation" stages, because for protection of the provision of the company practices moderate replanning of activities. It is done through exercising diversification strategies, which is one of the most wide-spread and perspective growth and development directions for companies. In some cases it is the only way of their survival.
Stage life cycle of the company takes dominant position of setting directions for strategy sustainable development. Basic principles of the investment policy development are:

- achieving strategic aims;
- growth of balance value of total assets and the value of its internal development sources (cashflow);
- forming of the investment business-portfolio.

It is evident that the process of managing investments is mainly decided by consistent exercising of development strategy as the result of forming appropriate investment policy, consistent with the current stage of company's life cycle.
Existing type for evaluation of character of strategic changes in the process of company's development helps to define the type of exercised investment policy on diagnostically matrix (Fig.2) (Smagin, Shikina, 2012).

Let's analyze the possible directions of Cia index movement on diagnostically matrix.
Natural development pathway (Cnat) – 3, is characterized by the steady character of strategic changes in the process of gradual exercising of standard strategies and directions of investment policy from the perspective if evolutional development of company's business (Tab. 3 and Fig. 2, bold line).
Trajectory of specific development (Cia) – 1, 2 is characterized by strategic changes in the process of radical business renewal. If the "diversification" strategy and corresponding investment policy are carried out properly, then trajectory of Cia index is directed towards shifting from stage "stabilization" or "stagnation" to stage "growth" (Tab. 3 and Fig. 2) .
If the investment policy is directed towards performing the strategy for adjusting the Cia index value to a natural level of investment activity (Cnat), than it is believed to be the most rational investment policy.

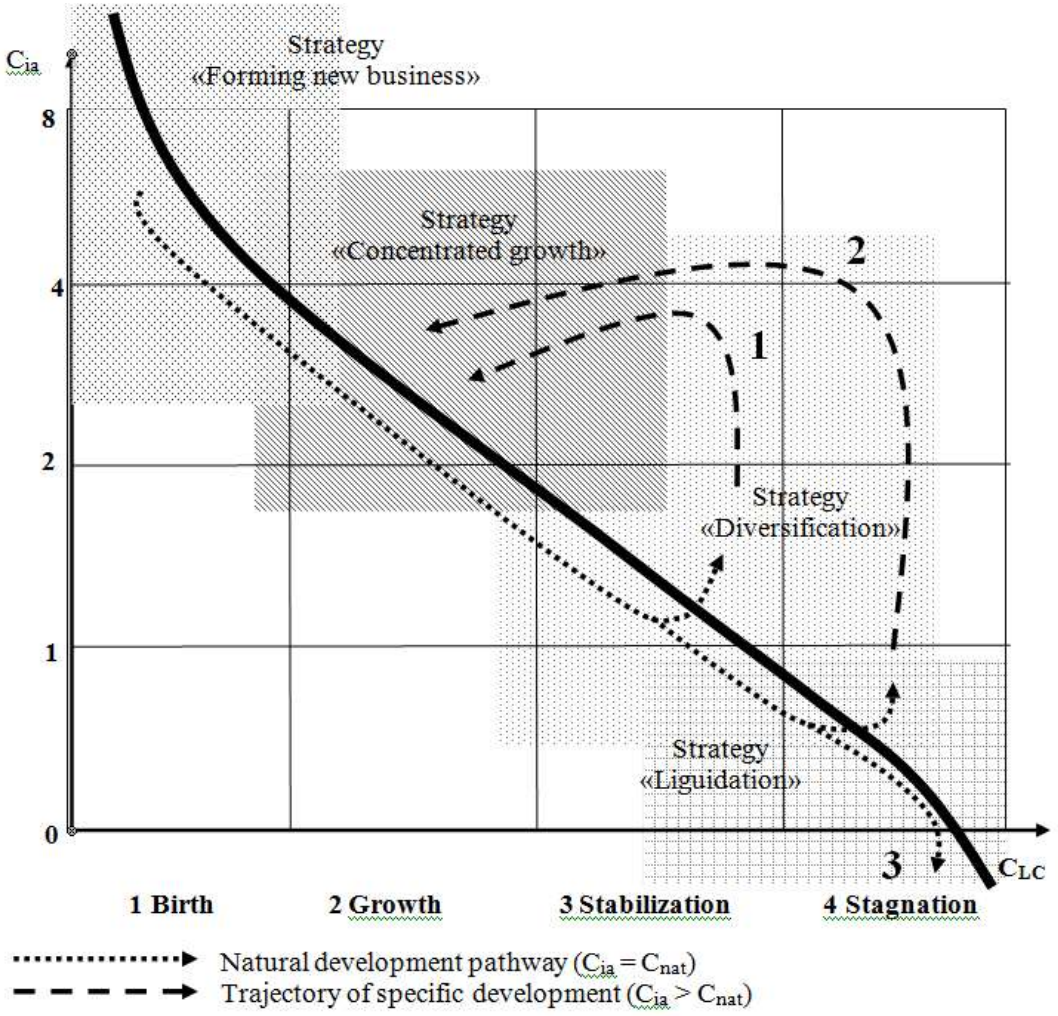


Fig. 5 – Dynamics of Cia index in the process of performing natural and specific development strategies

Offered diagnostically model of forming investment policy according to the trajectory of investment activity index (Cia) allows to determine the type of used investment policy and its

coordination with for phrased development strategy of the company (Tab. 4) (Smagin, Shikina, 2012).

Tab. 12 – Correlation of the type of investment policy to the level of investment activity (Cia)

	Name of investment policy	Intencity of investment activity
1	Conservative	Cia < Cnat, (passive)
2	Moderate	Cia = Cnat (moderate)
3	Agressive	Cia > Cnat (active, high)

Type of investment policy and level of investment activity (Tab. 4) can be detected as the result of comparing real and natural levels (Cia). The offered methodology of management of development of the organization allows to receive behavioural model which reflects the type of management realized by management.

4.BEHAVIORAL MODEL STYLE MANAGEMENT

The result can be illustrated as behavioral pattern that describes currently practiced type of management that answers the stage of company's life cycle and level of its investment policy (Shefrin, Thaler, 1988). The proposed behavioral model is shown at Fig. 3, it describes 5 zones that characterize the style of company management.

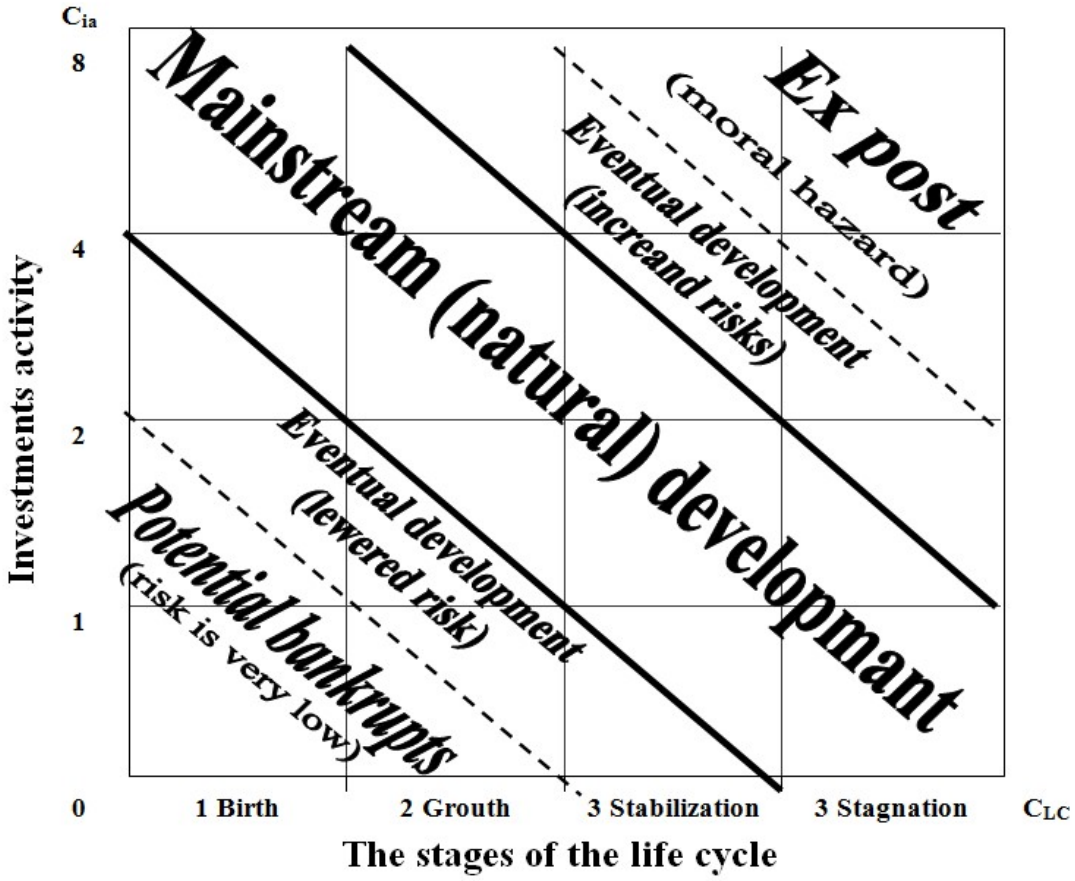


Fig. 6 – Evolutional states of the company on the plain "Cia – Cnat"

Main zone comply with **mainstream** (natural) level of development. Cia index value is characterized by persistent practicing of standard strategies and related directions of rational investment policy (Cia=Cnat) from the point of view of company's evolutional business development.
Zones of "**Eventual development**" (with increased and decreased risks) are connected from downside and from above to a mainstream way of development. The value of Cia index describes all the possible states of business which are triggered by the excessive (Cia > Cnat) or/and deficient level of outside financing, which in its turn initiate increased or decreased business risks.
"**Potential bankrupts**" zone corresponds to positions that connects from downside to eventual development zone (with lowered risks). Those positions are characterized by significant funding gap with naturally weak internal resources of development in the initial phase. Significant fund gap hinders company's steady development. In this zone all positions are characterized by low financial risk (Cia << Cnat) and high business risk (with gradual supersession of company's share from the market and/or seizure of the share by the competitors).
"**Ex post**" zone with increased risk. In the process of natural development this value of investment activity index (Cia) characterizes irrational (unallowable from the point of view of logical behavior of top management) states. In the process of specific development this value if investment activity index (Cia) can be defined by motiveless behavior of top-managers and foreign investors who give out "inadequate" reaction on the current stages of life cycle, or based on the insider information, or non-market factors (administrative resource, access to stable financing sources etc.).
The positions' area is characterized by high financial risk (Cia >> Cnat) which can lead to serious business problems (bankruptcy).

5.ANALYSIS OF THE INVESTMENT POLICY OF THE TYPE OF PIPE LEADING RUSSIAN COMPANIES

In order to the proposed method we have analyzed the activities of two leading companies of the Russian pipe industry. The study was conducted in several stages. In a first step cleaning and aggregation balance companies (Mokeev et al, 2016). In the second stage we calculated the index of investment activity of the enterprise according to the formula 1. Index calculation results Cia are shown in Tab. 5.

Tab. 13 – The dynamics of investment activity index Cia

The name	Period				
	2006	2007	2008	2009	2010
JSC "ChTPZ"	0.45	0.34	3.70	7.84	1.57
JSC "VMZ"	1.08	0.28	1.97	0.74	0.88

In the third step assesses the type of investment policy studied industrial companies (Tab. 5 and Fig. 4).
1) Graphical representation of the dynamics of the indicator Cia Industrial Company JSC Chelyabinsk Tube Rolling Plant is shown in Fig. 2. The value of Cia indicator of investment activity from 2006 to 2007, well below the natural rate, which corresponds to a passive investment policy (Tab. 5 and Fig. 4). Since 2008, the rate of investment activity Cia rises sharply to 3.7, which indicate an increase in the intensity of investment activities (conducting an aggressive

investment policy). In 2009, Cia indicator shows a steady trend of growth in investment activity to Cia = 7.8, which is two times higher than the natural rate (2.0 <Cia <4.0). In 2010, investment activity falls to Cia = 1.57, corresponds to the stage of maturity. It can be concluded about the active conduct of investment policies since 2007 to 2010, which corresponds to the implementation of a specific development strategy.
The results of analysis of the dynamics of investment activity index confirmed Cia opinion of financial analysts: "... in 2010 of JSC "ChTPZ" completed structural reforms and large-scale investment program aimed at meeting the needs of a complex fuel and energy complex".

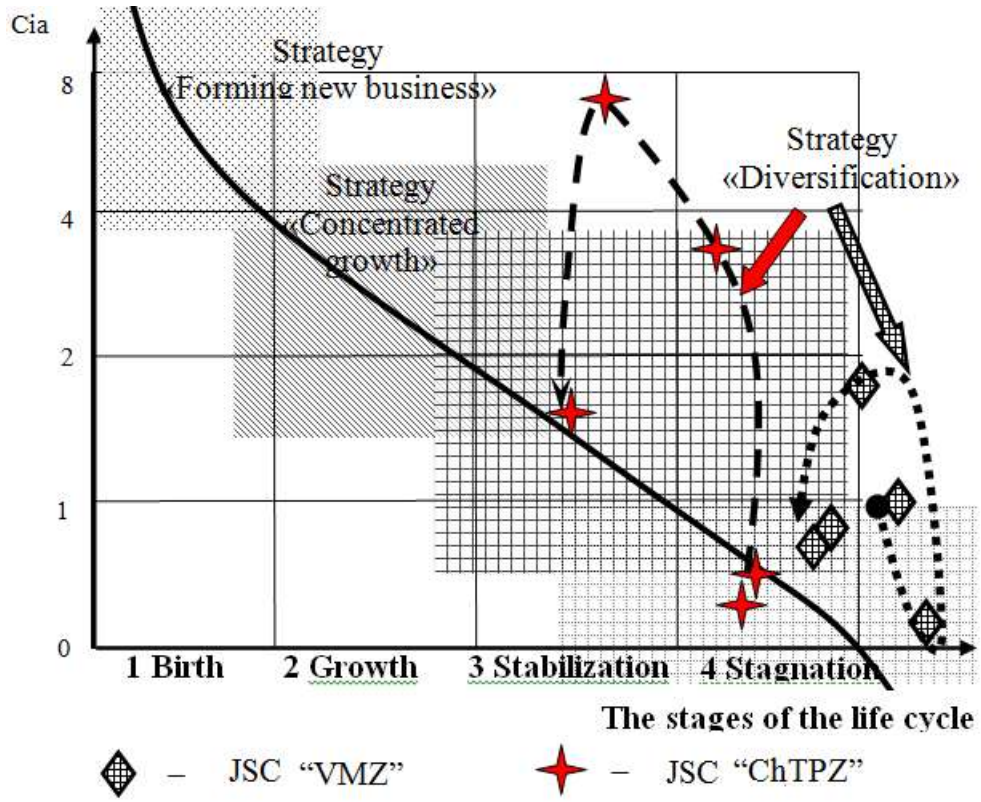


Fig. 7. The dynamics of investment activity index Cia JSC "ChTPZ" and JSC "VMZ"

2) Graphical representation of the dynamics of the indicator Cia Industrial Company JSC "VMZ" is shown in Fig. 4. During the period from 2006 to 2010, the value of the investment activity index Cia. It was in the area of the natural values of the level that corresponds to a moderate investment policy (Tab. 5 and Fig. 4), which also coincides with the opinion of financial analysts.
Comparison of the results of the investment policy of the type of assessment, the two leading plants derived from diagnostic matrix coincide with the opinion of financial analysts and allows to conclude that the proposed method is reliable (Tab. 6).

Tab. 6. Comparison of the results of the investment policy of type ratings

Enterprises	External assessment according to financial analysts	Assessment based on the analytical model (Cia - C_{LCS})
JSC "ChTPZ"	active investment policy	active investment policy
JSC "VMZ"	moderate investment policy	moderate investment policy

6.CONCLUSIONS

According to the results of the study, the authors proposed a method (behavioral model) of identifying the style of investment policy in achieving its strategic objectives. The proposed behavioral model, based on the qualitative assessment of the investment activity of companies (Cia) and the integrated index (C_{LCS}) of company.
As a result of testing of the proposed method for evaluating the investment company's policy of metallurgical production, we can conclude:
diagnostic matrix formation of investment policy allows to determine the type carried out by the investment policy of the company;
this method can be an instrument of strategic management and evaluation of investment risks of the enterprise.
Therefore, "Ex post" and "Potential bankrupts" zones are characterized by economically irrational behavior from the point of view of financial (very high/very low) risk, that leads to significant problems in business.
Main zone with mainstream (natural) development and eventual development (low and high risk) characterize area of positions where business and finance risks are balanced and can be controlled by top-management of the company.
As a tool for managing the process of strategic development the use of diagnostic and behavioral patterns of forming the investment policy is offered. Developed toolkit allows to diagnoze and the pick the right investment policy for company that will advocate to the stage of its development according to formed strategy.
Our model provides a basic framework on the study of the issue relevant to the evolution of human innovative behaviors and the promotion measurement of investment activity. Moreover, behavioral model allows evaluating business risks and identifying the style of top-management behavior.

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MANAGEMENT OF RESIDUAL INCOME: THE ROLE OF CHOSEN VARIABLES IN THE AREA OF RESIDUAL INCOME CREATION IN SLOVAK COMPANIES

Podhorska Ivana, Kral Pavol, Zvarikova Katarina

Abstract

Residual income models of equity value have become widely recognized tools in both investment practice and research. Conceptually, residual income is net income less the value of equity charge. Main objective of this paper is to capture the role of chosen variables in the area of residual income creation in Slovak companies. We will try to detect a dependence between the chosen variables and positive residual income in the data set of Slovak companies. An assumption of this paper is based on the idea that some financial indicators or variables of the company may affect on the value of residual income in this company. And good management of these variables can bring better results in residual income. Data set of Slovak companies consists of 11 483 companies. This database will be used for calculation of residual income and chosen variables. Partial objectives include a description of theoretical aspects of residual income and chosen variables. In addition, paper contains calculation of net income, equity charge, residual income and financial indicators in the data set of 11 483 Slovak companies in 2015.

Keywords: residual income, equity charge, residual income valuation, financial indicators,

JEL Classification: G3, G312, G32

1.INTRODUCTION

As an economic concept, *residual income* has a long history. As far back as the 1920s, General Motors employed the concept in evaluating business segments. More recently, residual income has received renewed attention and interest, sometimes under names such as *economic profit*, *abnormal earnings*, or *economic value added*. (Feltham & Ohlson, 1999) Residual income has sometimes called economic profit because represents the economic profit of the company after deducting the cost of all capital, debt, and equity. In forecasting future residual income, the term abnormal earnings is also used. Assuming that in the long term the company expects to earn its cost of capital, any earnings in excess of the cost of capital can be termed abnormal earnings. The residual income valuation model has also called the discounted abnormal earnings model. (Feltham & Ohlson, 1999)

Based on the assumptions of residual income were created *Residual Income Valuation Models*. The appeal of residual income models stems from a shortcoming of traditional accounting. Specifically, although a company´s income statement includes a charge for the cost of debt capital in the form of interest expense, it does not include a charge for the cost of equity capital. (Ohlson, 2009) A company can have positive net income but may still not be adding value for shareholders if it does not earn more than the cost of equity capital. Traditional financial statements, particularly the income statement, are prepared to reflect earnings available to owners. As a result, net income includes an expense to represent the cost of debt capital in the form of interest expense. (Mayers,

1999a) Traditional accounting lets the owners decide whether earnings cover their opportunity costs. The economic concept of residual income, on the other hand, explicitly deducts the estimated cost of equity capital, the finance concept that measures shareholders´ opportunity costs. Residual income models have proposed as a solution to measuring goodwill impairment by accounting standard setters. (Feltham, 1988, Penman, 1997)

2.THEORETICAL BACKGROUND

In this part, we described elementary theoretical aspects of this paper. The object of our interest is the issue of residual income and chosen variables. As we mentioned above, our objective is to determine the relevant variables, which have significant relationship with positive residual income. We assume that good management of these variables can bring better results in residual income.

2.1.Theoretical aspects of residual income

Linking between accounting book value and earnings to valuation model has received considerable interest in accounting and corporate finance literature. The genesis of accounting-based model can be traced back to works of Preinreich (1938), Edwards and Bell (1961) and Peasnell (1981, 1982) but re-appeared if that is a correct word in this sense in the work of Ohlson (1990) and Feltham and Ohlson (1995). Collins et al (1997) show that value-relevancy of earnings and book value has not declined, and while the incremental value-relevance of „bottom line“ earnings has declined, it has been replaced by increasing value-relevance of book value. Liu and Ohlson (2000) conclude that RIV (residual income valuation) model rests solely on the expected evolution of accounting data without ad hoc dividend policies and in this respect succeed in articulating how market value depends on anticipated accounting data realizations in addition to current realizations.
There are many different methods to valuing a company or its stock. For example, relative valuation approach, comparing multiples and metrics of a firm in relation to other companies within its industry or sector. Another alternative would be value a firm based upon an absolute estimate, such as implementing discounted cash flow modelling or the dividend discount method, in an attempt to place an intrinsic value to said firm. One absolute valuation method, which may not be so familiar to most, but is widely used by analysts, is the residual income method. (Lo & Lys, 2000)
In calculating, a company's residual income the key calculation is to determine its equity charge. Equity charge is simply a company's total equity capital multiplied by the required rate of return of that equity, can be estimated using the capital asset pricing model. According to the previous literature review, residual income is the difference between net income and equity charge. Equity charge is the product of cost of equity and book value of equity.

$$RI = NI - r_e \times BV_E \qquad (1)$$

Where:
RI residual income
NI net income
r_e cost of equity
BV_E book value of equity

It is important to note that, the decision about the concept of net income was difficult. In literature, we can find various views on this problem. We can find the approach, where net income is equal to the earnings after taxes (EAT). We can find the approach, where net income is equal to the net operating profit after taxes (NOPAT). In addition, we can find studies, where net income is equal to earnings without specific explanation. Finally, we decided to use the concept of earnings after taxes (EAT) for residual income calculation. Because the concept of residual income valuation is not the same as the concept of economic value added. In the concept of economic value added is usually used the net operating profit after taxes and capital charge. However, in the concept of residual income valuation is the most often used the earnings after taxes and equity charge. (Kral & Kliestik, 2015; Kimbro, 2016)

In the long term, companies that earn more than the cost of equity should sell for more than book value and companies that earn less than the cost of equity should sell for less than book value. The residual income model of valuation analyses the intrinsic value of equity into two components, namely: the current book value of equity, plus the present value of expected future residual income. (Ohlson, 1992) Equation number 2 captures residual income valuation´s formula:

$$V_0 = BV_E + \sum_{i=1}^{\infty} \frac{\widetilde{RI}}{(1 + r_e)^t} \qquad (2)$$

Where:

V_0 value of company
BV_E book value of equity
$\widetilde{RI}$ future residual income estimation
r_e cost of equity
t time period

Like other models, residual income model has some strength and weaknesses. The strengths of the residual income models include the following:

terminal values do not make up a large portion of the total present value, relative to other models,

- the residual income models use readily available accounting data,
- the models can be readily applied to companies that do not pay dividends or to companies that do not have positive expected near-term free cash flows,
- the models can be used when cash flow are unpredictable,
- the models have an appealing focus on economic profitability.

The potential weaknesses of residual income models include the following:

- the models are based on accounting data that can be subject to manipulation by management,
- accounting data used as inputs may require significant adjustments,
- the models require that the clean surplus relations holds, or that the analyst makes appropriate adjustments when the clean surplus relation does not hold. (Young, 1999)

2.1.Theoretical aspects of chosen variables

As we mentioned in previous chapters, residual income is the difference between net income and equity charge. It means that the elementary factors, which have impact on the value of residual income in company, are earnings after taxes, cost of equity and the book value of equity. However, the question is - are there other variables that affect the residual income? And next question - is the company able to affect the value of its residual income due to management of these variables? In this step is important to find relevant variables, which we will be able to use in the next calculation. We were looking for these variables in the relevant Slovak and international literature. We focused on the literature dedicated to issue of the value of companies; the value of brand; the value of goodwill and the value of residual income. We provide these literatures in the literature review. For example, we used studies from authors: Ballaster (2003), Cheng (2005), Seetharaman (2001), Jakubec (2011).
We often met with these variables - indicators from financial analysis (indicators from liquidity, profitability, solvency and stability), R&D expense, marketing costs, the value of assets, the value of liabilities, market share, age of company, the value of property, plant and equipment, the value of specific intangible assets, company size, riskiness of industry, the value of company income and so on. A disadvantage is the problem with calculation of some of them. So we decided to choose approximate variables, which we are able to calculate.
According to the literature, we decided to choose several relevant variables, which could have impact on the residual income. We choose following variables: (1) Cash ratio; (2) Return on Equity; (3) Debt-equity ratio; (4) Turnover ratio of short-term payables from business relations; (5) Retained earnings from previous years; (6) Company size; (7) Riskiness of industry. Theoretical aspects and calculation methodology of these variables we provide in the next chapter of this paper.

3.OBJECTIVE AND METHODOLOGY

The main objective of this paper is to detect a dependence between the chosen variables and positive residual income in the data set of Slovak companies. In this chapter, we described the calculation of residual income in data set of companies. In addition, we described the calculation of chosen variables, which could have impact on the residual income of company. We divided this process into the three basic methodology steps.
The first step – residual income. In this step, we tried to calculate the value of residual income in 2015 in data set of companies. This data set of companies consists of 11 483 companies from Slovak republic. Data set of companies includes financial statements of these 11 483 companies. As we mentioned in the theoretical background - residual income is the difference between net income and a product of the cost of equity and the book value of equity. It means that we had to calculated net income, cost of equity and value of equity in our data set of companies.

a) Net income - as we mentioned in theoretical background, we obtained net income as the value of earnings after taxes in companies.
b) Cost of equity - cost of equity is the return that stockholders require for their investment in a company. We used CAPM model (Capital Asset Pricing Model) for cost calculation. This is

general accepted model for calculation the cost of equity. We determined cost of equity according to next equation number 3:

$$r_e = R_f + R_p \times \beta + R_s \quad (3)$$

Where:
r_e cost of equity,
Rf risk-free rate; risk-free rate is income for investors which their obtained from their risk-free assets. For calculation, the risk-free rate has usually used the income from 10-years government bonds,
Rp market risk premium; the market risk premium is the difference between income from theoretical investment to the stock market as a whole (this market has higher risk = higher income) and income from risk-free investment. Then this difference is necessary to modify of country risk. Overview of market risk premiums can be found American professor of finance at the Stern School of Business at New York University Aswatha Damodaran´s website. Information published on this website have often used by experts for valuation and financial modelling,
β beta coefficient; beta coefficient expresses of company shares volatility, shares portfolio or the whole industry in comparison with volatility of the whole share market. This coefficient of share market as a whole is equal to 1. If the shares of company have volatility higher than 1 it means that they are more risk. We are able to find the value of beta coefficient free of charge on the website of A. Damodaran section Data/Discount Rate Estimation. In the section labelled "Levered and Unlevered Betas by Industry" in the Excel file are published benchmarks beta coefficient for different sectors. If the capital structure of company is similar as the capital structure of industry than we can directly use industry levered beta. In case that the capital structure of company is different from the capital structure of industry then we have to use unlevered beta and we have to transform unlevered beta to the levered beta for example by application of Hamada´s equation number 4:

$$\beta_1 = \beta_u + \beta_u \times \frac{D \times (1 - d)}{E} \quad (4)$$

where
β_l levered beta
β_u unlevered beta
D book value of capital
E book value of equity
d tax rate
Rs specific risk premium for company (premium for company size); specific risk premium for company often includes premium for company size. Because market risk premium (Rp) and beta coefficient (β) are calculated from the share prices of publicly traded companies. These companies are often greater than the companies for who we are trying to calculate cost of equity. In addition, in general we can say that greater companies are less risky than smaller companies are.

c) Equity – for our calculation we had to determine the value of equity. We obtained the book value of equity from the data set of financial statements of 11 483 companies. (Lindsey &

Weisman, 2016, Spuchlakova, Valaskova & Adamko, 2015)

The second step – chosen variables. In this step, we tried to calculate chosen variables. We chose variables according to the literature review, as we mentioned in previous chapter. Because financial health of company is important for its final residual income, we decided to mainly choose financial indicators from financial analysis of company. Calculation methodology of chosen variables is captured in following table number 1:

Tab. 1 – The calculation methodology of chosen variables. Source: own processing

Variable	Calculation	Recommended value
Cash ratio	$\frac{cash + cash\ equivalents}{current\ liabilities}$	<0,2-0,8>
Return on Equity	$\frac{earnings\ after\ taxes}{equity}$	>0
Debt-equity ratio	$\frac{equity}{total\ liabilities}$	>0,04
Turnover ratio of short-term payables from business relations	$\frac{accounts\ payable}{costs} \times 365$	<50 days
Retained earnings from previous years	Balance sheet	-
Company size	-	-
Riskiness of industry	-	-

Variables – company size and riskiness of industry do not enter into the next calculation. We include these variables in previous calculation of residual income. Variable company size is the part of specific risk premium for company size and variable riskiness of industry is part of the beta coefficient. (Kliestik & Majerova, 2015; Kollar et al, 2015)

The third step – determination of relationship. In this last step, we tried to determine the relationship between residual income and chosen variables. We tried to find the dependence between positive residual income and chosen variables. For determination, the significant relationship between positive residual income and chosen variables we decided to use Pearson correlation coefficient.

4.RESULTS

In this chapter, we provide results of our calculation. As we mentioned in chapter of objective and methodology, we worked with data set of 11 483 Slovak companies in 2015. We calculated residual income and chosen variables. We also divided our results we also into the three basic steps, according to our methodology.

The first step – residual income, first of all we calculated net income. We achieved net income as the value of earnings after taxes in companies. This information we obtained from financial statements of our data set of companies.

R_f (risk-free rate) in this paper we used rate from 10-year government bonds according to data from The National Bank of Slovakia. The value of our R_f was 0.89 %. Given that, risk-free rate is long-term rate we decided to use rate of 10-year government bonds. Because our calculation consists of data from 2015, we used annual average rate of 10-year government bonds in 2015.
R_p (market risk premium) in this paper we used data from Damodaran´s website. We provide our calculation in the next table number 2. Market risk premium USA is the average difference between the yields from S&P 500 stock index and 10-year USA government bonds since 2004. (Source - Damodaran´s website/section Data/Discount rate estimation/Historical Returns on Stocks, Bonds and Bills - United States/) Volatility factor for stock market is the factor, which take into account the higher volatility of stock markets, which lead to the higher stock default spread as country default spread calculated from ratings. Country risk premium is the multiplication of country default spread from ratings and factor of volatility for stock market. In addition, the last one R_p (market risk premium for Slovakia) is the sum of market risk premium USA and country risk premium,

Tab. 2 – Calculation of Market risk premium. Source: own calculation according to Damodaran´s website

Market risk premium calculation	
Market risk premium USA (S&P 500)	5.16 %
Rating USA (Moody´s)	Aaa
Rating Slovakia (Moody´s)	A2
Country default spread (calculation from ratings)	0.95 %
Factor of volatility for stock market	1.5
Country risk premium	1.43 %
R_p – market risk premium for Slovakia	6.59 %

β beta coefficient we had to choose for all companies in data set of 11 483 companies from Slovakia. We were able to find the value of beta coefficient, free of charge, on the website of A. Damodaran section Data/Discount Rate Estimation. In section "Levered and Unlevered Betas by Industry" in the Excel file are published benchmarks beta coefficient for different sectors. We defined beta coefficient to all companies according to their SK NACE classification. Because the capital structure of our companies were not similar as the capital structure of industry, we used unlevered β. Subsequently we transformed this β to the levered β. (application of Hamada equation).
R_s (specific risk premium for company – premium for company size). Big companies have lower probability of bankrupt than small companies do. This is the reason why we tried to determine the risk premium for company size. In the CAPM we can use for this risk premium information from company Morningstar/Ibbotson. Its determination of this risk premium is based on the information about market capitalization of companies in the US market. Because in Slovak republic we do not have this information, we decided to inspire additional fee, which are determined by Morningstar/Ibbotson but we replaced intervals of market capitalization. Instead of market capitalization, we used the value of the assets according to data set of companies. Following table number 3 captures deciles according to data set of companies, intervals of company size according to the value of assets and risk premium for company size.

Tab. 3 – Calculation of risk premium for company size. Source: own calculation according to Morningstar/Ibbotson

Deciles according to the number of companies in data set of companies	Intervals according to the value of asset in data set of companies	R_s – risk premium for company size
1	2 908 165 and more	-0.36 %
2	2 908 164 – 1 156 422	0.65 %
3	1 156 421 – 633 674	0.81 %
4	633 673 – 362 157	1.03 %
5	362 156 – 206 288	1.45 %
6	206 287 – 114 620	1.67 %
7	114 619 – 62 862	1.62 %
8	62 861 – 32 440	2.28 %
9	32 439 – 13 496	2.7 %
10	13 495 and less	6.27 %

In the process of residual income calculation, we encountered barriers in the calculation:

1. The first barrier - 5 companies from data set of companies do not have SK NACE. We were not able to determine beta coefficient in these companies. We decided to exclude these companies from the data set of companies.

2. The second barrier - for the determination of cost of equity we used method CAPM. But this method is not exact in Slovak conditions, we had a problem with the negative value of cost of equity in 1 405 companies from database (because r_s was negative). We decided to exclude these companies from the data set of companies,

3. The third barrier - we had another problem in our calculation of residual income. The problem was with companies, which had the negative value of equity. In Slovak republic, by course of law no. 7/2005 Z.z. Bankruptcy and Restructuring - "company in bankrupt" is the company, which has the negative value of equity. Given that, companies with the negative value of equity (1 068 companies) much misrepresented our calculation; we decided to exclude these companies from next calculation.

According to these barriers we had to exclude 2 478 companies from our next calculation. It means that our data set of companies includes 9 005 companies, after these changes.

Table number 4 captures calculation and results of residual income. The same value of R_s (-0.0036) in all rows is caused by filter, which we created when we worked with this big data - it is random situation.

Tab. 4 – Results of residual income in the first ten companies from data set of 9 005 companies. Source: own calculation in data set of companies

EAT	R_f	R_p	β	R_s	R_e	BV_E	R_e*BV_E	RI
377 677	0.00885	0.0659	1.28763	-0.0036	0.09011	3 709 402	334 245	43 432
796 281	0.00885	0.0659	0.50010	-0.0036	0.03821	7 336 604	280 327	515 953
105 302	0.00885	0.0659	6.32061	-0.0036	0.42178	393 462	165 955	-60 653
643 551	0.00885	0.0659	2.22537	-0.0036	0.15191	1 133 579	172 196	471 354
274 534	0.00885	0.0659	0.67618	-0.0036	0.04981	3 989 769	198 743	75 791
145 842	0.00885	0.0659	0.47413	-0.0036	0.03650	5 576 443	203 532	-57 690
-81 859	0.00885	0.0659	1.84857	-0.0036	0.12707	1 075 692	136 692	-218 551
75 844	0.00885	0.0659	0.77658	-0.0036	0.05643	2 588 366	146 060	-70 216
66 701	0.00885	0.0659	2.80601	-0.0036	0.19017	641 101	121 918	-55 217
-155 695	0.00885	0.0659	5.05122	-0.0036	0.33813	349 387	118 138	-273 833
. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .

As we mentioned above, our main objective is to detect a dependence between the chosen variables and positive residual income in the data set of Slovak companies. We tried to find relevant variables, which could have impact on the positive residual income. And due to good management of these variables company is able to achieve better results of its residual income. For these reason, our main subject of interest is positive residual income and we decided to exclude companies which did not create positive residual income (4 469 companies). It means that our data set of companies includes 4 536 companies, after these changes.

The second step – chosen variables, in this step we calculated chosen variables according to methodology, which we described in previous chapter. Following table number 5 captures results of chosen variables. The same value of variable – retained earnings from previous years (0) in all rows is caused by filter, which we created when we worked with this big data - it is random situation.

Tab. 5 – Results of chosen variables in the first ten companies from database of 4 536 companies. Source: own calculation in data set of companies

Cash ratio	Return on equity	Debt-equity ratio	Turnover ratio of short-term payables	Retained earnings from previous years
0.638	0.801	0.522	9.471	0
0.700	0.578	3.555	10.257	0
0.460	0.527	0.734	7.634	0

0.317	0.216	1.368	35.879	0
0.212	0.851	0.228	12.464	0
0.232	0.297	0.191	54.657	0
0.521	0.633	0.203	1.872	0
0.503	0.769	0.411	39.670	0
0.372	0.729	0.098	10.194	0
0.684	1.173	0.705	46.269	0
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.

The third step – determination of relationship, we tried to find the dependence between positive residual income and chosen variables. We decided to use Pearson´s statistic for the determination of significance of relationship between positive residual income and chosen variables. First, we had to exclude outliers from data set of companies. Table number 6 shows our definition of outliers in data set of companies.

Tab. 6 – Determination of outliers in data set of companies. Source: own processing

Variable	Outliers
Cash ratio	<0,2-0,8>
Return on Equity	Grubbs test
Debt-equity ratio	>0,04; Grubbs test
Turnover ratio of short-term payables from business relations	<50 days
Retained earnings from previous years	Grubbs test

We did not have a problem with variables, which have some recommended values. We defined as outliers these companies, which did not achieve recommended values. When we tried to define recommended value for turnover ratio, we took into account the fact, that we compare different industry to each other. The problem was with variables, which do not have recommended values. We decided to use Grubbs test for outliers for these variables (return on equity and retained earnings from previous years). Because we determined only lower boundary of debt-equity ratio (according to Slovak law, which we mentioned in previous chapter), we decided to test this variable by Grubbs test for outliers. (Svabova & Durica, 2016) For calculation of Grubbs test for outliers we decided to use statistical program XLSTAT – *Statistical software & data analysis add-on for Excel.*

Testing for outliers Return on Equity – we used XLSTAT/Testing for outliers/Grubbs test for outliers. Results of Grubbs test for outliers in data set of return on equity are captured in the table number 7.

Tab. 7 – Results of Grubbs test for outliers. Source: own calculation in XLSTAT

G (test statistic)	20,026
G (critical value)	3,925

Test statistic for outliers confirmed that there are outliers in data set (the value of test statistic is higher than critical value). The distribution of outliers in data set is captured in figure number 1.

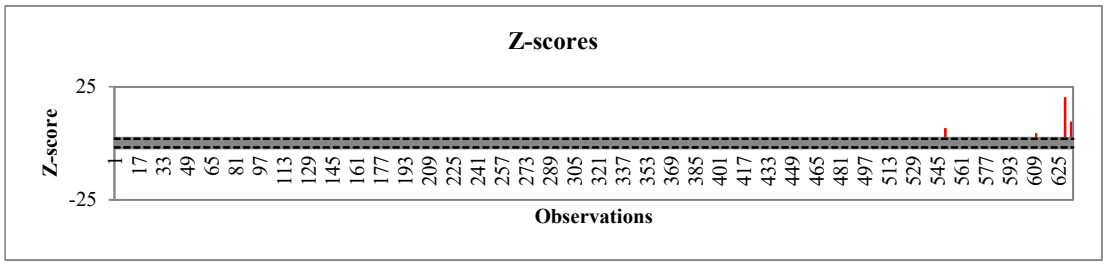


Fig. 1 – The distribution of outliers in data set of companies. Source: own calculation in XLSTAT

Based on the Grubbs test for outliers we decided to exclude 5 companies from data set of companies.

Testing for outliers Debt-equity ratio - we used XLSTAT/Testing for outliers/Grubbs test for outliers. Results of Grubbs test for outliers in data set of return on equity are captured in the table number 8.

Tab. 8 – Results of Grubbs test for outliers. Source: own calculation in XLSTAT

G (test statistic)	24,832
G (critical value)	3,926

Test statistic for outliers confirmed that there are outliers in data set (the value of test statistic is higher than critical value). The distribution of outliers in data set is captured in figure number 2.

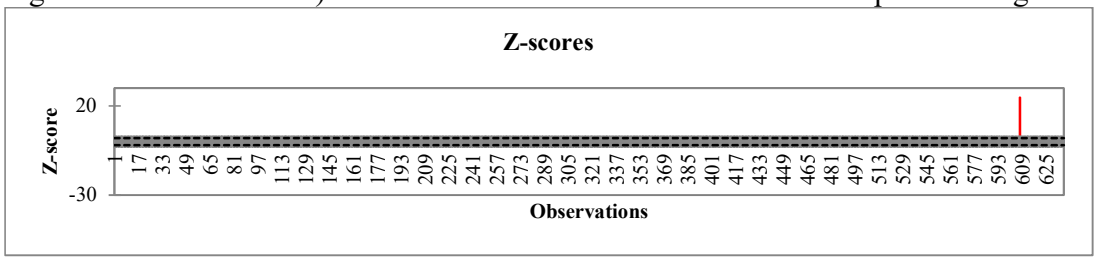


Fig. 2 – The distribution of outliers in data set of companies. Source: own calculation in XLSTAT

Based on the Grubbs test for outliers we decided to exclude 2 companies from data set of companies. In addition, in data set were companies which did not achieve recommended lower boundary of debt-equity ratio. Specifically, 20 companies did not achieve this value and we also decided to exclude these companies from the data set of companies.

Testing for outliers Retained earnings from previous years - we used XLSTAT/Testing for outliers/Grubbs test for outliers. Results of Grubbs test for outliers in data set of return on equity are captured in the table number 9.

Tab. 9 – Results of Grubbs test for outliers. Source: own calculation in XLSTAT

G (test statistic)	10,911
G (critical value)	3,917

Test statistic for outliers confirmed that there are outliers in data set (the value of test statistic is higher than critical value). The distribution of outliers in data set is captured in figure number 3.

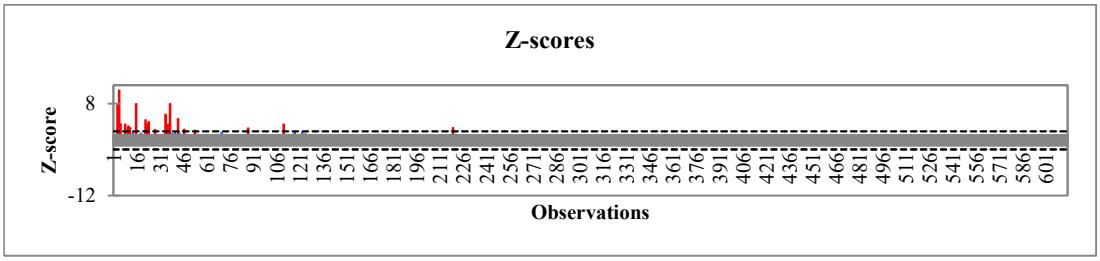


Fig. 3 – The distribution of outliers in data set of companies. Source: own calculation in XLSTAT

Based on the Grubbs test for outliers we decided to exclude 21 companies from data set of companies.
In table number 10 we decided to capture the number of excluded companies as an outliers. For variables cash ratio, debt-equity ratio and turnover ratio of short-term payables from business relations we used recommended values for detection of outliers. For variables return on equity and retained earnings from previous years we used Grubbs test for outliers.

Tab. 10 – The number of excluded companies as an outliers. Source: own calculation in data set of companies

Variable	Outliers	Sum of excluded companies
Cash ratio	<0,2-0,8>	1 458
Return on Equity	Grubbs test	5
Debt-equity ratio	0,04; Grubbs test	20+2
Turnover ratio of short-term payables from business relations	<50 days	286
Retained earnings from previous years	Grubbs test	21
Original data set of companies	-	4 536
Sum of outliers	-	1 792
Final data set of companies	-	2 744

We were able to obtain relevant data set of companies without outliers. This data set of companies consists of 2 744 companies from Slovak republic. This sum of companies is the base for our determination of dependence between positive residual income and chosen variables. For the determination of significance of relationship between positive residual income and chosen variables we decided to use Pearson´s correlation coefficient statistic. For statistic calculation of Pearson´s statistic, we also decided to use statistical software XLSTAT.

We tested the hypothesis about the significance of the correlation coefficient; it means significant dependence between variables. We defined the two-side hypothesis:

H_0: there is not significant relationship between variables

H_1: there is significant relationship between variables

We rejected the null hypothesis H_0 at significance level α, if the value of T statistic is higher than critical value Student's *t*-distribution with degrees of freedom $n - 2$ ($T_{\alpha, n-2}$). Test statistic has following form:

$$T = r \times \sqrt{\frac{n-2}{1-r^2}} \tag{5}$$

Based on the previous information, we defined following decision rule:
If $|T| \geq T_{\alpha,n-2}^{krit}$ we reject hypothesis H_0 and we accept hypothesis H_1 that there is significant relationship between variables.

Testing the significance of the relationship between positive residual income and chosen variables – we used XLSTAT/Correlation/Association tests/Correlation tests. Results of Pearson statistic in data set of companies are captured in the table number 11.

Tab. 11 – Overall results of Pearson´s statistic. Source: own calculation in XLSTAT

Variable	T (test statistic)	Test statistic/critical value	T (critical value)
Cash ratio	0,054995	<	1,965013
Return on Equity	7,387359	>	1,965013
Debt-equity ratio	1,396096	<	1,965013
Turnover ratio of short-term payables from business relations	0,57502	<	1,965013
Retained earnings from previous years	9,585949	>	1,965013

Based on the results of Pearson´s statistic in the table number 11 we can state that significant relationship exists between residual income and variables return on equity and retained earnings from previous years. Because the value of Pearson´s statistic is higher than critical value. It means that on the significance level $\alpha_{0,05}$ we rejected hypothesis H_0 and we accepted hypothesis H_1 there is significant relationship between variables. Vice versa, between positive residual income and variables cash ratio, debt-equity ratio and turnover ratio there is not significant relationship. Because the value of Pearson´s statistic is lower than critical value. It means that on the significance level $\alpha_{0,05}$ we accepted hypothesis H_0 there is not significant relationship between variables.

5.DISCUSSION

The main objective of this paper was determine and find relevant variables which have dependency with positive residual income in company. Based on our calculations, we obtained the following results - significant relationship exists between residual income and variables return on equity and

retained earnings from previous years. Between positive residual income and variables cash ratio, debt-equity ratio and turnover ratio there is not significant relationship.
It means that elementary variables, which have impact on the residual income, are net income, cost of equity and book value of equity. These are variables, which have directly impact on the residual income valuation. But we tried to find other variables which also have impact on the positive residual income of company. We think, if company knows relevant variables which have impact on its residual income, this company is able to manage these variables and finally to affect its residual income. According to literature, we decided to choose and to define several relevant variables, which could have impact on the positive residual income.
We worked with data set of 11 483 companies from Slovak republic. In the process of our calculation, we had several problems. This problems complicated our calculation of residual income and due these problems we had to exclude 2 478 companies from the data set of Slovak companies. Subsequently, we decided to only work with companies which created positive residual income. It means that we had to exclude 4 469 companies from the data set of Slovak companies. Into the next calculation of significance of relationship between positive residual income and chosen variables entered the data set of 4 536 companies. Another step consisted of the definition of recommended values for chosen variables and adjustments of data set of companies. We tested these data for outliers and then we excluded them from the data set of companies (we used Grubbs test for outliers). We obtained the data set of 2 744 companies. Finally, we tried to find significant relationship between positive residual income and chosen variables (we used Pearson´s statistic). For this statistic test we used the data set of 2 744 companies.
Based on our calculations, we can state that companies should focus on the variables return on equity and retained earnings from previous years. Because we found out that, these variables have significant relationship with positive residual income. But another possibility of development in this area we see in an effort to uncover other relevant variables that may affect on the residual income.

6.CONCLUSION

The main objective of this paper was to find relevant variables, which could have impact on the positive residual income in company. We tried to discovered significant relationship between residual income and chosen variables. For calculation we used data set of 11 483 Slovak companies. First, we had to calculate residual income. In the process of its calculation, we discovered elementary variables, which have directly impact on the residual income (net income, cost of equity, book value of equity). Subsequently, we tried to discover other variables, which could have impact on the residual income. We focused on the literature review and we defined seven potential variables. We calculated these variables in the data set of companies. Subsequently, we worked with these results. We excluded all companies that created problems in our calculation. We tried to find outliers in data set of companies and we deleted them. Finally, we used statistical method and we determined significant relationship between positive residual income and chosen variables.

Acknowledgments
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THE MOTOR VEHICLE TAXES AND INFLUENCE ON FLEET MODERNIZATION IN SLOVAK REPUBLIC

Poliaková Adela, Poliak Miloš

Abstract

This article is dedicated to the issue of taxes on motor vehicles in the Slovak Republic and the impact of the tax rate to the effort of entrepreneurs to modernize the fleet. Old vehicles have a serious impact on the environment, so is an effort of the European Union to reduce transport externalities. Determination on the minimum road tax for the member States is one of mechanisms that are placed to achieve the environmental protection. The aim of your research on the basis of the motor vehicle tax rates and cost analysis was to find out whether the resulting tax relief is sufficient motivation for the modernization of fleet.

Keywords: motor vehicle tax, road tax, EURO 6, new vehicle, costs, tax relief

JEL Classification: H25, H23

1.INTRODUCTION

We are living the time period when everything is focused on environmental protection. In transport it is possible to reduce the environmental pollution if the transport operators will replace their old vehicles with newer and greener vehicles, namely with the modernization of fleet.
In Slovakia a lot of small transport operators have in their fleet mainly older vehicles with the emission limit of EURO 3 that were stopped being produced in 2006. Thus, these vehicles are at least 10 years. Since 2015 the lower tax rate for newer and greener vehicles is introduced in Slovakia. The reduction of tax rate is based on Act Nr. 361/2014 of Collection of laws, which provides the percentage of tax relief for new vehicles and in the case of vehicles older than 12 years is the motor vehicle tax increasing.
However, is the motor vehicle tax benefit an enough motivation for transport operator for modernizing his fleet?

2.THE MOTOR VEHICLE TAX RATES ANALYSIS

In the price creation it is necessary to take into account all costs related to the execution of transport. One of these costs is the road tax. It represents the transport operator´s fixed costs, which burden the vehicle regardless the vehicle is in operation or in the technical readiness. Road tax is not united within the EU. It is governed by EU Directive 1999/62/EC. The differences in the basis of taxation are arising in different countries, but the problem is mainly the different tax rates, because the Directive lays down only minimum rates for motor vehicles and road trains.

2.1.Road tax rates comparison in selected countries

To compare tax rates in individual countries, let us consider two specific road trains. These road trains differ only in age and emission class. First road train´s age is 10 years and is of an emission

class EURO 3. The second one is one-year-old and meet the EURO 6 emission class. Both road trains are consisting of a truck with two axles, the maximum permissible axle load is 19,000 kilograms, and with semi-trailer of three axles and the maximum permissible axle load 24,000 kilograms. Unladen weight of the truck according to the registration certificate is 7020 kilograms and the trailer is 7200 kilograms of unladen weight. This unladen weight is important for the calculation of the tax rate in some countries – for example in Hungary. The road train has a maximum total weight of 40 tons.
The basis for comparing the currently applied tax rates, the data arising from the laws of individual countries and other sources were used. Road tax is not united. There are countries where the tax bears a national character and the countries where it bears a local character.
The next table 1 shows the annual tax rate for the considered road trains with EURO 3 and EURO 6. Comparing to other countries, Slovakia has the highest tax for the vehicle with EURO 3 emission limit also for EURO 6 emission limit. The tax rate in Slovak and Czech Republic is different for EURO 3 and EURO 6. This difference is caused by the vehicle age. In Germany and Hungary, this difference is caused by the emission class. In other countries is the tax rate constant, regardless of age or vehicle emission class. In France is the tax rate of the same height as the minimum rate stipulated by the EU directive.

Tab. 1 – Annual tax rates for considered road trains in individual countries. Source: Own processing

Country	Annual tax rate in EURs	
	EURO 3	EURO 6
Slovakia	2 233,00	1 674,75
Bohemia	2 086,49	1 084,97
Germany	1 287,24	929,24
Hungary	1 111,67	1 049,27
Austria	980,40	980,40
Poland	946,57	946,57
Italy	885,73	885,73
France	700,00	700,00
EU Directive	700,00	700,00

2.2.Rate changes depending on the age of vehicles in selected countries

In some countries there are factors affecting the level of rates. Mainly cleaner and newer vehicles are favoring. Next table 2 shows the percentage reductions or increasing tax rate for each of the compared countries. It is possible to see in the table that such changes are provided only in Slovakia and in Czech Republic. In Bohemia, the tax relief is significantly higher and the age over 108 months from the date of first vehicle evidence is the tax rate not increasing as in Slovakia. In Germany and Hungary, the tax rate is influenced by an emission class.

Tab. 2 – Increasing or decreasing road tax rate according vehicle´s age. Source: Own processing

Country	Decreasing/increasing tax rate according the number of months from the first registration (in per cents)					
	0-36	37-72	73-108	109-144	145-156	>157
Slovakia	-25	-20	-15	0	10	20
Czech Republic	-48	-40	-25	0	0	0
Poland/Hungary/Austria/ Germany/Italy/France	-	-	-	-	-	-

3.THE ANALYSIS OF COSTS RELATED TO NEW VEHICLES OPERATION

In this part of the analysis we pay attention to costs related to the operation of vehicles, because the volume of costs is one of key factors that influence the competitiveness of road transport. Only the costs that volume is changed in relation with the age of vehicle are analyzed. We have considered the costs relating to the place of establishment also the costs, which volume depend on the place of performance. During operation of a new vehicle some costs are decreasing, but another increasing or new costs are created.
By cost analyzing we have considered with defined road trains. Costs for road taxes, regular services, tolls and fuel have been analyzed.

3.1.Toll

After cost of fuel, cost of depreciation of vehicle and pay of the driver, fees for using of the road network are major expense in road freight transport and bus transport. However, there are countries that do not use the toll road network, for example Estonia, Montenegro. In other countries it is possible to realize the drive with vehicle in case of paying fees in the form of tolls or time pass. Currently, only few of transport operators perform only internal national transport, so it is necessary to follow this significant cost also abroad. The specified conditions and rates in individual countries are listed in next part.
In Slovakia, fees for using of the road network in the form of electronic toll levied. Toll in Slovakia is an income of The National Highway Company, Inc. and can be paid in cash, bank transfer, credit card or agreed fleet card. Trucks with a total weight over 3.5 tons and busses have to be equipped with on-board unit, which contents pre-loaded map of toll roads. In figure 1 you can see the toll road sections in Slovakia.

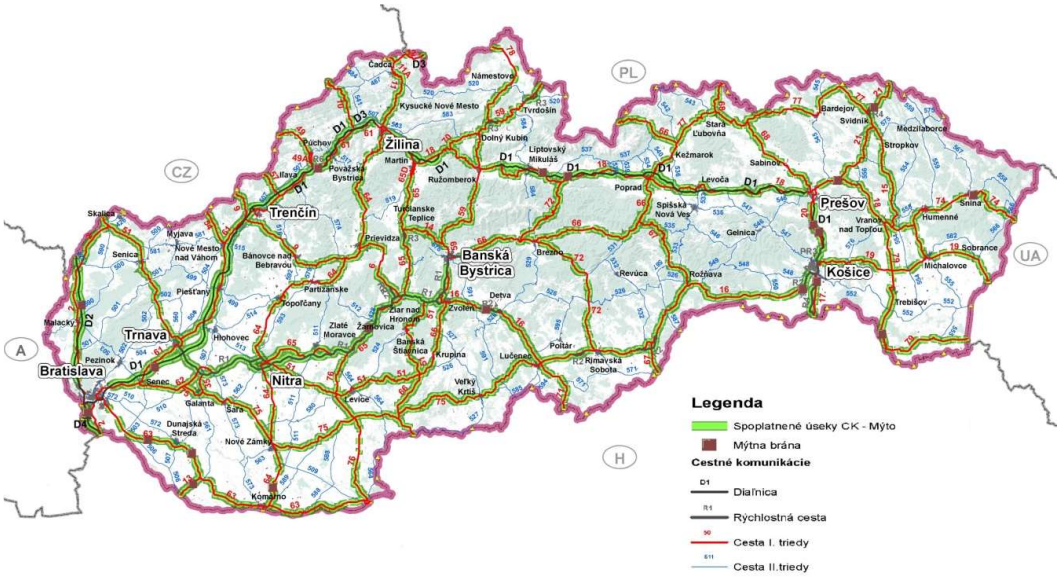


Fig. 1 – Toll road sections in Slovakia. Source: http://www.cdb.sk/sk/Vystupy-CDB/Mapy-cestnej-siete-SR/SR/Tematicke-mapy-SR/Spoplatnene-useky.alej

Toll rates depend on the type of vehicle, vehicle weight, number of axles and the emission class of motor vehicle. The toll rates are set separately for use:

- highways and motorways,
- selected 1st class roads that are parallel to the highways and motorways,
- selected 1st class roads that are not parallel to the highways and motorways.

Fees for the using of roads shall be specified in several ways, taking into account several factors. For us it is essential to compare rates from the point of view of vehicle emission class, because presently the new vehicles are EURO 6 emission class and we compare them with EURO 3 emission class.
In Slovakia, Czech Republic, Hungary, Poland, Germany, Austria and Belgium the fees for using the road network are depending from travelled distance, it means the rates are defined in EUR/km. Figure 2 compares different toll rates in EUR/km driven distance on highways and motorways for vehicles over 12 tons with EURO 3 and EURO 6 emission classes. In Poland, Hungary and Czech Republic the toll rates are calculated against exchange rate. While in most countries is the rate level gradually decreasing in dependence on emission class, in Hungary the rate decreases only by the EURO 3 emission class and subsequently is constant for all higher emission classes.
For France, Italy, Latvia, the Netherlands, Luxembourg, Sweden and Denmark, there is different charging than in previous states, because in France and Italy are tolls paid for certain sections and is not depending on travelled distance. In the Netherlands, Luxembourg, Sweden, Denmark and

Latvia the road network fee payment is paid via e-marks with a limited time validity. In case of the Benelux countries (excluding Belgium) there is no difference in toll rates, while in Latvia there is the difference between our two vehicles in the price of annual vignette 93 EUR.

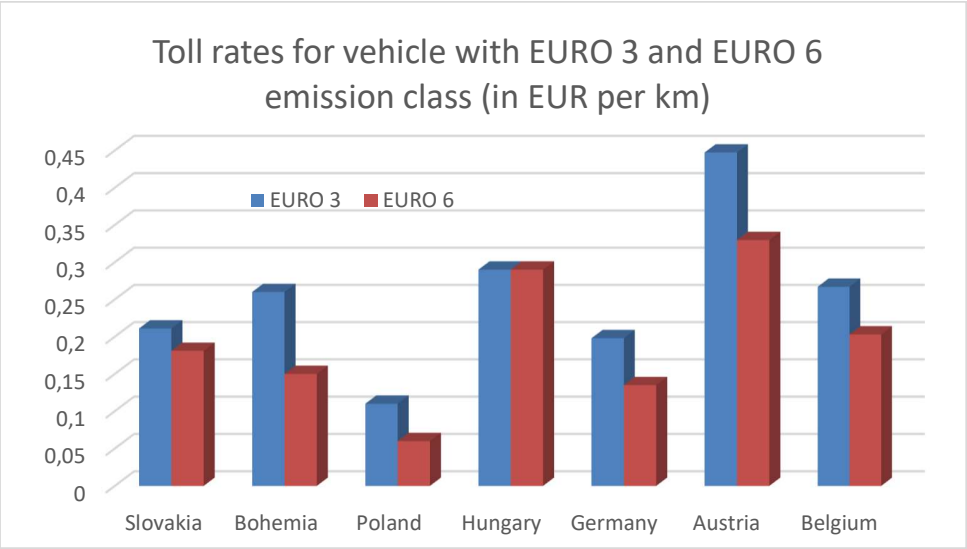


Fig. 2 – Toll rates for EURO 3 and EURO 6 emission class vehicles. Source: Own processing.

At the next picture, which is shown in Figure 3 is expressed as the percentage difference between toll rates vehicles EURO 3 and EURO 6. It may be noted how many percent of tariffs is possible save on tolls in case of the new vehicle with emission class EURO 6. In the Czech Republic and Poland, we can save almost half the cost, which are used for fees for the road network using.

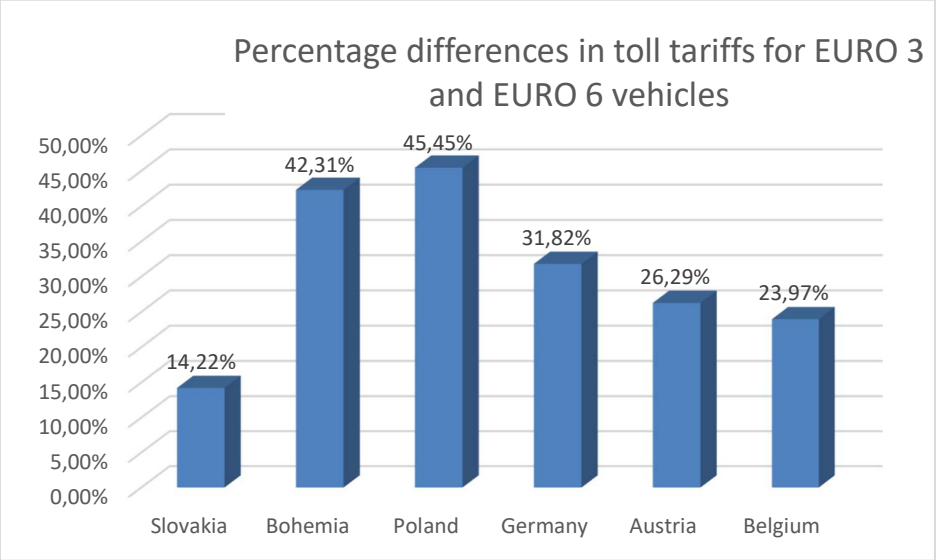


Fig. 3 – Toll tariffs percentage differences for EURO 3 and EURO 6 emission class vehicles. Source: Own processing.

3.2.The motor vehicle tax relief in Slovak Republic

With the purchase of a new vehicle the taxpayer is entitled to obtain the relief on the motor vehicle tax under the Act no. 361/2014 Coll. That is provided from the reason of transport operators motivation change own old fleet with newer and greener vehicles. Contrariwise, for older vehicles, the annual rate of motor vehicle tax is increasing. The percentage reduction or increasing of the tax rate is shown in Figure 4. The tax decreasing or increasing is dependent on the first month of first registration of the vehicle.

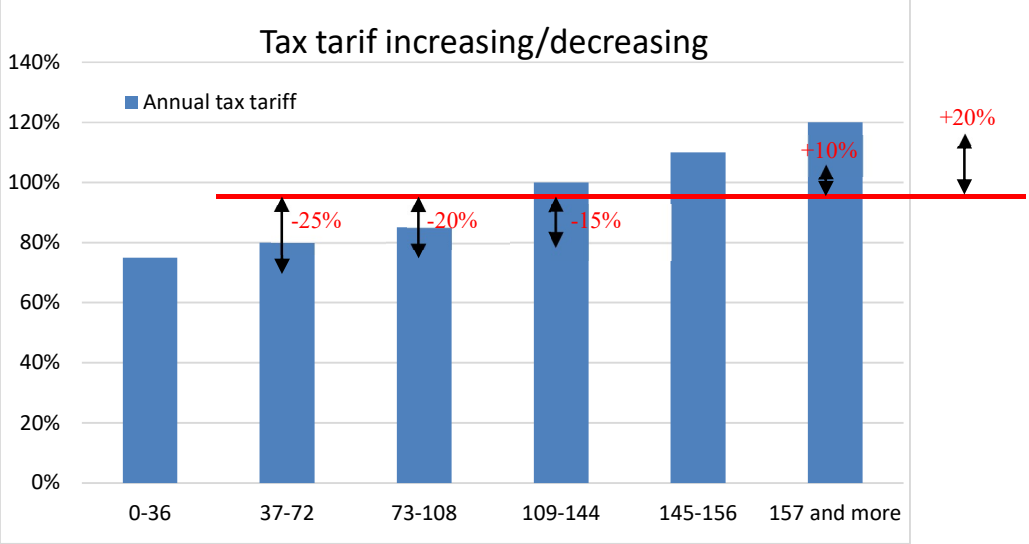


Fig. 4 – Toll tariffs percentage differences for EURO 3 and EURO 6 emission class vehicles. Source: Own processing.

In the case of purchase of the new road train the taxpayer is entitled to obtain a relief of 25 per cent from motor vehicle tax rate, especially for a tractor and for a trailer. In the case of a 10-year-old road train, the tax rate is 2 233 EUR. For road train, which was registered twelve months ago, the tax rate is 1 674.75 EUR. In this case, a tax credit in amount of € 558.25 is originated to the taxpayer.

3.3.Regular services controls

During operation of a vehicle costs associated with regular service control are originating. Service inspections are executed on the basis of written service document, designated by the vehicle manufacturer for the vehicle to be maintained in good condition. SCANIA truck manufacturer has distributed service controls into three groups S, M, L. For service control "S" the interval is set at 60 000 km and following every 120 000 km. For service control "M" the interval is every 140 000 kilometers and "L" every 240 000 km. These controls are different only in exchange of some filters and during service control "L" the gear oil and adjusting of valves and injectors is also changed and controlled. The price for service control contents costs for:

- engine oil 10W 40 Scania
- gear oil
- oil in the differential

- oil into the servo
- oil to redarder
- brake fluid
- chassis oils
- lubricants
- filters
- various cleaning sprays and reliever
- operation fluids
- labor costs for performed activities during service control
- engine diagnostics
- incorrect codes deleting
- total vehicle control
- customer notification about defects detected in the vehicle.

The content of these controls is the same for both vehicles but in the case of EURO 6 is also being replaced SCR filter. Price service inspections is individual for each type and brand of vehicles, so it is impossible to determine the exact price difference between the selected road trains. Service facility did not provide accurate information about the price of controls, but claimed that service inspections of EURO 6 vehicles are more expensive. The price difference of each type of service control is shown in Figure 5. In the event of the service control "S" is a difference around 100 EUR, service control "M" is around 200 EUR and price for a most extensive control "L" the price is higher, to about 600 EUR.

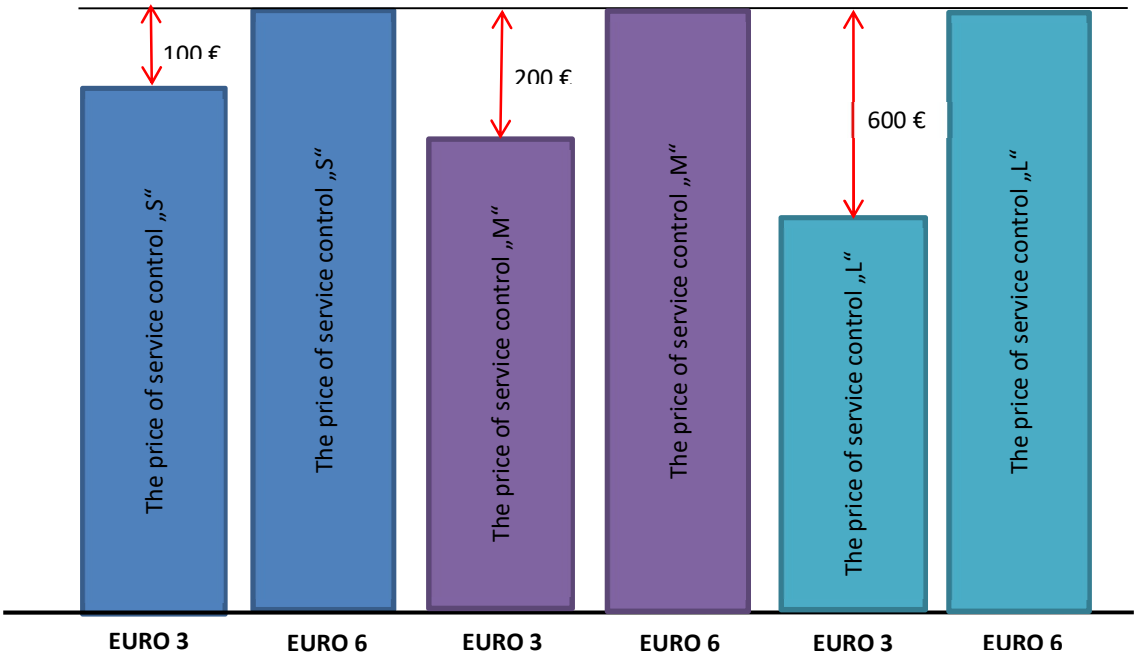


Fig. 5 – Comparison of difference in prices for service controls. Source: Own processing.

3.4.Fuel and technical additives consumption

Fuel consumption in trucks cannot be find somewhere in tables as in the case of passenger cars. This is because the consumption is influenced by a number of factors, that have a significant effect on changes. That are factors such as load weight, route profile, speed, the traffic, the weather, the ambient temperature and to a large extent, also the driver's driving style. Therefore it is not possible to determine the exact fuel consumption. SCANIA car manufacturer states that the new EURO 6 vehicles comparing to existing vehicles EURO 3 have fuel saving by up to 8 per cent. Figure 8 shows the fuel economy of vehicles SCANIA. This saving is caused due to continuous improvement of engine, gearbox, aerodynamics etc.
Annually, several test drives that compare the technical urea and fuel consumption, and speed of trucks of various types of brands is carried out. In table 3 you can see a comparison of lorries in category EURO 6, which was realized at the test strip in Germany with a length of 499.9 km. The fuel consumption of these vehicles is around 25 l / 100 km. On the basis of consultation with the transport company the equal consumption is not real in the road transport business. In the case of EURO 6 consumption is about 28.5 liters / 100 km and the EURO 3 about 31 l / 100 km.(Source: http://www.verkehrsrundschau.de/der-alte-will-es-noch-mal-wissen-1753637.html)

Tab. 3 – Consumption of fuel and AdBlue at the test strip. Source: http://www.verkehrsrundschau.de/der-alte-will-es-noch-mal-wissen-1753637.html

Brand of vehicle		Fuel consumption in litres/100 km	Speed in km/hour	AdBlue consumption
1	DAF XF 440	25.78	81.36	3.67 %
2	Iveco Stralis 420	24.61	80.31	6.69 %
3	MB Actros 1843	24.57	81.22	2.67 %
4	MB Actros 1863	26.56	82.33	2.22 %
5	Renault T 430	25.88	80.47	7.99 %
6	Scania G 410	24.18	80.00	8.61 %
7	Scania R 520	27.47	81.57	4.01 %
8	MAN TGX 18.560	25.74	81.19	2.71 %
9	Volvo FM 450	25.33	80.73	8.43 %
10	DAF CF 440	24.14	80.89	3.53 %
11	Scania R 450	23.82	81.10	7.94 %

Vehicles meeting the emission standards EURO 4, EURO 5 and EURO 6 must be equipped with EGR (exhaust gas recirculation), SCR (selective catalytic reduction) or with a combination both. These systems are used to reduce harmful emissions from diesel engines, and thus it is achieved that the engine is more environmentally friendly. SCANIA engines are equipped with SCR system only where it is necessary to use an aqueous solution of technical urea known as the AdBlue. In this case, although a vehicle has a higher consumption of technical urea, but lower fuel consumption compared with engines equipped with a combination of SCR and EGR systems. The dosage of urea, which is stored in a separate tank in vehicles, is operating fully automatically, against the control unit demand. It is sprayed into the exhaust gases and together pass to the catalyst

where it comes to a chemical reaction. Dangerous exhaust gas is then converted into harmless nitrogen and water vapor, because of the presence of technical urea. (http://www.adblue-sk.eu/adblue/informacie-o-adblue)
Average consumption of AdBlue in the case of EURO 4 corresponds to about 3-4% of the amount of fuel consumed, for EURO 5 the consumption is 5-6%, for EURO 6 is the consumption to 7-8%. (http://www.eurowag.com/sk/poradna/palivo/co-je-to-adblue)
Vehicles with EURO 3 are not yet equipped with SCR and thus there is no need to draw a technical urea. But in the case of new vehicles this new cost is arising and that is the already mentioned technical urea. On the one hand, a new cost, but on the other hand, there is a reduction in fuel costs. The technical urea can be purchased in several ways, namely:

- at gas stations, where its price range is from 0.29 to 0.5 EUR / l
- in stores in the IBC containers, where 1 000 l container costs from 199 EUR, it means the price is from 0.199 EUR / l (http://www.eurowag.com/sk/poradna/palivo/co-je-to-adblue)

For the purposes of our study we compare the cost of fuel and technical urea for vehicles with average fuel consumption of 31 l / 100 km (EURO 3) and 28.5 l / 100 km (EURO 6). For EURO 6 vehicle, it is considered with a consumption of 7% of AdBlue, it is 2 l / 100 km. In this case, the transport operator has in his company the available technical urea in large IBC containers, that means during driving per 100 kilometers a cost arises from the AdBlue in the amount of 0.40 EUR. Thanks to reduced fuel consumption, also in the case of this transport operator, 1,97 EUR per 100 km of drive is saved. It was considered with the price of € 0.95 /l of diesel. From this perspective, if the transporter has a EURO 6 vehicle with the considered annual driving performance of 130,000 km per year, he could save nearly 2 600 EUR. Figure 6 show the volume of the cost of fuel and AdBlue for each vehicle calculated to a distance of 100 km.

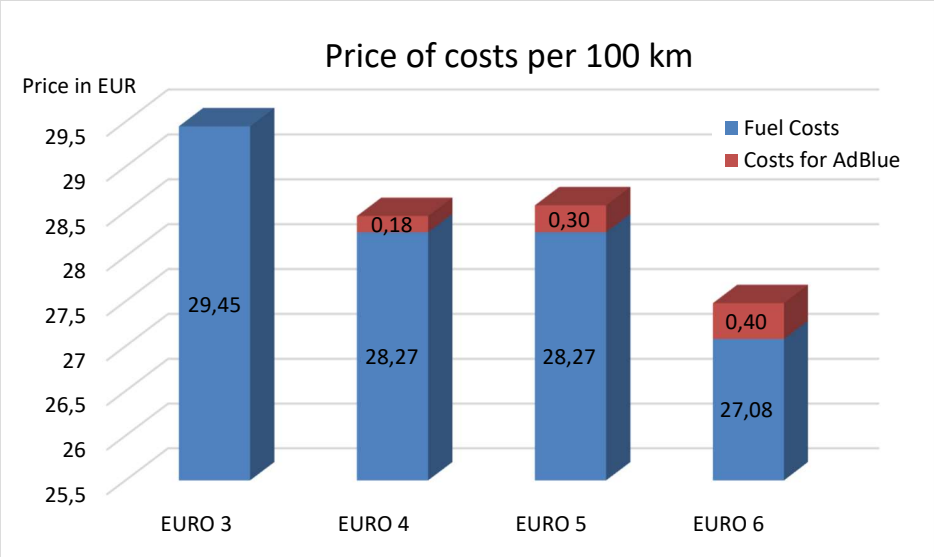


Fig. 6 – The price of costs per 100 km. Source: Own processing according SCANIA internal documentation

4.RESULTS AND CONCLUSION

The tax rates vary across the countries quite different. This problem is caused because the tax is not unified in the EU, but is governed only by Directive 1999/62 /EC. However, this directive establishes minimum tax rate, which is a major disadvantage because the country can provide a much higher tax rate than that laid down in this Directive. Another problem is also subject of tax. In some countries only vehicles used for business are subject of the road tax, for example in Slovakia, the other countries the vehicles used for private purposes are taxed too.
The rate of tax on motor vehicles was analyzed in eight countries on two specific road trains. These road trains were with a maximum gross weight of 40 t and differed from each other only in age and the emission class. It comes not only to differences in rates of tax but also to the differences in method of calculation, also in the possibility of applying reductions for specific road train.
The analysis also shows that not all countries offer the possibility of applying a tax rate reduction. The tax relief can be applied in Slovakia, the Czech Republic, Hungary and Germany. In Slovakia and the Czech Republic this relief depends on the age of the vehicle and in the other two countries depends on the emission class of vehicle. Highest tax in compared countries in both cases is applied in the Slovak Republic, for vehicle with EURO 3 emission class it is 2,233 EUR and for vehicle with EURO 6 emission class the rate is 1,674.75 EUR. Compared to the Directive, the tariff in Slovakia is more than three times higher. Even in the case where a 25% relief is provided, the tax is the highest in the compared countries, despite the fact that in Austria, Poland, Italy and France in both cases is the same tax rate. These countries do not provide any tax reduction.
One solution of these problems would be if the road tax was harmonized by EU regulation, or at least if it was determined the maximum rate by the regulation. It would not come to such a large difference in rates of tax and so transport operators who operate and have their vehicles registered in countries with higher tax rates have not been so greatly disadvantaged. Because the road tax as fixed costs involved in prices creation. It would also be appropriate to consolidate the rates reliefs for younger and cleaner vehicles and to choose one method of taxation, for example the taxation according to the total weight and number of axles.
Due to ascertaining whether the tax rates reliefs in Slovakia motivate the transport operators to the fleet renewal, the costs of vehicles with emission class EURO 3 and EURO 6 were compared. It was considered with the costs relating to the place of establishment but also to the costs which volume depends on the place of performance. During operation of a new vehicle some costs will reduce, some increase or new costs arise. Cost of tolls, motor vehicle tax, service controls and fuel consumption, and in case of EURO 6 also new costs of technical urea were analyzed.
Fees for use of the road network are selected in various ways in the form of vignettes or electronic tolls. Toll in the form of vignettes is collected in several countries, but only in Latvia is this annual vignette of 93 EUR cheaper for EURO 6 emission class vehicles. In other countries, the price of stamps is the same for all vehicles. In countries such as Slovakia, Czech Republic, Hungary, Poland, Germany, Austria and Belgium are the fees for use of the road network depending on the distance traveled, it means. tariffs are set at EUR per km. In these countries different rates according to the type of toll roads are applied. While Austria and Germany are charged only highways and motorways, other countries are charged at a lower rate also the lower class roads. In these countries, there is different tax rate for EURO 3 and EURO 6, except for Hungary, where the rate is fixed only for the EURO 3 emission class. The highest rate of tolls is in Austria and the lowest in Poland. In the case of new vehicle, it is possible in Poland and the Czech Republic save nearly 50 per cent of the tolls. In Slovak Republic can be saved only 14.22 per cent.

Only in Slovakia, tractor and trailer can be together calculated, when is used in one road train and downgraded from category as it originally belonged according to the total weight and number of axles. In the case of a new EURO 6 road train it arises tax relief of 25 per cent for taxpayer, in the case of EURO 3 vehicle there is no relief. Relief arising in a case of a new vehicle is in the amount of € 558.25 per year.

During the service inspections it comes to a significant change in the amount of costs. Content of controls for both of the road trains does not differ excepting to SCR exchange filter for EURO 6. There are three types of controls (SCANIA) and are divided according to distance driven by vehicle. During the "S" control it comes to the increasing of costs approximately 100 EUR, during the "M" control 200 EUR and for the "L" control, where comes to an exchange of SCR filter, is a price increase of around 600 EUR. Within one year, you need to make two service inspections. It follows that in one year it arises a difference in the price of inspection of 300 EUR, in the second year of 700 EUR.

The last cost item where there comes to a change of costs related to the operation of new vehicle, is a fuel consumption for new vehicles and consumption of technical urea in case of new vehicles. Newer vehicles are more economical in terms of fuel consumption. Thanks to the continuous improvement of engine, gear, aerodynamics etc. the SCANIA manufacturer claims up to 8% of fuel saving. Secondly, the vehicles are equipped with an SCR, when is necessary to draw to the vehicle fuel and in addition the technical urea. This is a costs arisen only with vehicles with emission categories up EURO 4. In the case of a vehicle EURO 3 the cost of technical urea does not arises. The consumption of technical urea is based on the average fuel consumption amounting to 7-8% for EURO 6 vehicle emission class. Taking into account that fuel consumption of EURO 3 vehicle is around 31 l / 100 km, of EURO 6 is about 28, 5 l / 100 km and additionally there is consumption of technical urea: 2 l / 100 km. The new vehicle with EURO 6 emission class is still more economical in terms of costs. For a distance of 100 km, almost 2 EUR can be saved, which in the case of an annual driving performance above 130,000 km can be nearly 2,600 EUR.

In Figure 7, there are calculated the approximate cost, supposing an annual driving the performance of 130,000 km, the amount of which increases with the use of new vehicles. Since the 25% tax relief it is applicable only for the first 36 months, all costs are calculated for a period of three years.

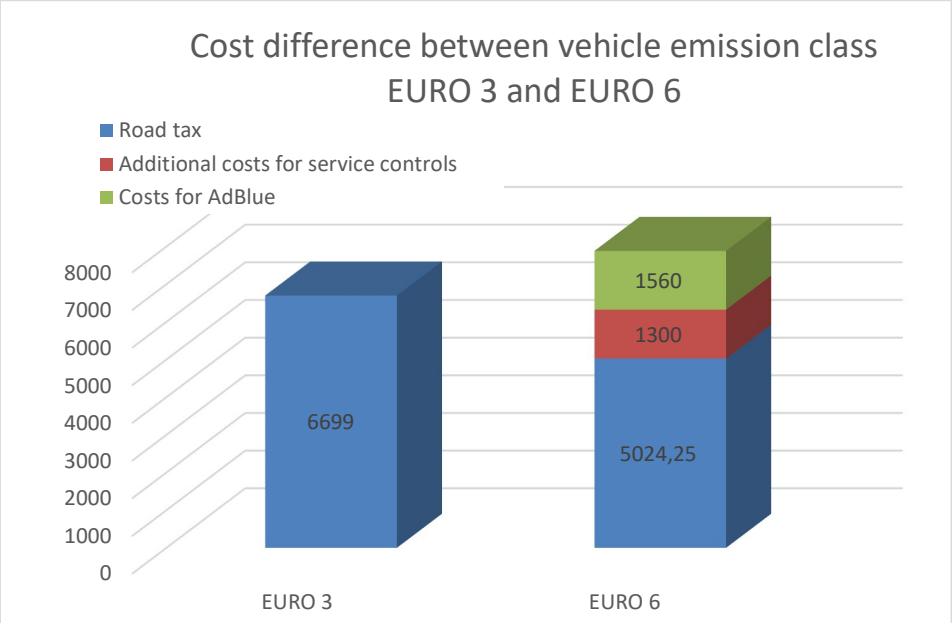


Fig. 7 – The difference in costs between vehicles with EURO 3 and EURO 6 emission class. Source: Own processing.

The aim of this study was to assess whether the resulting tax relief is motivation for buying a new car. Taking into account only the cost that are increasing, we can say that tax relief is not a sufficient motivation. As may be observed in Figure 7, the resulting tax benefit will not cover the cost of the service inspections and technical urea. To be able to say that the tax relief is motivation for buying a new car, this relief would have to at least cover these costs already mentioned. It would be achieved if the tax relief was higher than for example in the Czech Republic, where the relief is up to 48 per cent. It can be said that despite the fact that tax relief is not motivation for new vehicles, lower costs of operation are connected with, although the cost of the vehicle is high enough.

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THE DEVELOPMENT AND REGULATION OF INTERNET FINANCE ECONOMY. A CASE STUDY OF CHINA

Popescu H. Gheorghe, Ciurlău Cristian Florin, Bițoiu Teodora

Abstract

Relying on research on the development and regulation of Internet finance economy in China (Guo, Tao Kong, and Wang, 2016; Huang et al., 2016; Guo and Shen, 2016; Xie, Zou, and Liu, 2016), we first inspect the wider theoretical arguments that address this topic, attempting to supply a broader viewpoint in a sphere of investigation that has generated mixed findings: in China, Internet finance chiefly concerns financial services supplied by Internet-based companies that are nonfinancial entities. Internet finance covers a significant component in the market by allocating financial services to users who are inadequately assisted by the established financial sector, and enables financial transactions by decreasing expenses and diminishing risks via superior employment of user analytics information by cutting down data imbalance. Based on this evidence, we identify a demand to explore this topic further and we exemplify our argument via instances of the specific manners in which the pace of Internet finance's advancement is mainly determined by the rate of Internet technology. Internet finance inherently links with e-commerce and the sharing economy, and in China it endeavors to satisfy the credit financing demands of persons and SMEs, the equity financing demands of several innovative schemes, the investing and financing demands of individuals, and financial good sales via non-bank channels.

Keywords: China, Internet finance economy, e-commerce, technology

JEL Classification: F3, O16, P33

1. INTRODUCTION

This study builds on a substantial literature of empirical investigations on the fact that, in China, Internet finance chiefly concerns financial services supplied by Internet-based companies that are nonfinancial entities. Complementing the swiftness of advancement of China's Internet finance sector, the latter has uncovered risks in some zones, generated somewhat by inadequate guidance and guidelines (Androniceanu & Drăgulănescu, 2016; Andrei et al., 2016; Androniceanu, 2014; Androniceanu & Drăgulănescu, 2012; Becerra-Alonso, Androniceanu, & Georgescu, 2016), and somewhat by the absence of risk cognizance of investors. A tremendous amount of financial undertakings, previously rigorously hindered by the establishment, has been reactivated as Internet finance, and have been matter to restricted inspection: some people and entities have employed prohibited methods to collect funds on behalf of Internet finance. Resembling Internet finance advancement overseas, the principal determinant of Internet finance development in China is the diminished expense of financial transactions employing the Internet, bringing about improved user-friendliness of financial services. Internet finance reinforces and rounds out the established financial sector. (Guo, Tao Kong, and Wang, 2016)

2. LITERATURE REVIEW

In China, the development of Internet finance has been activated by: (i) constraining financial scheme generates an undersupply of financial services, particularly for small and medium-sized enterprises (SMEs) and impoverished families; (ii) regulator tolerance has supplied interval for Internet finance to materialize and develop; and (iii) IT instruments, chiefly mobile terminals and big data evaluation, gradually provide successful means for Internet finance to boost its cost-effectiveness (Van Heerden & van Rensburg, 2017; Anderson & Kantarelis, 2016; Ramcharan, 2016; Popescu Ljungholm, 2016) and manage financial risk. Internet finance can have an augmenting function, improving established financial transactions and allocating financial services to regions that established finance has not yet covered. Sound advancement of Internet finance necessitates (i) satisfactory infrastructure, encompassing big data, unified credit information and adequate market regulation; (ii) a team of competent financial experts; and (iii) a guiding plan that mediates the correspondence between supervising risk and stimulating innovation. (Huang et al., 2016)

The pace of Internet finance's advancement is mainly determined by the rate of Internet technology. The latter will additionally diminish transaction expenses and data imbalance in financial transactions. The new generation's routine of Internet utilization may impact financial transactions and organizational arrangements (Shin, 2017; Hurd, 2016; Lucas, 2016; Peters, 2016; Hsu, 2016) throughout the economy. Internet finance will progressively achieve an unintermediated position for finance and markets. The underlying role of Internet finance allocates resources spatially and temporally in an undetermined setting (Zogning, 2017; McBee, 2017; Chapman, 2017), assisting the real economy. In Internet finance, contracts are computerized and represent the notion's grounds, and risk signifies the likelihood of experiencing subsequent loss. The Internet may considerably cut down transaction expenses and data imbalance, boost well-organized management and appraisal of risk, and enlarge the confines of feasible transactions, furnishing a platform for providers and demanders of capital to transact unswervingly, and that impacts financial transactions and organizational types. (Xie, Zou, and Liu, 2016)

3. METHODOLOGY

For the investigation of the formulated issues, we develop first-rate recent literature and prove that the path of advancement of China's Internet finance might be demarcated into three phases: (i) the Internet enlargement from the established financial service, (ii) the flourishing advancement of Internet payment, and (iii) the rise of Internet credit and Internet money handling. In the phase of the Internet enlargement from established finance service, the advancement of Internet finance is beneficial to enhancing the technological stage of commercial bank, generating suitability to the manner of service (Fast, O'Brien, & Block, 2017; Tulloch, 2016; Mihăilă, 2016a, b; Popescu & Bițoiu, 2016), and reducing the management expense. The supervision division should comprehend the guidelines of Internet finance advancement and spillover risk, in an attempt to protect against inconveniences via comprehensive management. (Guo and Shen, 2016)

4. EMPIRICAL DATA AND ANALYSIS

To introduce empirical content to our theoretical model, we start with the finding that the supervision of Internet finance sector in China should be enhanced shortly, encompassing the instructions of access, performance, and withdrawal, and the ones of risk detection, timely caution, and managing mechanism. Distinct management policies should be customized to the features of various commercial banks. The impartial reorganization of important commercial banks should be intensified and monopoly should be diminished, in an endeavor to enhance proficiency for superior adoption of the difficult tasks created by the Internet finance, the risk-management strength of small-and-medium-sized commercial banks should be fortified, enabling such banks to clarify capital-raising intricacies of small-and-medium-sized companies, the occurrence of regional financial crisis should be precluded. (Guo and Shen, 2016) (Figures 1–4)

The mainstay of Internet strength in China is situated in responsiveness, allocation, fragmentation, impartiality, autonomy of choice, practicality, and fairness. Internet finance mirrors the rise of the distinct organization and platform pattern in finance. Payments are contingent on mobile and third-party payments. Payment connects financial goods, furthering more expressive business patterns. Big data is broadly employed in information processing, enhancing the appraisal of risk and noticeably diminishing data imbalance. Financial goods are thoroughly linked with the real economy. Confines for feasible transactions are considerably enlarged, and the provision and request of funds may attain equilibrium without established financial intermediaries and markets. Internet finance inherently links with e-commerce and the sharing economy (Bolton, 2016; Klosse & Muysken, 2016; Popescu & Predescu, 2016; Layard, 2016; Friedman, Friedman, & Friedman, 2016), and in China it endeavors to satisfy the credit financing demands of persons and SMEs, the equity financing demands of several innovative schemes, the investing and financing demands of individuals, and financial good sales via non-bank channels. (Xie, Zou, and Liu, 2016) (Figures 5–10)

The permeation of mobile payments has altered the buying routines of Chinese online users. The increasing amount of online platforms has enabled access to e-banking services. Chinese commercial banks have concentrated recently on mobile payment and they will be shortly turned into a mechanism characterized by e-bank online payment. Online banking gross merchandise value (GMV) increased up to 25% in 2016, whereas mobile banking GMV almost doubled its value in the same period. (Fig. 1)

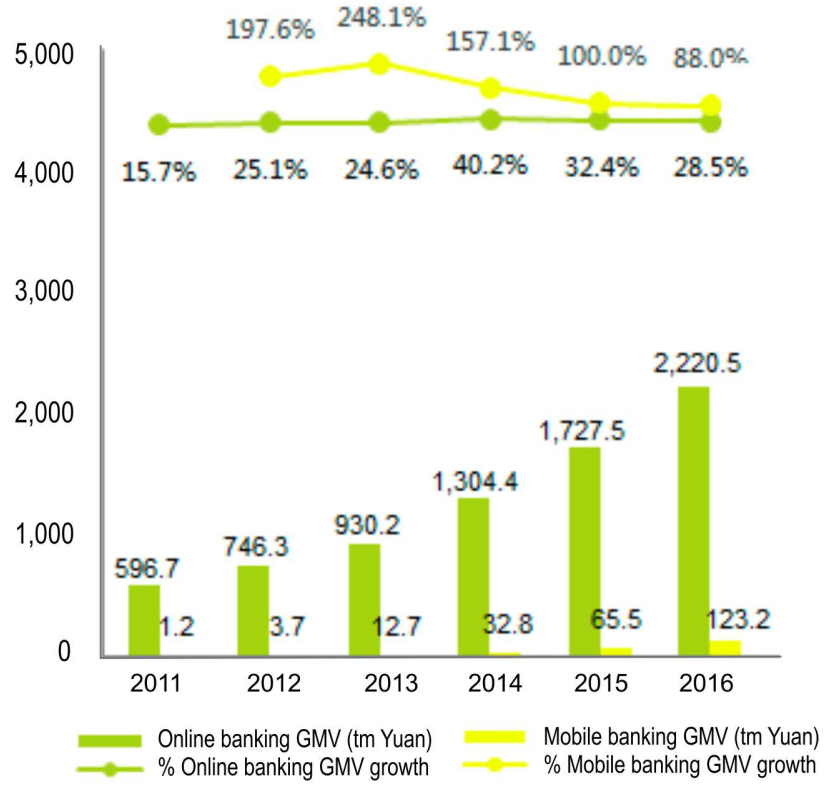


Fig. 1: China online and mobile banking GMV. Source: iResearch Global Inc.

E-banking service meets consumers' demands considerably and with the internet's swift advancement they are more reliant on e-banking. The significant replacement rate underscores Chinese commercial banks' requirement to regulate their e-banking business. China's online banking market is to maintain fast improvement even if its growth decelerates. China's online shopping market boosted by 24% year-on-year in 2016. About 75% of China's entire online shopping is assisted by mobile devices. (Fig. 2)



Fig. 2: Log on and buy. Sources: Boston Consulting Group and our estimations

The segment of mobile purchasing in the online market maintains its advancement, but its GMV growth may slow down in the long-term. Mobile shopping GMV may keep effective growth momentum as the entire online shopping market boosts considerably and principal e-commerce platforms and numerous established brand firms speed up the improvement of mobile businesses, augmenting mobile businesses and enhancing mobile services, and increasing the content performance while raising the types of products in mobile shopping market. Thus, China's mobile shopping GMV advanced by 30% in 2016, and the advancement of mobile shopping may assist companies in following the pattern of integrated marketing and multi-screen interplay. (Fig. 3)

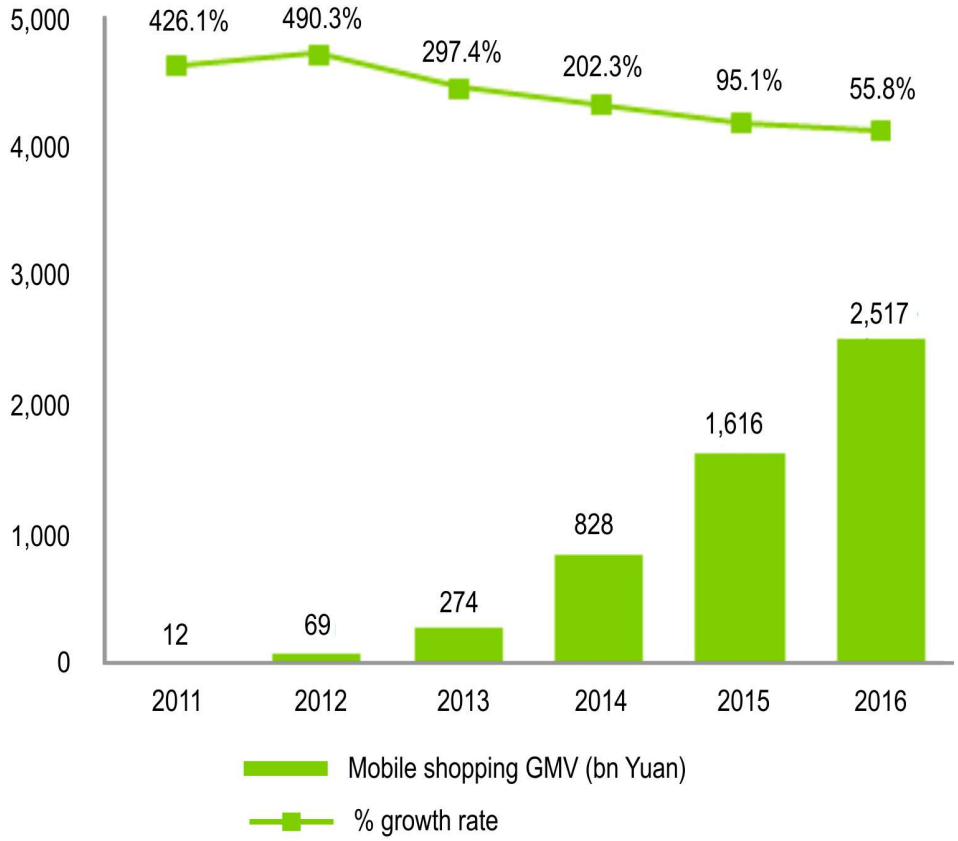


Fig. 3: China mobile shopping GMV. Source: iResearch Global Inc.

China's Internet consumer finance increased its scale by 150% in 2016. As wireless network has been progressively fashionable and mobile shopping may be effortlessly operated in consumption situations in uneven time, the flux of online shopping has moved to mobile from PC, whereas mobile shopping may be common in the online purchasing market shortly. Rising permeation of mobile shopping may be ascribed to the e-commerce firms' substantial endeavors to advance the mobile business. (Fig. 4)

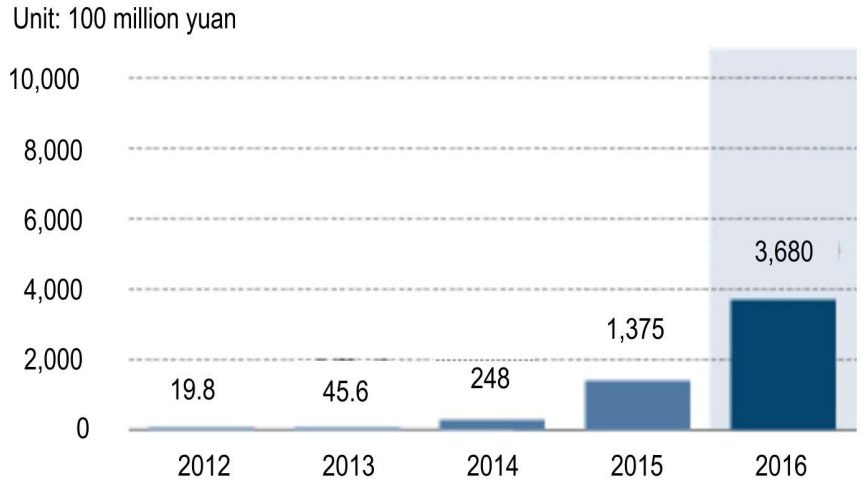


Fig. 4: The scale of China's Internet consumer finance. Source: Analysis

The scale of China's Internet finance market clarifies why numerous e-commerce firms personalize e-commerce products for mobile so that they supplement the kinds of items and gain new consumers. Several groundbreaking e-commerce firms only advance mobile business and as a result recently increased online consumers come mostly from mobile. Also online shopping in the performing pattern of live broadcasting and virtual reality has become commonplace. More firms may employ the new patterns to improve the process of mobile businesses, increasing the usage incidence of online users and replicating purchasing. (Fig. 5)

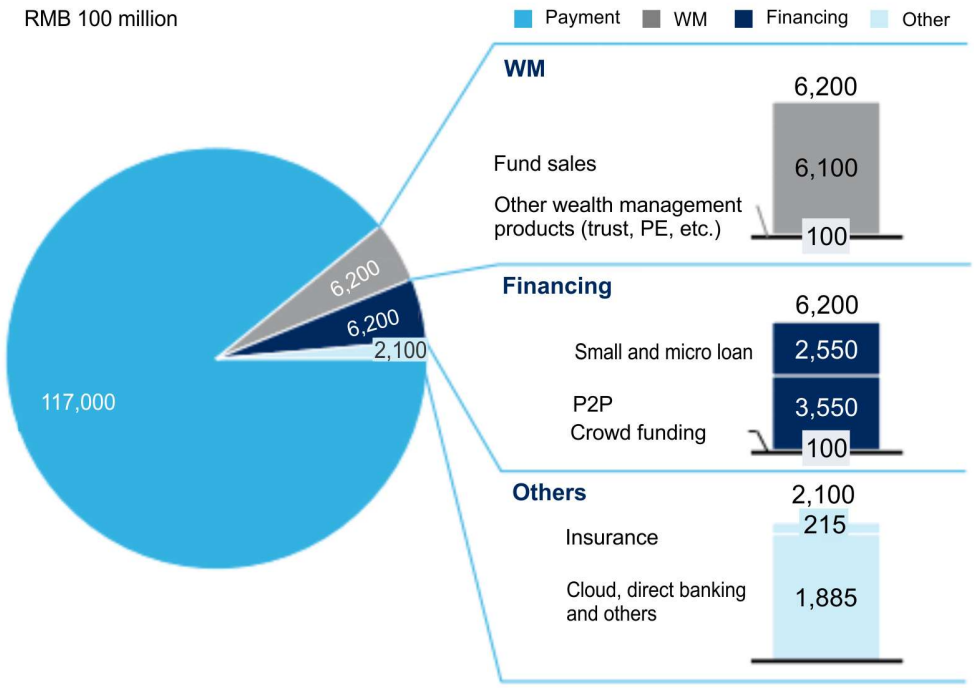


Fig. 5: The scale of China's Internet finance market.

Sources: CNNIC, iResearch, McKinsey analysis, and our estimations

Nowadays in China borrowers provide expediency, decreased rates and straightforwardness in gaining loans. Online lenders thus avoid prolonged application processing and inflexible requirements for borrowers that characterize banks and established private lenders. The escalation of online companies indicates that the consumer finance market is too large for credit card issuers only to assist, increasing almost four times its value in 2016. Shoppers who have credit cards opt for online consumer finance as a result of its suitability and proficiency. Consumer finance is a first concern for the government, taking into account the impulsion on economic growth via domestic use instead of exports. (Fig. 6)

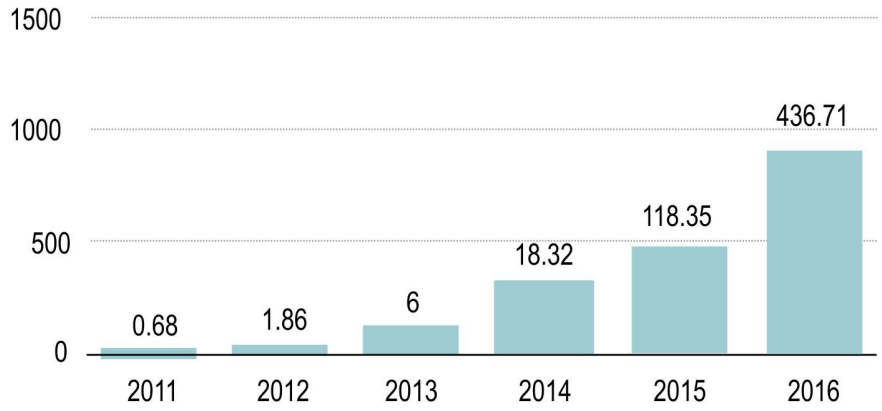


Fig. 6: Size of China's Internet consumer finance market.
Source: iResearch Inc.

Significant penetration degree and a deceleration from extremely swift growth influence internet firms to identify manners of attracting consumers. China's internet shoppers have risen considerably lately because the plentiful convenience of internet-facilitated smart phones stimulated usage and boosted the penetration degree. The Chinese internet market enlarged 6.2% in 2016, acquiring 43 million internet consumers. Internet companies should perform more sophisticatedly to draw users to their sites, or to be interested in their applications, demanding billions in advancement, marketing and funding dollars. (Fig. 7)

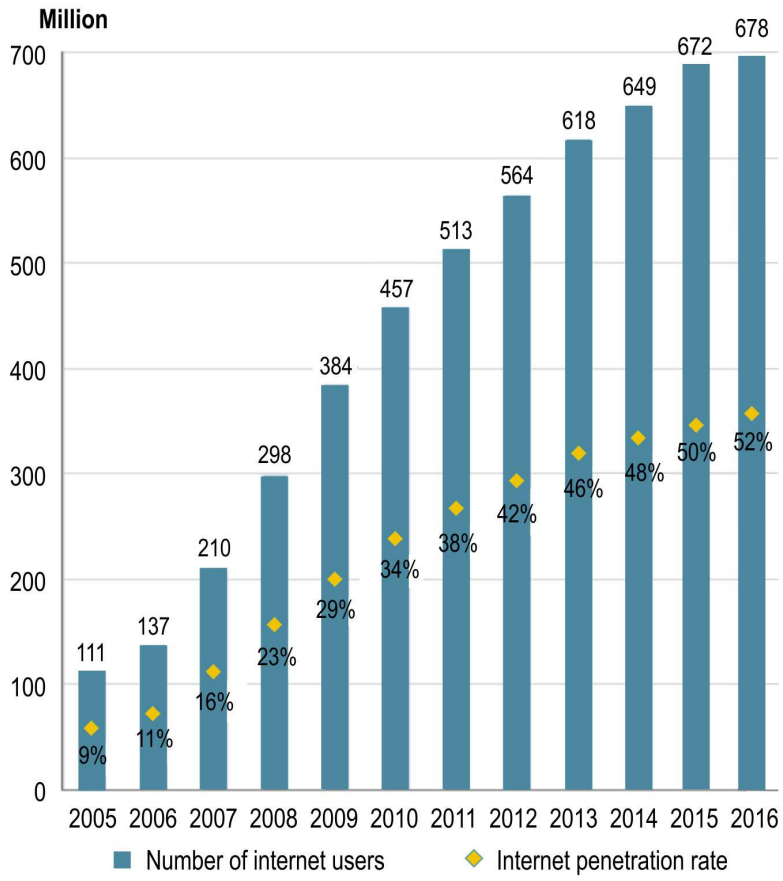


Fig. 7: Internet usage in China.
Sources: China Internet Network Information Center, McKinsey, and our estimations

Mobile payments in China were significantly higher than similar operations in the United States in 2016. Chinese internet firms have a relevant role in a market division that is an entrance to the financial technology ecosystem. The intensification of Chinese mobile payments is impacted by the unpredictable growth of online purchasing in addition to internet financial services, e.g. peer-to-peer lending and e-money market funds. China's advance in comparison with the United States in mobile payments is partly the consequence of the nonexistence of other feasible choices for non-cash payments. In China, the transaction value of mobile payments somewhat indicates payments that may not harmonize with real economic undertakings. (Fig. 8)

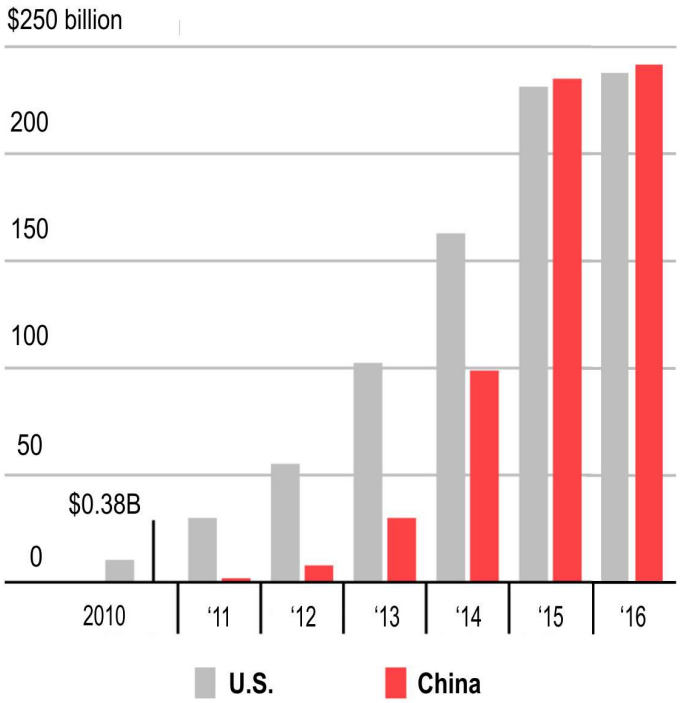


Fig. 8: Mobile-payment transactions.
Sources: Euromonitor International, *The Wall Street Journal*, and our estimations

In China, the substantial influx of smartphones and tablets swiftly allowed 76% of connected individuals to shop items through their mobile, raising by 20% in 2016. As the online shopping market has become progressively advanced, the quality of products and services will be instrumental in consumers' decision making process, assisting massively in the advancement of online shopping. Vertical e-commerce is to advance rapidly and thus become a chief tendency in the online shopping sphere in China. (Fig. 9)

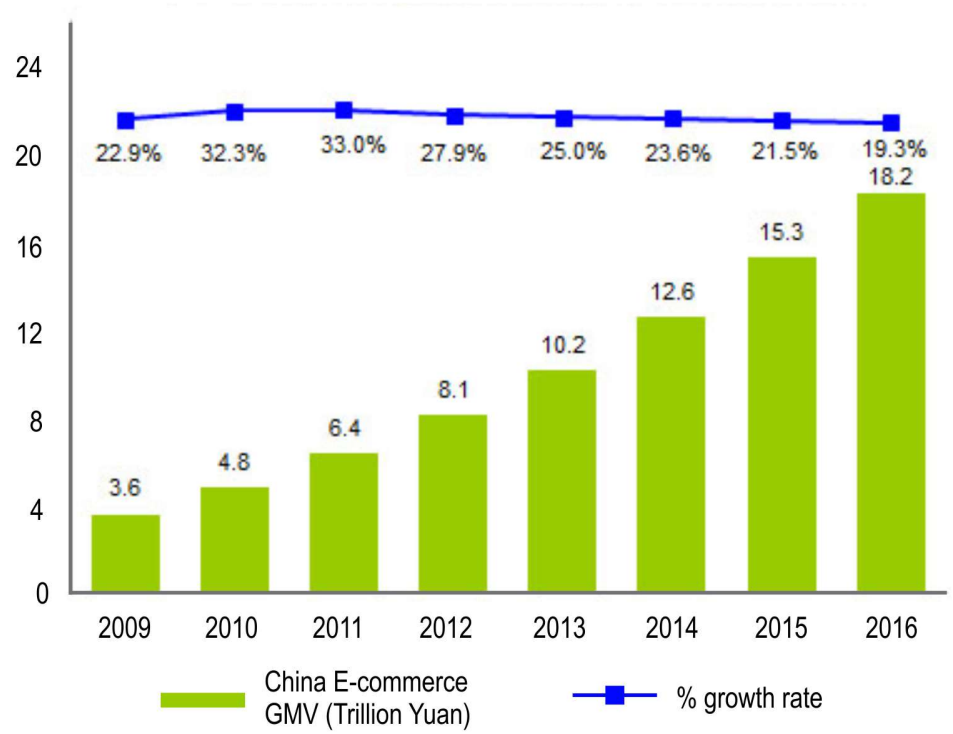


Fig. 9: China e-commerce market GMV. Source: iResearch Group Inc.

The consumer-to-consumer (C2C) subdivision boosted in China by 15.6% in 2016. The business-to-consumer (B2C) market represents 55.3% of the whole online shopping market, up 3.2% from 2015. The GMV of the B2C online shopping market achieved 2.6 trillion yuan in 2016, increasing by 31.6% from 2015. C2C market will have substantial capacity for advancement because of its considerable market dimension and full kinds of commodities. (Fig. 10)

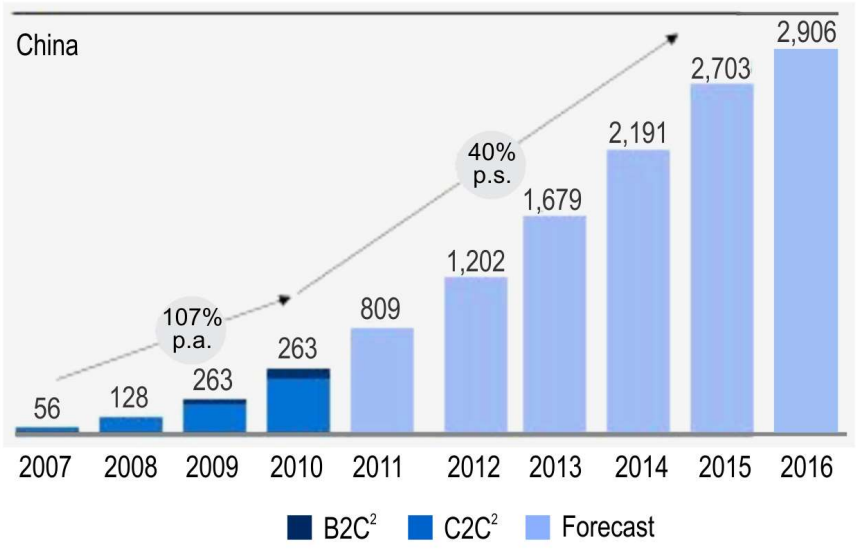


Fig. 10 China's e-commerce market. Sources: iResearch; CMM; CCID Consulting; Sino Market Research; Gartner; IDC; Euromonitor; Planet Retail; Forrester; BBE; GfK Market Consulting; McKinsey analysis; our estimations

5. RESULTS AND DISCUSSION

Our findings support our theoretical discussion and empirical analysis and are consistent with research highlighting that, by using Internet technology, Internet finance enlarges the undertaking of current financial entities and provides groundbreaking solutions. The advancement of Internet finance is associated with the real economy and the established financial sector (Carter, & Chu-May Yeo, 2017; Lindberg, 2016; Nica, 2016a, b), but is influenced by the pervasiveness of Internet utilization. Cities with significant degrees of Internet finance advancement are mainly localized in the eastern part of China. With the reasonably swift progress of the western part of China, the regional development paces of Internet finance display a particular level of confluence and encompassment. The extremely constructive associations between Internet finance and the established financial sphere, accessibility of Internet infrastructure, and inclusive degree of economic progress indicate that the advancement of Internet finance depends on the rise of the real economy and the traditional financial sector. (Guo, Tao Kong, and Wang, 2016)

Mobile payments of ordinary people are cost-effectively incorporated in central payment systems handled by central banks. Internet finance can accomplish the same allocative proficiency while significantly diminishing transaction expenses. Money and securities are transmitted via mobile communication networks. People and institutions are to open accounts at the payment department of their central bank for recording of deposits and securities, transmissions of money and securities are directed via mobile Internet networks, payment and settlement are electronic, and the distribution of work between commercial banks and central ones terminates. With the assistance from cloud computation, data from capital providers and demanders is disclosed and distributed via social networks, focused and regulated by search engines to create an effective data sequence (risk evaluation of a capital demander is performed at a moderate expense). (Xie, Zou, and Liu, 2016)

6. CONCLUSIONS

The implications of the developments outlined in the preceding sections of this paper suggest a growing need for a research agenda on the fact that a well-defined plus of Internet finance over established one is that the former considerably cuts down due-diligence expenses: financial transactions that may be commercially unrealistic in the established financial sector are facilitated. The long-tail characteristic of Internet technology entails that, as soon as the system is set up, the marginal expenditure of assisting further users is irrelevant. Internet finance may put in tangible value to financial transactions, particularly through facilitating commercially advantageous transactions (Grant, 2016; Fabre, 2017; Friedman & Gerstein, 2017; Shaefer, Wu, & Edin, 2017) from request for credit that in the past was commercially unfeasible. For Internet finance to operate, established market actors should have enough grasp of finance (Machan, 2016a, b, c; Peters & Besley, 2016; Popescu, 2016), access to Internet routes, a quality dataset and information assessment capacities. In China, Internet finance covers a significant component in the market by allocating financial services to users who are inadequately assisted by the established financial

sector, and enables financial transactions by decreasing expenses and diminishing risks via superior employment of user analytics information by cutting down data imbalance. (Huang et al., 2016)

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ANALYSIS OF THE GENERATORS OF THE COPMANY´S FINANCIAL PERFORMANCE

Ptáčková Barbora, Richtarová Dagmar

Abstract

Financial performance of a company is very important for the company´s management. It is a random process, which can be decomposed into the particular indicators. In economic practice is often worked with nonlinear functions and these has to be approximated to linear. Very important is also to find and quantify main factors which influence financial performance of a company the most. One of the possible ways is to apply method of pyramidal decomposition to financial indicators. In this paper a problem of the nonlinear delta method approximation of variance decomposition is derived and then this method is applied to a real data of selected company. Financial performance variance decomposition of selected company is verified and investigated.

Keywords: financial performance, economic value added, variance decomposition, deviation analysis

JEL Classification: C1, G3,

1.INTRODUCTION

Financial performance of a company is one of the main goals of the management. Meanwhile, in the past the financial performance has been analyzed by traditional indicators, nowadays modern indicators such as economic value added are used more frequently. Traditional indicators, which are used for financial performing, are based on the data from accounting. In these indicators the factor of the time, factor of a risk, market situation or costs of capital are not included and that´s why modern indicators, especially economic value added, are often applied. Methods used for financial performing of a company were presented e.g. Ehrbal (1998), Dluhošová (2004), Mařík 2005) or Pavelková (2009).

To find the main factors, which have the main influence on the company´s financial performance is very important. One way, how to find these factors is pyramidal decomposition of financial performance indicators. If this method is proposed to analyze financial performance of a company, it is possible to find relations among the component indicators, Zmeškal (2013).

Firstly, in this paper economic value added is characterized, then methods used for analysis of deviations are briefly described, while the method of decomposition of a variance is described in more details and then this method is applied to a data of selected company.

The objective of this paper is to find the main financial performance generators (commonly used value drivers) of a company from energy sector applying the method of a decomposition of a variance.

2.ECONOMIC VALUE ADDED

Maximizing shareholders value has become the new corporate paradigm in recent years. Shareholder's wealth is measured in terms of returns which they receive on their investment or it can either be in forms of dividends or in the form of capital appreciation or both, Dluhošová (2010) or Young (2001).

Traditional performance measures such as NOPAT, ROI or ROE have been criticized due to their inability to incorporate full cost of capital. Accounting income is thereby not a consistent predictor of firm value and cannot be used for measuring corporate performance, Vernimmen (2005). One such innovation in the field of internal and external performance measurement is Economic value added.

Economic value added is one of the modern indicators used for financial performing. This indicator is based on the concept of the economic profit. The difference between classical profit and economic profit is that economic profit includes the costs of capital – equity, liabilities and capital.

When the economic profit is positive, it means that company earns more than the weighted average costs of capital are and in this situation some wealth for the shareholders is created.

There are many ways how economic value added can be expressed. Basic formula, according to e.g. Brigham (2008), for calculating economic value added is

$$EVA = NOPAT - WACC \cdot C, \tag{1}$$

where $NOPAT$ is net operating profit after tax, $WACC$ is weighted average of cost of capital and C is total capital employed.

Economic value added can be expressed also in other way. The formula for this meaning is

$$EVA / E = (ROE - r_E), \tag{2}$$

where r_E is the cost of equity and ROE means return on equity. This expression of economic value added is used for analysis of a selected company´s financial performance.

3.METHODS OF DEVIATION ANALYSIS

It is useful to apply the analysis of deviations for in-depth analysis of the impact of component indicators on the base indicator. This analysis enables to quantify the impact of the changes in the component indicators on the base indicator, Zmeškal (2013).

One of the possible ways is to apply method of pyramidal decomposition to financial indicators. This method allows to determine the interactions and relationships among the component indicators. Method of pyramidal decomposition is often applied to the indicators of the company´s financial performance.

The pyramidal decomposition together with the analysis of deviation helps to identify not only the relationships between the financial indicators, but moreover, quantify the impact of selected indicators on base indicator.

Generally, any base indicator x can be expressed as a function of component indicators, i.e.

$$x = f(a_1, a_2 ... a_n). \tag{3}$$

The change of the base indicator can be determined as a sum of influences of component indicators,

$$\Delta y_x = \sum_i \Delta x_{a_i}, \quad (4)$$

where x is the base indicator, Δy_x is the change in the base indicator, a_i the i-th component ratio, Δx_{a_i} is the impact of i-th component ratio on the change in the base ratio.

Quantification of the impact of component indicator on the change in the base indicator in pyramidal decomposition can be expressed using two operations – additive relationship and multiplicative relationship, Zmeškal (2013).

3.1.Deviation analysis methods for additive relationship

Additive relationship can be expressed as

$$x = \sum_i a_i = a_1 + a_2 + ... + a_n . \quad (5)$$

Quantification of the impact under the additive relationship is generally applicable and the total impact is divided in proportion to the changes in the component indicators as

$$\Delta x_{a_i} = \frac{\Delta a_i}{\sum_i \Delta a_i} \cdot \Delta y_x , \quad (6)$$

where $\Delta a_i = a_{i,1} - a_{i,0}$, Δa is the value of the i-th component indicator at the beginning of the analysed period and a_i is the value of the i-th component indicator at the end of analysed period.

3.2.Deviation analysis methods for multiplicative relationship

Multiplicative relationship can be expressed as

$$x = \prod_i a_1 = a_1 \cdot a_2 \cdot ... \cdot a_n \quad (7)$$

According the way in which the multiplicative relationship is handled, it can be distinguished five basic methods: a method of gradual changes, a decomposition method with surplus, a logarithmic method or functional method or the integral method. Their description including derivation can be found in Dluhošová (2004).

3.3.Linear approximation delta variance analysis method derivation

It is often worked with nonlinear functions in economic practice. These functions has to be approximated to linear functions using Taylor expansion, Zmeškal (2013). Variance analysis method can be classified as a dynamic analysis, because this method works with time series of financial indicators.

The basic non-linear function can be expressed as $Y = f(F_1, F_2, \cdots, F_n)$ and the margin of this function is expressed as $\Delta Y = \Delta f(F_1, F_2, \cdots, F_n)$.

Taylor expansion has to be used for approximation to linear function because this is a non-linear function. Generally, Taylor expansion is expressed as

$$\Delta f(F_1, F_2, \cdots, F_n) = \sum_j \frac{\partial f(\cdot)}{\partial F_j} \cdot \Delta F_j + \frac{1}{2} \sum_j \sum_k \frac{\partial^2 f(\cdot)}{\partial F_j \cdot \partial F_k} \cdot \Delta F_j \cdot \Delta F_k + \cdots. \quad (8)$$

The linear part in Taylor expansion is

$$\Delta f(F_1, F_2, \cdots, F_n) = \sum_i \frac{\partial f(\cdot)}{\partial F_i} \cdot \Delta F_i \,. \quad (9)$$

The residual deviation is expressed as

$$\Delta f(F_1, F_2, \cdots, F_n) = f(F_1, F_2, \cdots, F_n) - E\big(f(F_1, F_2, \cdots, F_n)\big). \quad (10)$$

And then the variance formula is following

$$\mathrm{var}\big(\Delta f(F_1, F_2, \cdots, F_n)\big) = E\big(\Delta f\big)^2 = \left(\sum_i E\left[\frac{\partial f(\cdot)}{\partial F_i} \right] \cdot \Delta F_i \right)^2, \quad (11)$$

where $\Delta F_j = F_j - E\big(F_j\big),\ a_i = E\left[\frac{\partial f(\cdot)}{\partial F_i} \right]$.

After all substitution variance of component indicators can be expressed as follows

$$z_i = a_i^2 \cdot \mathrm{var}\big(F_i\big) + \sum_{j \neq i} a_i \cdot a_j \cdot \mathrm{cov}\big(F_i, F_j\big). \quad (12)$$

Relative influence of component indicator is then expressed as

$$s_i = \frac{z_i}{\sum_i z_i}. \quad (13)$$

More detailed delta variance analysis approximation is possible to find in Dluhošová, Ptáčková, Zmeškal (2015).

4.ANALYSIS OF MAIN GENERATORS OF SELECTED COMPANY FINANCIAL PERFORMANCE

The goal of the application is to find the relative influence of the component factors on economic value added of selected company from energy sector. The input are quarterly data of this company in period 1Q 2006 to 3Q 2015.

4.1.Input data

There are in Fig.1 presented the input quarterly data of component indicators of analyzed company in the period 1Q 2006 to 3Q 2015.

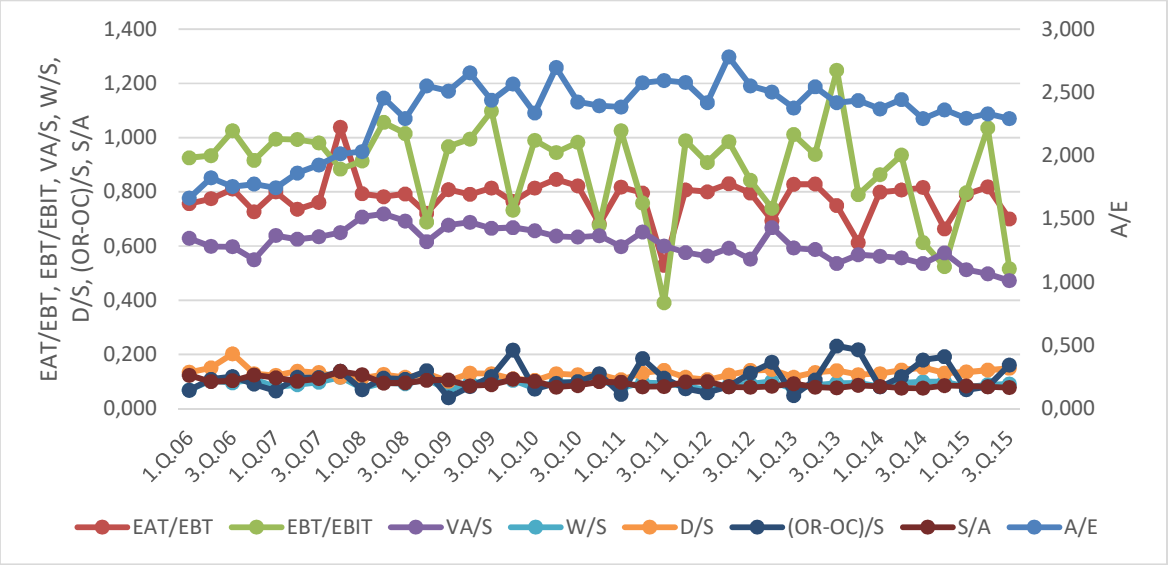


Fig.1 – Quarterly data of component indicators. Source: own calculation.

Input quarterly data of risk-free rate and risk premiums, which are determined according to methodology of Ministry of industry and trade of the Czech Republic are presented in Fig.2.

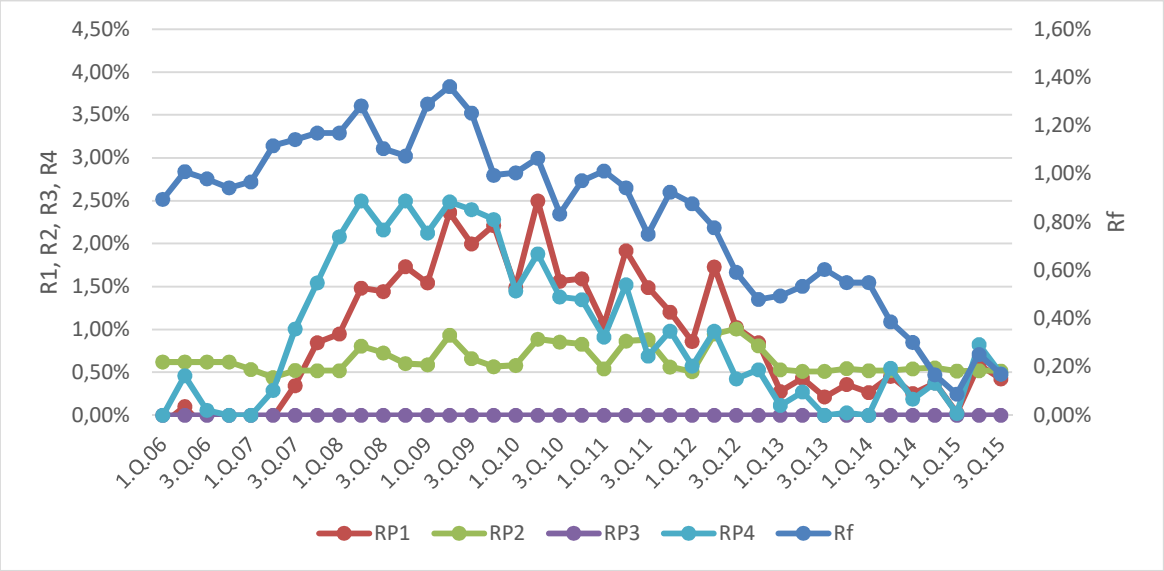


Fig. 2 – Quarterly data of risk-free rate and risk premiums. Source: own calculation.

4.2.Application of delta non-linear variance analysis method - formulas

The method of pyramidal decomposition allows to determine the interactions and relationships among component indicators to economic value added as a base indicator. For the analysis of financial performance generators is proposed following pyramidal decomposition, where the economic value added is in the nonlinear form and is determined as

$$\frac{EVA}{E} = \left[\left(\frac{EAT}{EBIT} \cdot \frac{EBT}{EBIT} \cdot \left(\frac{VA}{S} - \frac{W}{S} - \frac{D}{S} - \frac{(OR - OC}{S} \right) \cdot \frac{S}{A} \cdot \frac{A}{E} \right) - (R_E) \right], \tag{14}$$

where E is equity, EAT is earnings after tax, EBT is earnings before tax, $EBIT$ is earnings before interest and tax, VA is value added, W are wages, S are sales, A are assets, OR are other revenues, OC are other costs and R_E are costs of equity. By using building model of ministry of industry and trade of the Czech Republic it is possible to express costs of equity as

$$R_E = R_F + RP_1 + RP_2 + RP_3 + RP_4, \tag{15}$$

where R_F is risk free rate, $RP_{1,2,3,4}$ are risk premiums which are determined according to methodology of Ministry of industry and trade of the Czech Republic, mpo.cz.

It is possible to express economic value added by partial indicators after applying pyramidal decomposition on the economic value added as

$$\frac{EVA}{E} = \left[F_1 \cdot F_2 \cdot \left(F_3 - F_4 - F_5 - F_6 \right) \cdot F_7 \cdot F_8 - (F_9 + F_{10} + F_{11} + F_{12} + F_{13}) \right], \tag{16}$$

where F_1 is $\frac{EAT}{EBIT}$, F_2 is $\frac{EBT}{EBIT}$, F_3 is $\frac{VA}{S}$, F_4 is $\frac{W}{S}$, F_5 is $\frac{D}{S}$, F_6 is $\frac{(OR - OC}{S}$, F_7 is $\frac{S}{A}$, F_8 is $\frac{A}{E}$, F_9 is R_F, F_{10} is R_{podnik}, F_{11} is $R_{finstab}$, F_{12} is R_{finstr} and F_{13} is R_{LA}.

According to (12) it is possible to determine value of partial indicators to base indicator, while parameter a_i is generally expressed as

$$a_i = E\left(\frac{\partial\left(\frac{EVA}{E} \right)}{F_i} \right), \tag{17}$$

For component indicators according to proposal pyramidal decomposition parameters a_i are expressed as

$$\begin{aligned} &a_1 = E\left[F_1 \cdot F_2 \cdot F_7 \cdot (-F_4 - F_5 + F_3 + F_6)\right],\ a_2 = E\left[F_8 \cdot F_2 \cdot F_7 \cdot (-F_4 - F_5 + F_3 + F_6)\right], \\ &a_3 = E\left[F_8 \cdot F_1 \cdot F_7 \cdot (-F_4 - F_5 + F_3 + F_6)\right],\ a_4 = E\left[F_8 \cdot F_1 \cdot F_2 \cdot F_7\right],\ a_5 = E\left[F_8 \cdot F_1 \cdot F_2 \cdot F_7\right], \\ &a_6 = E\left[F_8 \cdot F_1 \cdot F_2 \cdot F_7\right],\ a_7 = E\left[F_8 \cdot F_1 \cdot F_2 \cdot F_7\right],\ a_8 = E\left[F_8 \cdot F_1 \cdot F_2 \cdot (-F_4 - F_5 + F_3 + F_6)\right], \\ &a_9 = -1,\ a_{10} = -1,\ a_{11} = -1,\ a_{12} = -1,\ a_{13} = -1. \end{aligned} \tag{18}$$

Variance of partial indicators is determined according to (12). Formulas of variance influence calculation in coincidence with previous part for proposed pyramidal decomposition are expressed as

$$
\begin{aligned}
&z_1 = a_1^2 \cdot \mathrm{var}(F_1) + a_1 \cdot a_2 \cdot \mathrm{cov}(F_1, F_2) + a_1 \cdot a_3 \cdot \mathrm{cov}(F_1, F_3) + a_1 \cdot a_4 \cdot \mathrm{cov}(F_1, F_4) + a_1 \cdot a_5 \cdot \mathrm{cov}(F_1, F_5) \\
&+ a_1 \cdot a_6 \cdot \mathrm{cov}(F_1, F_6) + a_1 \cdot a_7 \cdot \mathrm{cov}(F_1, F_7) + a_1 \cdot a_8 \cdot \mathrm{cov}(F_1, F_8) + a_1 \cdot a_9 \cdot \mathrm{cov}(F_1, F_9) + a_1 \cdot a_{10} \cdot \mathrm{cov}(F_1, F_{10}) \\
&+ a_1 \cdot a_{11} \cdot \mathrm{cov}(F_1, F_{11}) + a_1 \cdot a_{12} \cdot \mathrm{cov}(F_1, F_{12}) + a_1 \cdot a_{13} \cdot \mathrm{cov}(F_1, F_{13}), \\
&\vdots \\
&z_{13} = a_{13}^2 \cdot \mathrm{var}(F_{13}) + a_{13} \cdot a_1 \cdot \mathrm{cov}(F_{13}, F_1) + a_{13} \cdot a_2 \cdot \mathrm{cov}(F_{13}, F_2) + a_{13} \cdot a_3 \cdot \mathrm{cov}(F_{13}, F_3) + a_{13} \cdot a_4 \cdot \mathrm{cov}(F_{13}, F_4) \\
&+ a_{13} \cdot a_5 \cdot \mathrm{cov}(F_{13}, F_5) + a_{13} \cdot a_6 \cdot \mathrm{cov}(F_{13}, F_6) + a_{13} \cdot a_7 \cdot \mathrm{cov}(F_{13}, F_7) + a_{13} \cdot a_8 \cdot \mathrm{cov}(F_{13}, F_8) + a_{13} \cdot a_9 \cdot \mathrm{cov}(F_{13}, F_9) \\
&+ a_{13} \cdot a_{10} \cdot \mathrm{cov}(F_{13}, F_{10}) + a_{13} \cdot a_{11} \cdot \mathrm{cov}(F_{13}, F_{11}) + a_{13} \cdot a_{12} \cdot \mathrm{cov}(F_{13}, F_{12}), \vdots
\end{aligned}
\tag{19}
$$

4.3.Results

Method of variance decomposition is applied to economic value added of a selected company and according this method main influencing factors and generators are determined in coincidence with previous part. Results are showed in a Tab. 1.

Tab. 1 – Main influencing factors of economic value added. Source: own calculation

	A/E	EAT/EBT	EBT/EBIT	VA/S	W/S	D/S	(OR-OC)/S
$E(F_i)$	2,3135	0,7752	0,9027	0,6013	0,0911	0,1307	0,1167
a_i	0,0334	0,0974	0,0837	0,1520	-0,1520	-0,1520	0,1520
s_i	**-14,05%**	**13,96%**	**49,22%**	**6,21%**	**2,19%**	**3,38%**	**0,25%**

	S/A	R_f	R_{finstr}	R_{podn}	R_{la}	$R_{finstab}$	EVA
$E(F_i)$	0,0941	0,0077	0,0088	0,0064	0,0000	0,0093	
a_i	0,8078	-1,0000	-1,0000	-1,0000	-1,0000	-1,0000	
si	**24,96%**	**-2,54%**	**9,61%**	**2,43%**	**0,00%**	**4,39%**	**100%**

It is apparent that if the financial performance of selected company is measured by the economic value added indicator, then the most influential factor is indicator EBT/EBIT, which generates 49,22% of variance of economic value added, less important indicator is S/A, which consider 24,96% of variance of economic value added. The last important indicator is EAT/EBT, which generates13,96% of variance of economic value added of a selected company. These indicators have positive influence on economic value added. On the other side, indicator A/E has negative influence, so the variance of economic value added of selected company is falling, when the variance of this indicator is growing. More details are showed in the Fig. 3.

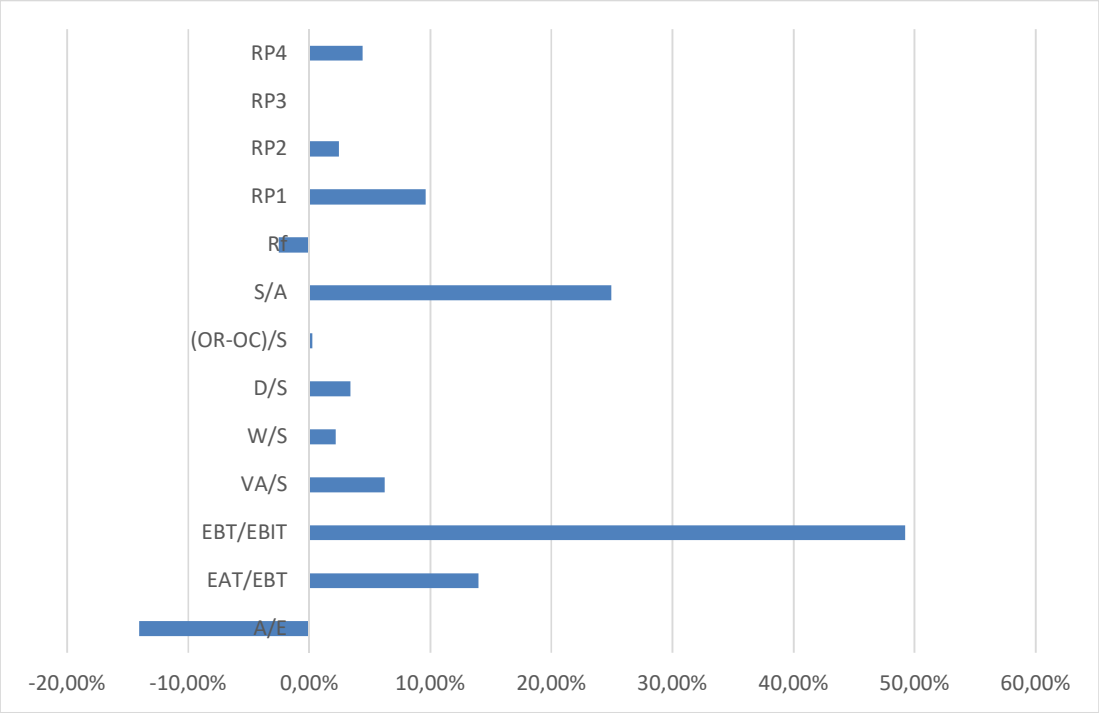


Fig. 3 – Generators of economic value added. Source: own calculation.

5.CONCLUSION

This paper was devoted to the deviation influential of selected company from energy sector. Financial performance of this company was analysed according to economic value added indicator over a period 2006 – 2016. Quarterly data of the company were used for the analysis.

Firstly, pyramidal decomposition of economic value added was proposed and main influencing factors were determined according to a method of variance decomposition. Indicator EBT/EBIT is considered to be the most influencing factor. S/A indicator can be considered as a second most influential indicator. Indicator S/A has negative influence to economic value added variance, so variance of economic value added is falling, when the variance of this indicator is growing.

It is possible to use the method of variance decomposition for time series of indicator and according to this method it is possible to determine main influencing factors of base indicator.

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THE PREDICTATBILITY OF TIME SERIES MOMENTUM: INTERNATIONAL EFFECTS

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Abstract

This study re-examine the time series momentum of Moskowitz, Ooi, and Pedersen (2012) and Kim, Tse, and Wald (2016) by testing the most liquidity equity indices of biggest countries on each area. We find that time series momentum have ability to predict over the high frequency data, when we allows the variance to be conditional over time. Moreover, the effect is better to capture with a standard GARCH model than the other GARCH-type models.

1. INTRODUCTION

Moskowitz et al. (2012) (MOP) develop the idea of time series momentum (TSMOM) from the idea of momentum by Jegadeesh and Titman (1993). In their study, the TSMOM was examined in the futures market with most liquidity equities as well as commodities, and it is determined only by the past returns of equities scaled by its unconditional volatility. Previous studies show the momentum effect appear largely on the least liquidity stock, the prove were provided by Korajczyk and Sadka (2004) and Lesmond, Schill, and Zhou (2004). In the study of MOP, they find that the momentum returns also exist the most liquid futures contracts. Developed from the model of MOP, Kim et al. (2016) also find the same results as well as they show that the returns are not need to scaled by the constant volatility to be comparable and have the effect.

We using the approach of Kim et al. (2016) to examine the time series momentum, and we also allow the variance to be conditional on its previous values and the lagged term of the residuals to test the predictability of the time series momentum. In this study, we test the effect of TSMOM by using the most liquidity indices of the biggest economy on each regions from 2001 – 2016. Our findings is quite robust to the previous studies that TSMOM have the ability to predict the trends of the returns, especially when the frequency of the data is high and when we allows the variance to be conditional over time.

We organize the paper as follows. In Section 2, we review the prior research works and discuss about the methodology using in this paper. We also describe the statistical issue of the data in Section 3 and present the results in Section 4. Concluding remarks are in Section 5.

2. LITERATURE REVIEWS

2.1 Time series momentum:

The definition of time series momentum was first documented by Moskowitz et al. (2012), according to them, there are two ways to approach the time series momentum. The first approach comes from the idea of regressing the excess returns for one instrument in month t on its return lagged by some months:

$$\frac{r_t^s}{\sigma_{t-1}^s} = \alpha + \frac{\beta r_{t-h}^s}{\sigma_{t-h-1}^s} + u_t^s \quad (1)$$

where r_t^s is the returns on the instrument s at time t, and σ_{t-1}^s is the ex ante volatilities of its. The most important things in this methodology is that the returns itself will be scaled by its ex ante volatilities, which is assumed to be constant for all the assets at all time, to make all the assets become more easy to compare together. More specifically, the annualized variance for each instrument will be calculated as follow:

$$\sigma_{t-1}^s = 261 \sum_{i=0}^{\infty}(1-\delta)\delta^i (r_{t-1-i} - \bar{r}_t)^2 \quad (2)$$

where the scalar of 261 is the number of trading days of the year, the weights $\sum_{i=0}^{\infty}(1-\delta)\delta^i$ is added up until reached one, the $\bar{r}_t$ is the exponentially weighted average return. The chosen value for δ follow the principles of $\sum_{i=0}^{\infty}(1-\delta)\delta^i = \frac{\delta}{1-\delta} = 60$ days.
The second approach to the time series momentum is just focus only on the sign of the past returns, and the regression of it can be summarized as follows:

$$\frac{r_t^s}{\sigma_{t-1}^s} = \alpha + \beta sign(r_{t-h}^s) + u_t^s \quad (3)$$

where the sign is just have only two values: +1 or -1 (i.e. based on whether the past return is up or down, respectively).
Developed from the models of Moskowitz et al. (2012), Kim et al. (2016), also find that without of volatility scaling, the time series momentum still have the same effect and the alphas produced are not much different. Kim et al. (2016) also confirmed that the result of Moskowitz et al. (2012) largely driven by their risk parity approach to asset location. In this empirical study, we approach time series momentum by using the following regression:

$$r_t^s = \alpha + \beta sign(r_{t-1}^s) + u_t^s \quad (4)$$

Moreover, this study also allows the variance to be conditional on time, because return itself is noisier and hardly to predict if we assumed the variance error term to be constant overtime. Specifically, this study will employs the GARCH-type models to investigate whether the predictability of time series momentum is exist or not. The GARCH-type models will be discussed within the section bellows.

2.2 GARCH-type models:

The GARCH-type models (GARCH stands for Generalize Autoregressive Conditionally Heteroskedastic) are developed to fill the gaps of the ARCH class of models. The main motivation of GARCH (and also ARCH) is come from the very important feature of financial series which is known as “volatility clustering” (i.e. the current level of volatility positively follows its previous values). There are numbers of GARCH-type models have been developed, however, this research only focus on the three most related GARCH models that focus directly on the sign and size volatility of returns: the standard GARCH model, the GJR model, and the exponential GARCH model.

2.2.1 Standard GARCH model:

Standard GARCH model was first developed independently by the studies of Bollerslev (1986) and Taylor (1987). The main idea of GARCH is that it allows the conditional variance to depend on its previous own lags, as well as the previous lags of the squared residuals. The full model of GARCH(p,q) is shown as bellows:

$$y_t = \theta_0 + \theta_i X + u_t \quad u_t \sim N(0, \sigma_t^2) \qquad (5)$$
$$\sigma_t^2 = \alpha_0 + \sum_{i=1}^{p} \alpha_i u_{t-i}^2 + \sum_{j=1}^{q} \beta_j \sigma_{t-j}^2$$

In this study, we try to capture the time series momentum effect of return series by using the GARCH(1,1) model to test the effect, and that will lead to the full model as follow:

$$r_t^s = \theta_0 + \theta_1 sign(r_{t-1}^s) + u_t^s$$
$$u_t^s \sim N(0, \sigma_t^2) \qquad (6) \qquad \sigma_t^2 = \alpha_0 + \alpha_1 u_{t-1}^2 + \beta_1 \sigma_{t-1}^2$$

On the other hand, the development of standard GARCH (p,q) also shows a lot of problems that are directly connected to its conditional variance. Specifically, the variance itself does require a positive condition to be exist. Furthermore, GARCH models cannot explain fully the leverage effect because of the truth that they treat the lagged residuals by their magnitudes, not for the sign (i.e. since we squared the residuals, their sign immediately will gone away). The main focus of us is about the sign of the returns, thus we will also apply the GJR model and the exponential GARCH to check to the robustness of the time series momentum effect.

2.2.2 The GJR model:

The GJR model named after the authors Glosten, Jagannathan, and Runkle (1993), and is an extension of the GARCH by considering the difference between positive and negative volatility. Hence, the conditional variance equation now is given as:

$$\sigma_t^2 = \alpha_0 + \alpha_1 u_{t-1}^2 + \beta_1 \sigma_{t-1}^2 + \gamma u_{t-1}^2 I_{t-1} \qquad (7)$$

where I_{t-1} will take the value of 1 if the previous lagged 1 of residual is negative, and zero otherwise. By definition of variance, the non-negative constraint in this model now will become α_1 must be positive and the sum of α_1 and γ should be positive either. The full model applied to this study now will be:

$$r_t^s = \theta_0 + \theta_1 sign(r_{t-1}^s) + u_t^s$$
$$u_t^s \sim N(0, \sigma_t^2) \qquad (8) \qquad \sigma_t^2 = \alpha_0 + \alpha_1 u_{t-1}^2 + \beta_1 \sigma_{t-1}^2 + \gamma u_{t-1}^2 I_{t-1}$$

2.2.3 The exponential GARCH (EGARCH):

Nelson (1991) supposed the exponential GARCH model by define the conditional variance equation as:

$$\ln(\sigma_t^2) = \omega + \beta\ln(\sigma_{t-1}^2) + \gamma\frac{u_{t-1}}{\sqrt{\sigma_{t-1}^2}} + \alpha\left[\frac{|u_{t-1}|}{\sqrt{\sigma_{t-1}^2}} - \sqrt{\frac{2}{\pi}}\right] \qquad (9)$$

The two most benefits of EGARCH are that the model fixed the non-negative problem of variance as well as the asymmetries arise between the relationship of the volatility and mean of the returns. As the standard GARCH and the GJR, the full model of EGARCH to be employed in this study is:

$$r_t^s = \theta_0 + \theta_1 sign(r_{t-1}^s) + u_t^s \qquad u_t^s \sim N(0, \sigma_t^2) \qquad (10)$$

$$\ln(\sigma_t^2) = \omega + \beta\ln(\sigma_{t-1}^2) + \gamma\frac{u_{t-1}}{\sqrt{\sigma_{t-1}^2}} + \alpha\left[\frac{|u_{t-1}|}{\sqrt{\sigma_{t-1}^2}} - \sqrt{\frac{2}{\pi}}\right]$$

3. SAMPLE SUMMARY STATISTICS

Our cross-country equity indices are drawn from Datastream International provided by Thomson Financial. Data are available for all 20 countries from 2001 to the end of 2016 (i.e. the detailed will be shown at the Appendix. The choosing of country is based on its economic performance rating by World Economic Forum (2016), and on their natural geographic. Following previous literature of Moskowitz et al. (2012) and Kim et al. (2016), we choose the most rating equity index of each country to avoid the returns being contaminated by illiquidity problems as well as the stale price issues. The data mainly being used in this study is the five-day trading data, and to check the robustness of our suggested model, we also use the weekly and the monthly data to test. The holiday as well as the off-trading day will be assumed to have the same price as the previous trading day.

Since log returns have several advantage for the data processing, returns are calculated as the natural log of the current and it latest previous returns. The sign return variable, $sign(r_{t-1}^s)$, is just a simple comparison between the price of current time and its lagged 1 period, if the price goes up then $sign(r_{t-1}^s)$ will take the value of 1, and -1 otherwise. Since the target of assessing the predictability of time series momentum in different timing returns, we report the descriptive statistics of return based mainly on daily, weekly, and monthly data.

Table 1 presents basic statistics of returns variables (i.e. daily, weekly and monthly returns, respectively) by countries as well as the economic regions that they are belong to. As shown from Table 1, the longer timing period of returns will have larger volatility. Specifically, the volatility in index returns of each country just have a small different compared to other countries in the same geographic region. Furthermore, the developed countries returns less volatile than developing one.

Table 1: Summary statistics of returns among different timing periods (daily, weekly, monthly)

		Mean			Standard Deviation			Skewness			Kurtosis		
		Daily	Weekly	Monthly	Daily	Weekly	Monthly	Daily	Weekly	Monthly	Daily	Weekly	Monthly
North America	US	0.015	0.075	0.332	1.205	2.408	4.252	-0.232	-0.775	-0.854	12.667	8.588	4.921
	CA	0.017	0.084	0.371	1.060	2.207	3.813	-0.666	-1.039	-1.256	14.131	9.837	6.952
	MX	0.047	0.234	1.056	1.218	2.748	4.938	0.027	-0.492	-0.709	9.129	7.526	4.552
South America	BR	0.035	0.174	0.798	1.753	3.695	7.142	-0.089	-0.351	-0.491	7.536	5.846	3.888
	AR	0.093	0.463	2.143	2.109	5.041	10.434	-0.215	-0.119	-0.192	7.717	5.829	5.777
	CO	0.057	0.285	1.262	1.261	3.377	6.692	-0.164	-1.740	-0.299	16.188	21.421	4.521
	CL	0.033	0.164	0.719	0.750	1.921	3.838	-0.167	-0.776	0.051	13.879	6.948	3.629
	PE	0.061	0.303	1.329	1.402	3.684	8.537	-0.443	0.080	-0.544	14.886	16.099	8.544
Europe	UK	0.006	0.028	0.138	1.202	2.500	4.031	-0.150	-0.256	-0.774	9.769	8.199	3.977
	DE	0.016	0.079	0.363	1.520	3.337	6.387	-0.054	-0.646	-1.019	7.731	6.475	6.137
	FI	0.001	0.007	0.065	1.542	3.401	6.465	-0.103	-0.219	-0.393	6.654	4.587	4.505
	CH	0.003	0.016	0.099	1.200	2.653	4.010	-0.157	-0.632	-0.691	10.033	8.592	3.828
	SE	0.013	0.067	0.301	1.453	3.065	5.437	0.021	-0.070	-0.648	7.395	7.498	4.554
Oceania	AU	0.012	0.061	0.288	1.011	2.221	3.810	-0.459	-0.733	-0.827	8.639	8.391	3.639
	NZ	0.011	0.054	0.233	0.680	1.616	3.466	-0.570	-0.849	-0.808	8.855	6.868	4.519
Asia	CN	0.009	0.043	0.261	1.610	3.746	8.270	-0.371	-0.658	-0.504	7.800	6.035	4.429
	JP	0.004	0.021	0.132	1.382	3.173	5.251	-0.385	-0.827	-0.588	9.660	8.297	4.210
	KR	0.030	0.153	0.713	1.388	3.007	5.902	-0.599	-0.686	-0.544	10.518	6.720	5.105
	IN	0.057	0.282	1.246	1.405	3.480	7.297	-0.543	-1.011	-0.627	13.116	8.745	6.309
	RU	0.042	0.207	0.957	2.105	5.225	9.910	-0.410	-0.709	-0.785	13.372	10.491	5.232

Table 2: Pearson correlations among the returns between countries

		North America			South America					Europe					Oceania		Asia				
		US	CA	MX	BR	AR	CO	CL	PE	UK	DE	FI	CH	SE	AU	NZ	CN	JP	KR	IN	RU
North America	US																				
	CA	0.932 67.892																			
	MX	0.998 59.010	0.784 48.579																		
South America	BR	1.259 47.150	1.083 45.633	1.333 50.820																	
	AR	1.070 29.502	1.031 33.029	1.094 29.943	1.737 33.851																
	CO	0.414 18.000	0.475 24.198	0.531 23.429	0.703 21.313	0.772 19.291															
	CL	0.418 33.204	0.377 34.288	0.471 38.318	0.656 36.661	0.599 26.008	0.329 23.621														
	PE	0.647 26.353	0.710 34.582	0.709 29.006	1.019 28.965	1.026 23.512	0.599 22.914	0.452 30.249													
Europe	UK	0.797 41.918	0.714 43.056	0.773 39.535	0.994 34.011	0.948 25.655	0.544 24.469	0.446 36.262	0.746 31.407												
	DE	1.119 49.084	0.865 40.476	1.002 40.960	1.229 33.037	1.104 23.316	0.574 19.950	0.519 32.564	0.816 26.351	1.504 92.256											
	FI	0.887 34.524	0.783 34.714	0.855 32.550	1.049 26.783	0.947 19.368	0.563 19.245	0.493 29.996	0.808 25.611	1.377 70.663	1.744 70.908										
	CH	0.736 37.587	0.615 35.080	0.696 34.453	0.846 27.934	0.801 21.215	0.483 21.410	0.404 31.945	0.643 26.306	1.182 90.949	1.432 80.566	1.305 63.285									
	SE	0.934 40.099	0.789 37.904	0.903 37.736	1.133 31.573	0.994 21.808	0.597 21.916	0.502 33.022	0.814 27.732	1.418 88.593	1.782 86.912	1.803 86.354	1.317 73.337								
Oceania	AU	0.178 9.393	0.247 15.031	0.257 13.543	0.305 11.096	0.340 10.255	0.248 12.581	0.208 18.141	0.350 16.176	0.407 22.581	0.412 17.669	0.504 21.704	0.386 21.327	0.446 20.277							
	NZ	0.019 1.453	0.086 7.615	0.088 6.817	0.076 4.054	0.117 5.202	0.123 9.224	0.080 10.167	0.142 9.591	0.164 13.033	0.149 9.289	0.197 12.138	0.171 13.609	0.153 9.946	0.355 38.265						
Asia	CN	0.127	0.178	0.234	0.372	0.267	0.232	0.163	0.314	0.237	0.249	0.278	0.176	0.235	0.382	0.155					

														15.35					
		4.171	6.680	7.628	8.456	5.023	7.317	8.660	8.941	7.847	6.514	7.160	5.800	6.418	0	9.073			
		0.212	0.321	0.303	0.379	0.436	0.348	0.220	0.405	0.479	0.523	0.625	0.503	0.543	0.799	0.359	0.492		
	JP		14.27	11.63	10.06		12.95	13.84	13.58	19.16	16.34	19.51	20.24	17.85	44.30	26.26	14.42		
		8.153	2	2	2	9.626	1	2	7	5	8	4	5	4	3	0	1		
		0.310	0.357	0.440	0.525	0.505	0.371	0.270	0.451	0.514	0.633	0.676	0.516	0.629	0.766	0.299	0.490	1.068	
	KR		15.88	17.14	14.05	11.13	13.79	17.08	15.13	20.58	20.01	21.16	20.69	20.86	41.38	21.26	14.27	42.61	
		11.989	3	7	1	8	5	8	4	0	1	5	6	9	4	9	6	5	
		0.386	0.381	0.468	0.618	0.582	0.432	0.282	0.527	0.588	0.682	0.689	0.557	0.671	0.527	0.206	0.441	0.619	0.777
	IN		16.81	18.07	16.46	12.73	15.98	17.70	17.65	23.61	21.41	21.32	22.27	22.15	25.40	14.05	12.62	21.39	27.61
		14.905	4	2	9	4	5	1	5	2	7	5	6	2	5	6	8	6	3
		0.764	0.868	0.933	1.252	1.380	0.890	0.556	1.033	1.228	1.370	1.454	0.996	1.425	0.767	0.314	0.507	0.916	0.957	1.012
	RU	20.0888	26.84	24.84	22.93	20.79	22.61	23.94	23.76	35.31	30.13	31.86	27.29	33.50	24.55	14.30		21.09	22.03	23.16
		5	3	0	8	4	8	5	7	0	2	8	0	4	1	0	9.614	5	2	6

*The first-upper cell of each country report the correlation value, the second-down cell report the corresponding t-statistic, respectively. The bold value shows the countries large correlation between the other countries' market.

Daily returns of the indices have higher excess kurtosis implies that the distributions of its puts more mass on the tails, in other words, its distributions tends to contain more extreme values. All of indices returns provide negative values, which will lead to the distributions of the returns be skewed to the left. Finally, the daily mean returns is close to zero, whereas that of a weekly, or monthly, return series is much higher. In sum, the descriptive summary statistics shows the large difference in return distributions exist between country-type (developed and developing) and their geographic locations.

Table 2 present the Pearson correlation of daily log return between countries, and the bold values shows the large correlations between countries. Clearly, the US market shown the largest effect than other countries. Unambiguously, US show its effect on the North America region, the US, Canada, and Mexico always go hand in hand, we can obtains the influence of the US market in several other markets. However, the US market seems not affect much to the Oceania and the Asia markets as it do with the Europe and the South America regions. A different note from this point is that the Russia market seems to be more correlated with most of the biggest economies of each region. On the other hand, China itself seem to be not much correlated with other markets. In sum, due to the international effect, the equity indices of most biggest countries on the world tend to go together, the difference here is just about the level of correlation between them.

4. EMPIRICAL RESULTS AND FINDINGS

4.1 Results from the GARCH-type models:

For testing the predictability of time series momentum, we run the three regression models (i.e. the standard GARCH, the GJR, and the EGARCH) for each country index, then obtain the coefficient values and their p-value. Each regression was updated at each iterations until we find the best suitable value for the coefficient.

Table 3 reports the results of each country retrieved from the standard GARCH models for each timing periods. The standard GARCH models tend to be most suitable for the daily and weekly returns. With the monthly returns, for some of countries, GARCH seems not to be the suitable one to match the data. Overall, it seem to be a good news when we allow the variance of the time series momentum to be conditional over time (i.e. to be dependent on its previous value) because it is significant for all of the sample data. The intercept (both for the mean and variance equation) is not meaningful since they are insignificant at most of the normal significant levels. The conditional mean is significant, but not incorporate much to capture the return's volatility.

As from Table 3, the volatility of time series momentum is best capture by the GARCH-type models and GARCH-type models is most suitable for the daily and weekly data. To check the robustness, we next run the regression for the daily and weekly data, we next run the GJR and the EGARCH apply for daily and weekly. Additionally, we also want to see whether the leverage effect and the asymmetries affect most to the returns. Table 4 and Table 5 employ the GJR and EGARCH to capture the series of returns. As obtained from the Tables, the GJR and the EGARCH provide the results does not different much from the Table 3. Specifically, the GJR and EGARCH in most of the case capture very well the volatility of returns, however, in some cases the large of the previous volatility cannot explain the current values.

The results from the GARCH-type models lead to our first finding is that, for capture the time series momentum of equity indices, the standard GARCH model is better than some other GARCH-type models (i.e. here is the GJR and EGARCH models) and easier to use in the practice. The second finding is that GARCH-type models is more suitable for the high frequency data than

the lower one, in other words, the application of GARCH-type models to capture the tendency of return is better use with daily and weekly data than the monthly.
All of the models above use the sample from the 2001 – 2014 to capture the sense of the data, because of the main focus of this paper is try to test the predictability of time series momentum, we use the sample of two years data to check for the predictability. The main reasons of using last two year out-of-sample is that the last two years, due to most of the events occurred all over the world, the indices of most countries involves to large volatility, and that may be the challenge for the forecasting ability of GARCH model. Next section will present the forecasting accuracy of the standard GARCH-type model.

4.2 The forecasting ability of standard GARCH model:

This section mainly concentration on challenging the forecast ability of GARCH model. We divide this section into two parts based on the frequency of the data, and for simplicity, we only focus on some biggest economy on each geography regions (i.e. the United States, Brazil, United Kingdom, Australia, China, and Japan)

Table 3: Standard GARCH results of different timing periods of returns

			North America			South America					Europe					Oceania		Asia				
			US	CA	MX	BR	AR	CO	CL	PE	UK	DE	FI	CH	SE	AU	NZ	CN	JP	KR	IN	RU
Daily return	Mean Equation	θ_0	-0.007	0.006	0.033	0.067	0.078	0.059	0.029	0.048	0.017	0.002	0.017	0.013	0.023	0.016	0.012	0.040	0.048	0.042	0.026	0.053
			48.3%	52.9%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	7.2%	85.2%	20.4%	18.9%	6.3%	4.8%	5.2%	0.6%	0.0%	0.0%	3.0%	0.0%
		θ_1	0.581	0.542	0.709	1.102	1.171	0.685	0.404	0.640	0.575	0.775	0.798	0.598	0.762	0.518	0.424	0.859	0.814	0.731	0.768	1.119
			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Variance Equation	α_0	0.006	0.006	0.012	0.030	0.050	0.093	0.006	0.028	0.005	0.010	0.007	0.010	0.008	0.005	0.009	0.024	0.030	0.005	0.016	0.064
			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		α_1	0.090	0.087	0.082	0.079	0.121	0.230	0.143	0.200	0.102	0.080	0.061	0.117	0.074	0.093	0.118	0.082	0.120	0.087	0.118	0.148
			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		β_1	0.905	0.900	0.905	0.902	0.865	0.663	0.843	0.790	0.895	0.912	0.936	0.873	0.920	0.901	0.841	0.905	0.850	0.916	0.876	0.835
			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Weekly return	Mean Equation	θ_0	0.002	-0.015	0.071	0.136	-0.046	0.098	0.018	0.136	-0.039	-0.013	-0.112	-0.015	-0.084	-0.029	-0.064	0.017	-0.174	-0.076	-0.228	-0.220
			97.0%	73.9%	29.3%	12.2%	63.0%	11.7%	64.3%	7.2%	39.8%	85.1%	9.0%	78.6%	15.3%	45.4%	9.5%	82.3%	3.9%	34.7%	0.5%	3.0%
		θ_1	1.337	1.325	1.861	2.593	3.052	1.913	1.255	1.950	1.302	1.876	2.047	1.423	1.750	1.211	1.146	2.315	2.261	2.076	2.236	3.165
			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Variance Equation	α_0	0.044	0.107	0.440	0.289	0.484	0.603	0.120	0.149	0.056	0.383	0.085	0.076	0.099	0.136	0.378	0.054	0.845	0.303	0.123	0.953
			7.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.5%	0.0%	0.1%	0.2%	0.2%	0.0%	0.0%	0.3%	0.0%	0.0%	0.4%	0.0%
		α_1	0.163	0.167	0.148	0.081	0.169	0.333	0.198	0.145	0.227	0.236	0.088	0.133	0.166	0.277	0.307	0.038	0.111	0.075	0.082	0.247
			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		β_1	0.849	0.793	0.743	0.870	0.802	0.648	0.766	0.843	0.803	0.719	0.893	0.854	0.821	0.717	0.430	0.951	0.698	0.852	0.905	0.712
			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Monthly return	Mean Equation	θ_0	-0.101	-0.081	0.380	0.451	1.059	0.302	0.328	0.444	-0.164	-0.015	-0.183	-0.039	0.231	-0.312	-0.212	-0.081	-0.164	0.101	-0.069	0.092
			50.7%	60.8%	14.5%	18.9%	7.5%	37.1%	10.8%	23.6%	34.2%	97.1%	51.8%	84.1%	45.9%	8.7%	14.6%	79.6%	50.8%	76.2%	83.6%	81.2%
		θ_1	2.588	2.806	3.620	5.186	7.487	4.575	3.067	5.487	2.624	3.940	4.182	2.705	3.359	2.914	2.529	5.101	3.781	4.772	5.041	6.945
			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Variance Equation	α_0	0.492	0.966	1.429	5.552	5.287	0.128	1.953	3.305	0.299	2.794	0.904	0.624	0.952	0.454	0.428	1.162	9.754	4.641	1.317	12.479
			11.9%	18.1%	19.6%	5.6%	0.0%	72.2%	2.8%	1.2%	18.0%	0.2%	10.8%	5.9%	7.5%	16.5%	4.9%	15.1%	5.9%	1.1%	22.3%	2.2%
		α_1	0.396	0.349	0.109	0.178	-0.019	0.055	0.255	0.323	0.209	0.252	0.120	0.208	0.156	0.088	0.184	0.209	0.197	-0.030	0.229	0.511
			0.0%	3.4%	24.0%	3.0%	4.5%	2.8%	0.2%	0.0%	0.2%	0.0%	0.5%	0.2%	2.6%	2.9%	7.9%	0.9%	0.0%	19.7%	1.5%	0.1%
		β_1	0.585	0.531	0.730	0.547	0.879	0.935	0.433	0.633	0.762	0.631	0.810	0.704	0.769	0.814	0.722	0.785	-0.123	0.723	0.747	0.236
			0.0%	1.2%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	80.4%	0.0%	0.0%	20.1%

*The first row of a cell present the coefficient value of GARCH model, while the second rows report the P-value of each coefficient.

Table 4: The GJR results of daily and weekly returns

			North America			South America					Europe					Oceania		Asia				
			US	CA	MX	BR	AR	CO	CL	PE	UK	DE	FI	CH	SE	AU	NZ	CN	JP	KR	IN	RU
D	M	θ_0	-0.020	-0.003	0.015	0.048	0.070	0.045	0.021	0.043	-0.007	-0.027	0.009	-0.011	-0.001	0.002	0.005	0.033	0.031	0.028	0.017
			3.77%	70.29%	19.44%	0.00%	0.00%	0.00%	0.00%	0.00%	49.75%	3.38%	54.04%	0.00%	93.38%	80.63%	41.69%	2.78%	2.04%	3.09%	18.58%
		θ_1	0.564	0.535	0.695	1.089	1.171	0.686	0.402	0.639	0.564	0.754	0.783	0.582	0.744	0.508	0.423	0.857	0.806	0.721	0.763
			0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	V	α_0	0.006	0.007	0.012	0.030	0.051	0.097	0.007	0.026	0.007	0.012	0.006	0.010	0.008	0.006	0.010	0.025	0.034	0.008	0.017
			0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		α_1	0.005	0.014	0.010	0.016	0.108	0.104	0.077	0.165	0.000	-0.003	0.024	0.011	0.002	0.016	0.066	0.061	0.057	0.041	0.088
			31.41%	3.25%	1.99%	0.00%	0.00%	0.00%	0.00%	0.00%	97.14%	57.59%	0.00%	3.29%	67.44%	0.54%	0.00%	0.00%	0.00%	0.00%	0.00%
		γ	0.111	0.091	0.112	0.082	0.024	0.190	0.104	0.046	0.145	0.132	0.048	0.142	0.105	0.118	0.082	0.031	0.101	0.077	0.050
			0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		β_1	0.929	0.919	0.918	0.920	0.864	0.677	0.848	0.801	0.916	0.926	0.948	0.900	0.938	0.912	0.841	0.907	0.852	0.916	0.879
			0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
W	M	θ_0	-0.101	-0.081	0.038	0.053	-0.043	0.019	-0.022	0.115	-0.091	-0.128	-0.170	-0.101	-0.158	-0.108	-0.091	0.026	-0.213	-0.088	-0.184
			3.54%	7.98%	55.66%	53.21%	67.44%	79.19%	62.65%	13.34%	6.57%	4.99%	1.34%	4.45%	0.94%	1.76%	2.25%	74.19%	0.63%	28.60%	2.52%
		θ_1	1.324	1.306	1.737	2.595	3.051	1.926	1.255	1.950	1.263	1.803	2.003	1.385	1.721	1.217	1.125	2.300	2.234	2.114	2.241
			0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	V	α_0	0.117	0.112	0.421	0.447	0.480	0.714	0.138	0.147	0.107	0.392	0.084	0.101	0.111	0.224	0.353	0.041	1.249	0.391	0.079
			0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.31%	0.00%	0.00%	4.61%
		α_1	-0.061	-0.024	-0.063	-0.051	0.172	0.147	0.118	0.077	0.022	-0.033	0.005	-0.074	-0.001	0.022	0.043	0.050	-0.045	0.041	0.125
			0.00%	20.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	31.55%	8.77%	59.18%	0.00%	96.29%	37.53%	8.98%	0.00%	0.00%	13.93%	0.00%
		γ	0.373	0.257	0.348	0.183	-0.005	0.301	0.152	0.092	0.375	0.412	0.106	0.250	0.197	0.464	0.339	-0.020	0.266	0.054	-0.071
			0.00%	0.00%	0.00%	0.00%	87.69%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	19.12%	0.00%	6.77%	0.03%
		β_1	0.846	0.834	0.780	0.869	0.802	0.641	0.754	0.861	0.792	0.759	0.919	0.900	0.873	0.683	0.510	0.953	0.613	0.833	0.910
			0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

*The first row of a cell present the coefficient value of GJR model, while the second rows report the P-value of each coefficient.
**D represents for daily return; W is for weekly returns; M is for mean equation; and V is for Variance Equation

Table 5: The EGARCH results of daily and weekly returns

			North America			South America					Europe						Oceania		Asia				
			US	CA	MX	BR	AR	CO	CL	PE	UK	DE	FI	CH	SE		AU	NZ	CN	JP	KR	IN	RU
D	M	θ_0	-0.031	-0.004	0.010	0.048	0.066	0.034	0.018	0.042	0.003	-0.026	0.009	-0.014	-0.006		-0.002	0.002	0.019	0.026	0.024	0.012	0.026
			0.00%	64.07%	39.23%	0.42%	0.03%	0.34%	0.29%	0.00%	86.51%	3.88%	53.14%	15.32%	59.00%		81.85%	70.66%	11.44%	4.25%	6.91%	31.81%	13.98%
		θ_1	0.562	0.525	0.683	1.084	1.172	0.670	0.399	0.621	0.819	0.746	0.768	0.585	0.734		0.497	0.415	0.843	0.807	0.715	0.757	1.108
			0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	V	ω	-0.117	-0.118	-0.113	-0.112	-0.191	-0.291	-0.235	-0.290	-0.196	-0.104	-0.076	-0.148	-0.092		-0.138	-0.211	-0.136	-0.168	-0.137	-0.176	-0.175
			0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		α_1	0.151	0.144	0.146	0.148	0.269	0.348	0.269	0.383	0.010	0.133	0.101	0.183	0.121		0.168	0.206	0.188	0.205	0.182	0.236	0.248
			0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	15.38%	0.00%	0.00%	0.00%	0.00%		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		γ	-0.085	-0.067	-0.084	-0.061	-0.016	-0.081	-0.064	-0.035	0.010	-0.091	-0.050	-0.094	-0.085		-0.089	-0.058	-0.016	-0.071	-0.053	-0.045	-0.063
			0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%	9.02%	0.00%	0.00%	0.00%	0.00%		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		β_1	0.994	0.992	0.992	0.987	0.985	0.917	0.979	0.967	0.010	0.993	0.997	0.987	0.994		0.990	0.969	0.991	0.973	0.997	0.988	0.980
			0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	96.88%	0.00%	0.00%	0.00%	0.00%		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
W	M	θ_0	-0.099	-0.080	-0.003	0.063	-0.051	-0.016	-0.043	0.093	-0.120	-0.172	-0.193	-0.096	-0.129		-0.124	-0.107	0.015	-0.217	-0.060	-0.158	-0.360
			4.28%	7.04%	96.62%	46.84%	60.84%	86.71%	37.33%	19.71%	1.48%	1.18%	0.59%	5.18%	2.63%		0.79%	0.36%	85.44%	1.08%	45.51%	5.27%	0.00%
		θ_1	1.268	1.259	1.749	2.585	3.004	2.089	1.443	1.899	1.164	1.774	1.938	1.333	1.648		1.174	1.168	2.223	2.234	2.166	2.197	3.197
			0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	V	ω	-0.084	-0.114	-0.028	0.031	-0.193	2.849	0.424	-0.182	-0.136	-0.016	-0.063	-0.016	-0.111		-0.159	-0.323	-0.070	1.428	0.207	-0.116	-0.143
			0.00%	0.00%	17.29%	28.17%	0.00%	0.00%	0.00%	0.00%	0.00%	41.61%	0.11%	26.74%	0.00%		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		α_1	0.151	0.183	0.173	0.076	0.361	-0.033	0.152	0.277	0.229	0.121	0.120	0.069	0.182		0.278	0.501	0.097	0.072	0.152	0.182	0.438
			0.00%	0.00%	0.00%	0.45%	0.00%	29.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		0.00%	0.00%	0.00%	18.72%	0.00%	0.00%	0.00%
		γ	-0.236	-0.179	-0.172	-0.139	0.010	-0.312	-0.348	-0.054	-0.210	-0.206	-0.115	-0.205	-0.152		-0.198	-0.177	0.030	-0.304	-0.161	0.022	-0.071
			0.00%	0.00%	0.00%	0.00%	55.23%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		0.00%	0.00%	0.81%	0.00%	0.00%	4.43%	0.00%
		β_1	0.958	0.954	0.919	0.944	0.965	-0.618	-0.139	0.987	0.961	0.946	0.979	0.954	0.973		0.928	0.438	0.998	-0.067	0.763	0.991	0.925
			0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.84%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		0.00%	0.00%	0.00%	59.52%	0.00%	0.00%	0.00%

*The first row of a cell present the coefficient value of GJR model, while the second rows report the P-value of each coefficient.
**D represents for daily return; W is for weekly returns; M is for mean equation; and V is for Variance Equation

The Figure 1 show the comparison trend of the actual returns and the forecast returns of the six countries. As obtained from the figure, the forecast return based on GARCH model tend to capture well the trend of the actual returns.

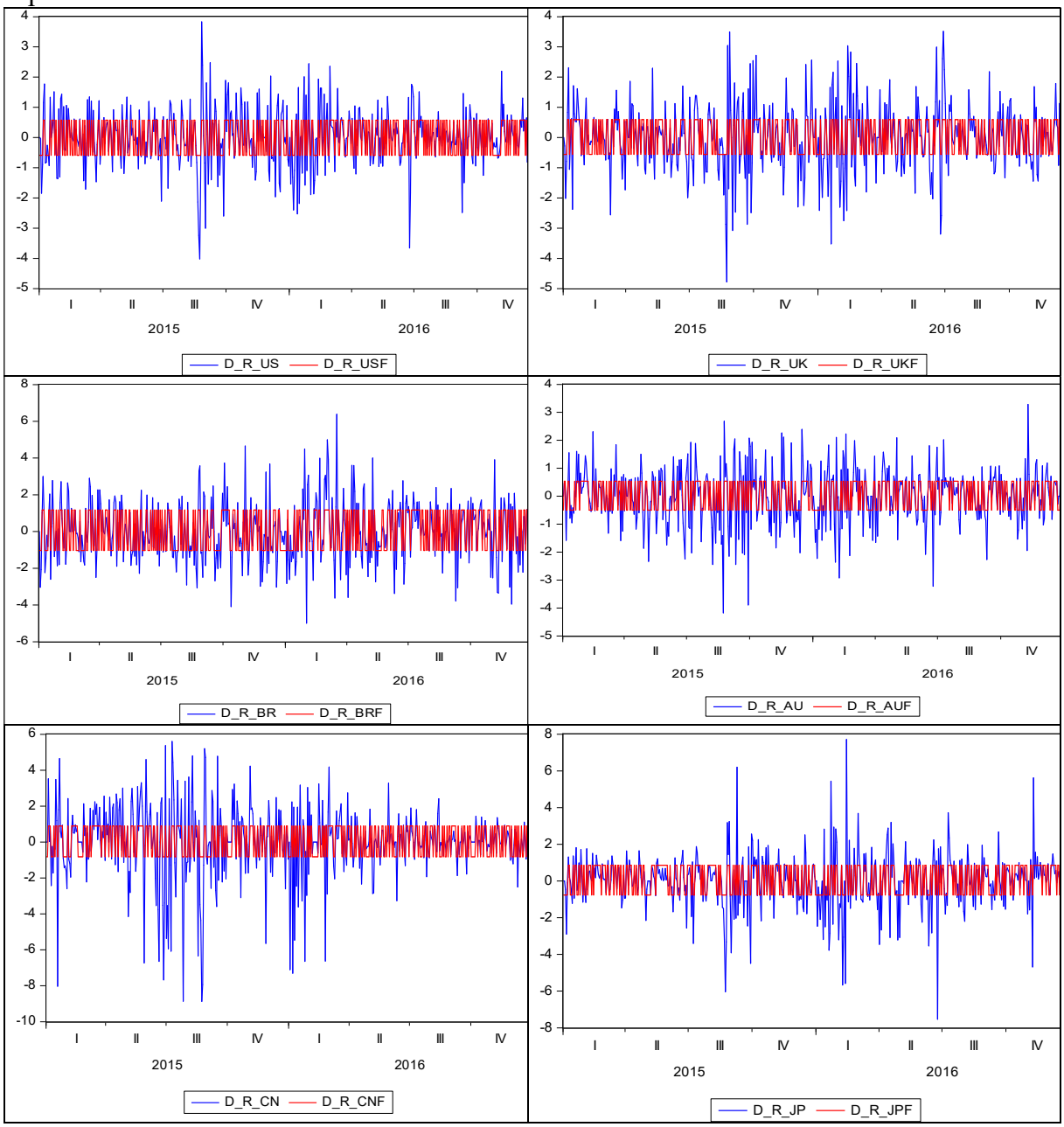


Figure 1: The comparison of the actual and forecast daily returns

The Figure 2 show the comparison trend of the actual and the forecast of monthly returns of six countries. The results are not different much from Figure 1, that is the time series momentum is capture well the trend of the indices in the out-of-sample data.

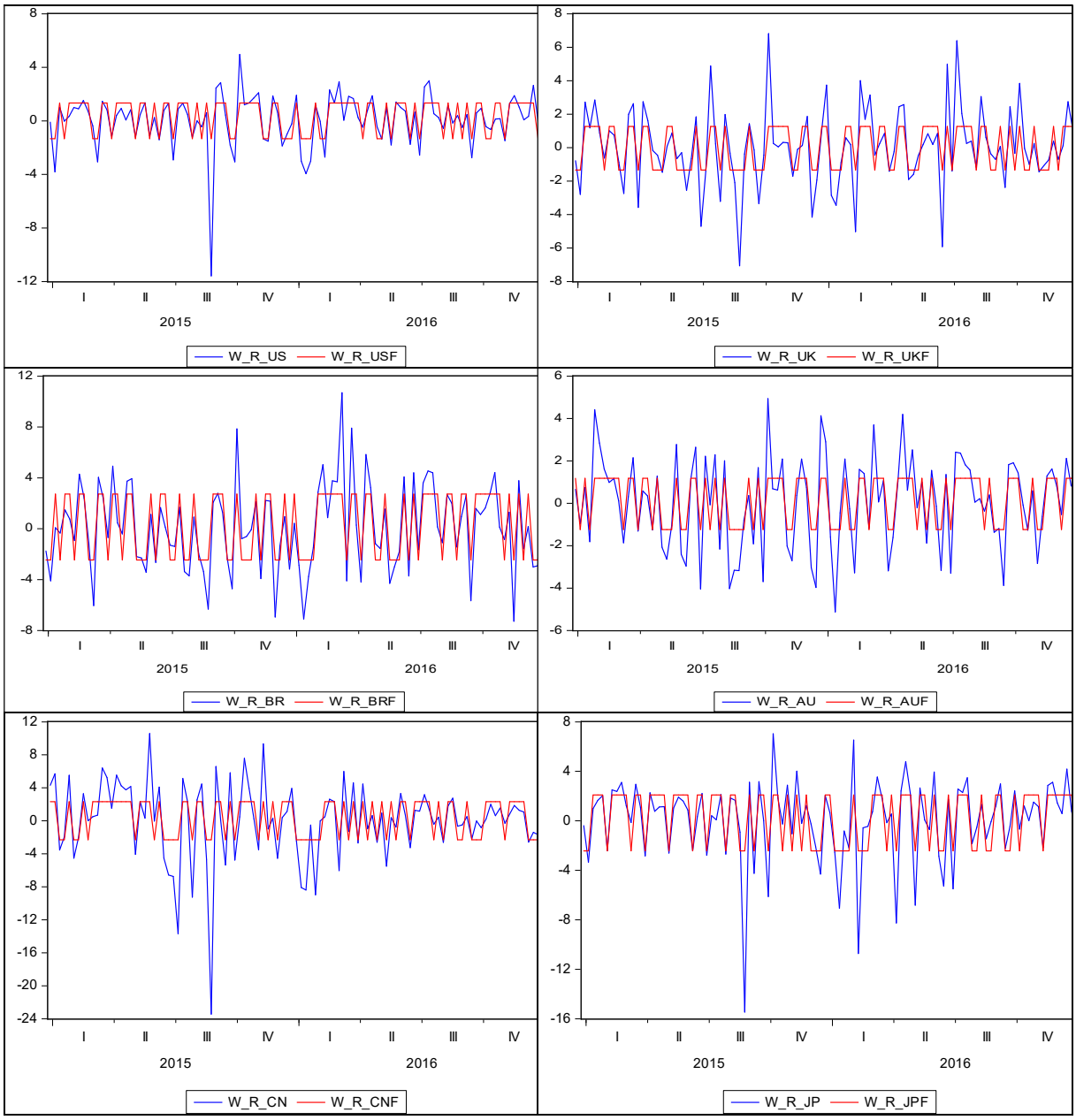


Figure 2: The comparison of the actual and forecast weekly returns

In sum, the forecast can do well it responsibility about the trend of the return will go up or down. For equity indices, standard GARCH can be concluded as the most suitable one for this job.

5. CONCLUSION

We re-examine the time series momentum by using the 20 most liquid equity indices of 20 biggest economy in each geographic region. Following the method of Kim et al. (2016), we do not scale the momentum by the volatility of return, instead of that, we allow the volatility to be conditional over time on its residuals and its previous values. We find that the time series momentum is more suitable with GARCH-type model, especially the standard GARCH model.

In addition, the higher frequency of the data will lead to the more precisely fitting of the model. Overall, the time series momentum have predicting ability internationally cross countries. Overall, the results are consistent with the prior time series momentum studies about the useful of time series momentum in predicting the trends of the future returns.

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IMPACT OF CORPORATE SOCIAL RESPONSIBILITY ON FINANCIAL PERFORMANCE OF THE COMPANY: THE CASE OF ORANGE POLSKA

Rentkova Katarina, Vartiak Lukáš

Abstract

A positive financial performance is desired by every company. To fulfill this desire, companies use various management methods and adopt different concepts. Corporate Social Responsibility (CSR) is currently a very popular concept. In general, adoption of the CSR concept brings companies a competitive advantage in terms of expanding their market share. But does it also have an impact on financial performance? The aim of the paper is to find out whether CSR has an impact on financial performance of the company. To fulfill the aim, a comparison of Orange Polska's financial performance in the two-year period before participating, in the year of participating and in the two-year period after participating in the European CSR Award Scheme is to be conducted. A comparison is being performed with an assumption that adoption of CSR improves financial performance of the company. Methods of analysis, comparison, selection and mathematics are being used. As a main finding may be considered that financial performance of Orange Polska wasn't improved. The reasons may vary but according to Orange Polska's medium-term action plan for the period of 2016-2018, its new strategic goal is to return to positive movement to its financial performance. This obliges us to future research aimed at comparing Orange Polska's financial performance in the period of 2016-2018.

Keywords: CSR, CSV, financial performance, financial indicators, Orange Polska

JEL Classification: G31, L15, O16

1.INTRODUCTION

It may seem that there is nothing new on the concept of Shared Value. However, Shared Value represents a conceptualization which is able to change and deliver real sustainability. Firstly, Shared Value is connected with the term Creating Shared Value (CSV) which can be a driver of the company's profitability. Secondly, there is a connection between Shared Value and Sustainable Development, as well as Corporate Social Responsibility (CSR). In general, CSV is able to influence the company's financial performance and adoption of the CSR concept brings competitive advantage in terms of expanding the market share of companies. But the question is whether CSR also has an impact on financial performance of companies.
In the 21st century, an importance of CSR has been increasing and its popularity grows as a result of popularization of this concept by non-profit organizations and public media. This is followed by the fact that the number of companies who have adopted the CSR concept continues to grow. This trend has not circumvented the telecommunications industry and telecommunication operators are thus becoming socially responsible. It is clear that their activities contribute to the welfare of the society and thanks to that socially responsible telecommunication operators acquire more customers. Of course, to differentiate them, there are those who are only at the beginning and those who have fully adopted the CSR concept. Orange Polska precisely belongs to the second group, as evidenced by the recognition in the form of participation in the first ever European CSR Award Scheme in 2013.

The aim of the paper is to find out whether CSR has an impact on financial performance of the company. To fulfill the aim, a comparison of Orange Polska's financial performance within a specified time frame is to be conducted. The paper is divided into five parts. Introduction represents an input to the problem. Theoretical solutions present the definitions of CSR and the results of studies indicating a relationship between CSR and financial performance. Objectives and methodology contain identification of research assumptions, as well as methods and sources used in the paper. Results and discussion consist of the main findings. Comparison of Orange Polska's financial performance is also included in this part. Conclusion evaluates the results in relation to fulfilling the aim of the paper.

2.THEORETICAL SOLUTIONS

The main difference between CSR and CSV is that CSR represents an older concept than CSV. The roots of the current CSR movement can be traced to the period 1945–1960. During this period, there were some limited discourses about CSR (Carroll & Shabana, 2010). The publication of Howard R. Bowen from 1953 named Social Responsibilities of the Businessman can be considered as the first to highlight the concept of CSR. He defined CSR as the obligations of businessmen to pursue those policies which are desirable in terms of the objectives and values of our society. Following this publication, various research projects have been conducted in an attempt to develop a more accurate definition of CSR (Tehemar, 2014). However, there is no agreed definition of CSR. So what exactly can be included in this term? In short, CSR is a concept whereby organizations integrate social and environmental concerns in their business operations and in their interaction with stakeholders. This whole concept is performed on a voluntary basis. The broadest definition of CSR is concerned with the relationship between global organizations, governments of countries and individual citizens. On a local level, CSR is concerned with the relationship between organization and local society in which it operates. Another definition is concerned with the relationship between organization and its stakeholders (Crowther & Aras, 2008). Therefore, CSR is a broad field that encompasses such terms as sustainability, corporate citizenship and social innovation. Also, CSR is attracting more attention than ever before (Bockstette & Stamp, 2011).
CSV was introduced in 2011 by Michael Porter and Mark Kramer in Harvard Business Review. Porter & Kramer (2011) defined it as "corporate policies and practices that enhance the competitiveness of a company while simultaneously advancing social and economic conditions in the communities in which the company sells and operates." According to Bockstette & Stamp (2011), CSR has been seen as a costly concept aimed against profitability, however with an introduction of CSV, companies started to realize that their engagement in non-profit areas can have a positive impact on their competitiveness at the same time. CSV is represented by "investments in long-term business competitiveness that simultaneously address social and environmental objectives." According to Ghasemi, Nazemi & Hajirahimian (2014), CSV is a higher development stage of CSR. It can serve as a helpful tool in achieving excellence and enhancing company's competitiveness. Končitíková (2015) shares the same view as she adds that CSV is currently perceived as a modern trend and an output or higher level of CSR. Moore (2014) thinks that with the general knowledge about the positives of CSV has been widely spread as a new way to run business and is being highly accepted by many governments, nongovernmental organizations and top-ranking companies in the world.
Another difference between CSR and CSV is that authors are sure that CSV has a positive impact on financial performance of companies but they are not uniform whether CSR can even influence financial performance of companies. Firstly, some studies indicate a positive relationship between CSR and financial performance. According to Cochran & Wood (1984), reported asset values of companies with higher CSR rankings are higher, which affects their

financial performance positively compared to their competitors. This is because they use their assets differently. Jones (1995) stated that stakeholder theory, an ethical theory that proposes managers have a duty to put stakeholders' needs first in order to increase the value of the company, influences financial performance by focusing on stakeholder satisfaction. The results of the study conducted by Pava & Krausz (1996) indicate that there are strong evidence supporting a positive correlation between CSR and financial performance. Also, there is a strong positive correlation between CSR, represented by a social reputation, and financial performance specified as accounting-based financial measures. This strong positive correlation is backed up by the stakeholder theory (Preston & O'Bannon, 1997). Meta-analysis, a strong method of research which weighs the parameters of individual studies as opposed to aggregating studies, conducted by Orlitzky et al (2003), provided a conclusion that CSR have a positive influence on financial performance of the company. This was confirmed on the basis of the existence of a bidirectional relationship between these two variables. Bird et al (2007) examined a range of CSR activities' impact on the market value of companies. They find evidence showing a correlation between CSR and financial performance. Horungová & Pavláková Dočekalová (2015) examined an importance of CSR to the financial performance of companies in Czech Republic with the result that standards of CSR bring many advantages, thus CSR "may have a greater importance in the management of company than, for example, achieving a certain level of profitability."
On the other hand, there are studies indicating a negative relationship between CSR and financial performance. An early study by Vance (1975) found a negative correlation between CSR and stock price. As a result, socially responsible companies are not good investments for investors. Also, a negative correlation between CSR and operating income growth was found in the study by McGuire et al (1988). It may be caused by high CSR ratings of several companies that tend to more stable earnings than other companies. Lopez, Garcia & Rodriguez (2007) analyzed CSR and financial performance between the years 2002 and 2004 by the accounting measure of profit/loss before taxes. The finding of a negative correlation between CSR and financial performance supports the theory that CSR is at a disadvantage because it is incurring unnecessary and avoidable costs. In our recent research (Vartiak, 2016) we examined financial performance of Slovak excellent companies (Business Excellence status). It was focused on companies awarded according to the EFQM Excellence Model which is also used for assessment of CSR. Our research has provided results that that in some cases, financial indicators of a company are affected by the achievement of Business Excellence status which goes hand in hand with CSR.

3.OBJECTIVES AND METHODOLOGY

The aim of the paper is to find out whether CSR has an impact on financial performance of the company. To fulfill the aim, a comparison of Orange Polska's financial performance in the two-year period before participating, in the year of participating and in the two-year period after participating in the European CSR Award Scheme is to be conducted. Orange Polska was selected as a socially responsible company which participated in the first ever European CSR Award Scheme in 2013. 2015 Annual report of Orange Polska containing of historical financials represents a main source of the secondary research. Golden Book of 2013 CSR Award Scheme is another important source. A comparison is being performed with an assumption that adoption of CSR improves financial performance of the company. According to Jankalova (2015), CSR performance can be assessed by the results of a financial analysis. That's why these financial indicators were selected for a comparison of Orange Polska's financial performance: Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA), Total Revenue (TR), Operating Cash Flow (OCF). Also, these financial indicators are the only financial indicators

which were measured in the case of Orange Polska during the whole period of 2011 – 2015. Definitions of mentioned financial indicators, according to Stofkova et al (2015), are listed in Tab. 1.

Tab. 1 – Definitions of financial indicators used for a comparison. Source: Stofkova J. et al. (2015). *Finance.* Bratislava: DOLIS s.r.o.

EBITDA	A net income with interest, taxes, depreciation and amortization added back to it.
TR	An amount of money that a company actually receives during a specific period, including discounts and deductions for returned merchandise.
OCF	A measure of the amount of cash generated by a company's normal business operations.

Secondary research is being performed with these research assumptions (RA):

- RA1: EBITDA tends to increase from 2013
- RA2: TR tends to increase from 2013
- RA3: OCF tends to increase from 2013

Secondary research includes comparison, analysis, selection and mathematical methods. Based on these methods, financial performance of Orange Polska is to be compared and RAs are to be tested. Results are to be presented in the form of text and graphs.

4.RESULTS AND DISCUSSION

Orange Polska is Poland's leading telecommunication provider operating in all segments of the Polish telecommunications industry. It owns the largest technical infrastructure in Poland with operations in fixed voice, data and mobile networks. Orange Polska's goal is to achieve a strong leadership position in all its core markets. Orange Polska is a socially responsible company since 2005 so its success is being founded not only on a broad portfolio of innovative products, a powerful, proactive sales force and outstanding customer care, but even on awareness of economic, social and environmental responsibility towards stakeholders. CSR policy of Orange Polska is focused on the following areas: Economy, Innovation, Community, Customers, Environment, Employees (Orange Polska, 2016).
As mentioned above, Orange Polska participated in the first ever European CSR Award Scheme in 2013. European CSR Award Scheme is initiated and funded by the European Commission, coordinated by CSR Europe and Business in the Community, supported by Alliance Boots, and implemented by National Award Partners together with national stakeholders. The first European CSR Award Scheme was a unique initiative to bring together CSR networks from 30 European countries to reward collaborative partnerships of business and non-business organizations. The awards received 749 applications – 259 in the SME and 490 in the large company categories (European Commission, 2013).
When looking at financial performance of Orange Polska, according to the methodology, EBITDA, TR and OCF between period of 2011-2015 are to be compared in following graphs.

These financial indicators, together with cost savings, EBITDA margin and dividend yield, are presented as key figures in Orange Polska's financial reports from 2011 to 2015.

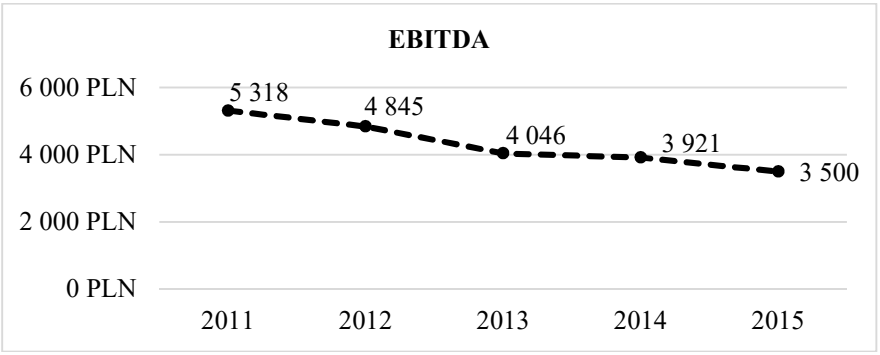


Fig. 1 – Orange Polska's EBITDA between period of 2011-2015 (in PLN millions). Source: Orange Polska. (2016). Annual Report 2015. Warsaw: Orange Polska.

Orange Polska's EBITDA between period of 2011-2015, illustrated in Fig. 1, was constantly decreasing during the whole period. The difference in Orange Polska's EBITDA between 2011 and 2015 represents a 34.19 % drop. Since we have assumed that EBITDA tends to increase from 2013, we can conclude that RA1 was not confirmed.

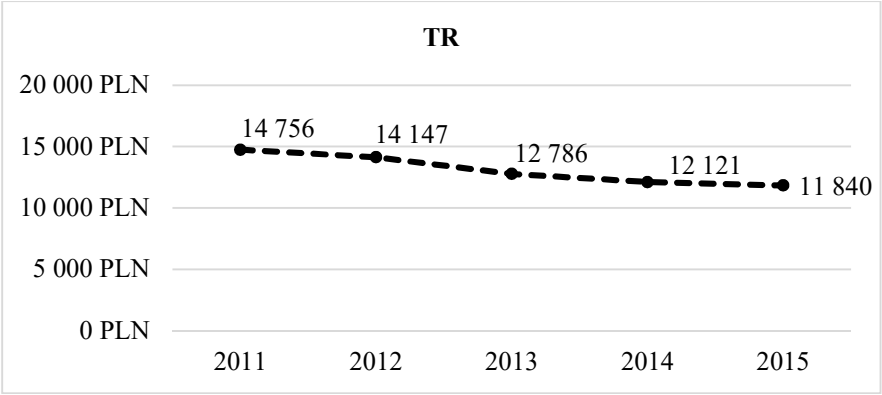


Fig. 2 – Orange Polska's TR between period of 2011-2015 (in PLN millions). Source: Orange Polska. (2016). Annual Report 2015. Warsaw: Orange Polska.

According to Fig. 2, Orange Polska's TR was also decreasing between period of 2011-2015. Compared to a large drop in EBITDA, there is a 19.76 % drop in Orange Polska's TR between 2011 and 2015. Since TR does not tend to increase from 2013, RA2 was not confirmed, too.

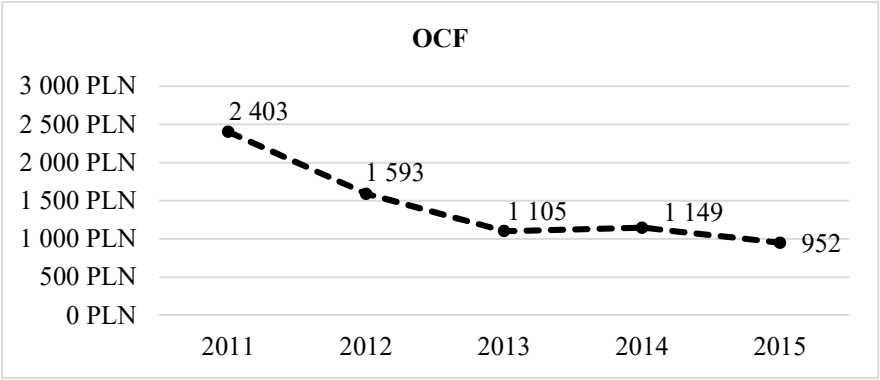


Fig. 3 – Orange Polska's OCF between period of 2011-2015 (in PLN millions). Source: Orange Polska. (2016). Annual Report 2015. Warsaw: Orange Polska.

An interesting situation occurred in Orange Polska's OCF comparison (Fig. 3) whereas its decrease from 2011 to 2013 was followed by an increase by 3.98 % in 2014 and subsequent decrease by 17.15 % in 2015. Therefore, RA3 was not confirmed.

5.CONCLUSION

As well as CSR is a long-term commitment, European CSR Award Scheme is not the end of the CSR journey of a company. Participating in European CSR Award Scheme delivers a long-term impact of its legacy and also provides long-term benefits. In order to ensure that the CSR journey of the European CSR Award Scheme's participants will continue, tangible outcomes such as improved relations with stakeholders, better company image and effective internal processes are promoted (European Commission, 2013). These factors, together with the results of conducted studies, have led us to the formulation of an assumption that adoption of CSR improves financial performance of the company. Since Orange Polska has adopted CSR in 2005 and participated in the first ever European CSR Award Scheme in 2013, it represents an ideal company to verify this assumption. Based on a comparison of Orange Polska's financial performance in the two-year period before participating, in the year of participating and in the two-year period after participating in the European CSR Award Scheme, we can conclude that the case of Orange Polska did not confirm an impact of CSR on financial performance of the company. This was also confirmed by testing of RAs:

- RA1: EBITDA tends to increase from 2013 – not confirmed
- RA2: TR tends to increase from 2013 – not confirmed
- RA3: OCF tends to increase from 2013 – not confirmed

Reasons of non-improved financial performance of Orange Polska in the period of 2011-2015 may vary. We can only assume that Orange Polska is aware of these reasons and action was taken to change it. As we look at its medium-term action plan for the period of 2016-2018 (Orange Polska, 2016), Orange Polska's new strategic goal is to return to a positive movement in TR and EBITDA in 2018. As a part of its medium-term action plan for the period of 2016-2018, Orange Polska expects that improvement of financial performance will be supported by revenue improvement, operating leverage and further cost optimization initiatives. This obliges us to future research aimed at comparing Orange Polska's financial performance in the period of 2016-2018. Other suggestion for further research is to examine what would be the financial performance of Orange Polska if it was not a socially responsible company. This can be examined through two ways. The first is an analysis of financial performance of Orange Polska in the period before it adopted the CSR concept. The second way is examination of financial performance of another comparable Polish company operating in the telecommunications sector which has not adopted the CSR concept.

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STAKEHOLDERS IN AUTOMOTIVE SECTORS IN THE CZECH REPUBLIC

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Abstract

Automotive industry in the Czech Republic is important and highly monitored. A reason for this is mainly the fact that the automotive industry contributes significantly to the formation of GDP, according to the Ministry of Industry and Trade (MIT, 2016) 15% long-term profit is made in the automotive sector. This sector also creates large quantities of jobs, it employs more than 150,000 people. Prosperity in the automotive sector therefore has an impact on the overall climate and standard of living in the Czech Republic and can be assumed by companies in public sectors and cooperate with stakeholders. The aim of this article is to show how stakeholders perceive companies through their annual reports, and how this perception of corporate social responsibility is linked to the performance of companies. The survey included 94 companies. It was not confirmed that the success measured by financial indicators is related to the communication with external environment.

Keywords: automotive, non financial indicators, stakeholders

JEL Classification: M14, M21, D92, G17, G32

1.INTRODUCTION

An important prerequisite for the future success of companies is monitoring, measuring and managing activities under indicators that the firm considers important. It usually uses indicators of financial analysis, but this is only a narrow view of financial performance. Many companies are operating within their KPIs and nonfinancial indicators, but rather focus on measurable indicators (such as market share and its development). Non-financial assumptions are both internal, which could be included in product quality and its further development, insufficient capital, capable management and well-educated and motivated employees - and all this in quality process management. An external prerequisite for success is continuous monitoring of customers and markets, as well as cooperation with other stakeholders and the wider environment company.

2.THEORETICAL BACKGROUND

Financial indicators are performance-driven, based on accurate numbers. Even this accuracy is limited, as shown by (Klečka, Čámská, 2015) for differences in the value indicators depending on the standards according to which company charges and thus counts indicators. Corporate success is measured only in terms of the past. Good state firms built on previous successful development is one of the prerequisites for success in the future, but it is not a single condition nor sufficient. If a company wants to build long-term prosperity it must exploit market potential and itself to seek or create new opportunities. Ongoing work to improve their competitiveness is a necessary condition for survival (Porter, 1998). What is recommended for building long-term competitiveness is the perception and collaboration with broader neighborhood businesses, the so-called stakeholders. The question is how to measure the degree of

cooperation and how to record in charts. During direct questioning in enterprises, the respondents' answers shift from reality to a perceived ideal state (Štamfestová, 2014).

2.1.Measuring the success of the company without financial indicators

The prerequisite of competitiveness is not only the subject´s current financial performance. Other assumptions can (Nečadová, Soukup, 2013) be divided into quantitative (price, cost, market share, productivity) and qualitative (research and development and application of results, personnel policy, doctrine). The condition is not only creating value for the shareholder, but its share for stakeholders (Neumaierová, 2012). This implies a need to monitor as well as customers, as well as suppliers, the satisfaction of the public and state administration, which affects the company's image.
Without monitoring internal and external growth assumptions and the valuation of the company, the company runs the risk that its success will not last long. It is necessary to devote optimization within the company but also to issues of retention and growth - innovation, research, markets, customers, employees, workers, etc. Moving from a financial perspective for non-within the Performance Management induces the formation of a number of systems for measuring performance. The prerequisites of successful companies were studied by (Pollak, 2004), when reviewing the vitality of companies with 10 criteria (they have a different weight), of which only two were of financial nature (cash flow - interest rate and structure of capital resources), others focus on the future and stakeholders.
The Foundation for Performance Management recommends using a range of non-financial indicators (Shaw, 1999) that are grouped into five groups based on production and product, Sales and Marketing, Human Resources Management, likes and internal environment. What is missing is a greater focus on cooperation with the wider enterprise environment. The most quoted and probably most widely used model is the Balanced Scorecard (Kaplan, R. S. Norton, D. P., 2000). This model is based on the transformation of the company's strategy to set verifiable indicators that cover all areas of the company. Balanced Scorecard concept, according to its authors, consists of four dimensions. In addition to the financial aspects of this, the concept also encourages the monitoring indicators within the next three perspectives: customer, internal business process perspective and learning and growth. All four perspectives are interconnected system of causal relationships with direct connection to business strategy.
In the Czech Republic, an extensive research was carried out (Štamfestová, 2014), when they were asked about the company on a variety of soft features, which the author grouped into 10 categories - financial and market performance, production quality and customer satisfaction, information technology, innovation, education, satisfaction and motivation and company image.
Trying to pick up the company's image often produces inconsistent results in terms of CSR. Overall, businesses accessing the corporate philantropy more purposefully. Basic preference is derived from the need to achieve basic financial and economic business objectives. The corporate philanthropy is always a part of the marketing strategy. The goal of the corporate philanthropy is to improve the image of the company. (Boukal, Špička, 2014). The organization may communicate its engagement in sustainability and may presents results achieved in this field by creating and publishing corporate social responsibility (CSR) reports. Despite the increase in the number of such reports their quality is different. (Habek, Wolniak, 2016).

2.2.Competitiveness, long term success and financial indicators

Corporate success is often measured by financial indicators. Those often used primarily for communication with the professional community can be divided into 3 groups:

- Absolute (EAT, EBIT, EBITDA)
- Ratio (ROE, ROA, asset turnover)
- Growth (sales growth, profit growth, g).

For measuring success with one indicator, one can use creditworthy or bankruptcy models; however, it is necessary to choose a model with good predictive ability. The models are built based on the application of statistical methods and their information value is burdened with error that increases when using a longer delay. It has been shown that it's better to use an indicator derived straight from the company. Therefore, it's useful to choose an approach of calculating EVA as a top indicator revealing real contribution to the company and its long-term development.
The purpose of this approach is to analyze and evaluate the impact of the production system and resistance against the competitive forces in the value-chain on partial processes, which add to the product as a specific measurable value EVA – Economic Value Added (Porter, 1996).
Economic Value Added (EVA) is defined as

$$EVA = NOPAT - C \times WACC \quad (1)$$

where
NOPAT is Net Operating Profit after Tax,
C Firm Capital,
WACC Cost of Capital.

Comparing businesses of different sizes is problematic; therefore, the following method will be used further.

A successful long-term firm creates value, therefore EVA > 0, ie.
$NOPAT > C \times WACC$

or

$$NOPAT / C > WACC \quad (2)$$

Because for non-financial firms is

$EBIT > NOPAT,$

then it is possible to use the previous rule, so that if

$$ROA > WACC, \quad (3)$$

then also NOPAT/ C will be greater than WACC and thus in case of ROA > WACC company creates economic value added.

The financial performance of the company's competitiveness existence may therefore be an indicator ROA, respectively its value being greater than WACC.
Klečka (2013) used EVA for finding the best of financial indicators for productivity too.

2.3.Annual report

The Annual Report is a document that gives information about the development of the Company's fiscal year. The company informed through an annual report on the financial condition, business and results of operations for the past financial year and on the future outlook for the financial situation, business activities and expected results. The annual report is a marketing communication tool, through which the company presents its goals, philosophy and contemporary communication theme. A well-crafted annual report helps build the company's image, increases its credibility and strengthens its market position.
Annual reports are required to complete by those companies that must have audited financial statements. According to the Act no. 563/1991 Coll. a joint stock company is a company that compulsorily generates equity capital and in the previous year, with two of the three following criteria: the amount of their balance sheet amounted to more than CZK 40 mil., Net sales amounted to more than 80 million CZK. The average amount of employees is over 50 people.
The purpose of the annual report is to present a comprehensive, balanced and complete information on the development of performance, activity and current economic position of the company. Since the text of the law is rather general, it is also general in its interpretation. Besides the general description of what the annual report describing the Accounting Act gives yet another specific area, which is contained in the annual report of financial and non-financial Expression.
The annual report explicitly lists the following points:

- Facts that occurred after the balance sheet date and are important for fulfilling the purpose of the annual report (have an effect on performance, activity and current economic status)
- Expected development entity
- Activities in research and development
- Activities in the field of environmental protection and labor relations
- Information on the enterprise organizational unit abroad if it is established
- Objectives and risk management (pricing, credit, ...) of the company, etc.

The Company may mention in the annual report other information, such as:

- Introduction by the CEO, chairman
- Information on the activities of the company with regard to its activities;
- Information on the company's donation, etc.

Integrated reporting is one of the latest innovations regarding sustainability reporting and non-financial information in the world. The research of trends show, that reporting practices have been ahead both from theoretical developments and institutional efforts (Rivera-Arrubla, Zorio-Grima, Garcia-Benau, 2016).
The European Commission has prepared a directive (European Comission, 2015), which from 2017 recommends: "Large public-interest entities (listed companies, banks, insurance undertakings and other companies that are so designated by Member States) with more than 500 employees should disclose in their management report relevant and useful information on their policies, main risks and outcomes relating to at least

- environmental matters,
- social and employee aspects,
- respecting of human rights,

- anticorruption and bribery issues, and
- diversity in their board of directors.

There is significant flexibility for companies to disclose relevant information (including reporting in a separate report), as well as they may rely on international, European or national guidelines (e.g. the UN Global Compact, the OECD Guidelines for Multinational Enterprises, ISO 26000, etc.)"

Cited directive will apply to large entities, but those patterns will also affect the behavior of their partners - suppliers, customers, competitors. The aim is to monitor voluntary (not forced) behavior of firms in this area. Existing article (Lo, Ramos, Rogo, 2017) find that firms most likely to have managed earnings to beat the prior year's earnings have Annual report more complex.

The article focuses on the analysis of observed or rather described facts in the annual reports of smaller entities, which are not, however, the final suppliers on the consumer markets, they move within B2B. An original equipment manufacturer refers to a company that makes a final product for the consumer marketplace. Tier 1 companies are direct suppliers to OEMs. The term is especially common in the automobile industry and refers to major suppliers of parts to OEMs. Tier 2 companies are the key suppliers to Tier 1 suppliers. Tier 3 companies are supply Tier 2 firms. Tier 4 companies are the providers of basic raw materials, such as steel and glass, to higher-tier suppliers. (AIA, 2016).

We are interested in companies in Tier 1 and Tier 2. It can be expected that companies in the Czech Republic will not comment on the respect of human rights, because it is automatically assumed. On the contrary, the issue of diversity on the board is a problem that will probably not be mentioned because a Czech company has a rather dismissive view to setting artificial criteria of diversity. Mentions of diversity are considered an artificial intervention in the internal affairs of the company.

3.METHODS

The aim of research was to determine how to behave in company reports, without being under pressure - whether at the market of risk or legislation. We are also interested in the company with its own product in Tier1 or Tier 2 automotive.

The basic restrictions in selecting companies were:

- medium enterprise (50 - 500 employees),
- automotive sector,
- transparency (the company published all annual reports the last five year).

The condition of transparency was proven to be very restrictive, because the attitude towards compliance with data publishing was and is poor in the Czech Republic (Bokšová, 2013).

We decided to maintain this condition. The reason is it can be expected companies remaining in the sample are willing to be transparent towards stakeholders. These are exactly the companies we want to use in deriving the results - which stakeholders and which non-financial indicators are important to them and how they relate to the creation of economic value added.

The aim of the selection was to obtain annual reports of medium-sized companies, which have their own production. We analyzed the annual reports of 2015, a relatively quiet period in economic terms. 2015 can be perceived as an economic stimulus (MIT, 2016) in terms of macroeconomic parameters and results of the companies in the industry.

94 firms in the survey sample were selected on the basis of the above criteria.

(Tokarčíková, Ďurišová, Malichová, 2015) discusses the way how to identify the right indicators of sustainability in the process of reporting and evaluation in automotive company.

Expectations are that companies after publishing transparent information about their financial and non-financial performances will have lower costs, attract and retain more effective employees and will tend to be more successful in a long-term perspective.
On the basis of previous researches the following aspects were selected and monitored from annual reports:

- Financial indicators
- Comments on the plan performance
- View for next year
- Long-term strategy
- Research and Development
- Market development
- Customer satisfaction
- Relations with suppliers
- Human Resources
- Sponsorship and donation
- Local community and work with it

Evaluation was carried out by scaling when the criteria mentioned in any part of the text scored on a scale of 0-5 according to the rules in the table. 1.

Tab. 1 – Rating occurrence - an explanation of scaling. Source: own processing

Scale	Evaluation	Description	Gross rating
0	non-existent	is no mention of it	or even no relationship with the company
1	not enough	the aspect is only mentioned	
2	marginally	the aspect is developed	is elaborated and mentioned in links
3	significantly	the aspect is perceived in links	
4	consistently	the aspect is perceived and evaluated	is comprehensively evaluated
5	complexly	the aspect is a complex perception and includes evaluation and planning	

The difference between when the firm does not even mention the aspect in its report or at least mentions may seem significant. Unfortunately the difference is often marked by whether a company generates annual report independently or use a recommended template. There is virtually no difference between 0 mentions about R & D and stating that the company "does not and will not have R & D". Likewise employee care summarized by the phrase "enterprise is involved in no legal disputes with their employees," does not attest the perception of employees as allies in building a corporate prosperity. Therefore, evaluation scales are finally summarized into a less articulated Gross rating.

To search for links between financial and non-financial success factors, companies are divided into five groups according to ROA (see Tab. 2).

Tab. 2 – Groups according to ROA. Source: own processing

Group	ROA	Description	Companies	Percent
A	ROA < 0	loss	7	7%
B	0 < ROA < 2.5%	weak	11	12%
C	2.5% < ROA < 10%	short-term OK	30	32%
D	10% < ROA < 20%	good	33	35%
E	ROA > 20 %	excellent	13	14%

Limits were chosen as

- 2.5%, which is a long-term risk free rate (long-term bonds),
- the 10% is typically WACC in the sector Auto Part for Europe 2015 (Damodaran, 2015) and
- 20% - this is limit, that has been expertly chosen as an excellent ROA.

The aim was to answer the following research questions:

1) Is there a relationship between non-financial indicators in the Annual Report and the financial success of the company?
2) Does the monitoring of specific non-financial indicators vary depending on the extent to which the company is successful?
3) Which indicators of the company's automotive sector are paying more and which less?
4) Is the monitoring of indicators different in automotive sector and in the manufacturing industry?

The data processing used basic statistical tools - correlation analysis and descriptive statistics.

4.RESULTS AND DISCUSSION

Table 3 shows the relationship between the monitored non-financial aspects and ROA. Dependency was monitored using non-parametric correlation analysis. The table indicates statistically significant mutual relationships, where a statistically significant correlation relationship has been confirmed (at a level of 95%).

Tab. 3 – Correlation of indicators: own processing

		2	3	4	5	6	7	8	9	10	11	ROA
Financial indicators	1	0.32	0.15	0.17	0.18	0.17	0.07	-0.11	0.22	0.14	0.04	0.02
Implementation of the plan	2		0.29	-0.02	0.30	0.07	0.07	0.14	0.28	0.11	0.03	-0.11
Next year´s perspective	3			0.30	0.24	0.05	0.15	0.19	0.21	0.17	0.20	0.05
Long-term strategy	4				-0.06	0.10	0.12	0.12	0.05	0.01	-0.06	0.01
R & D	5					-0.05	-0.06	0.14	0.26	0.15	0.06	0.08
Market	6						0.01	-0.10	0.07	-0.13	-0.05	-0.06
Customer satisfaction	7							0.19	0.17	0.00	0.29	0.01
Relationship with suppliers	8								0.15	0.13	0.14	0.05
Human resources	9									0.29	0.28	-0.05
Sponsors and donors	10										0.26	-0.09
Local community and env.	11											-0.02

The table shows that there are two non-financial indicators that have no dependency with any other indicator, and those are monitoring the market and relationships with suppliers. Conversely, the biggest degree of conjunction with the others shows the indicator of next year´s perspective. Thus, if supported by the companies, devoting more focus to these values (for example, instructions on what to target in the template used) would likely increase the overall usage of non-financial indicators in annual reports for the stakeholders' interests.
Another finding is that a relationship between the assessment of relations with stakeholders in annual reports and financial performance monitored through ROA has not been confirmed.
We also monitored the extent to which the above facts in the annual reports are monitored; for that we used the Gross rating, its mean value, standard deviation and coefficient of variation, which compares the standard deviation to the mean value (coefficient of variation = standard deviation/ average). The fields Next year´s perspective and Human resources have been proven to be the most intensively evaluated, they even have a lower coefficient of variance.

Tab. 4 – Value of Gross rating of indicators. Source: own processing

	Average	Standard deviation	Coeff. of variance
Next year´s perspective	2.81	1.40	0.50
Human resources	2.64	1.46	0.55
Implementation of the plan	2.40	1.45	0.60
Financial indicators	2.30	1.45	0.63
R & D	2.04	1.39	0.68
Long-term strategy	1.72	1.20	0.69
Relationship with suppliers	1.64	1.10	0.67
Market	1.34	1.00	0.74
Customers satisfaction	1.34	0.91	0.68
Sponsors and donors	1.13	0.57	0.50
Local community and environment	1. 13	0.57	0.50

Fig. 1 shows the evaluation in detail groups (first and second column of Table. 1) .

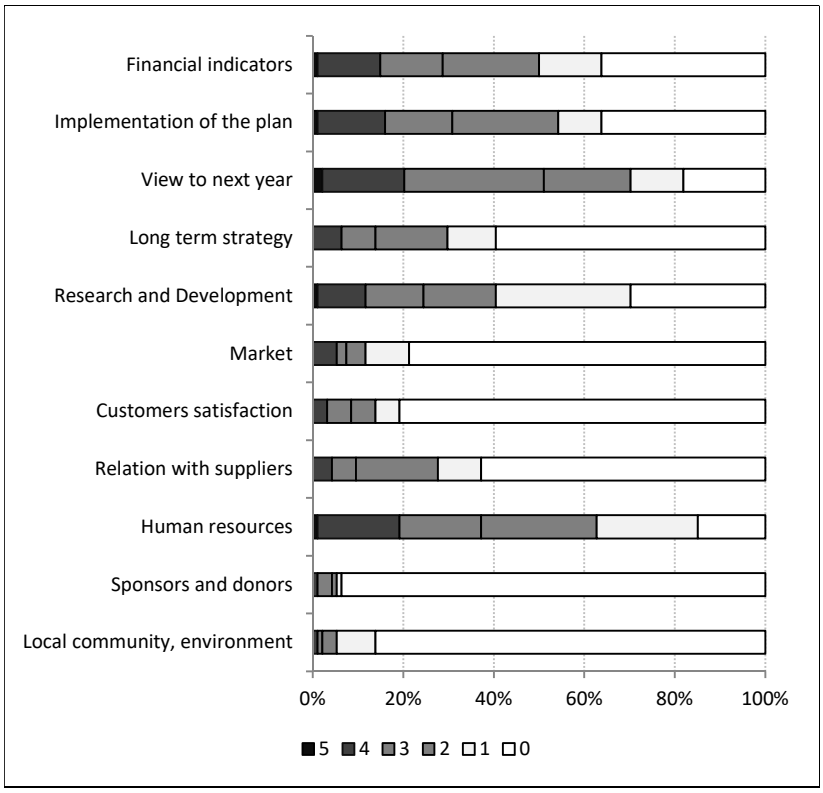


Fig. 1 – Evaluation indicators - detail. Source: own processing.

Table 4 illustrates that

- the relationships with suppliers are more concerning for companies with losses or, conversely, significantly profitable,
- unprofitable businesses mention the care for employees the least, it is most addressed by companies with zero or very small profit,
- R & D focus most on extremely profitable businesses,
- implementation plan: attention is paid most on non-profit and low-profit businesses.

Although it is not a provable claim, it seems that, even though no correlation between attention to stakeholders in the Annual Report, there are indications that the profitable automotive companies monitor indicators pointing at the future; the less successful are more concerned with the past.

Tab. 5 – Averages indicator values in groups according to ROA. Source: own processing

	A	B	C	D	E	all	var
Relationship with suppliers	2.1	1.4	1.5	1.6	2.1	1.6	0.10
Human resources	2.1	3.0	2.7	2.6	2.7	2.6	0.08
Research and Development	2.1	1.7	2.0	2.0	2.5	2.0	0.07
Implementation of plan	2.4	2.6	2.5	2.4	1.9	2.4	0.06
Market	1.3	1.0	1.4	1.5	1.0	1.3	0.05
Customer satisfaction	1.0	1.4	1.3	1.5	1.0	1.3	0.05
Sponsors and donors	1.6	1.0	1.1	1.1	1.0	1.1	0.04
Next year´s perspective	3.0	2.5	2.9	2.9	2.7	2.8	0.04
Financial indicators	2.1	2.3	2.1	2.5	2.4	2.3	0.02
Local community, environment	1.0	1.4	1.1	1.1	1.2	1.1	0.02
Long-term strategy	1.9	1.5	1.7	1.8	1.8	1.7	0.01

In comparison with the analysis of annual reports done last year using companies in the manufacturing industry (Scholleova, 2016) we can see that the automotive businesses and companies in manufacturing industry are comparable. Automotive companies monitor R & D and human resources less, while they are more engaged in the implementation of the plan and the future. The comparison is shown in fig. 2.

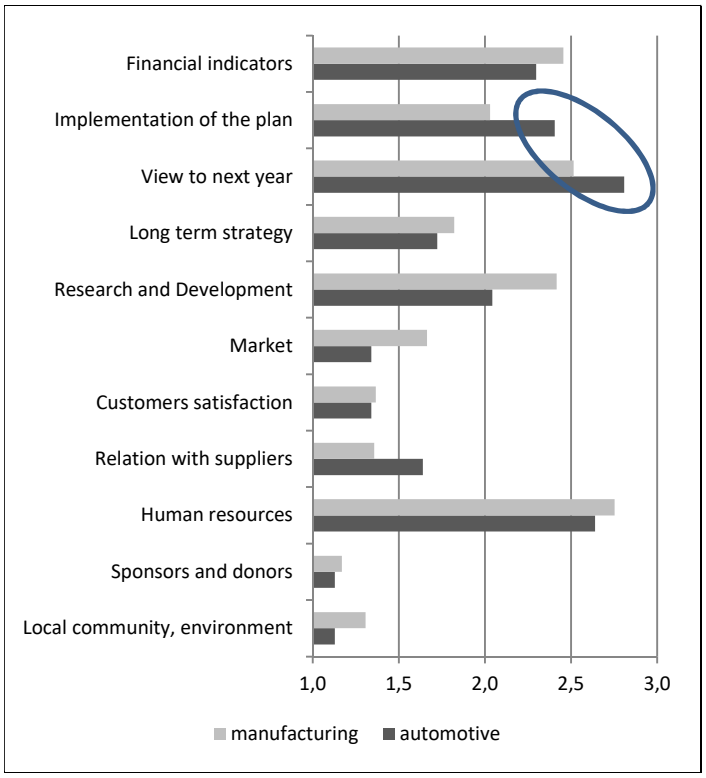


Fig. 2 – Comparison of Automotive and manufacturing industry. Source: own processing.

5.CONCLUSION

The compilation of annual reports is the duty of every company; content and form are partly strictly prescribed, partly a recommended template. Reports should address both financial results and the development of non-financial conditions and relations, on both external and internal levels of communication and should be examining the past as well as the future. In fact, companies devote little attention to annual reports. It is obvious that annual reports are more of a forced document of communication rather than being used as information material. Companies in CZ do not really tend to be transparent, only a minority publish its results (required by law) without reminders and enforcement fines. The objects of the study were annual reports of transparent medium enterprises from the automotive industry, which have a great significance in the Czech Republic as employers, manufacturers and exporters. The survey shows that watching and commenting on a circle of non-financial indicators is not too developed, and in some areas not used at all (communication with the local community, sponsoring). In reports, attention is only paid to evaluating past and future perspectives and employees. Tracking individual non-financial indicators did not show any correlation with the creation of economic value added.

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TRANSFORMATION OF TRADITIONAL MANAGEMENT MODEL

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Abstract

The article deals with the transformation management model in the Brazilian company Semco. It describes the transition from a militarist model used for participatory management model and analyses organizational implications that the transformation brought. Theoretical background gives and insight into new paradigms of management, management dilemmas and management innovations. The main part of the paper is based on case methodology. Empirical stud includes a brief history of the company, the arrival of new leader, organizational diversity, radical changes in corporate governance and new principles and values such as sharing of information, profit sharing and freedom. The article concludes with the finding that adapting the work environment to people makes to feel a strong sense of belonging to the company and at the same time it eliminates dilemmas of management that the traditional management model is facing.

Keywords: amorphous structure, dilemmas of management, participative management, reengineering

JEL Classification: M10, M20, L20

1.INTRODUCTION

The backbone of today´s economy are still enormous corporations. The impact of these corporations on society is so significant that we have the impression of living life in the world of organizations. This world is characterized by Drucker (2004) as "new pluralism" or in other words, institutional diversity and distribution of power. A central source of this world and its case is management. Maybe that´s why Drucker (2002) identified management as a social function. Its aim was to ensure the results and performance of the organization. However, some organizations and their management don´t reflect the fact that real success always lies outside because only cost centres are located inside organizations (Slinták, 2016). The only profit centre is customer. Besides this, this also leads to changes in business environment due to economic, social, technological and political changes. It creates a space for describing these changes connected with the old and new paradigms of management.

Nowadays, we can see organizations that are in captivity of past paradigms as well as organizations that are trying to adapt to new paradigms of management. This fact is connected with findings there are at least four apparent contradictions from which a new model of management can be constructed. The dilemmas are: 1. Management or leadership, 2. Hierarchy or community, 3. Trust or control, 4. Profit or service.

In order to explore these discrepancies, a study of Brazilian company Semco will be used. It offers plenty of examples from the field of management thinking and practice which is related to the transformation of the military management model known as participative management. In the next part of this article, we will therefore try to answer the question, what management practices lead to the transformation of management model and what effects transformation of management model can bring.

2.METHODOLOGY

This article is based on the case methodology. Basically, this approach is a form of empirical study which is a suitable for the comprehensive exploration of the phenomenon. The phenomenon in this case are the dilemmas of management. This phenomenon will be examined in the context of the practices of the Brazilian company Semco. The reason, why this company has been selected, is its unusual management model that defines current managerial thinking. Due to this fact it is possible to examine the existing management problems through the perspectives that reflect the practices of this company.
Case methodology is not based on statistical basis. Disadvantages of our research can be seen in not generalizing the results from our study. On the other hand, we suppose that it is possible to reveal and describe some theoretical limits in a specific situation which arise due to specially modified conditions of business practices. Therefore, our attention is to study specific features of an unusual management model, and this practices compare with today´s management issues.

3.THEORETICAL BACKGROUND

3.1.New paradigms management

Every scientific discipline consists of a set of assumptions that determine how we perceive the reality around us. These assumptions set out the boundaries of our knowledge. Premise defines the content of various disciplines and determine what is permitted. This does not apply only to the natural sciences but also social sciences. In the case of management, i.e. the prevailing theory, the paradigms offer a much greater impact on human communities than in the natural sciences. This means that if we build on bad paradigms in science, for example that Earth is the centre of the universe, it would not have too much impact on the lives of individuals. However, the same is not true for social disciplines such as management. If we come out of a bad premise in management, for example that people are machines, it can have far-reaching consequences on the lives of individuals, either in the form of individual motivation, psychological development or individual happiness. In this context, Drucker (2002,2007) identified two basic sets of premises which defined theoretical and practical level of management from 30s of the twentieth century. From the mentioned, we can define especially: 1. There is only one correct organizational form, 2. There is only one correct method of managing people, 3. Market, technology and customers remain essentially unchanged, 5. Markets are defined by national borders. At the same time, he notes that none of these premises is valid anymore. Thus, it is a task of management to redefine these premises to meet the needs and requirements of today´s world. Management dilemmas are a key topic also for many other authors. In the literature, we can find references to literature sources that deals with different dilemmas (such as contradiction between governance and management) as well as sources that expand Handy's view with other conflicting elements in the contemporary theory of management.

3.2.Management dilemmas

The crisis in the contemporary perception of management is described by Charles Handy (2016) in his essay *The New Management*. He argues that management is struggling with internal ambiguity that need to be solved. Solving dilemmas of management should lead to the creation of a new management model. According to Handy (2016), the current management faces these dilemmas: 1. Management or leadership, 2. Efficiency or effectivity, 3. Trust or control.
In the case of authors, who describe partial dilemmas, most of the attention leads to conflict between management and leadership. The scope of scientific articles and books devoted to this

issue is so big that we will try to summarize only the basic thoughts defining these concepts. They are summarized in the following table.

Tab. 1 – Fundamental lines of thoughts on management and leadership. Source: own.

Fundamental idea	**Authors**
The manager restricts freedom, while the leader does the opposite – he gives space to others in an effort to pass on to them a greater part of responsibility.	Zaleznik (1977)
Managers are dependent on organizations; organizations are dependent on leaders.	Gardner (1990)
The manager does things right. The leader does the right thing.	Bennis (1990, 1994), Drucker (2002, 2008),
Managers are trying to motivate people (you have to). Leaders try to inspire people (to they want to do something).	Marrioti (1998)
Organization shouldn't control people. The challenge is to lead people. And the goal is a productive use of strengths and knowledge of people.	Drucker (2007)
Management relies on the power that results from formal hierarchy. Leadership comes from authority that you have to deserve (on the basis of your abilities and willingness to serve others).	Kanter (1989), Handy (2016),
There are two basic levels of performance which are namely to manage things (i.e. management) and to get to certain point or focus (i.e. leadership).	Carter-Scott (1994), Kouzes and Posner (2006)
Management (controlling) should be applied to systems, processes and artificial things. Leadership is about people.	Covey (2013, 2014), Handy (2016)
Management ensures the coherence of organizations. It is a source of order. Leadership creates the future. It brings changes and innovations.	Kotter (1990), Handy (2016)

3.3.Management innovation

Authors, who are of a crucial importance in this area, are Gary Hamel and Bill Breen (2008). The book and the article *The Future of Management* shows the destructive impact of management of the industrial age and its authors introduce three major challenges faced by today´s management: 1. Accelerate the pace of strategic self-renewal, 2. Make innovations to work for everyone, 3. Adapt working environment in a way that it strengthens human abilities such as initiative, creativity and passion. Management innovations often faces obstacles that arise as a result of persistent paradigms (see Slinták, 2013). In these obstacles, we can see contradictions of management as described by Charles Handy. Hamel and Breen (2008) argues that we create organizations that are not human oriented (see also Hamel, 2012). It may be caused by: 1. Too much management (discipline), too little leadership (freedom), 2. Too much bureaucracy (the rules), too little community (shared purpose), 3. Too much external stimulation (you must), too little meaning (I want). Other authors also follow the findings and knowledge of the above mentioned authors. The proposals of these authors are often incorporated into the organizational models which seeks to eliminate individual differences. An example might be a model of chaordic organization (Hock, 1995, 1999) which seeks a balance between order (management) and chaos (guidance), model of single company (Košturiak, 2016) which offers an alternative to companies based on traditional management model, model of

learning organization (Senge, 2016) which is built on the creation of suitable working conditions for the development of human beings, team learning and shared vision or model of biotic organization (Slinták, 2015) which deals with the conflict between management and leadership, hierarchy and network, trust and control and service and profit. One of these models is also a model of participatory governance applied by Brazilian company Semco. Specific features of this model are further described in the following sections.

4.EMPIRACAL STUDY: SEMCO

4.1.Birth of the company

Semco is a Brazilian company founded in Sao Paolo in the 1950s. It was set up by Antonio Curt Semler, an Austrian born engineer (Semco, 2016). It was originally focused on manufacturing centrifuges for the vegetable oils industry. The introduction of the Brazilian government's National Shipbuilding Plan in the 1960s, provided Semco with a new opportunity, and the company commenced production of hydraulic and load pumps, axles and other naval components (Stockport, 2010). During 1960-1970, company equipped over 70 percent of the domestic fleet.

4.2.A new leader

Ricardo Semler (Antonio Semler ´son) joined the company in 1980, 27 years after Semco was set up, it had about 100 employees, manufactured hydraulic pumps for ships, generated about $4 million in revenues, and teetered on the brink of catastrophe (Semler, 1989). Ricardo became increasingly frustrated with the lack of real responsibility, and the condescension with which the other Board and senior staff treated him. His ideas for diversification were mostly ignored (Semler, 2001, Stockport, 2010). Finally, he was appointed president of the company by founder (his father), which gave him the power to enforce radical organizational changes. Under Ricardo´s influence, Semco started to focus on a small number of customers (only shipyards) and then it started diversifying its businesses and purchased manufacturing licenses from other companies (Andrés and et al., 2015). And what is important, Semco started to change its management philosophy. It manifested for example by changing fundamental managerial habits, introducing ideas such as flexible hours, determination of wages or participatory decision making. Since the middle 80s, Semco has begun to change its existing management system. There were also created four strategical business units (SBU).
At the beginning of the nineties, Semco has decided to form strategic partnerships with established international companies that were thinking about business in the Brazilian market. Subsequently, number of companies were created such as ERM Brazil (Environmental Resources Management, for environmental consultancy), Cushman & Wakefield (real estate consultancy and facilities management market) or RGIS (to provide computerized inventories for retailers). With a new millennium, some part of the original company had specialized only in the development and creation of new business models in order to create new business units. This gave rise to the company Semco Manutenção (providing electrical and civil maintenance and other services) and BRENCO (Brazilian Renewable Energy Company).

4.3.Variable organization

In the recent past, Semco group had seven business units (Semco, 2016). Nowadays, there is no Semco Group, it is only Semco Partners. It has five business units in its portfolio at any given time. Each joint venture is managed independently, with its own structure, teams, and

board of directors — the latter comprised of representatives from both Semco Partners and its global business partner (Semco, 2016). Many firms, which were a part of Semco Group in the past, are no longer its part of Semco Partners. Former businesses are Pitney Bowes Semco, Semco Route Maintenance, RGIS, and others. Semco Partners is also aimed at established Brazilian companies if there is the opportunity to form an association with a strategic international player that is a leader in their segment.
From 1982 to 2003, Semco has gone from 4 to 212 million (US$) and employed from 90 to 3000 employees. In 2007, revenues were 240 million ($). This mentioned performance shift in time, when the company implemented a radical innovation in management, is unique when we consider what external conditions Semco needed to face. The Brazilian economy was during the 80´s and 90´s very unstable. There was currency devaluation, record unemployment and hyperinflation. Not only individual companies suffered but also the entire industry. In the history of this company, there is therefore hidden not only its excellent adaptation skills but moreover never-ending desire to grow and improve in an extremely unfavourable business environment.

4.4.Radical changes in management

When in 1981 Ricardo Semler took over the company from his father, it used to be a traditional organization. It had a fixed pyramidal structure based on formal hierarchy internal regulations provided a dense network of internal rules. In such structure, everyone has to do what he/she was told to do. Everything was subordinated to the rules and regulations. Information were moving in a direction from top to bottom. The company was by its size defined as a medium enterprise. There worked approximately 90 employees. However, most of them were motivated only by earnings. The company applied traditional system of rewards and punishments. All company activities, that were distributed among individual functional departments, were subjected to pre-established plans and strategic intentions. Semco indicated narrow approach only in the area of shipping industry. And its purpose was to produce its products (hydraulic pumps for ships) in a way to earn something and retain its existence. Overall, the company resembled more of a company with machines programmed by people than living organization with creative and imaginative people.
Semler´s dream was to transform the authoritarian (military) management model into natural management system. The difference between these systems was mainly in the approach to people. While the first system used people (human is a production tool), the other sought to integrate human participation (human is a partner or colleague). Management system, that has gradually evolved in Semco, resembled participative management model. Its features are: 1. The elimination of artificial rules and regulations (return to common sense), 2. Creation of dynamic hierarchies (boss is the one who really knows and understands), 3. Sharing of information (to inform is a must not a privilege), 4. Manage and lead oneself (to treat workers like adults), 5. Sharing of wealth (participative distribution of profit),6. Improving quality of human life (the company´s commitment to improving the lives of others). A series of partial changes, that form the future shape of the company, was beyond all these features. For example, you will not find a receptionist in Semco. Everyone must be able to serve himself/herself. There is no special dining room for managers. There are no special parking places for bosses (a rule who comes first, parks first). The subordinates decide about their leaders (regular assessment of top managers). Semco is constructed in a way that everyone is replaceable (including top management). Employees are treated like partners. From the original bureaucratic structure of 12 levels, only three has been left. The shape of the organizational scheme has changed, too. Organization in pyramid was changed to organization in circles.

Participative management style, that has developed in Semco, is significantly different from the original concept of the working conditions which strengthen the influence of individual on the happening in the whole organization. Thanks to this organization, the company can continually form into new shapes based on the individual effort and interest of their employees (Semler, 1999).

4.5.New order: profit and information sharing

Hierarchy, size and insufficient flow of information are the main obstacles of participative management. Semco reached this conclusion during several years when it introduced radical changes in its structure. The company management definitely knew that the only true source of power is information (Semler, 2001,2013). Engagement and partnership cannot flourish without a lot of information that are available to people on the lowest positions. Therefore, total abandonment of control meant to surrender privileged and priority rights on information. According to Semler (2013), the privileged information becomes dangerous source of power in every organization. Therefore, it was decided that they will share all information. The basis was the idea of open management (open book management). Today every employee receives all the information (including the company's financial statements), so that all team members can better participate in decision-making. The company also began to provide trainings for employees (the aim was to increase economic knowledge) so that employees were familiar with the balance sheet, income statements and other financial statements.
Semco also shares the wealth that it creates together with their employees. This causes the profit distribution among organizational units (business units) and these units then distribute profit among employees. Wealth distribution system is called SemcoPar (Semco Profit-Sharing Programme). It is formulated in a way that each quarter, the profit made by each autonomous business unit is calculated and 23 per cent of that sum is divided among the employees of that unit in equal amount. The remaining 77 % of the profit is deducted for taxes (40 %), dividends to shareholders (25 %) and reinvestments (12 %). If there is a year without profit, logically there will be no profit to share.

4.6.Real partnership

The Semco management philosophy is based on sharing (information and wealth), partnership and freedom. First among all of these is employee involvement. Workers who control their working conditions are happier and more effective, than those who don't (Smith and Greeb, 1993). Employees are regarded as associates, each of whom can vote on major decisions affecting the firm (Semler, 1989). The absolute trust to the employees is today´s typical feature of Semco company. Semco treats them as partners. It does not think in terms of superiority and inferiority. On a way to a new management, Semco tries to find new terms which better expresses its relationship to its employees or to those who cooperate with the company. This fact is also reflected in the company name. Today, Semco is named Semco Partners.

5.CONCLUSION

From the time that Semco has begun to promote radical changes in the concept of management, there was an enormous increase in productivity. During the first ten years, the company has grown from a factory employing 90 workers to a company consisting of six factories with 800 employees. Sales increased from 4 million (US$) to 35 million (US$).
It should be noted that the working environment of this company is not for everyone. This is due to the fact that in this system, only independent, responsible and productive people can

remain. Imaginary triangle of personal mastery (I know, I can, I want) takes here a concrete form that excludes all parasites, slackers and despots. The company is committed to meritocracy. Leading role can take only the one who will get the respect of those who he/she leads. Therefore, Semco is not a suitable place for traditional managers. Semco does not tolerate commanding and controlling, insisting or even enforcement of fear and uncertainty. Credibility and leadership are evaluated each semester. That´s why no one can be sure with his/her position. Semco also does not have a fixed structure, there are even no in-house rules. Internal consistency ensures only three shared values and ten operating principles. Semco is a participatory company which appreciates participation of its employees in decision-making. Each employee is therefore drawn into the happening in the company through voting rights which carry the right to co-decide and oppose.

Semco can be considered as representative of the new management. In this management system, there are no dilemmas of management because everything what company does, is subjected to human beings. And management was always about humans. Even the definition of the company is subjected to the human dimension. The company is not understood as an artificial system as we can found in Ricard Semler´s words (2001, 240): *"I appreciate my share in Semco, however in reality this is not my company anymore. I am not Semco. Semco is simply Semco."* Semco is also different from a traditional concept of the company in terms of its purpose. The main objective is not profit. When defining the success, the company has concluded that it can be profitable in a long-term only if it gives priority to the quality of life. In the case of Semco, this means to establish self-management as a standard and to help others to get where they want.

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RETAIL CORE BANKING SERVICES COMPARISON TOOLS AND THE QUALITY OF INFORMATION

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Abstract

Retail core banking services provided by the payment accounts are the most frequently used financial services. However, consumers bear the negative impact of the information asymmetry in form of tariff opacity, tying, bundling and conditional prices. The Payment Account Directive, transposed now in the national legal systems, seeks to change it. It relies strongly on the comparison tools which should provide understandable, accurate and verifiable information. Every member state has a duty to provide at least one such tool allowing consumers making well-informed choices. Our main goal is to perform quality of information assessment for three representative comparison tools in the Czech Republic, Poland and Slovakia. The results are not satisfactory regarding the accuracy, full price statement and relevance. None of the surveyed tools provided the result page without errors in form of incorrect calculation, misguiding results and plausible but not completely accurate results. We describe observed flaws in detailed result confirmation. We do not find any major flaw in terms of comparability and verifiability. The secondary objective of the paper is to assess the readiness for the upcoming regulation concerning a standardised terminology for the most common services linked to a payment account. This regulation is right now being prepared by the European Banking Authority.

Keywords: comparison tool, consumer, bank, payment account, regulation

JEL Classification: G21, G28

1.INTRODUCTION

This paper is focused on the comparison tools (hereinafter referred to as CT) for the retail core banking services (hereinafter referred to RCBS) in the Czech Republic, Poland and Slovakia. RCBS term relates to basic day-to-day needs that are common to all payment accounts (hereinafter referred to as PA) in the EU. Although there are some differences among the national payment instruments usage and types such as cheque preference in France, Malta and Cyprus. RCBS stands for basic instruments that are offered by every PA as European parliament (2014) defines it. European parliament (2014) is also known as Payment Account Directive (hereinafter referred to as PAD) which seeks to improve the situation on the RCBS market as one of its regulation goals. The EU-wide studies (Van Dijk Management Consultants & CEPS, 2012a; Centre for European Policy Studies, 2009; European commission, 2013) show the issue of tariff opacity, tying, bundling and conditional prices. The latest EU-wide study (European Banking Authority, 2016a, pp. 12) finds similar issues. The banking fees are one of the main reasons for consumer complaints, particularly in terms of a lack of transparency that impedes consumers from making well-informed choices, the comparability of fees and pricing.
CTs were chosen as one of the main tools how to diminish the effect of above stated factors which are together creating the environment of asymmetrical information on price. Since the PA is the most common bank product, possible magnitude of the problem is significant. The studies (TNS Opinion & Social, 2013, pp. 13; Demirguc-Kunt, Klapper, Singer & Van Oudheusden, 2015, pp. 83) show that PA is owned in the Czech Republic by 82%, in Poland

by 78% and in Slovakia by 77% of adult population. We show in our case study (Soukal & Draessler, 2015, pp. 150) that the ratio of price optimal PA choice for "e-banking and ATM services only" consumer profile is around 20.5% only. The ratio drops even lower as the consumer profile gets more complex. The PAs from different providers are close substitutes providing almost the same range and quality of services standardized by EU law as well as national law. The ratio should be then much higher suggesting that information asymmetry issues stated above are indeed present on the market. The EU relies strongly on CTs in information asymmetry reduction. The PAD (Chap. II/Art. 7) states the duty to offer consumers of each member country at least one CT through a special website list of the supervisor authority (usually national bank or national trade inspection authority).
The first goal of the paper is to test a representative CT for the Czech Republic, Poland and Slovakia regarding a result page quality of information. This output and product's rank in the result page significantly influence consumer's choice, see e.g. EU-wide behavioural experiment (ECME Cons. & Deloitte, 2013). The concerns regarding reliability and independence come as well from the structure of the CTs ownership. Study (Van Dijk Management Consultants & CEPS, 2012a, p. 47) points out that more that 70% of CTs tools are owned and run by for-profit organizations active in advertising/marketing, internet publishing, provision of information on finance or newspapers.
Secondly, our goal is to the assess readiness of CTs for the latest upcoming regulation concerning a standardised terminology for the most common services linked to a PA which is right now being prepared by the European Banking Authority (hereinafter referred to as EBA).

2. Object of study and methodology

2.1.Online comparison tools

Studied CTs belongs into a "shopbot" set of applications along with other similar tools such as price comparison agents, shopping agents, and shopping robots described in (Zhu, Siegel & Madnick, 2008, pp. 321). The literature is not completely consistent regarding the shopbots' impact, e.g. Smith (2002, pp. 461) claim that "*In spite of the wealth of information provided by shopbots, shopbot customers remain asymmetrically informed about critical product attributes such as service quality and are using brand and prior positive experience as proxies for this missing information*". Similarly warn Baye and Morgan (2004) that sellers can use short-term price promotions, which are difficult for shopbot monitoring, in an attempt to avoid the deleterious outcome associated with price competition. However, most of the authors agree that shopbots have a positive impact in both price level as well as price dispersion (Tang, Smith & Montgomery, 2010). Also from the consumer point of view, the EU-wide survey (ECME Cons. & Deloitte, 2014, s 75-76) shows that 78% of consumer groups have a normal or good perception concerning the CTs.
The importance of shopbots is significant and so the quality of service has to be high in order to improve the market performance. CTs can be assessed by a large variety of criteria. CT assessment, for the purpose of improving the internal market of the EU performance, was the object of wide surveys e.g. (ECME Cons. & Deloitte, 2013; Adamescu et al., 2013). The latter one summarizes European Consumer Summit findings on basic CT features which consumer protection intuitions, regulators, business representatives and EU representatives agreed on:
1.Core principles
a)Transparency and impartiality of comparison,
b)Quality of information,
c)Compliance and redress,
2.Experience enhancers

a)Comprehensiveness,
b)User-friendliness.

2.2The survey features

We are focused on the issue of quality of information which is the most important part of the core principles. It stands for easily understandable, accurate and verifiable information provided by the CT. In other words the assessment of the quality feature contains requirements of:

1. Relevance and clarity: Information provided by CTs should be relevant for assessing and comparing offers from a consumer perspective, in simple language, concise, with adequate scope and depth but with the possibility to consumers to access more detailed information.

2. Comparability: CT should provide same set of information, in uniform manner, separating or distinguishing services which are not identical or mentioning the differences for all offers included in the same comparison to ensure comparability.

3. Accuracy and full price: To provide comparison exactly to the offer as it is made available by the seller. The consumer should be given the final product price, including applicable taxes, charges, additional fees and other costs with a breakdown of these charges.

4. Verifiability: CTs should enable consumers to easily verify the information, by indicating the contact information of the seller.

Moreover, we prefer additional attribute which can be described as the history of service. In order to choose representative CT, we searched for comparison tools with at least five years of service. Five years is demanding in the environment of online comparison services for such dynamic market as RCBS. It allows avoiding tools that were not consumer and time-tested to be trustworthy. The study for European commission assessed the RCBS CT offer situation in EU by survey of 120 free of charge CTs in total. We studied detailed information regarding the features of surveyed CTs in the Czech Republic, Poland and Slovakia in (Van Dijk Management Consultants & CEPS, 2012b).
The Czech Republic is represented by 6 CTs. We choose Kalkulátor bankovních poplatků CT available on bankovnipoplatky.com. This CT was assessed by evaluators (Van Dijk Management Consultants & CEPS, 2012b, pp. 65) for the Czech Republic as "*Most popular comparison tool for current account, because it focuses on current account fees only*." Slovakia is represented in mentioned study by 6 CTs. We choose Porovnanie cien – bežné účty – štandardtné CT at financnahitparada.sk because it was appraised for high frequency of updates and evaluators positively rated the funding source which was found as independent (founded by A. Kiska nowadays president in Slovakia). The Poland was a rather problematic case because the first three most promising CTs in the study (Van Dijk Management Consultants & CEPS, 2012b) are not available anymore. The rest was evaluated not that positively as Czech or Slovak CTs were (e.g. predefined profiles comparison only, very limited coverage, sponsored links…). In this case we had to make an exception and search for the CT offer ourselves. Our own survey found more than 10 possible applications. We choose Porównywarka kont bankowych CT at kontomierz.pl. Service is available since 2009 and the website provides variety of services related to the PA such as home-budget management with application that can directly import

the data from personal PA provided by major banks. Moreover the application was funded by EU regional operational program "Innovacyjna Gospodarka" and so it had to be evaluated and approved by an official authority. We did not evaluate results page yet. We assessed only the information on the CT and the input form since the result page analysis was a further task.
As a base for a test consumer we decided to use a mainstream profile manifesting average activity and e-banking exclusive preference regarding the communication channel. The study (Draessler, Soukal, Hedvičáková, 2011) identified this profile as the major segment of the market of consumers with activated e-banking by two-step cluster analysis.

Tab. 1 – Surveyed services and features. Source: own.

minimal month (credit) turnover	incoming payment	standing order	ATM withdrawal own bank
average balance	direct payment	direct debit	ATM withdrawal another bank

Although it is not the most representative profile in the range of demanded services it suits the best to the trend of tariff policies. The banks are trying to transform branches from counters, where the payment services are established, to financial consultant service, where the other financial services are sold and cross-sold successfully for the last 10 years. Some PAs maintenance fees or card fees depend on the amount spent by the card. The chosen profile does not include the information on the amount and so it is assessed individually. In order to compare the deviation of our calculation from CT calculated price we convert currencies to € accordingly the exchange rate EUR/CZK = 27.02, EUR/PLN = 4.34 (EUR is in both cases the base currency).
The last criterion regards the latest regulation that is being prepared by the EBA. Consultation paper for regulatory technical standards setting out the Union standardised terminology for the most common services linked to a payment account (European Banking Authority, 2016b) outlines one of the most probable list of EU standardised terms and definitions. CTs will have obligatory duty to use this terminology when it is adopted by the EU commission. PAD (Chap. II/Art. 7) states not just mentioned duty but moreover that the CTs will have to inform about the range of comparison in case that some offers are not included. Unfortunately this part was transposed in the Czech Republic in a way that it is not clear whether the "complete offer" includes all the services/terms in the standardised terminology list or just complete offer of PAs.

3.RESULTS

Surveyed services, please see Tab. 1, were filled out in the input form of all chosen CTs. We do not assess the input form since we assess the quality of the output. So only briefly on the input form – the CTs represent two basic approaches: complex-structured and minimalistic-compact. Bankovnipoplatky.com CT is the first case. It covers a large variety of services connected to PA. Besides the most widely used it covers much less and maybe very rarely used services such as telebanking, collecting box orders, cash-back etc. The input form is structured into several screens:

1. account and statements,
2. card and ATM services,
3. electronic banking and direct payments,
4. standing orders,
5. direct debits,

6. cash utilization,
7. other services.

Other two CTs show a different approach and provide only one input screen. This compact approach allows offering a comparison for only the most frequently used services and so the range is less than half of the previously described one. Nevertheless it is sufficient for the demanded range of our test profile with the only exception – user cannot distinguish own and another bank for outgoing payments. At first it comes from the price model where the banks in other countries do not separate by special fee outgoing domestic payments into another bank. Secondly it comes from logical assumption that consumer does not have an overview how many payment orders are going to account provided by own and how many to another bank.
All compared CTs have result pages very alike regarding the base design. We include only the top parts of each CT for the demonstration purposes since the result pages were too long, see figures bellow. For complete price comparison and its verification please see sub-chapter Accuracy and full price.

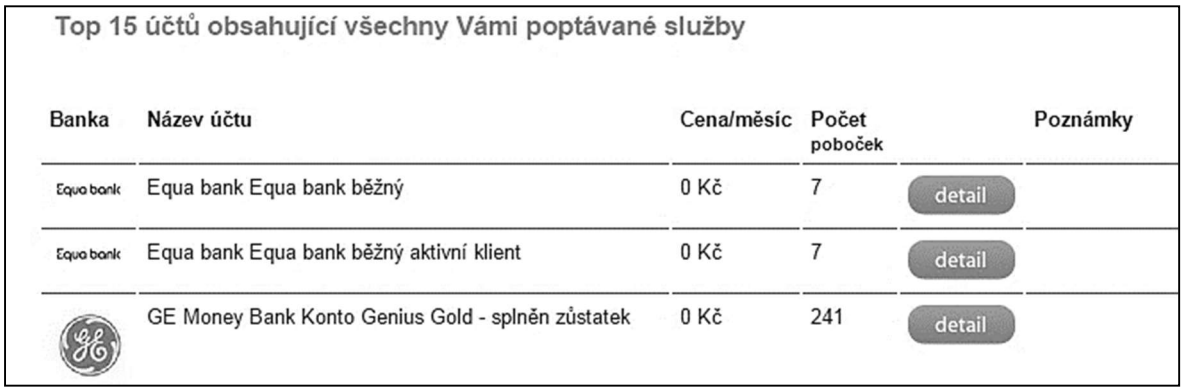


Fig. 1 – Bankovnipoplatky.com CT result page demonstration. Source: own.

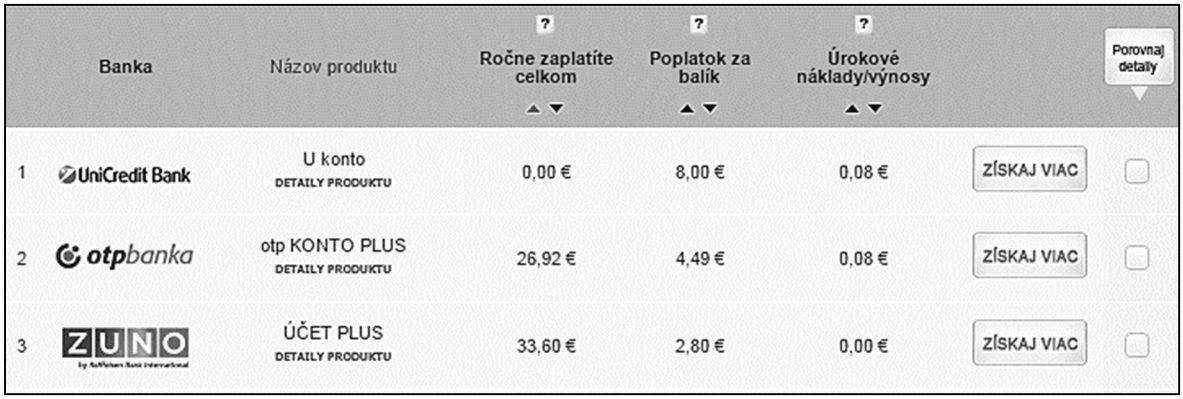
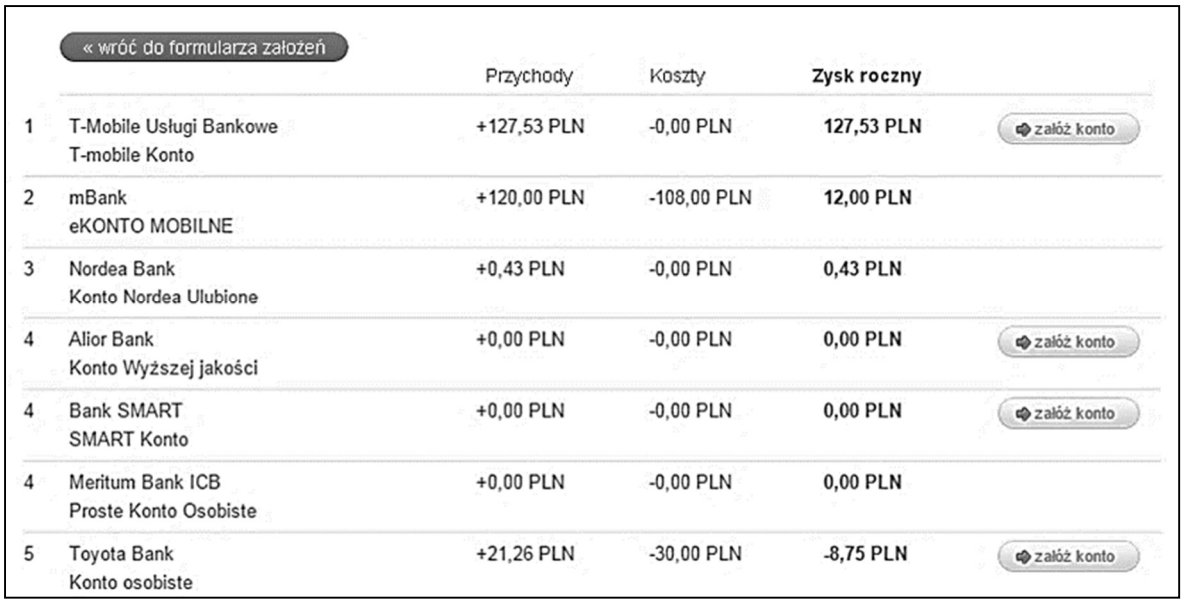


Fig. 2 – Financnahitparada.sk CT result page demonstration. Source: own.



« wróć do formularza założeń

		Przychody	Koszty	Zysk roczny	
1	T-Mobile Usługi Bankowe T-mobile Konto	+127,53 PLN	-0,00 PLN	127,53 PLN	załóż konto
2	mBank eKONTO MOBILNE	+120,00 PLN	-108,00 PLN	12,00 PLN	
3	Nordea Bank Konto Nordea Ulubione	+0,43 PLN	-0,00 PLN	0,43 PLN	
4	Alior Bank Konto Wyższej jakości	+0,00 PLN	-0,00 PLN	0,00 PLN	załóż konto
4	Bank SMART SMART Konto	+0,00 PLN	-0,00 PLN	0,00 PLN	załóż konto
4	Meritum Bank ICB Proste Konto Osobiste	+0,00 PLN	-0,00 PLN	0,00 PLN	
5	Toyota Bank Konto osobiste	+21,26 PLN	-30,00 PLN	-8,75 PLN	załóż konto

Fig. 3 – Kontomierz.pl CT result page demonstration. Source: own.

3.1.Relevance and clarity

All three CTs' input forms and result pages are written in common language, avoiding complex legal and technical terms. Used expressions are concise and do not go beyond the level of detail necessary to enable consumers to make a meaningful comparison with an exception of highly conditional benefits, including the offer which does not correspond to the consumer profile and including the offers that are not available for a new consumer.

This first mentioned issue concerns Kontomierz.pl CT, please see the fig. 3. Please notice the first two accounts on the result page. Accordingly to it a consumer is supposed to receive notable benefit from using T-Mobile konto and eKonto mobilne. The first one is a variant of Alior Bank PA with special feature. It consists in several bonuses in case consumer's mobile services provider is T-Mobile. The bonuses are in form of extra credit for prepaid phones (bonus is received when buying a credit) and other features (MyWallet application, mobile payments for free). The second one contains a bonus for a new account user that has never opened any account in mBank. The same campaign or we can say marketing tool is used in the Czech Republic by mBank as well and at least once per 2 years. We do not find any of these conditions to be relevant nor clearly explained and distinguished from regular comparison. This sort of bundling as a result of cross-selling is one of the issues that are mentioned in (Centre for European Policy Studies, 2009, pp. 35) as a factor that can reduce price transparency and the comparability of offers.

The second problem is the comparison of Bankovnipoplatky.com for Citibank accounts. The calculation of price was correct in a way of displayed conditions however it was at least highly misguiding because displayed information was not applicable on our consumer profile. Please see the Tab. 2 and the comment bellow it for further details since this problem could be classified as both: comparability issue as well as miscalculation and accuracy issue.

The third problem is present at both Kontomierz.pl and Bankovnipoplatky.com CTs. Both included in the comparison PAs that are not available for a new consumer anymore, please see the third column in the Tab. 2 and Tab. 4. The relevance of such offer is at least questionable. However the provider of Bankovnipoplatky.com CT defends this approach as an overview for the consumers that still have this type of PA. The bank can provide an obsolete version of PA for longer than a year before it forces a consumer to change the product. It happens regularly within one brand and even if the bank abandons the market the "take-over" bank keeps previous

PA portfolio but does not offer it to a new consumer. This happened e.g. when Citibank decided to sell the whole retail section in the Czech Republic to the Raiffeisenbank. Raiffeisenbank even still provides the Citibank website for former Citibank clients. Then including this PA gives an overview for the consumers that still possess it by comparing it to other products available on the market. We agree. However, accordingly to the requirement of relevance and comparability, such accounts are supposed to be clearly distinguishable from offers. It does not happen and so their inclusion is rather confusing for most of the consumers.
The last area of analysis was focused on providing layered information structure where appropriate or at least a link for detailed information. Kontomierz.pl and Financnahitparada.sk CTs provide it when clicked on the specific product or "know more" button. Structured details about the services and a price list are offered for every compared PA. Although the Slovak one is much more detailed the polish one rather more helpful because it provides clear overview of which fees were taken into account and from which amount the final price was calculated. Bankovnipoplatky.com CT provides more information as well but in less comprehensible way. At first it redirects you outside the CT website and secondly most of the links are on the official site of the PA providing bank. No uniform way of presenting the information beside notes by the CT which can be found on the right-hand side of the result screen. The notes contain the detailed information on specific services conditions in order to have them for free. However these notes are available for only some PAs and the key is not clear. Then the usability and clarity of the notes as a reliable source of detailed information about the tariff is rather problematic.
Besides of that we mentioned above no issues in relevance and clarity worth mentioning. A minor comment is that unlike the Financnahitparada.sk CT the polish one set the rank correctly in case of equal prices, please see Alior, Smart and Meritum bank rank on the fig. 3. Financnahitparada.sk sets the rank for equal prices by alphabet.

3.2.Comparability

The output of all three of the surveyed CTs was in a uniform manner and using the same currency and time units of measurement and the same set of information for all offers. All result pages provide well-arranged overview by price as main comparison factor with information on at first brand (bank) then product name and at last price. However there is some difference in a way of displaying the results regarding additional information.
Compared to other CTs Bankovnipoplatky.com clearly states that offered account provide all demanded services. This information gains its importance in case of cash services over the counter which is not provided by most of the low-cost banks. The bankovnipoplatky.com CT displays next to the PA name whether specific condition such as credit turnover was met or not. This is in accordance with the requirement that if the compared PAs are not identical, differences in their characteristics should be clearly mentioned. Nevertheless this feature does not work for all accounts the same way and for some accounts, such as Ukonto by Unicredit, it states only "condition is met". This might confuse the user because he/she does not know which condition it is not important for the result itself. The next difference is that the result page allows comparing the PA providers by the number of branches. This way consumer clearly distinguishes a low-cost banks with low number of subsidies from other branch-relying ones. However the page does not allow comparing by this factor and the order of the accounts is fixed by the month fee. It as well does not provide information on the price construction. Although the comparability principle concerns mainly the range of services the possibility to distinguish accounts which are based on a package might be beneficial for certain users. It is related to the consumption variability issue discussed in the discussion.

Financnahitparada.sk CT result page has standard structure "brand-product-price" which is complemented by the price construction information and the interest costs/revenues. The result page allows the comparison by all three criteria unlike the other surveyed CTs. It is a bit unusual that fees are calculated on year base instead of a month one. Regarding the consumer way of thinking it might not be the best approach since most of the consumers are used to think within the frame of a month and the banks' price lists are constructed this way as well. We appreciate the possibility to compare PAs by the price of the package. Base package price with no regards to benefits or discounts can be demanded as a main factor of comparison since if the consumer does not want to rely on meeting a specific condition(s) since the final price takes into the account package price with all discounts and benefits.
Kontomierz.pl CT result page standard structure "brand-product-price" complements by the profit (bonus) overview which determines along with the costs (fees and charges) the final price. The comparison is made by the final year-price the same way as Financnahitparada.sk CT. If the products or services compared are not identical, differences in their characteristics should be clearly mentioned. The last feature which we find as limiting for comparability is that the ranks based just on fees and charges are not available. The only ranking is accordingly the year price which contains both the benefits and the fees.

3.3.Accuracy and full price

This is the most important principle for RCBS comparison since most of the PAs are close substitutes providing almost the same range and quality of services standardized by EU law as well as national law. CT calculation was followed by the results confirmation. The confirmation was performed by the researcher by the price lists of each bank listed in the CT results.

Tab. 2 – Results and confirmation for Bankovnipoplatky.com CT. Source: own.

Bank; PA CT description	**CT result in CZK**	**Our result in CZK**	**Deviation in EUR**	**Notes**
Equa bank; Equa bank běžný	0	0	0	Correct result
Equa bank; Equa běžný aktivní klient	0	0	0	Correct result
Raiffeisenbank; eKonto SMART	0	0	0	Correct result
UniCreditBank; Partners (aktivní) konto zdarma	0	NA	NA	Product is no longer offered to new consumers
Moneta Money Bank; Moneta Gold	0	NA	NA	Product is no longer offered to new consumers
ZUNO; účet plus	0	0	0	Plausible result: there are no fees for ATM withdrawal in case the withdrawn amount is over 1.000 CZK
ZUNO; účet plus – podmínka splnění zůstatku*	0	0	0	Redundant result: consumer profile meets the condition of balance, the previous ZUNO účet plus result already displayed correct amount.

mBank mKONTO	0	0	0	Correct result
UniCreditBank UniCredit Konto Perfektní zdarma	0	NA	NA	Product is no longer offered to new consumers
UniCreditBank U konto	0	0	0	Correct result
Moneta Money Bank Genius Active	0	149	5.51	Incorrect result - consumer profile does not meet the requirement of minimum balance 250,000 CZK and then the maintenance fee 149 CZK has to be paid
Fio banka Fio běžný	0	0	0	Plausible result – CT presumes that profile meets the requirement of card month payments over 4,000 CZK. If the amount is lower, then 0.22 € for ČSOB ATMs and 1.29 € for other than Fio and ČSOB ATMS fee is charged per withdraw.
Airbank Malý tarif	25	25	0	Correct result
Citibank Citikonto Plus – splněn obrat**	0	169	6.25	Incorrect/misguiding result – consumer profile does not meet the requirement of minimum turnover 25,000 CZK and then the maintenance fee 169 CZK has to be paid
Citibank Citikonto Plus* – splněn zůstatek*	0	169	6.25	Incorrect/misguiding result – consumer profile does not meet the requirement of minimum balance 250,000 CZK and then the maintenance fee 169 CZK has to be paid

* translated as: the condition of balance has been met
** translated as: the condition of turnover has been met

We can see that half of the results are with a note. However 3 results only are evaluated as incorrect or regarding the second and third case as highly misguiding. The incorrect result gave Moneta bank an unfair advantage over others since the requirement was not met and it is not common. Similar problem regards the offer of Citibank. CT displayed a note that for both cases the price is valid after a certain condition is met (turnover, balance). However this time neither of both was met by the consumer profile. These offers should not be included at all or should be included with a correct month fee. So it is a question whether it is the problem of accuracy or relevance.

Tab. 3 – Results and confirmation for Financnahitparada.sk CT. Source: own.

Bank; PA CT description	**CT result in EUR**	**Our result in EUR**	**Deviation in EUR**	**Notes**
UniCreditBank; U konto	0	0	0	Correct result
Otpbanka otp; Konto Plus	3.75	3.75	0	Correct result
ZUNO; Účet Plus	4	4	0	Correct result

ČSOB; Konto Pohoda	2.99	2.99	0	Correct result
Prima Banka; Osobný účet	5.4	5.4	0	Correct result
Otpbanka otp; Konto Base	5.29	5.29	0	Correct result
Poštová banka; Dobrý účet	5.99	5.99	0	Correct result
Raiffeisenbank; Účet	4	4	0	Correct result
ZUNO; Účet	4	4.2	0.2	Incorrect result: ATM withdrawal from own bank costs 1 € each but from another bank it costs 1.2. Other services are free of charge.
VÚB banka; Flexiúčet	5.99	5.99	0	Correct result
Privatbanka; Konto Plus	4.66	4.7	0.04	Correct result: although the fees do not match precisely the difference is negligible and is not considered as incorrect or misguiding calculation. It probably came from rounding because of calculation from the total year fees.
Fio banka; Fio osobný účet	4.8	3.6	1.20	Incorrect result: it seems that CT did not take into account that 1 ATM withdrawal per month is for free (ATM withdrawal costs 1.2 €)
mBank; mKonto	4.8	4.8	0	Correct result
VÚB banka; Flexiúčet 3	4.99	4.99	0.00	Correct result
Sberbank; Active	6.49	6.49	0.00	Correct result

Although the CT does not display redundant, obsolete or plausible results unlike the Bankovnipoplatky.com one, it contains two incorrect results. Surprisingly Fio bank PA can be obtained for less than CT displays. That is unusual because the problem is mostly that some fees are missing. It causes the loss of 5 positions in rank for the Fio bank which is a lot. The comparison tools behavioral experiment conducted within the study (ECME & Deloitte, 2014, pp. 336) shows that likelihood of being chosen as first choice drops in some cases from 40 % to 15 % when the non-ad offer is ranked first compared to one five ranks bellow. The second case of ZUNO does not cause that serious change in rank nor substantial extra costs for consumer however it is still incorrect result.

Tab. 4 – Results and confirmation for Kontomierz.pl. Source: own.

Bank; PA CT description	**CT result in EUR**	**Our result in EUR**	**Deviation in EUR**	**Notes**
T-Mobile Uslugi Bankowe; T-mobile Konto*	0	0	0	Plausible result: if the T-Mobile benefit is not taken into account, the fees are plausibly zero because the only condition regards the payments by card in amount of only approximately 50 € per month.
Nordea Bank; Konto Nordea Ulubione	0	NA	NA	Product is no longer offered to new consumers
Alior Bank; Konto Wyższej jakości	0	0	0	Correct result
Bank SMART; SMART Konto	0	0	0	Correct result
Meritum Bank; Proste Konto Osobiste	0	NA	NA	Product is no longer offered to new consumers
Nordea Bank; Konto Nordea Spektrum	2.25	NA	NA	Product is no longer offered to new consumers
Toyota Bank; Konto jedyne	2.49	2.49	0	Plausible result: there are no fees in case of electronic payments over approximately 93 €.
Toyota Bank; Konto osobiste	2.5	2.5	0	Plausible result: there are no fees in case of electronic payments over approximately 93 €.
Getin Online; Konto Swobodne	2.99	2.99	0	Correct result
Getin Online; Konto Perfekcyjne	0	0	0	Plausible result: there are no fees in case of electronic payments over approximately 93 €.
Open Finance; Konto Optymalne	2.99	NA	NA	Product is no longer offered to new consumers
Eurobank; konto Active	3.45	3.45	0	Correct result
Eurobank; Konto Doskonale	3.45	NA	NA	Product is no longer offered to new consumers
Bank Pekao SA; Eurokonto Mobilne	3.99	7.59	0.83	Incorrect result: consumer profile did not meet the condition of incoming payment and so the maintenance fee of 1.4 € would be charged. There is also a fee for every SMS (even the confirmation ones). In case of payment confirmation it adds costs of 0.05 € per payment. The displayed fee

				regards the situation when there are less than 4 wire transfers per month which we find as not plausible.
mBank; eKONTO MOBILNE**	9	14-18	1.15-2.07	Incorrect result: one-time bonus is not taken into account, fee for ATM withdrawal seems not to be taken into account. This fee varies from 1.15 to 2.07 €.

* Total fees were calculated with no regard to the bonus from T-Mobile extra credit for prepaid phones.
** Total fees were calculated with no regard to the bonus from "a new client" status.

Two incorrect results were identified however the second one is a special case because it is both incorrect and misguiding at the same time. The first result did not take into account that the profile had lower credit turnover than 5,000 PLN required in order to have the maintenance fee discount. Moreover this account offered a bit unusual fee type and the calculation of payment card usage was wrong as well. Due to an accumulation of errors it might the problem of data recency which we will comment in the discussion. The second case of incorrect and misguiding result comes from at first the fee variance regarding the ATM of another bank withdrawals and the marketing campaign one-time bonus for a new consumer (see the Relevance and clarity chapter). We find this information to be highly misguiding since it should be clearly distinguished from other "regular" offers.

3.4.Verifiability

All surveyed CTs allow verifying the information, by indicating the contact information of the seller. The best case is Financnahitparada.sk CT where the consumer can either see the data used in calculation and addition fee information or be redirected to the website of the PA provider. The Bankovnipoplatky.com CT provides the link for PA providers' links however at some cases the page is redirected to the Chytryhonza.cz page with the details regarding the account fee structure, campaign etc. This might be a bit misguiding but we do not consider it as a problem since the Chytryhonza.cz offers the direct link at the bank. Unfortunately the detailed information regarding the fee structure are available for only some accounts and the overall information is not in such comprehensible way as Financnahitparada.sk offers. Kontomierz.pl CT offers more detailed information on the fees the calculation is based on but the direct link at the bank's website is available for some PAs only. Moreover it is not a direct link on the product or pricelist page, it usually is directly on the order page for a new consumer who wishes to "buy" the PA.

3.5.EU standardised terms and definitions

All the CTs will have to adapt in not that distant future new standardised terms and definitions list. Because of the abstract level which was chosen by the EBA it might result into input form complete redesign for those who provide the compact CT version. The complex and detailed forms will just include few words more. Greater problem will be the range of services. All surveyed CTs will have a certain problems in case that the CTs should provide complete range of services related to the PA included in the EBA proposal (European Banking Authority, 2016b). None of the surveyed CTs provides credit card and overdraft comparison. Financnahitparada.sk offers another CT which includes these services and so some merge of those two applications could be the way. However Kontomierz.pl and Bankovnipoplatky.com CTs do not provide this feature or any separate application for it. It will depend on national

supervising authority (usually national bank and national trade inspection authority) whether they will force the CT providers into adding the features in order to be included in the list of official RCBS CTs or whether they will tolerate just the note "the comparison does not include the services of the overdraft and credit card".

4.DISCUSSION

It is worth mentioning that Lim and Lee (2015) studied and described one of the main weaknesses of shopbots regarding the problem of loyalty programs. The shopbots and our surveyed CTs do not monitor sometimes very complex loyalty programs. We had only two cases when Kontomierz.pl included T-Mobile and mBank marketing campaign and loyalty offer from cross-selling. It is a very difficult question to answer – include as many loyalty conditions as possible or disregard them? The first option would be demanding to incorporate into CTs and making the comparison input form too complex but the result page would be more accurate. However loyalty programs were several times mentioned in the paper as source of tariff opacity. Strict non-inclusion policy might create at least some pressure on the providers to offer product which can be competitive under the plain and simple fee comparison with regard to only usual quantity discount or specific consumer status. The benefits can be taken into account as Hedvicakova and Pozdilkova (2015) did when assessing the student PAs offer. The benefits based on a special PA kind for only specific segment are relevant. However only if clearly distinguished or separated from the regular PA offer.
The second issue to be mentioned regards the problem of variability of consumption and distinguishing which PAs are based on a package. We commented this feature in Financnahitparada.sk CT description. This might be beneficial for users who want to pay for only "what they really use" or for users with higher variability of consumption. The consumer expects the stable price on an account with a package price construction. However many packages are constructed as "pre-paid" services for only certain month usage frequency. Then consumer does not pay just the package tariff, some months the fees are much higher. This rises even better question for further research – how to construct the CT to allow taking into account the variability problem? Many tariffs include free of charge limits. Let us demonstrate a specific and often demanded service such as at ATM withdrawals. In this case mBank mKONTO offered 3 withdrawals for free and then 1.3 € fee per each. Recent tariff changes based the calculation by the factor of withdrawn amount instead of withdrawal frequency, however the idea is still the same – just a minor variability caused major month fee change. We use "major" because this is a low-cost account with mostly zero fees. A year costs zero or 35 € means a great difference in account ranking in any CT. This was just one service example intentionally on a low-cost account where consumer expects zero fees. The situation of major retail banks' PAs is even worse in terms of comparability. They contain not just frequency limitation but various conditional sales and bundling mentioned by (Centre for European Policy Studies, 2009) as factors decreasing price transparency and the comparability of offers.

5.CONCLUSION

Our survey chooses three representatives CTs accordingly the criteria based on the EU-wide studies (ECME Cons. & Deloitte, 2013; Adamescu et al., 2013; Van Dijk Management Consultants & CEPS, 2012b). The main goal was to assess the data quality provided by the CTs because EU strongly relies on them in information asymmetry reduction issue on the RCBS market. Only one the Financnahitparada.sk CT shows no flaws in terms of relevance and clarity. The other CTs included misguiding information when included offers that were highly conditional: mobile phone operator, one-time marketing campaign bonus, accounts that were

not supposed to be in the rank because of different turnover and balance condition. We find only minor issues in the comparability criterion such as the possibility to rank PAs by additional factors (package price, bonus…). We claim that all result pages provide a well-arranged overview by price as main comparison factor. We do not find any major issues in verifiability criterion since all pages provides either links at the banks' websites or/and the structured overview on which fees the calculation was based on.

The most serious are the objections on accuracy and full price. None of the surveyed CT provided the comparison without any incorrect result. Bankovnipoplatky.com CT displayed 3 and both Financnahitparada.sk and Kontomierz.pl CT 2 each. Bankovnipoplatky.com CT had problem with exclusive account offer since all 3 offers were incorrect calculations regarding the condition of high turnover or balance. These PAs would not even be on the list of 15 best accounts in case of correct calculation. The deviation was around 5-6 € per month. The other CTs showed deviation in month fee amount only up to 2 €. An interesting result was Fio bank result in Financnahitparada.sk which was actually lower than the CT displayed. The mistakes in calculation were present usually when calculating very specific fees (interval fee) or ATM withdrawals from another bank. The most accurate calculation (the smallest deviation) showed Financnahitparada.sk.

Our findings are a bit disturbing. In order to empower consumers to make informed choices through CTs we strongly suggest at first for supervising authorities (usually national bank and national trade inspection authority) to test the CT before including it in the list of the official PA CTs. PAD transposition in the Czech Republic does not state this duty and it is rather vague regarding the CT inclusion conditions. Secondly to test whether the CT provides an effective procedure to report incorrect information on published fees or not as well as whether the calculation correction was implemented in a timely manner or not.

The CT providers should query the supervising authorities to clearly state whether the "complete offer" includes all the services/terms in the standardised terminology list prepared now by the EBA or just complete offer of PAs. PAD (Chap. II/Art. 7) description is obviously closer to the "offer of PAs" however national transposition is far from clear since it states "complete offer of services linked to the payment account". European Banking Authority (2016b) included in the list of services linked to the PA credit cards as well as overdrafts. Neither of them is monitored by the surveyed CTs with a certain exception of Financnahitparada.sk which provides separate application for this comparison.

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COMPARATIVE ANALYSIS OF SIX SIGMA BELT ROLES DEPLOYMENT IN SMES AND LARGE ENTERPRISES

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Abstract

Six Sigma methodology brings a lot of possibilities, how to radical improve process and product quality. Since a decade the pressure started rising throughout the world that SMEs can enhance their capability, improve quality and increase their profitability by using Six Sigma. However, Six sigma used by large organization cannot be adopted for SMEs. There are too many differences between this two company types. In presented paper actual theoretical fundamentals of SS belt roles are analyzed and by a comparative analysis core research questions connecting to differences of SS belt roles deployment in SMEs and large enterprises are answered. Also deployment guidelines for SS belt roles in SMEs are highlighted.

Keywords: Six Sigma Belts, philosophy, analysis, SMEs, Lean Six Sigma

JEL Classification: L60, L15, L25

1.INTRODUCTION

Six Sigma (SS) is a disciplined and data driven methodology that was developed to enhance the quality of processes with the objective to establish an almost zero-defect quality strategy and thus to increase customer satisfaction and to improve financial results (Kumar, 2014; Nave, 2002). In 2003, Lean Six Sigma was established as part of the evolution of SS (Kubiak, 2011). It is the combination of Lean Management and SS which are the most popular business strategies for enabling continuous improvement in the manufacturing, service and public sectors (Albliwi, 2013). Lean focuses on removing all types of waste from the process while SS concentrates on controlling the process statistically and removing variation from the process (Corbett, 2011). The companies merged both methodologies to overcome the weaknesses and bring out the advantages of both (Maleyeff, 2012). The phrase "Lean Six Sigma" (LSS) is therefore used to describe the integration of these both approaches (Sheridan, 2000).

Many authors argue that LSS or SS can be implemented successfully in any organizations, irrespective of the size of the company (Harry and Crawford, 2004). As with all new initiatives the introduction of LSS requires new skills and this means training for employees. The number and range of tools and techniques available in the LSS tool kit is vast and it is critical that staff are aware of them and trained well enough in their use as well as being able to follow the DMAIC methodology (BSI, 2011). Education (teaching people how to think differently) and training (teaching people how to do things differently) are very serious critical success factors for any continuous improvement and culture-change initiative (Pyzdek, 2003). For this reason, several authors emphasize the importance of training and expertise within the organization in order to ensure a strong foundation of "know how" (Galloway, 2008).

To produce the expected results with LSS, organizational roles and responsibilities must be clearly defined and aligned. SS offers therefore an interesting approach to training. Everyone, who are trained in SS, distinguish themselves with a colored belt system determined by ranks like karate students (Richardson, 2007). These are the following four main classifications:

Master Black Belt (MBB), Black Belt (BB), Green Belt (GB), Yellow Belt (Chakrabarty and Tan, 2007). However, Rowlands (2004) has argued that the original SS training and deployment is not suitable for SMEs because of many differences like for example financial and resource limitations, the lack of management awareness and knowledge or the reduced process complexity (Burton, 2004; Kumar et al. 2011; Timans, 2014). Due to this reason this paper highlights the differences of the deployment of SS belt roles in SMEs and large enterprises.

2.RESEARCH QUESTIONS AND METHODOLOGY

Basically, this paper focuses on the following research questions between SMEs and large enterprises:

- What are differences of SS belt roles in regards to the hierarchy and proportion of the company's total population?
- What are differences of SS belt roles in regards to working time?
- What are differences of SS belt roles in regards to the number of executed projects?
- Where are differences of SS belt roles in regards to cost savings?

The investigation is based on advices and recommendations of different authors in the current literature which mostly concern manufacturing companies. These shall be summarized in this paper. For this analysis, leading journal databases like Science Direct, Emerald, Taylor & Francis, Web of Science, EBSCO databases were used. Before starting with the comparative analysis and presenting the findings, theoretical fundamentals will be explained.

3.THEORETICAL FUNDAMENTALS

The SS belts represent statistical and problem solving skills of people (McCarty, 2005; Pyzdek, 2003). The International Standard for SS, BS ISO 13053-1 (BSI, 2011) recommends the following minimum competencies for SS personnel depending on their belt level (see table 1).

Tab. 14: Competencies for Six Sigma personnel (BSI, 2011)

Competency/Skills	**Master Black Belt**	**Black Belt**	**Green Belt**	**Yellow Belt**
Practical Problem Solving Skills	Highest Level of availability	Proficient User	Highest Level of availability	Basic Competence
Six Sigma Tools Knowledge	Highest Level of availability	Highest Level of availability	Proficient User	Proficient User
Statistical Skills	Highest Level of availability	Proficient User	Basic Competence	Skill not needed

MBBs are certified, trained experts specialized in SS practices and represent the top of the SS structure. Their main responsibilities include training and mentoring of BBs, helping to prioritize, select and charter high-impact projects. MBBs undergo BB training (four weeks of SS training over a four month period) plus two weeks of additional training on mentoring SS projects. They also write as well as develop training materials and work closely with the Champions. BBs also possess extensive LSS knowledge through rigorous training in the

statistical methods and are responsible for implementing process improvement projects with the DMAIC methodology. BBs have typically completed their training combined with a LSS Project and an exam (www.isixsigma.com; Montgomery and Woodall, 2008). BBs coach GBs (Leyendecker, 2011). A GB is a LSS practitioner who has been trained in the SS DMAIC problem solving methodology, often 1 or 2 weeks within two month, and basic statistical tools. GBs also usually complete their education with a project (McCarty, 2005; Montgomery and Woodall, 2008). The specialized training and education on statistical methods and other quality tools equip BBs and GBs to function as team leaders and technical problem solvers (Montgomery and Woodall, 2008).

Nevertheless, beside the training of mentors, it is equally important to have a large group of employees trained in basic SS tools (Chakrabarty and Chuan, 2009). Many companies call this basic level of training with the name Yellow Belt (YB). Their knowledge of SS tools is not as extensive as that of the MBBs, BBs, GBs, however they still play a key role in executing SS projects (Marzagao and Carvalho, 2016). A YB is a project team member who has basic knowledge of SS and is responsible for running smaller improvement projects (www.isixsigma.com). YBs undergo usually a 2-4 day´s training workshop (www.korn-consult.com). Beside the belt roles also the team members of the project play a very important role with their relevant experience as well as the owner of the business processes that is the target of a LSS project. For effective SS deployment within a department, process owners as well as team members shall receive at least basic training in the SS mindset (www.isixsigma.com). It is suggested to be even a certified GB or YB. In addition, there are also roles on a higher management level who must support the LSS program. On top of that is the Sponsor who is responsible for the overall initiative (www.isixsigma.com). Sponsors shall participate on a basic awareness and understand training for approximately a half day so they can fund projects appropriately and understand what will be delivered. Champions, who are also on executive level, usually receive training on technical aspects as well as on how to lead an initiative (www.isixsigma.com). Three training days shall be enough for them (Zabel, 2007). They are the sponsors of a specific LSS project and responsible to identify the right projects, ensure the availability of resources for training and projects as well as being involved in project tollgate reviews (Montgomery and Woodall, 2008). They request the quality managers who may be BBs or MBBs to form a team from respective departments (usually GBs or YBs) where there is a problem (Pyzdek, 2003).

In general can be said that it is important to train both managers and employees while implementing LSS because it enables people to have a clear sense in understanding the fundamentals, techniques and tools (Kwaka and Anbari, 2006). It is also important to start training at the top of the organization and then cascade it through the organizational hierarchy to transfer the knowledge into the organization effectively (Antony and Taner, 2003). Furthermore, providing regular training opportunities to employees and formulating newer training methods promote management and employee commitment (Deshmukh and Lakhe, 2009). Regarding this, it must be pointed out that it is essential to attract the best people with good leadership to be involved in the company´s first wave SS Black Belt training (Pyzdek 2003). The selection of top talents would give a clear message to the organization that the management is committed and serious about LSS. This will also motivate other employees to get involved in the journey.

4.COMPARATIVE ANALYSIS

To answer the research questions the following chapter is structured in four different sections.

4.1.Six Sigma belt roles structure

Pulakanam and Voges (2010) recommend 0,1% MBBs in a company. Normally, there would be one MBB for ten BBs (Raghunath and Jayathirtha, 2013a). Feng and Manuel (2008) stated that BBs are the driving force of the program due to the fact that in each SS organization there is at least one BB employed. In the literature is stated that typically BBs comprise 1% or 2% of the company´s total population (Raghunath and Jayathirtha, 2013a; Pulakanam and Voges, 2010). One Black Belt shall be supported by four GBs or team members (Leyendecker, 2011; Kumar et al. 2008b). Researchers argue with a GB number of 5-10% of the organizations population (Pulakanam and Voges, 2010; Raghunath and Jayathirtha, 2013a). These guidelines are mainly related to larger enterprises. Following studies were conducted in the last years to investigate if the recommended percentages of SS professionals are met in the companies:

- Jesus (2015) investigated 29 Brazil manufacturing companies and came to the result
- that on average 1,9% GBs, 0,2% BBs and 0,02% MBBs are present in the companies.
- Feng and Manuel (2008) received 10 responses in his study about US healthcare
- organizations. The average percentage of SS professionals was typically around 0,2 %
    - of total work force.
- The empirical study from Monteiro et. al. (2014) included a number of 46 Brazilian
- companies from the manufacturing and service industry. 11 companies had here less than 500 employees. Overall 50% had the MBB category, 86% had the BB category and 75% had the GB category. The YBs were only in 6% of the companies available.
- Cauchick and Marcos (2009) report that of the SS respondents in his survey 40% had
- MBBs, 80% had BBs and 50% had GBs

Unfortunately the both latter surveys do not show the proportion of total employees in these roles. However, it can be concluded that the program was not implemented in the companies of these studies according the recommended values from the literature.

Taking now into consideration the many differences in SMEs, executives must understand that LSS requires the same leadership and commitment as in larger companies (Burton, 2004). Nevertheless, an extensive role system like in large organizations where MBBs and BBs are involved is usually not required there (Kumar et al. 2006, 2008a, Wessel and Burcher, 2004). There is no need for Master Black Belts in a SME environment. The BB could take the coach role and train the rest of the employees at different levels of SS expertise, i.e. GB for middle managers and YB for supervisor and shop floor employees. This will not only save financial resources for SMEs, but also build their own capability and understanding of SS for the long-term sustainability of the initiative. This approach was popular and practiced by participating case study firms in the empirical research conducted by different authors (Kumar et al. 2011). It also leads to the fact that there should be a direct reporting structure from the BB to the project champion (Timans et. al. 2012).

However, Burton (2004) did the experience that BBs and GBs would be interchangeable in SMEs for about 80% of the organization´s SS opportunities. A GB and YB approach addresses

many of the constraints of SMEs and allows them therefore to achieve results at a more manageable pace. Due to the reason that not all problems require a complex statistical approach it is rather more important to gain knowledge in applying the right tools for the right opportunities what can be covered by GBs and YBs instead of BBs. As result, it can be concluded that the majority of benefits are not derived from BBs they are rather generated at the GB and YB level, especially when the SS process becomes institutionalized. A group of 25 individuals for a GB certification over a 2-3 month period and approximately 25-50 individuals for a YB certification over a 2-4 week period is recommended. Later in the lifecycle, some individuals can be transitioned to the next belt level (Burton, 2004). Accordingly, the proportion of BBs in a SME may be lower than in larger enterprises. Findings from empirical research indicate the need of 1-2 BBs for a company with 250 employees (Kumar and Antony, 2008).

Furthermore, Harry and Crawford (2004) have introduced the "White Belt" (WB) additionally, a new generation of belt system in the SS infrastructure which is of shorter duration than the BB, GB or YB program. This WB is another training alternative for SME enterprises that have limitations sending their employees for BB, GB or YB training. Also Kumar et al. (2008a) suggest SMEs to introduce a WB concept in SMEs instead of heavily investigating the BB system. WBs shall mainly improve processes as for example in work cells or similar settings that would not justify the requirement of a BB and thus bringing down the cost of implementation (Raghunath and Jayathirtha, 2013b). A company of a size of 100 people should plan for about 10 to 15 White Belts (Kumar et al. 2011), trained for approx. 4 hours or maximum one day on basic LSS methodology (www.korn-consult.com). According to Monteiro et. al. (2014) empirical study 11% of the companies had the WB category.

Additionally to this, Wessel and Burcher (2004) also recommend an one-day awareness training for the management and their employees of SMEs to facilitate the cultural implementation element and consequently to promote willingness to change organizational structures.

4.2 Working time

In a study from Cauchik and Marcos (2009) 35 % of the SS companies had full-time MBBs. It is generally recognized in larger enterprises that it is more effective to have MBB as well as BB positions be full-time, meaning that 100% of their time and energy is dedicated to SS endeavor within the company (Montgomery and Woodall, 2008; Porter, 2002; McCarty, 2005; Burton, 2004). A GB works usually part-time (McCarty, 2005; Montgomery and Woodall, 2008). For many SMEs it will be practically infeasible to invest in education and training of their employees to become full time BBs (Timans, 2014). Timans et. al. (2012) conclude that part-time BBs are the best option for smaller companies. Kumar et al. (2008b) recommend that GBs should be able to spend at least 20% of their time in SMEs.

4.3 Cost savings and project execution

There are different statements from researchers about cost savings by SS projects in larger enterprises. A LSS deployment typically passes the breakeven point in 6 to 12 months (Snee, 2010). Experience has shown that companies considered to be doing an effective job of deploying LSS get the following returns: large companies return 1-2 percent of sales/year and SMEs return 3-4 percent of sales/year (Snee, 2004).

Porter (2002) estimate that the average BB save around £100k. Kumar et al. (2011) expect that a BB save approx. £75k per project. Harry (1998) stated that GB and BB projects typically return in excess of $50k and $175k per project. However, the estimated savings from a BB

project in a SME environment is different from that in large organizations. A typical BB in a SME environment may save £30–£35k per project (Kumar et al. 2011).

Nevertheless, LSS programs are very expensive. To train someone to BB cost typically between £5k and £10k in the UK. But trainings shall be rather seen as an investment than as cost. A BB project has a payback time of 2.5 times of the training costs within six months on the first project. Therefore companies will most likely see a direct impact on bottom line results very soon through investment in Belt trainings. Projects are typically 4-6 months in duration (Montgomery and Woodall, 2008). According to Leyendecker et. al. (2011) a BB carry out four till five projects on average and a GB one till two projects on average. Harry and Schroeder (2002) think that a WB in SMEs can offer much quicker a return on investment by completing approximately one project per month, than the two to three projects per year from a GB or BB. The expected savings from a WB project can be around £5000 per project.

5.CONCLUSION

The SS role system structure in SMEs provides a hardly explored research area so far. Nevertheless, the current literature shows that many researchers advise SMEs against a LSS structure like in larger enterprises. It can be concluded that SMEs do not require such an extensive role system with MBBs and BBs. A MBB for instance is not needed there. Instead, the BB shall report directly to the Champion and train the employees of a company. However, the number of BBs present in SMEs should be lower and also a full-time activity of them like in large enterprises is not needed. The focus in SMEs shall be on the education of GBs, YBs and WBs. It must also be taken into account in this context that the described guidelines concern to manufacturing companies mainly. Perhaps, other industries like the public and service sector need to follow a different SS belt strategy based on their industry requirements.

Core results of this paper are summarized in following table 2. It shows the SS belt roles structure with guidelines for SMEs as well as large enterprises and highlights the main differences between both company sizes. The recommended guidelines can support large enterprises and especially SMEs to structure their SS role system according their needs in an efficient way. It is a good basis but needs to be developed further in future to standardize a roadmap for the implementation of SS belt roles in SMEs. For that, the recommended guidelines in this paper has to be validated by empirical studies and expert interviews in future.

Tab. 2 SS belt roles differences between large enterprises (left) and SMEs (right) and (source: author)

LARGE ENTERPRISE	MAIN DIFFERENCES	SME
Sponsor Executive level Responsible for initiative 0,5 days basic awareness training	Higher return in SMEs expected: 3-4% of sales/year in SMEs 1-2% of sales/year in large companies	**Sponsor** Executive level Responsible for initiative 0,5 days basic awareness training
Champion Executive level Responsible for project selection and resource availability 1-3 days basic awareness training		**Champion** Executive level Responsible for project selection and resource availability 1-3 days basic awareness training
Master Black Belt Full-time role Responsible for training and coaching of employees Approximately 0,1% MBBs of the total organization 4 weeks BB training education and 2 weeks mentoring training	No MBB required in SMEs BB take trainer role in SMEs and report to champion directly	**Black Belt** Part-time role Responsible for training and coaching of employees Responsible for project execution

Black Belt Full-time role Responsible for project execution Approximately 1-2% BBs of total organization 4 weeks training education Approximately 75-175 000 Euro savings per project Execute 4-5 projects on average per year	No full-time BBs needed in SMEs Less BBs in SMEs required Higher focus on GBs, YBs and WBs	Approximately 0,5% BBs of the total organization 4 weeks training education Approximately 35-40 000 Euro savings per project
Green Belt Part-time role Assist Black Belts in project execution Approximately 5-10% GBs of the total organization 1-2 weeks training education Approximately 50 000 Euro savings per project Execute 1-2 projects on average per year	Higher GB proportion of the company's total population in SMEs required No part-time GBs possible in SMEs.	**Green Belt** Assists BBs in project execution 1-2 weeks training education Shall spend 20% of their time More than 10% GBs of the total organization
Yellow Belt Project Team Member Support GB in project execution 2 training days education	Higher YB proportion of the company's total population in SMEs required	**Yellow Belt** Project Team Member Support GB in project execution 2 training days education
	Additionally Introduction of WBs in SMEs	**White Belt** Project execution in work cells or manufacturing lines Between 10-15% WBs of the total organization 4 hours or 1 training day education Approximately 6000 Euro savings per project Execute 12 projects on average per year

Abbreviations:

Six Sigma	SS
Lean Six Sigma	LSS
Master Black Belt	MBB
Black Belt	BB
Green Belt	GB
Yellow Belt	YB
White Belt	WB

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PERFORMANCE MANAGEMENT THROUGH BALANCED SCORECARD IN HEALTHCARE: CZECH HOSPITAL CASE STUDY

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Abstract

The article is based on the interest of authors to implement the Balanced Scorecard into organizations operating in a specific market of medical services. Balanced Scorecard (BSC) is a popular method of creating links between operational activities and strategic objectives set by the company. The method is applied in particular areas with regard to performance measurement. This method is widely used within many types of businesses and brings positive results to management. Currently, this method is being applied even in less commercial environment such as health, social services, or spa.
In the first part of the article, the authors summarized the main international research dealing with the issue of BSC in health care. A separate chapter presents key performance indicators in healthcare as a tools of measurement of quality for four Balanced scorecard perspectives – financial perspective, customer perspective, learning and growth perspective and internal business perspective. The main part of this article is a case study that represent the application of BSC method for increasing the performance of hospital. The study includes a strategic map illustrating the development of fulfilling the vision of a hospital, and setting key criteria for controlling each perspective of the Balanced Scorecard. In the concluding part, the authors introduce general methodology by applying the BSC to the direction of medical organizations.

Keywords: balanced scorecard, health care, hospital, key performance indicators, case study

JEL Classification: I11, M21

1.INTRODUCTION

The first article dealing with establishing the Balanced Scorecard (BSC) into the direction or medical organizations was published in 1994. Since then, there have been a number of authors dealing with the topic, such as Bisbe and Barrubés (2012, pp. 919-927), Chow, Gaunulin, Haddad and Williamson (1998), Swayne, Duncan and Ginter (2008, pp. 378-379), or Fortenberry (2010, pp. 248-259), and the BSC in hospitals, for example Lin et al. (2013, pp. 1917-1924). According to Zelman et al. (2003), the BSC was accepted by a wide range of health care organizations, including hospitals, psychology centres, and national medical organizations. Even though the BSC has been applied as a strategic direction tool successfully many times, there is also proof of unsuccessful applications. Nelly and Bourne state that the level of unsuccessful attempts is around 70%. That is why it is necessary to focus on the successful implementations and scrutinize the reasons for their success. Examples of successful implementations can be found in Chow et al., 1998; Stewart and Bestor, 2000; Pink et al., 2001; Oliveira, 2001; Fitzpatrick, 2002; Shutt, 2003; Tarantino, 2003; Randor and Lovell, 2003a, b.
In their study, Inamdar et al. (2002) mention certain instructions which could help managers with establishing and controlling an organization using the BSC. Nowadays, given the fact that this is a very changeable and uncertain environment, controlling such organizations is not easy.

The main instructions are to:

- Evaluate the ability and preparedness of an organization for establishing the BSC. In particular, the readiness of an organization is measured in terms of the abilities of its employees an amount of time needed for establishment and its information system.
- Control the development and establishment of the BSC during all its phases.
- Control education before, during, and after the implementation process.
- Expect and support the change of roles between various sectors.
- Accept a systematic approach.

It their research, Inamdar and Kaplan (2002) highlight the motivation factor as a basis of successful implementation of BSC in medical organizations and define the following potential assets:

- It helps the organization with defining a market-oriented, costumer-oriented strategy,
- Facilitates, monitors, and evaluates the implementation of the strategy,
- Guarantees communication and cooperation,
- Defines its responsibility for productivity in all levels of organization directing,
- Ensures continuous feedback of strategy implementation and supports market adjustment and adjustment of regulatory work from the side of the government.

Santiago (1999) assumes that the BSC system in the health care could be useful for:

- Informing patients, employees and state authorities about the quality of provided services.
- Thanks to publishing their outcome, it will be possible for the patients, employees and payers to make right decisions based on, for example, the amount of capacity utilized.

Summarizing the BSC method, we can say that the main task of the implementation of the BSC is to answer the following questions:

- What is our financial situation? (Financial perspective) How are we perceived by the patients? (Customer perspective)
- What can we do in order to improve the standard of our services provided? (Learning and growth perspective) What is it we want to get better at? (Internal business process perspective)
- Financial perspective is associated with the company strategy which is implemented and contributes to receiving better results. (Learning and growth perspective)
- In what do we want to be the best? (Internal processes perspective) (Chen, 2006)

Financial perspective is associated with the company strategy which is implemented and contributes to receiving better results. Here are some examples of financial goals in a hospital: patient expenses, expenses according to diagnosis-related groups (DRG), etc.
Customer perspective identifies customer segmentation in which the company will conduct business and compete. Some of the indicators of this perspective are, for example, customer satisfaction, number of complaints, etc.
In-house business process perspective – it is necessary to identify critical internal processes in which the organization needs to be excellent. It is necessary to focus on those processes which will have the main impact on customer satisfaction and on reaching the organization's financial

goals. Some of the examples are: waiting lists; hospital bed capacity, the duration of stay; and any indicators of quality and clinical procedures.
The learning and growth perspective – people with skills, knowledge and attitude are the basics of any organization, and that is why motivation and satisfaction of employees is very important. For this kind of perspective, the most important is the aspect we need to take account of. Examples of indicators based on employees are a combination of general indicator results, such as satisfaction, training and development, but also a number of hours of training or sick leave on the side of employee.
According to Urrutia de Hoyos (2003), the choice of perspectives is based on the following pattern: The indicators of learning explain how value will be created by the organization in the future; internal business processes show how value is created in the present, and financial indicators explain how value had been created in the past. This concept is also supported by Voelker et al. (2001) who emphasizes that traditional systems focus on financial measures primarily which, in many cases, prevents an organization from growth and success.
The following table shows an overview of the perspectives as they were used in various medical organizations. In the first line, there are traditional perspectives as we know them from Kaplan and Norton. The lines following then show the four perspectives adjusted.

Tab. 1 – Overview of the four perspectives of Balanced Scorecard. Source: Bergeron, 2016

Strategy	Q1	Q2	Q3	Q4
Kaplan and Northon	Financial	Customer	Internal	(Learning and growth perspective)
Duke Medical Center	Expenses	Patient satisfaction	State of functions and health	Education and research
Henry Ford Health Service	Low expenses for services	Customer satisfaction	Growth	System integration
Johns Hopkins	Financial goals	Patient satisfaction	Clinical outputs	Research and learning
New Zealand HHS	Financial	Patient and quality	Process and efficiency	Organization health and learning
Ontario Hospitals Association	Financial performance and conditions	Patient satisfaction	Clinical utilization and outputs	System integration and changes

2.KPI – Key Performance indicators

Health care–related key performance indicators (KPIs) are quantifiable measures of quality used to track an organization's progress with specific, essential processes and outcomes. The current state of the art indicates a need to develop integrated KPIs for healthcare facilities, seeking links between performance, maintenance, operations and energy expenditure, and cost-effectiveness (Pullen et al., 2000). Healthcare organizations have been developing key performance indicators for monitoring, measuring, and managing the performance of their systems to ensure effectiveness, efficiency, equity and quality. Healthcare systems are expected to achieve and manage results in line with their established objectives and quality standards (Arah, 2003). KPIs are used by hospitals

- to monitor and evaluate performing against benchmark values or standards.
- to show trends and explain how improvements are being made over time.
- to compare results with approved standards or against other similar comparable organizations

KPIs helps hospitals to improve the services they provide by identifying whether the performance is at the desired level or not and also to identify where improvements are required. (Parmenter, 2010)
KPIs can be integrated with strategic institutional objectives that include directional change, benchmarks, targets, and time frames. Progress can be tracked by using a performance dashboard or balanced scorecard (Abujudeh, 2010). The key indicators should directly influence the success rate of the organization's vision, which is why the Balanced Scorecard frames, leading the vision to various fields and subsequently defining performance indicators, are used for their creation. Then the process of planning of the future value of these metrics and of measuring of achieved value takes place, which leads to achieving the organization's goals and improvement of economic output (Bergeron, 2006). The following picture (Fig. 1) shows an overview of indicators according to individual perspectives.

	Financial Perspective	
Inpatient and Outpatient revenues	Cash flow	Fundraising
Return on net assets	Asset turnover	Bond rating
No. of days in accounts receivable	Cost per case	Avg length of stay
Operating margin	Operating expense	Case-mix index
Operating margin by payor or mix	Revenue growth	CMAAD
Bad debt %	Inpatient net margin per discharge	CMAAD per Bed
Accumulated depreciation to total fixed assets	Unit profitability	CMAPD
Debt to assets	Inpatient/Outpatient volume	Days cash on hand
Times interest earned	Medicare days	Medicaid days
	Customer Perspective	
Patient satisfaction	Marketing budget per payor contract	
Patient transfers	Advertising budget per bed	
Patient retention	Patient falls	
Patient referral rate	Market share	
	Internal Process/Quality Perspective	
ER volume	Nurses to patient index	FTE per Bed
Avg ER waiting time	Infection rates	Occupancy rate
Mortality index	Patient complaints	Change of occupancy
Complications index	% of outpatients preregistered	CMAAD per FTE
Clinical outcomes	Patients who leave ER without being seen	
	Learning and Growth Perspective	
Avg length of stay	Lost work days per month	Certifications
Outpatient activity	Training hours per employee	Employee turnover rate
Physician satisfaction	Patient loads	Absenteeism rate
Agency use	Employee recruitment	

Fig. 1 – An example of the BSC perspective indicators in medical organizations. Source: Kocakülâh and Austill, 2006

There are many indicators in the field of health care, which can be divided as follows: clinical, financial, patient-oriented, qualitative, quantitative, hybrid, processional, output-oriented, result-oriented, concerning the whole hospital, concerning individual departments.
According to Bergeron (2006), the division into clinical and non-clinical indicators is very important. The non-clinical indicators monitor primarily capacity, hospital bed capacity, profitability, income, etc., while the clinical ones comprise for example mortality rate. The KPI output represent, for instance, an amount or utilization of hospital bed capacity, while, for example, the KPI results encompass infection rate or death rate. Concerning for example the division of KPI from the perspective of the whole organization, or from such in which are focused on individual hospital departments, from the former we can follow, for example, employee or patient satisfaction, while, on the other hand, from the latter we can follow the blood usage, or an amount of certain interventions, etc. Besides the non-clinical indicators, we can find a lot clinical indicators which include primarily care quality. Here we can see a lot of qualitative standards, of which many are constituted by institutions focusing on quality in health

care. It is possible to classify the quality indicators according to many points of view, as each institution sets its own structure. It could be, for instance, periodic eye exams of diabetics, flu vaccination of people over 65 years of age, a portion of call-outs under the purview of maximal scope of medical transport, etc. (Bergeron, 2006).

3.METHODS

This study does not attempt to investigate factors that lead to the success of Balanced Scorecard implementation in health care organization. This study expands the boundary of knowledge of the Balanced Scorecard and its implementation in hospital. As the research objective is to answer the why implement the Balanced Scorecard into hospitals and how, the case study approach was selected. This hospital was selected from the reason that the researcher was involved into implementation.
Data was collected for study from interviews, researcher observation and documents analysis. A part of the data was collected from the publicly available documents and sources:

- Annual report 2013, 2014 and 2015,
- Data from Institute of Health Information and Statistics of the Czech Republic,
- Data from Quality from the customer's perspective (QCP) survey in accordance with the STEM/MARK methodology,
- the AC's recommendation,
- results of survey questionnaire for employees.

For the financial perspective were used these indicators and factors: ratio analysis, profit, EBIT, year-on-year turnover growth outside of the health insurance system, utilization of investment grants and contributions, utilization of non-investment grants and contributions, costs stability and due date. For the customer perspective were chosen these indicators and factors: hospital evaluation according to QCP, satisfaction of hospitalized patients according to QCP, satisfaction of hospitalized patients according to QCP, a number of legitimate complaints /total number of complaints, utilization of hospital bed capacity and satisfaction of clients with the length of waiting time for hospital beds in accordance with one's state of health. For the internal processes perspective were used these indicators and measures scales: retaining Joint Accreditation Commission, retaining Joint Commission International accreditation, average salary growth, implementation of cultural and social needs funds, employees' satisfaction with interpersonal relations in the hospital, employees' satisfaction with the organization, employees' satisfaction with the working conditions, employees' satisfaction with the information and occurrence of decubitus ulcers. For the learning and growth perspective were used these indicators and measures scales: a number of grant programmes, the total number of publication, recording of attendance success rate of the language courses participants, success rate of the language course participants.

4.CASE STUDY - BALANCED SCORECARD OF HOSPITAL

4.1.Characteristics of a medical organization

The chosen hospital is the largest and the most important provider of medical services in the given region, which makes it the centre of specialized and super-specialized health care of the region of 1.2 million citizens. Annually, there are 46,500 patients hospitalized and up to 600,000 ambulatory procedures are carried out. In the central operation rooms, there are more than 1,800 surgical procedures realized. The remarkable advantage is a complete continuity of health care provided, starting with entrance diagnostics, continuing through medical care and up to the after-treatment.
With its 3,143 employees, the hospital is one of the largest employers in the region. The total amount comprises more than 500 doctors, 1,300 nurses, and 830 other health care workers.
The hospital holds the most prestigious certificate of quality and safety – Joint Commission International Accreditation. This prestigious accreditation was built in the hospital on the basis of controlling the quality system which was set according to the standards of the Joint Accreditation Commission of the Czech Republic; Accreditation Committee Joint Accreditation Commission in Czech. JAC reaccreditation took place successfully in 2010, 2013, and 2016. In 2015, the hospital was given the Czech Stability certificate, which proves that the hospital is a credible and stable entity.
In spite of their difficult economic development, the hospitals manage to keep money management profitable on a long-term basis. A healthy and strong economy is one of the basic priorities of the hospital and its management. Unlike many other Czech hospitals, profitable and effective money management is among the basic values of the company. Regardless of the permanently decreasing economy of the Czech health care system, the hospital is successful at accomplishing positive economic results and keeping the positive cash flow and stable balance of payments. This gives the hospital negotiating power.
The range of the hospital's activities surpassed a regional scale. The readiness, quickness and precision of the hospital's medical staff in emergency situations caused by a mass-casualty accident is respected and recognized nationwide. The hospital is also successful in the research field. Regarding this matter, a remarkable role is played by the financial support of scientific projects created by institutional financial means, grants provided by the Regional Authority and the Ministry of Health. In 2013, the strategic goal was to complete the construction of the scientific research centre on the premises of the hospital. This biotechnological centre is focused on the field of top-class research in applied clinical research and development, mainly in the areas of tissue engineering, biobanks, cryopreservation, medical genetics, nanotechnology, electron microscopy and environmental analyses of impact on health of the population.
For 20 years, the hospitals have been participating in the education of medical workers in cooperation with the medical faculty of the university also located in the region.

The hospital's mission:
We want to provide our patients top-class services in the wide range of medical fields.
We will ensure complex health care via the agency of joint teams of reputable professionals.
We want to be the best hospital in the Czech Republic. We will create the image of an excellent, reliable, safe and amicable hospital. We will train young doctors, develop our scientific research activity and apply its outputs into practice. We want to build out success on educated and motivated employees. The basic conditions of our progress and growth are positive economy results and their permanent improvement.

Motto:
"The fundamental goal of our efforts is a satisfied patient who is provided high-quality health care."

Fundamental values:
"The fundamental goal of our efforts is a satisfied patient who is provided high-quality health care."
Our main goal is a satisfied patient who is provided high-quality treatment.
The positive economic results are necessary for our progress.
We want our employees to fully realize their potential in interesting work and to try to be the best at what they do.
It is natural for us to treat clients and each other with respect.

We are loyal towards the hospital.

Strategic goals:

- To keep the stability and profitability in the hospital's economy
- To widen the range of provided health care with other services which are in real demand
- To make use of the medical programme associated with the centralization of health care
- To continue to make investments in the latest modern medical technologies, with the maximum utilization of the grants from the national budget and the European funds
- To build a friendly hospital for clients and increase their satisfaction
- To develop clinical research projects which will be fully under the hospital's control
- To increase the quality of provided care, the system of its control and the safety of our clients
- To develop cooperation with external organizations (the medical faculty and other significant research or educational institutions)

4.2.The BSC Utilization

The hospital's strategic goals create an interconnected system in which there is an effort to express the duration of the hospital's vision fulfilment in the sincerest way. The vision fulfilment is illustrated in relations between the individual goals. Fig. 2 – the strategic BSC map of the chosen hospital. Source: own. This map is followed by establishing the measures for controlling individual perspectives of the Balanced Scorecard.

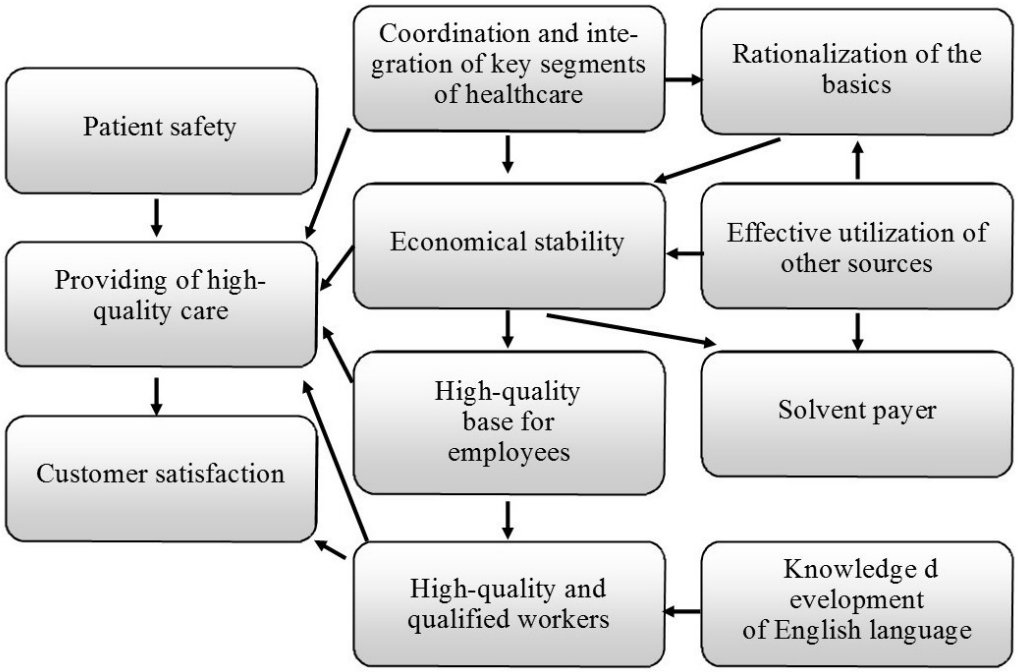


Fig. 2 –The strategic BSC map of the chosen hospital. Source: own

This map is followed by establishing the measures for controlling individual perspectives of the Balanced Scorecard.

a) The financial perspective

In the scope of the financial perspective, the goal of the BSC is to ensure the hospital's stability and optimization of the most important cost items, which are personal costs, energy costs and food costs. In the course of the last 5 years, the hospital successfully utilized all financial possibilities offered to hospitals by the EU structural funds (associated with establishment of super-specialized health care centres). For some of the projects, financial support from the state budget was obtained. There were significant investments in construction work and new medical technology. Total investment in 2015 was 321,202,940.90 CZK, while in 2014 it was only 89,754,603.07 CZK. All goals, measures and other figures are in the Table 2.

Tab. 2 – The financial perspective. Source: own

Goal	**Measuring scale**	**Unit**	**Period**	**Strategic action**	**Budget value**	**Investment value**
Strategic action	Ratio analysis		1 year	Reaching the planned values of budget items, analysing ratio indicators. Evaluating economic stability.		Maintaining stability
	Profits	%	1 year	Supporting fund-raising activities. Active individual communication with regular donors, making the donors public. Holding annual fund-raising events,	4.5%	10%

Goal	Measuring scale	Unit	Period	Strategic action	Budget value	Investment value
				promoting of public fund-raising programs, etc.		
	EBIT	%	1 year	Year-on-year turnover growth outside of the health insurance system Compared with the previous development		1–2% of the turnover
	Year-on-year turnover growth outside of the health insurance system	%	1 year	To make the promotion of extra services more effective, strengthen communication with the media during cooperation on TV programme production, use the internet to create a better media image, to increase the promotion of paid services.	4.65%	15%
Effective use of other sources	Utilization of investment grants and contribu-tions		1 year	Support of employees asking for investment means from subsidy programmes. Choosing an employee to help with a documentation phase.		∧trend
	Utilization of non-investment grants and contribu-tions		1 year	Support of employees asking for non-investment means from subsidy programmes. Choosing an employee to help with a documentation phase.		∧trend
Rational i-zation of costs	Costs stability		1 year	Profound analysis of costs with assets according to the items. A comparison with previous analyses. Recommendation of rationalization without affecting the stability of the hospital's functioning.		Stability
Solvent payer	Due date	amount	1 year	Consistent observing of obligation maturities, record keeping and management of high-		0 commitments after

Goal	Measuring scale	Unit	Period	Strategic action	Budget value	Investment value
				risk maturities, ensuring sufficient financial reserves.		the deadline

b) The customer perspective

In terms of the customer perspective, the hospital focuses on the satisfaction of clients. They participate in an evaluation survey called Quality from the customer's perspective (QCP) in accordance with the STEM/MARK methodology. The highest rating the hospital has gotten was an "A+," which met the conditions for "satisfied patient" certification. Overall satisfaction of hospitalized patients reached 64.5%, which makes it the 5th on the list of the best-evaluated hospitals in the Czech Republic. Overall satisfaction of outpatients in 2014 (n=996) was 90.2%, which was more than in 2013 (n=1564) when the satisfaction rate reached 88.3%. As far as legitimate complaints are concerned, there were only 3 legitimate ones out of 88 patients' complaints received in 2015. In the previous year, there were 71 complaints received, with 6 of them being legitimate. In terms of key care segments coordination, the hospital focuses mainly on the utilization of hospital bed capacity. The utilization in 2014 reached 78.2%; in 2015 it decreased to 77.5%. Overall satisfaction with length of waiting time for hospital bed in accordance with one's state of health was (n=2598) 94.1% in 2015, which was worse than in 2014 (n=2802) when it reached 95.9%. For the measuring scales, see the Tab. 3

Tab. 3 – The customer perspective. Source: own

Goal	Measuring scale	Unit	Period	Strategic action	Budget value	Investment value
Customer satisfaction	Hospital evaluation according to QCP	%	1 year	Annual participation in hospital to QCP evaluation programme in concordance with STEM/MARK methodology.	5th place	3rd at worst
	Satisfaction of hospitalized patients – according to QCP	%	Each 2 years	Monitor the satisfaction of hospitalized clients regularly via the agency of QCP questionnaire survey in accordance with STEM/MARK methodology. Improvement of the weak segments based on previous research (service availability, food quality, etc.)	84.5%	80%

Goal	Measuring scale	Unit	Period	Strategic action	Budget value	Investment value
	Satisfaction of hospitalized patients – according to QCP	%	Each 2 years	Monitor the satisfaction of outpatients regularly via the agency of QCP questionnaire survey in accordance with STEM/MARK methodology. Improvement of the weak segments based on previous research (waiting time, aesthetic cultivation of outpatient's department, accessibility in terms of time, etc.)	90.2%	80%
	A number of legitimate complaints /total number of complaints	amount	1 year	Evaluation of clients' complaints, evaluation of risk from previous experience, elimination of risk, strict record keeping.	3	0 legitimate complaints
Coordination and integration of key segments of healthcare	Utilization of hospital bed capacity	%	1 year	Evaluation of hospital bed capacity utilization regarding the departments and clinics, if there is unsuitable capacity for 3 times in a row, execute the transformation of the hospital beds.	77.5%	80%
	Satisfaction of clients with the length of waiting time for hospital beds in accordance with one's state of health	%	1 year	Monitor the satisfaction of clients regularly via the agency of QCP questionnaire survey in accordance with STEM/MARK methodology. Reorganization in case of 2 unsuitable investigations	94.1%	80%

c) The internal process perspective

The goal of internal processes is to ensure such processes which actively support the strategic customer and financial goals. It is necessary to establish, monitor, direct and control such processes; this may be helpful in fulfilling the strategy of the hospital. Among the hospital's primary goals in terms of this perspective there is not only maintaining the high-quality care provided (declared by Joint Accreditation Commission and Joint Commission International accreditations), but also ensuring the patient's safety. In 2009, the hospital won first place in the competition called "The Safe Hospital" – and it continually tries to keep this status. Close attention is also paid to creation of internal foundations for employees, the know-how media. As any other organization, the hospital wants to have satisfied, motivated employees of high quality who will be loyal towards their employer: see table 4.

Tab. 4 – The internal processes perspective. Source: own

Goal	Measuring scale	Unit	Period	Strategic action	Budget value	Investment value
High-quality health care providing	Retaining Joint Accreditation Commission		Each 3 years	Regular inspection of ISO standards, internal standards. Elimination and recording of mistakes. Sharing information among all levels of the organization.	yes	reaccredita-tion
	Retaining Joint Commission International accreditation		Each 3 years	Regular inspection of ISO standards, internal standards. Elimination and recording of mistakes. Sharing information among all levels of the organization.	yes	reaccredita-tion
High-quality internal base of employees	Average salary growth	%	1 year	Annual evaluation of average salary growth in accordance with qualification. Creating financial management in order to ensure reserves.	2.6%	^ 3%
	Implementation of cultural and social needs funds	%	1 year	Negotiate with the trade union in the subject of collective agreement in favour of all sides.		^ contribution amount
	Employees' satisfaction with interpersonal relations in the hospital	%	Each 2 years	Monitoring employees' satisfaction on a regular basis via questionnaire survey. Annually, set aside financial means for a team-building	Medical workers - 91,4%	80%

Goal	Measuring scale	Unit	Period	Strategic action	Budget value	Investment value
	– survey questionnaire for employees			department. Annually, set aside financial means for a team-building department. Organizing a Christmas party for all employees. Document conflicts for effective management of such situations.	Non-medical workers - 90,6%	
	Employees' satisfaction with the organization - survey questionnaire for employees	%	Each 2 years	Monitoring employees' satisfaction on a regular basis via questionnaire survey. Ensure the definition of rights and obligations in terms of work, communicating direction of the organization in all segments of the working places, cooperation with other working places of the hospital, supporting the fulfilment of potentials of all employees.	Medical workers - 90,1% Non-medical workers - 93%	80%
	Employees' satisfaction with the working conditions- survey questionnaire for employees	%	Each 2 years	Monitoring employees' satisfaction on a regular basis via questionnaire survey. Ensure accessibility of personal protective equipment, increase the quality of facilities with new items, support good physical conditions in the workplace.	Medical workers - 81,5% Non-medical workers - 82.25 %	80%
	Employees' satisfaction with the information - survey questionnaire for employees	%	Each 2 years	Monitoring employees' satisfaction on a regular basis via questionnaire survey. Ensure sufficient information providing about activities of the workplace, events in the hospital and activities of the unit.	Medical workers - 93,6% Non-medical workers - 93,75%	80%

Goal	Measuring scale	Unit	Period	Strategic action	Budget value	Investment value
Patient safety	Quality indicator-occurrence of decubitus ulcers	%	1 year	Ensure the profound monitoring currency of decubitus ulcers and keeping records, ensure accessibility of aids for preventing decubitus ulcers, support the education of employees in the issue.	AP - 6,4% DP - 11,45%	AP (4-11%) DP (10-20%)
	Quality indicator – patients' falls causing injuries	%	1 year	Ensure the profound monitoring of fall occurrence and keeping records, ensure the safety in the hospital regarding prevention. Promote internal campaign about fall prevention (education of patients, information board.)	0.49%	0.4-0.8%
	Quality indicator – correct patient identification	%	1 year	Monitor the execution of security process (usage of identification bracelets for patients, right verification of operational sites, execution of verbal control by asking questions, proper document recording, evaluation of risk of fall in patients.	91.23%	100%

d) The learning and growth perspective

This perspective aims at the factors which directly influence goal fulfilment in previous fields. Human resources have the direct impact on the quality of provided health care and the functioning of the hospital. Without them, none of the activities required inside the hospital could be carried out. That is why one of the main goals of this field is the expertise of the employees and their productivity. Given the growing number of clients from abroad, the strategic goal focusing on the knowledge of English language was included. Their command of English is currently very low. For the measuring scales see the Tab. 5.

Tab. 5 – The learning and growth perspective. Source: own

Goal	Measuring scale	Unit	Period	Strategic action	Budget value	Investment value
High-quality and qualified workers	A number of grant programmes	amount	1 year	Annually organize educational event regarding teaching and grant project support. On the regular basis, inform employees about grant projects via intranet. Choose employees to help with submission of projects.	IGA - 6 AZV - 7 IP - 16 GAČR - 0	IGA - 5 AZV - 5 IP - 15 GAČR - 2
	The total number of publication	amount	1 year	Monitor publication activity in the scope of scientific library. Motivation of employees to publish actively. Guarantee monetary assessment for the publishing employees.	192	200
Development of English language command	Recording of attendance success rate of the language courses participants	%	midyear	Course attendance records		70 % attendance
	Success rate of the language course participants	%	1 year	Recording success rate of participants. Motivation of the employees from their immediate superior.		60 % success rate

5.CONCLUSION

While applying the Balanced Scorecard, the hospital used commonly known methods of creating the BSC in a way how they were described by their authors in their publications. The main differences emerged in the moment of concretization of individual measuring scales, where we can find oppositions to the fundamental idea of the BSC – controlling and increasing of performance – and to the basics of controlling hospitals in a way used in the Czech Republic, see Figure 3.

The first step in the application of the Balanced Scorecard method in the direction of hospitals introduces the very idea and philosophy to the general office of the chosen medical organization through personal consultations, interviews and discussion. The goal is to accomplish general approval, consensus, but also the purpose is the realization of such a project. If we take an approval for the result of this phase, the next step is to define the architecture of measuring. In commercial practice, it means to define the so-called Strategic Business Unit (SBU). Kaplan and Norton (1992) state: "such an SBU will have its own products, customers, marketing and distribution channels and production space".
The draft of the BSC model for the hospital can serve as an example in which the connecting of measuring scales of workers of individual departments, departments themselves as units of an organization and the hospital as an organization providing medical care occurred. Regarding the closer attention to services provided in the next two researched organizations, it was decided that the model will be designed enterprise-wide.

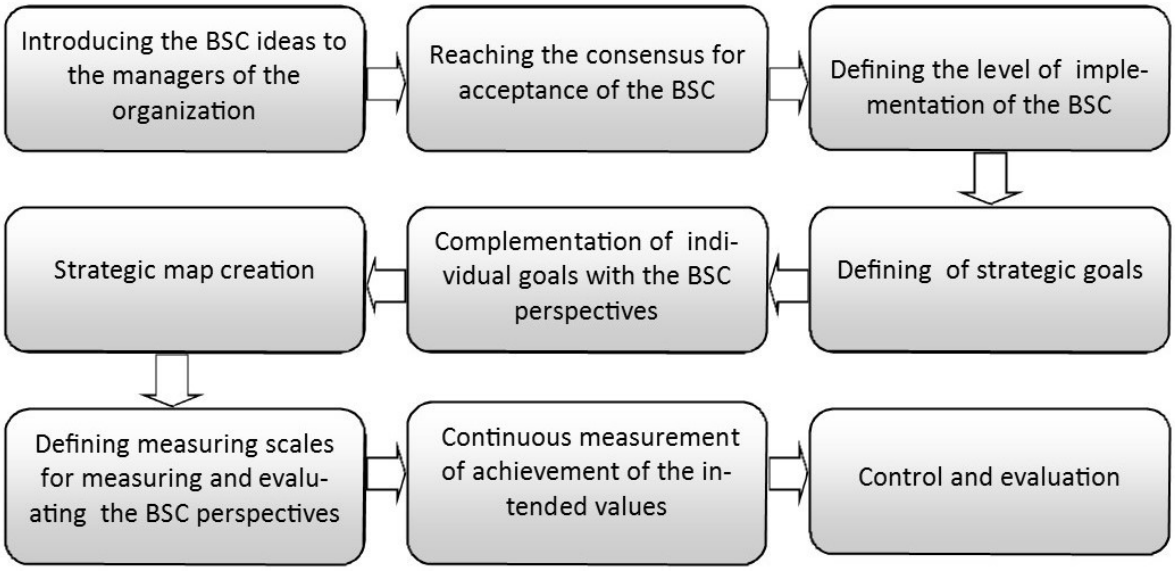


Fig. 3 – The methodology scheme of the BSC application in medical organizations. Source: own

During the next phase, it is important to interview other executive officers in a way that makes it possible for key goals (which the organization wants to reach through the four perspectives) to be defined. The interviews were carried out in a rather free form with the target to find out the most complex idea of an individual officer regarding his or her idea about the term "the strategic goal(s)." In the course of this phase. it was possible for the first time to unify attitudes, suggestions and thoughts into one general model for the BSC. The materials provided by individual organizations were used, such as annual reports, budget evaluations from previous years, budgets and investments plans for following years, internal documents and guidelines and results of satisfaction surveys, all of which organizations have processed along with other less relevant materials which they were willing to submit.
On the basis of such goals, the task was to adjust these goals into the four BSC perspectives, to classify and sort them in the event that some of them would reoccur. This gross and very complex model was subsequently consulted with the officers in order to reach the general agreement about the goals and the important selection took pace – which of the goals will be part of the final BSC model for individual perspectives? It was needed to incorporate so-called strategic maps, a graphic illustration of the way in which the goals fit into each other through the four perspectives, and to verify whether these goals suitably complement one another throughout this map.

When all the goals were defined, the group had one more task – the suggestion of a suitable measuring scale which would be able precisely, both in advance and retrospectively, to evaluate the success rate of fulfilling of individual goals. An ability to document and express the meaning of a goal is an important characteristic for each measuring scale. These measuring scales need to be analysed in terms of reciprocal relations in such way, so that there is no reciprocal elimination in the scope of the whole BSC concept.

It is important to keep in mind the particularity of non-profit institution which implements the BSC model. The common denominators of the BSC implementation project were, within the selection of strategic goals, two things: a client (patient) and costs. These items shaded into each other in all negotiations because of one reason, which is the performance of a medical organization. Under what circumstances it is possible to consider a hospital to be of high performance? To what extent it is possible to lower the costs without causing a decrease in quality of services provided? It is neither possible to speak about increasing the market share neither nor to take up a special price strategy. There is probably just one option for a medical organization in order to reach a high level in their performance – through so-called operational excellence. The question is what the outcome will be? The executives of individual organizations agreed that their existence and next development are dependent on grants and donations. This shows that it is needed to engage attention of potential sponsors with the institution's name and reputation, and also to try to make the processes for gaining the grants as easy as possible.

It is important to kept in mind all the risks associated with the implementation. The biggest risk can be the implementation of the Balanced Scorecard in a non-profit medical organization itself. If we follow the fundamental BSC philosophy and performance connected to it, it is important to be aware of the fact that the driving force of the whole concept is the interconnection of reward and motivational system with the fulfilling of strategic goals. With this, these questions arise: to what extent it is possible both financially and non-financially to motivate a worker of non-profit medical organization to perform beyond his or her obligations? Is it possible for more successful or higher-quality medical organization to charge their clients higher of even lower prices? Is it possible for them to widen their market share? How can a medical organization motivate their employees? Can a medical organization accept risky decision in the way that managers of commercial institutions do it?

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LOCATION STRATEGIES OF BANKING BRANCHES IN THE CZECH REPUBLIC

Sucháček Jan

Abstract

Organizational-geographical perspective is only seldom debated within banking studies. Internal banking hierarchies tend to follow existing settlement systems. Insufficient attention is devoted to the location decision-making of both banking headquarters and affiliates. The latter is the subject of our article. The main objective of the paper is to analyze and assess location factors staying behind the collocation of the first-tier banking affiliates in the Czech Republic. Collocation of banking branches in the country is shaped by numerous relevant location factors and just their hierarchy and importance are discussed thoroughly. Our research revealed that infrastructure, enterprise clientele and geographical location are treated as the most important factors affecting the location of banking branches. On the other hand, sport and cultural facilities occupy the bottom of the hierarchy of examined location factors.

Keywords: location factors, location strategies, organizational structures of banks, geography of banks, affiliates, Czech Republic

JEL Classification: B52, D22, G20, L20, R10, R12, R30

1.INTRODUCTION

There is no necessity to remind close interconnectedness among banks and parameters of territorial economies. Banking sector and banks can be examined from different perspectives and albeit organizational-geographical point of view is one of pivotal ones, it is still quite underrated, which concerns both theory and practice.
In any case, banking geographies substantially co-determine qualities of these rather peculiar enterprises. Banking activities, which include mainly gathering the deposits and provision of credits, in turn considerably co-form socioeconomic structures and relations. This becomes salient in advanced and even more in post-transformation economies (Fojtikova, 2014 or Seda and Del Rio, 2014).
Banks should be treated as the hubs of the geography of finance. Undoubtedly, geographical distribution of banking headquarters affects and co-forms spatially enormously differentiated financial landscapes of individual countries. While attention is usually devoted to head offices of the banks, their affiliates were monitored in less intense manner so far.
Czech Republic, which serves as a typical example of open and relatively small economy of post-transformation type, represents quite interesting arena for banks. At the same time, it is worth noticing spatial dimension of banks and banking sector in the country have been rarely discussed so far. If it was the case, banking headquarters lured much higher attention than banking affiliates. Despite its significance, location of banking branches in the country is rather neglected theme.
Our article leans upon extensive research, which facilitated the identification of relevant location factors standing behind the establishing of banking affiliates in the Czech Republic. At the same time, we were able to grasp certain principles shaping the spatial distribution of banking branches in the country. There are no doubts that organizational hierarchies of banks

with their territorial connotations are so important categories that it would be imprudent to disregard them. This remains valid for both theoretical and practical domains.
The main objective of this paper consists in the analysis and assessment of location factors that determine establishing of banking branches in the Czech Republic. Our attention concentrates on commercial banks headquartered in the Czech Republic. Research, which creates the backbone of this article, discussed the concrete location factors. They were bound to the location of banking affiliates in the country.

2.SELECTED THEORETICAL ASPECTS OF THE GEOGRAPHY OF BANKS

Spatial implications of banking sector mainly in the framework of western economies gave rise to the geography of finance. Various authors, such as Corbridge, Martin & Thrift et al (1994), Dow (1999), Martin (1999), Martin & Minns (1995), Pike & Pollard (2010) or Bassens & van Meeteren (2015) deal with ample aspects of the financial geography. Leyshon, Thrift & Toomey (1989) focus on the role of information technologies and financial services that transform and dynamise banking maps. It should be stated, banking sector is characterized by higher spatial concentration than other branches of the economy (Gál, 2004).
Analyses show financial and producer services work as mutual magnets, which promotes strong geographical concentration of banks and other financial services into large cities. Semple (1985) stresses intense interconnections among banks and other financial and producer services. Porteous (1995) accentuates the significance of personal contacts and networking, which typically occur in large cities and other metropolitan areas. This naturally entails also the reduction of transaction costs.
Contrary to that, actors residing or working elsewhere – mainly in remote places and regions – are often befallen by higher transaction costs (Martinat et al, 2016). Not surprisingly, spatial concentration of banks that tend to follow geographical distribution of the population, becomes rule rather than exception. Indeed, organizational structure of banks in a way embodies and at the same time also reflects territorially strongly uneven development (Suchacek, 2012).
Geography of banks should be monitored thoroughly as particular places – represented most frequently by large cities and metropolitan areas in general – act as decisive nods of financial decision-making as well as allocation of finance (Alessandrini, Croci & Zazzaro, 2005 or Melecky & Stanickova, 2014 or Polednikova, 2014). As mentioned by Corbridge, Martin & Thrift (1994) or Dow (1999), territories, which are lacking the banking centres or are remote from existing ones find themselves in a disadvantage in accessing finance. Martin & Minns (1995) wisely point out that the neglect of financial flows between the regions has created an enormous gap in our understanding of regional development and regional power.
As stated by Leyshon, Thrift &Toomey (1989), the recent growth of interest in the geography of money has been stimulated by an explosive growth in information technology and financial services and also by profound changes, upheavals that have remapped, and are continuing to transform the financial landscape of the world. This remains fully valid even now (Bassens & van Meeteren, 2015, Pike & Pollard, 2010, Dvorokova, Kovarova & Sulganova, 2012, Karreman, 2009, Kiszova & Nevima, 2013, Porteous, 1999, Cohen, 1998 or Hall, 2012).
At the same time, one should bear in mind the above mentioned conceptions explaining the geography of banks are applicable mostly in advanced standard economies. The situation in banking sector in Central East Europe, where the Czech Republic as a typical representative of post-transformation economy can be ranked, is still rather specific and largely path-dependent. That is why the applicability of standard conceptions striving for the illumination of banking organizational structures and geographies will be partly confined in this case.

3.MATERIALS AND METHODS

The whole research has been accomplished via questionnaire survey containing altogether 20 questions. The research was largely of qualitative character. Basic sample was composed of 24 commercial banks with headquarters in the Czech Republic. Data gathering was accomplished by means of electronic and telephone questioning. Respondents were represented by the members of top or middle managements in individual banks.
At the beginning, all banks were addressed by means of e-mail. In case of no response, respective managers were contacted via telephone when the purpose of the whole research was explained to them. In case of their approval they finally received the questionnaire via e-mail. At the end, 21 banks joined the research and the rate of return thus reached satisfactory value 87.5%. After the pilot phase in 2011 that lasted 6 months, the whole research has been executed in the course of 2012.
For the purposes of our research, structured questionnaire proved to be pertinent. We utilized Likert scale ranging from -3 to +3. The higher value, the higher intensity of the examined phenomenon. While -3 marks utter disagreement, +3 denotes complete agreement and 0 is a medium value. This scale was applied in the major part of questions. Further interesting and specific information that facilitated the completion of the whole research were obtained by means of open questions within our questionnaire. Our attention focused primarily on the issues with high frequency of occurrence, nonetheless we regarded also other information gathered within this research.

4.RESULTS AND DISCUSSION

In this section, we will discuss the hierarchy of location factors staying behind the collocation of banking affiliates in the Czech Republic. Put succinctly, banking branches are orientated mostly to profit and customers. It is worth noticing that quantity of enterprise clientele was assessed with the same intensity as geographical location. Infrastructure was the only location factor, which proved to be more relevant.
While customers are generally luring banking affiliates in the country, firms are distinctively being preferred. This can be accounted for by their higher attractiveness from financial point of view. Indeed, pecuniary motives drive the location of branches of individual banks, which provide credits to the enterprise clientele and are indispensable for enterprise activities.
Further important items affecting location preferences of banking affiliates are embodied by the quality, quantity and availability of the labour. The same concerns the quality of entrepreneurial environment. Human resources and their quality are traditionally considered by banking branches. Prestige and reputation of the place play also rather relevant role in the framework of analysed location factors. This factor occupies the top of soft factors of location. Contrary to that, price of particular piece of land, which represents rather concrete and tangible factor of location, did not reach large score. This confirms a certain financial autonomy of banks. Low scores of the proximity of competition, national policies or agglomeration advantages in a way confirm this fact.
Similarly to previous studies evaluating the location preferences of largest enterprises (Suchacek & Baranek, 2011 or Suchacek, 2015), the lowest positions of the hierarchy are occupied by the quality of the environment, sport and cultural facilities or willingness of managers to move. In a real life, these soft location factors are actually perceived rather intensely. Managers, who answered the questions in the framework of our questionnaire, considered their loyalty to the employers and tended to accentuate rather hard factors directly influencing the economy of banks. In that way, questioned managers indirectly declared their fidelity to their own banks.

Tab. 1: Location factors for banking branches in the Czech Republic. Source: author

Ranking	Location factors	Average	Standard deviation
1.	**Infrastructure**	2.24	0.81
2.-3.	**Enterprise clientele**	2.00	1.02
	Geographical location	2.00	1.11
4.	**Availability/quantity of work force**	1.57	1.09
5.	**Image/prestige of the place**	1.50	1.43
6.	**Local work force quality**	1.43	1.87
7.-8.	**Quality of entrepreneurial milieu**	1.38	1.21
	Attractiveness/financial standing of enterprise clientele	1.38	1.76
9.-10.	**Quantity of common clientele**	0.95	1.96
	Attractiveness/financial standing of common clientele	0.95	2.15
11.-12.	**Proximity of competitors**	0.57	1.62
	Nearness of decisive authorities	0.57	0.66
13.	**Price of the land**	0.33	1.83
14.	**Low wage demand**	0.29	1.61
15.	**Public administration system**	-0.10	1.57
16.	**National policies**	-0.19	1.47
17.-18.	**Closeness of related economic branches**	-0.24	1.72
	Agglomeration advantages	-0.24	1.06
19.	**Quality of environment**	-0.71	1.42
20.	**Willingness of managers to move**	-0.86	1.78
21.	**Sport facilities**	-1.52	1.74
22.	**Cultural facilities**	-1.57	1.68

Process of location decision-making in case of banking affiliates is also characterized by the large share of exact calculations and banks have a lot of particular information at disposal. Role of intuition turned out to be rather suppressed. This can be ascribed to strongly standardized nature of decision-making. At the same time, certain repeatability during the process of establishing banking affiliates cannot be considered in absolute terms as conditions for functioning and activities of banking branches in the Czech Republic were assessed as quite varying.

Members of top and middle managements that answered the questions in the framework of the questionnaire proved to be largely satisfied with functioning and activities of respective banking branches. In their opinion, their banking affiliates run rather smoothly and are efficient (see also figure 1).

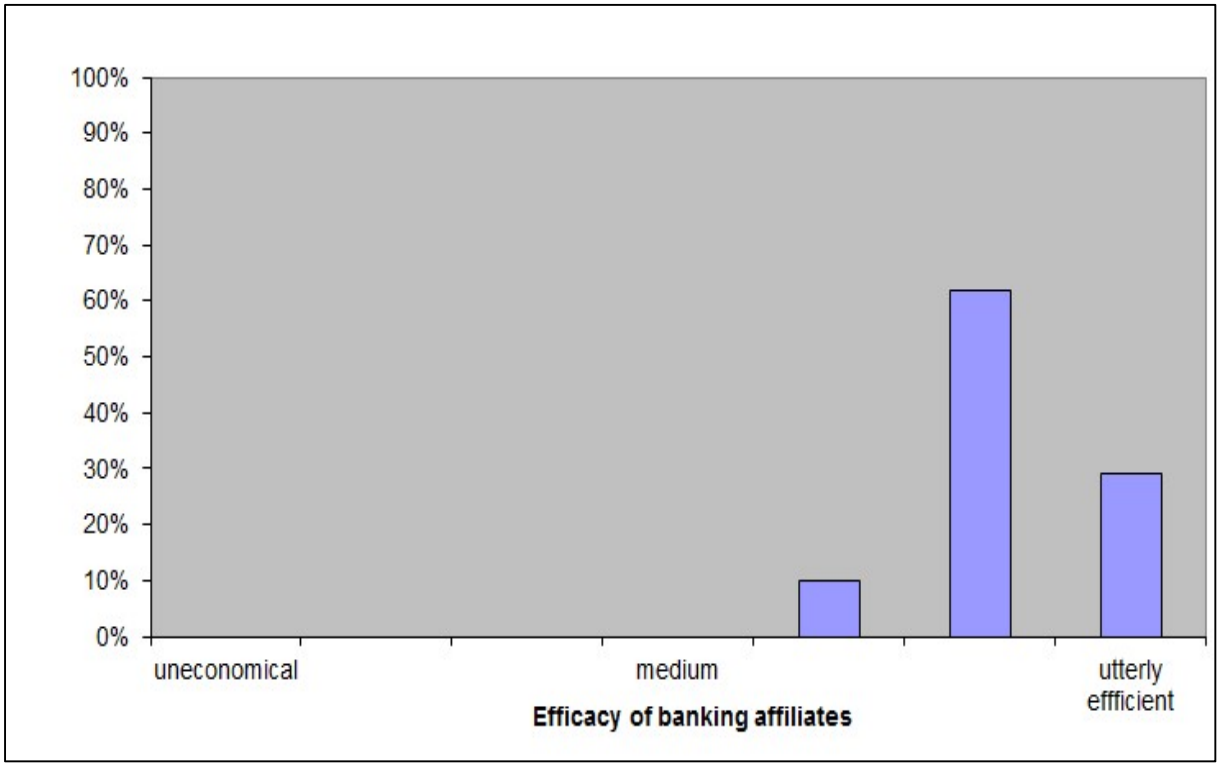


Fig. 1 – Efficiency of banking affiliates. Source: author

In contrast to the researches dealing with enterprise sphere (Suchacek & Baranek, 2011 or Suchacek, 2015), banks can be generally characterized as rather diplomatic entities. Enterprise managers quite openly confessed higher congruence with territories where their headquarters are located to the detriment of the places and regions where their affiliates can be found. In case of banks, solidarity with territories, where branches are collocated, reached the average score 2.24 and in case of congruence with territories with the seats of head offices, the respective score reached merely 1.62.

Banking headquarters support cultural, sport and other activities in territories of various scales. It turned out, regional level lures the highest attention of banks with the score 0.95, the next position is occupied by the local level with 0.81 and the promotion of above activities at the national level was evaluated as weaker with the value 0.70.

The next interesting information related to the collocation of banking affiliates in the country concerns time perspective, which serves as further possible way of assessment of location decision-making. Initial expectations when establishing banking affiliates were evaluated as quite realistic and did not differ much from real functioning of these branches. This reflects the amounts of information, banks collect before setting up banking branches (see also figure 2).

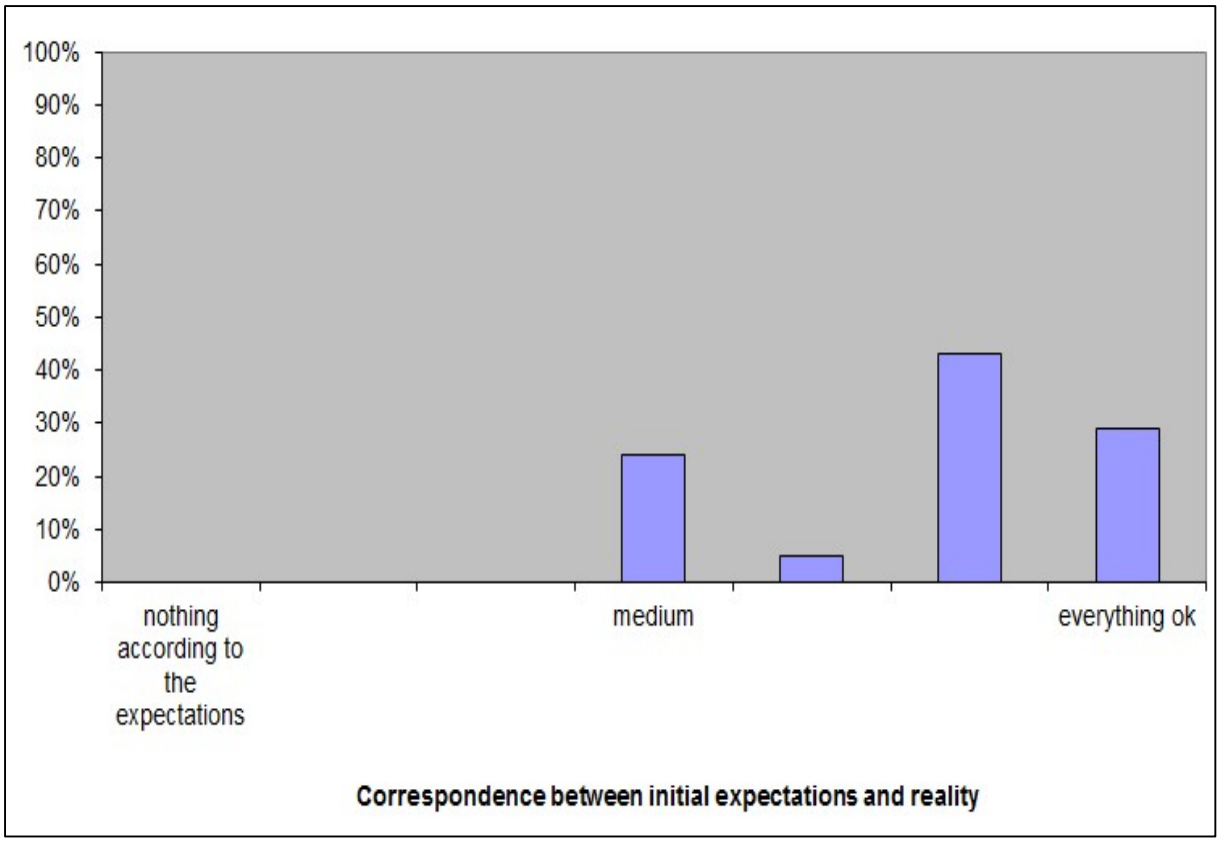


Fig. 2 – Locational expectations and experience. Source: author

Previous researches (Suchacek, 2012) showed that banking headquarters in the Czech Republic are currently concentrated exclusively into the capital city. According to banking managements, Prague differs from the other territories mainly as to the proximity of clientele, nearness of central institutions as well as infrastructure and prestige. As for other conceivable towns in the country that could possibly act as hosts of banking headquarters, Brno was mentioned seven times, Ostrava four times and Plzeň just once. The main motive for possible relocation of banking seats is relatively cheap and quality labour. No other towns that could possibly host banking headquarters, were mentioned.

5.CONCLUSION

In contrast to the large enterprises, location strategies of banking affiliates bear certain specifics. Banking sector prefers traditional location factors, such as infrastructure and geographical location, however, the presence of enterprise clientele, image/reputation of the given territory or quality, quantity and availability of the labour are accentuated as well. On the other hand, the bottom of the hierarchy of location factors determining the collocation of banking headquarters reflects the loyalty of the questioned managers to their employers and comprises items, such as quality of the environment or sport and cultural facilities. In spite of country's size, the conditions for functioning of banking branches were assessed as differentiated ones. Location decision-making in case of banking branches in the country is based on exact calculations rather than intuition, which is not so striking. Efficiency of affiliates is perceived as rather high. Surprisingly, banks are more congruous with places and regions, where their affiliates are collocated. Nonetheless, these answers of banking managers apparently bear strong diplomatic bias as it is natural that banks do regard also the milieu surrounding their head offices. Initial expectations when setting up banking branches turned out rather valid and did not substantially differ from the reality. According to the accomplished questionnaire,

absolute spatial concentration of banking head offices into the capital city can be attributed mainly to the nearness of clientele, central institutions, infrastructure as well as prestige and reputation. Only Brno, Ostrava and Plzeň were named as towns that might possibly bait banking head offices.

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IDENTIFICATION AND CLASSIFICATION OF BEHAVIORAL FACTORS OF FINANCIAL REPORTING. EVIDENCE FROM POLAND

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Abstract

The quality of financial reports depends on various factors. Some of them is connected with behavioral aspects of human activity in accounting system of entity.
The main aim of this paper is to identify the behavioral factors of financial statements and to present author's proposal of their detailed, multidimensional classification and interpretation.
Moreover, the authors present the results of questionnaire surveys conducted among students of the University of Economics in Katowice majoring in 'Finance and Accounting.' Students' opinions on the scope and impact of behavioral factors on the quality of financial statements were examined.
The paper uses the method of literature review and the analysis of the results of published studies concerning the most important behavioral determinants of board of directors, accountants, financial directors, auditors and users of reports. The authors used also the method of observation and questionnaire analysis.

Keywords: financial reports, behavioral factors, financial accounting

JEL Classification: M41

1.INTRODUCTION

Financial statements are a standardized set of information, which is used as a basis for assessing the financial situation of an economic entity. They are a primary source of data on the state of assets, equity, financial performance and flows of value within the entity in the modern economy. Accuracy, rightness of decisions made by users of financial statements, largely depends on their quality. The quality issue of financial statements has long been raised in the literature (Mattesich, 1995; Alexander & Jermakowicz, 2006; Flint, 1982; Strojek-Filus, Szewieczek, & Maruszewska, 2015). Authors emphasize the difficulties of its measurement and subjectivity in defining it.
The quality of financial statements is defined by a set of attributes that must be met as indicated in the conceptual Framework of IFRS. Note, however, that the previous Framework pointed out to other quality characteristics as of primary importance. Hence the approach to understanding the quality of financial statements has changed on the basis of international standards. The qualitative characteristics of financial statements have been the subject of many studies, in particular the credibility characteristic (Healy, Hutton, & Palepu, 1999; Bowen, Rajgopal, & Venkatachalam, 2005; Maines & Wahlen, 2006; Ge & McVay, 2007; Ramanna, 2008; Daigle, Kizirian, Sneathen 2008; Erb & Pelger, 2015). The quality of financial statements depends on many factors. The increasing importance is attributed to behavioral factors, that may affect both financial statements as some selective sets of financial information and the individual information they presented. Financial statements are the product of financial accounting system, but the system in any economic entity is organized, operated and controlled by people – a wide range of financial employees – accountants. Starting from the psychological observation, Bond and Smith (1996) point out to the effect of the pressure of a larger group on an individual, who

can begin to submit to the expectations of this social group, and imitate certain patterns of behavior, which can result in conformist attitudes.
Behavioral factors of financial statements are a varied and very dissipated issue. It is worth noting that targeting the IAS/IFRS financial statements at the widely understood investors (owners of equity) resulted in additional dissipation of these factors (Sulik-Górecka, 2015). Those factors can impact on the individual financial statements to varying degrees and scope. Behavioral aspects are becoming more prominent in the teaching process at business schools in Poland, in particular at finance and accounting departments. However, they are rarely taken into account in the context of preparing and reading financial statements.
The main aim of this paper is to identify the behavioral factors of financial statements and present author's proposal of their detailed, multidimensional classification and interpretation.
Moreover, the authors present the results of questionnaire surveys conducted among students of the University of Economics in Katowice majoring in 'Finance and Accounting.' Students' opinions on the scope and impact of behavioral factors on the quality of financial statements were examined.

2 IDENTIFICATION OF BEHAVIORAL FACTORS OF FINANCIAL REPORTING

In the past, research on the size of entities and its relevance for disclosures in financial statements was conducted. For example, Watts and Zimmerman (1986) argued that it is influenced by the fact that the political costs are higher for large companies, disclosing more information in order to increase confidence in their affairs.
Atanosovski (2013) studied factors affecting the quality of the disclosures in financial statements and distinguished the following factors:
- size of reporting entities,
- industry,
- ownership structure,
- type of auditor,
- internationalization,
- capital structure and financing.

Atanosovski proved a hypothesis, according to which there is a positive relationship between the size of the company and the degree of disclosures of fair value in financial statements. Similar conclusions were reached earlier by Chalmers and Godfrey (2004), but their empirical research related only to the impact of the size of the companies on the quality of disclosed information on financial instruments.
The desire to increase the company's capital at the lowest possible cost of acquisition is also a behavioral factor, whose impact on the disclosures in financial statements was examined by Diamond and Verrecchia (1991). Increased transparency and voluntary disclosure of additional information reduces the overall company risk and improves the possibilities for raising capital. Bushman and Smith (2001) studied the relationship between financial reporting quality and investment, and found that increase in the financial reporting quality led to increase in investment efficiency. On the other hand, financial reporting quality affects the tendency of managers for engaging in activities that are of little or negative value, which was emphasized by Mohammadi (2014). The condition for the fulfillment of the informational role of financial reporting is the lack of delays in disclosing information. According to Blitzer (2015), the delay in the disclosure of information may be affected by factors such as: recent mergers and acquisitions, small size of the company, low liquidity and high financial leverage. Lee, Mande and Myungsoo (2008) showed that an important determinant influencing the timing of financial reporting is multinationality of the company.

The influence of the company's environment on the financial reporting quality was also studied in the literature. Hassan (2012) listed factors such as: government, business enterprises, accounting profession, economic factors, international influences, and culture. On the other hand, Zheng (2010) classified factors such as: country's economic level, capital market, legal system. In particular, taxation is a factor strongly affecting the company within the legal system. In countries where there is a strong link between taxation and accounting, business enterprises are likely to adopt very conservative financial reporting practices to minimize their tax liabilities. According to Cooke and Wallace (1990), the role of law in financial reporting system is larger in code law countries than that in common law countries. Another behavioral factor analyzed in the literature in the context of the impact on the financial reporting quality are accounting standards (Ball, Robin & Wu, 2003).
Significant impact on financial reporting quality has the quality of auditing. Statutory auditors as employees of financial and accounting services are also susceptible to various types of behavioral factors, which was, among other things, examined in the investigation of auditors' perceptions about the main drivers of audit quality, conducted by the Association of Chartered Certified Accountants (ACCA) and Macquarie University. Important factors that affect the quality of the audit proved to be: audit firm size, audit partner tenure, communication between audit firms and client management, audit companies experience, partner/manager attention to audit. Findings were compliant to Behn, Carcello, Hermanson and Hermanson (1997), or Schneider and Messier (2007).
Characterological factors of employees of financial and accounting services, and managers exert considerable influence on financial reporting quality. Those responsible for the accounting and reporting are distinguished by such features as: accuracy and reliability, diligence, regularity, stress tolerance, patience, punctuality (Zygmański, 2015). The influence of the tendency to accounting fraud on the financial reporting quality was examined in the literature (Zager, Malis, & Novak, 2016).

3 RESEARCH METHODOLOGY

The paper uses the method of literature review and the analysis of the results of published studies. In order to identify and classify behavioral factors of financial reporting the following were applied:

- the method of observation and qualitative analysis,
- method of synthesis of partial conclusions from the review of individual entries in financial statements prepared in accordance with the Accounting Act and IAS/IFRS.

Based on this part of the research we proposed author's classification of these factors together with their justification and interpretation.
The other part of the study used questionnaire surveys filled out by students of the University of Economics in Katowice from a degree course of 'Finance and Accounting.' The students of full- and part-time, postgraduate and doctoral studies participated in the study. The postgraduate students study 'Financial Accounting' degree course.

4 PROPOSAL FOR CLASSIFICATION OF BEHAVIORAL FACTORS OF FINANCIAL STATEMENTS

The authors have identified 8 groups of behavioral factors that can affect with different intensity and to different extent financial statements. Some of the factors affect the entire accounting

system, including financial statements. The authors concluded that the most important factors are related to the services performed by employees of financial and accounting services, managers and statutory auditors. Another group of factors relate to the conditions of internal and external functioning of the entity. The last group are those factors that are associated with the solutions contained in the accounting legal regulations.
The classification distinguished the following basic groups of factors:

- personal interests of board members,
- employee incentive system,
- behavioral traits of employees of financial and accounting services,
- financial audit quality,
- organizational structure of an economic entity,
- environment of economic entity,
- situation of economic entity,
- accounting legal regulations.

Specific factors that according to the authors impact on the quality of the financial statements were identified within each of the above groups.
Table 1 presents author's detailed classification of the behavioral factors of financial reporting.

Tab. 1 – Author's classification of behavioral factors of financial reporting. Source: own elaboration

GROUP OF FACTORS	**INDIVIDUAL FACTORS**	**INTERPRETATION**
Personal interests of board members	Remuneration conditioned upon the financial result disclosed in the financial statement	These factors affect the tampering with financial data presented in financial statements within the allowed accounting policies or in violation of the law. Such practices partially fall within the scope of earnings management.
	The extension of the management contract on the basis of board performance, including financial results	
	Personal relationships among board members	
	Personal relationships between the board and the equity owner	
	The pursuit of business combination with another entity associated with the transition to the board of the new entity on more favorable terms	
Employee incentive system	System of rewards, bonuses, rates for overtime	Better remunerated employees are more involved in the fulfillment of their duties. They do their job with greater care. Employees who feel that the employer appreciates their efforts and the efforts in the benefit of the entity have more positive attitude to work and are
	Training of financial and accounting employees in order to improve their qualifications funded by the employer	
	The internal control system of employees of financial and accounting services	
	The remuneration of employees of financial and accounting services, in	

	particular the chief accountant, in relation to the national average	willing to improve the quality of their work.
	Identification of employee's individual benefits with the benefits for an economic entity	
Behavioral traits of employees of financial and accounting services, including a chief accountant	Awareness of the need for continuous improvement of professional skills, updating knowledge e.g. on accounting, commercial, tax law	In the literature, there are indicated characteristics which are often attributed to an accountant. In many societies there are also stereotypes of a perfect accountant. The results of the study confirm that the model employee performing the accounting profession should have a set of specific personality traits.
	Accuracy and Diligence	
	Integrity	
	Ability to accurately recognize the problem	
	Communication skills	
	Reliability, self-discipline, orderliness	
Financial audit quality	Statutory auditor's reliability and accuracy when working	The quality of financial statements largely depends on the quality of financial audit. This, in turn, is heavily burdened with a human factor. Too frequent and profound changes in legal regulations may hinder the preparation of the auditor. Also, a number of informal relationships between the management board of the audit entity, the statutory auditor, and the management board of the audited entity may disrupt the fairness of the audit process, and thus affect the quality of financial statements.
	Knowledge of internal and external conditions of functioning of the economic entity	
	The presence of informal links with the management or owner of the economic entity, often occurring in the context of long-term cooperation	
	Substantive preparation of a statutory auditor	
	Fear of losing orders for auditing in subsequent years	
	Intense competition among auditing entities	
	National and international standards of financial audit – high frequency and extent of changes in the short term	
Organizational structure of economic entity	Information flow – difficult or easier – between internal units	The quality of the financial statements partially dependents on the specific procedures used in the unit, connected with e.g. the inventory, the selection of cost settlement method, the choice of the contract price and so on. The procedures are developed taking into account the organizational structure of the unit. It is also important whether the entity is part of the group in which
	Internal audit	
	The use of financial budgeting, methods of preparing the budget	
	Degree of alignment of solutions for financial accounting to organizational structure	
	Affiliated entity forming part of the capital group	

		joint solutions are generally worked out (financial, operational, accounting group policy).
Environment of economic entity	Intense competition, aggressive behavior of entities within the competitive pricing policy	The quality of the information presented in financial statements may be affected by external factors such as changes in the tax law of a given country, deterioration or improvement of the situation in a given industry, investor sentiment associated with the anticipated recession, economic crisis. Also, changes in accounting law can provide an incentive for additional tampering with financial statements, e.g. through accounting policy instruments related to the valuation.
	The macroeconomic situation, crises, recessions	
	The situation of the industry	
	The tax system in the country in which the entity operates	
	Directions of the accounting law transformation	
Situation of economic entity	Increase of own equity	The financial situation of the entity may cause certain additional management actions related to e.g. acquiring foreign capital or entering into agreements with contractors. Such actions can lead to a higher credit capacity, liquidity and solvency of the entity. Lack of system solutions in the field of management may favor unusual operations, exceeding the powers, breach of business ethics.
	Gaining access to credit	
	Attracting contractors	
	Tax strategy adopted by the economic entity	
	The solutions adopted in the management of economic entity	
	Adopted simplified accounting solutions	
	The size of the entity	
	Willingness to take risks by the equity owners	
	The degree of the IT environment utilization in accountancy of the economic entity	
Accounting legal regulations	The scope and quality of approved alternatives in the asset valuation and the presentation of information in financial statements	Too high frequency of changes in regulations and their large range may cause confusion among employees and misapplication of solutions affecting the quality of financial statements. Targeting financial statements at one
	Frequency of law changes	
	Favoring one user of financial statements in regulations	
	The degree of detail of financial statements	

	Standardizing or not the form and scope of financial statements, e.g. by imposing a specific format of individual reports	user may, in turn, reduce the quality of the financial statements as such and thus undermine their function in the economic system. Standardization (reformatting) financial statements may facilitate their comparison with the situation of other entities

It should be emphasized that the proposed classification requires a permanent updating due to successive changes introduced to the legal regulations concerning the principles and scope of financial statements. The authors are aware that the proposal is burdened with the point of view accounting for economic practice, work culture, habits occurring in Poland. At the same time, it is worth noting that there is a duality of the accounting law in the form of the Polish Accounting Act and IAS/ISFR in Poland. It means that some economic entities are required to prepare financial statements in accordance with Polish regulations, and some – in accordance with international standards. The third group are the entities that have a choice in the adoption of legal basis out of the two above mentioned. The authors have taken into account the specificity of financial statements prepared in accordance with the Polish Accounting Act in the proposed classification.

5 RESEARCH RESULTS

The authors of the paper conducted a questionnaire survey regarding the classification of behavioral factors of financial reporting. Respondents were given a total of 430 surveys. There were distributed 206 questionnaires to full-time graduate students, 168 to part-time graduate students, 50 to postgraduate students and 14 doctoral students. The results of each study groups will be discussed separately.
The authors focused on these factors, which have been marked by the students as not affecting the quality of financial statements. All the remaining factors were identified as having an impact on the financial statements.
Among postgraduate students majoring in 'Financial Accounting' were distributed 50 questionnaires, of which 41 questionnaires were correctly and completely filled in. It should be emphasized that most of the students of this degree course are people who already work in the accounting, generally at the lowest positions.
The results of the questionnaire survey among postgraduate students are as follows:

a) 69% of respondents did not consider the factors affecting the quality of financial statements as the factors related to the personal interests of board members,

b) 70% of respondents did not consider the factors affecting the quality of financial statements as the factors related to the employee incentive system, including bonuses, rewards and remuneration,

c) 52% of respondents did not consider the factors affecting the quality of financial statements as the factors related to financial audit,

d) 39% of respondents did not consider the factors affecting the quality of financial statements as the factors related to the environment of the economic entity.

Among the factors that in the opinion of respondents influence most financial statements were indicated:

- training of financial and accounting employees in order to improve their qualifications,
- internal control system of employees of financial and accounting services,
- accuracy of employees of financial and accounting services,
- awareness of the need for continuous improvement of professional skills, updating their knowledge,
- the ability to accurately recognize the problem by employees of financial and accounting services,
- reliability, self-discipline, orderliness of employees of financial and accounting services.

The responses were very scattered among the factors that according to the respondents bear the smallest impact on the statements. One cannot identify dominant factors.
Among the factors that according to the respondents are most common in business practice the following were indicated:

- accuracy of employees of financial and accounting services,
- awareness of the need for continuous improvement of professional skills, updating their knowledge,
- the ability to accurately recognize the problem by employees of financial and accounting services,
- reliability, self-discipline, orderliness of employees of financial and accounting services,
- frequency of law changes,
- application of simplified solutions in accounting.

It is worth noting that in this group of respondents a significant part of the responses regarding the factors most affecting financial statements and the most common business practice concerns the personal characteristics of employees of financial and accounting services. The majority of postgraduate students are accountants who work in small or micro-entities and accounting offices dealing with the provision of accounting services. The selected responses indicate rather own experiences of the respondents, and to a lesser extent the general state of knowledge on this subject.
The questionnaire surveys were also distributed among doctoral students majoring in 'Finance and Accounting'. Students of this degree course are generally associated with large economic entities (capital groups, banks, state institutions such as Tax Chamber, Social Security Institution, etc.) as the board members, directors or financial specialists. The study included 12 doctoral students, all surveys were correctly and completely filled in.
The results of the questionnaire survey among doctoral students are as follows:

- 65% of respondents did not recognize the following factors as influencing the quality of financial statements: factors related to the organizational structure of the entity, including the use of financial budgeting in the entity,

- 22% of respondents did not recognize the following factors as influencing the quality of financial statements: as the factors classified as 'situation of economic entity,' in particular the size of the entity, willingness to take risks by the equity owners, the solutions adopted in the management of the enterprise, use of simplified solutions in accounting .

Among the factors that in the opinion of respondents influence most financial statements were indicated:

- remuneration of the board members conditioned on the financial result disclosed in the financial statement,
- extension of the managerial contract based on merit,
- personal relationships between the board and the equity owner,
- statutory auditor's reliability and accuracy when working,
- the presence of informal links with the management or owner of the economic entity, often occurring in the context of long-term cooperation,
- statutory auditor's fear of losing orders for auditing in subsequent years.

Among the factors that according to the respondents bear the smallest impact on the statements the following were indicated:

- activities in the structure of the capital group,
- intense competition, aggressive behavior of entities within the competitive pricing policy,
- industry's situation,
- macroeconomic situation,
- the degree of detail of financial statements.

Among the factors that according to the respondents are most common in business practice the following were identified:

- remuneration of board members conditioned upon the financial result disclosed in the financial statement,
- accuracy of employees of financial and accounting services,
- awareness of the need for continuous improvement of professional skills, updating knowledge of employees of financial and accounting services,
- ability to accurately recognize the problem by employees of financial and accounting services,
- communication skills of employees of financial and accounting services,
- frequency of law changes.

It is worth noting that in this last group of factors dominate the personality traits of accounts. A similar result was obtained in the case of postgraduate students.
An important difference is, however, totally different perception of factors that do not affect the quality of financial statements as well as the factors that affect the least and the most.
The factors associated with the interests of board members and the quality of financial audit were recognized as the most influential by the doctoral students. This is a completely different approach compared to the one presented by postgraduate students.

202 completed surveys were received in the group of full-time students. The following were regarded as behavioral factors having the strongest impact on the quality of financial statements:

- remuneration of board of directors conditioned upon the financial result disclosed in the financial statement – 20% of respondents,
- accuracy and diligence of employees of financial and accounting services, including a chief accountant – 16% of students,
- organizational structure of economic entity in respect of information flow – difficult or easier – between internal units – 15% of answers,
- the degree of the IT environment utilization in accountancy of the economic entity – 8% of respondents.

On the other hand, the factors least affecting the quality of the statements include:

- awareness of the need for continuous improvement of professional skills, updating knowledge e.g. on accounting, commercial, tax law – 21 % of students,
- macroeconomic situation – 19 % of respondents,
- standardizing or not the form and scope of financial statements, e.g. by imposing a specific format of individual reports – 18% of answers,
- intense competition among auditing entities – 13% of respondents.

Slightly different results were obtained in the responses of part-time students who recognized the following factors as the most influential on the financial statements:

- the remuneration of employees of financial and accounting services, in particular the chief accountant, in relation to the national average – 18 % of answers,
- the degree of detail of financial statements – 17 % of respondents,
- frequency of law changes – 13 % of students,
- internal audit – 9 % of respondents.

Whereas the weakest impact on the quality of financial statements have, in the opinion of part-time students, the following factors:

- willingness to take risks by the equity owners – 12 % of respondents,
- intense competition, aggressive behavior of entities within the competitive pricing policy – 11 % of students,
- communication skills of employees – 7 % of students.

Obtained results show that opinions of students are very diversified.

6 DISCUSSION

Classification of behavioral factors influencing the quality of financial statements is a problematic and questionable issue. This applies both to the identification of factors as behavioral or non-behavioral, as well as to their recognition as affecting the quality of the financial statements. Cultural bias, customs of the country and habits occurring in the job of accountants are significant while identifying the affecting factors. Surely, they include simplifications used in accounting and bad or good practices in the field of financial audit occurring in a given country. The classification proposed by the authors is partly conditioned by this state of affairs. One can conclude that the process of identification and classification of

behavioral factors, that affect financial reporting itself is heavily burdened with behavioral factors.
The classification of behavioral factors carried out by the authors requires updating resulting from the changing business environment in a given country, but also in the world and following it the changes in attitudes, behaviors, reactions of persons having a direct or indirect impact on the financial statements. According to the authors, it will be possible to observe the impact of a growing number of factors that indirectly affect the quality of financial statements in the future. The reasons for this process are, among others, changes made in the scope of financial statements and the understanding of their quality. Of growing importance are also financial statements, for which other behavioral factors will be identified.
The questionnaire surveys have shown that students of various study modes differently evaluate and recognize behavioral factors influencing the quality of financial statements. The study results show that full-time, part-time, postgraduate and doctoral students pointed to other factors, among those listed as not affecting the quality of financial statements. Significant differences also occurred in relation to the factors that most and least impact on the quality of financial statements. Postgraduate students, who are generally practitioners in small and micro entities, based their assessment on their own experiences in the entity, and not the possibility as such. Doctoral students better prepared theoretically, who have contact with much larger entities, looked at the problem from a larger perspective. They indicated factors which are – in their opinion – the greatest threat from the point of view of their impact on the correctness of the registration of economic processes in the accounting system and their reflection in financial statements.
On the other hand, all groups of students indicated as the most common in practice factors related to the personality of the employees in accounting. Such a result can be attested to the fact that they had the opportunity personally experience or observe such phenomena in the entity in which they are or were employed. The question is whether it can be concluded that this group of factors is a common business practice? On the basis of the survey sample adopted by the authors such a conclusion is impossible. However, this question should be the starting point for further research on behavioral factors.

7 CONCLUSION

Differentiation of behavioral factors influencing the quality of financial statements is very large. With the economic development, globalization processes and use of increasingly sophisticated instruments of IT support in accounting there are more and more factors of behavioral character that impact upon the accounting system in the economic entity, including financial reporting. The classification of behavioral factors proposed by the authors requires continuous development and extension, as new issues are identified in practice. At the same time, expanding the scope of information of financial statements in accordance with IAS/IFRS increases the set the factors influencing statements. The evolution of international standards concerning the preparation of financial statements, increasingly exposing them to the interests of investors and capital providers means that some factors are gaining importance. One should also be aware of non-financial statements, to which more and more attention is devoted in practice, and which require the identification of separate behavioral factors.
Changes occurring in legal regulations on financial reporting in the form of national and international standards force employees to continuously update and expand their knowledge and skills. Financial engineering, applied in accounting on an increasing scale, requires new skills from employees. In such conditions of special significance are becoming personality traits of employees as well as the skills and knowledge acquired during their studies. These factors have been recognized as the most common in practice by the respondents. Moreover, they are

likely to have an increasing impact on financial reporting in the future. At the same time, factors related to the behavior of managers as increasingly better recognized in business practice and stigmatized may be of smaller importance in the future. The role of financial audit in achieving adequate quality of financial statements is worth noting. Statutory auditors may undergo some pressure, take an opportunistic attitude towards their management and the boards of the companies surveyed. They may also have an insufficient, non-updated knowledge and skills, particularly in relation to complex transnational holding structures. According to the authors, the group of factors related to the financial auditing will be increasingly important in the future. Although other groups of factors may occur periodically in certain circumstances, their impact may determine the quality of financial statements.

The results of the study carried out among the students of the University of Economics in Katowice have shown that there are significant discrepancies in the assessment of these factors depending on the mode of study. The identification and assessment of the impact of individual factors and their groups largely depends on the preparation of students in the field of accounting theory, their practical experience and personal experience in specific business entities.

Students attributed special importance to the factors related to the attitudes and interests of managers as well as accountants' personality characteristics. They also pointed out to the group of factors related to the financial auditing. The results are all the more satisfactory that little attention is paid to the behavioral problems of accounting in the teaching process of undergraduate, graduate and postgraduate degree courses in 'Finance and Accounting' at the University of Economics in Katowice.

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USE OF SOCIAL NETWORKS FOR COMMUNICATION WITH THE PUBLIC ADMINISTRATION

Svobodová Libuše, Martina Hedvičáková

Abstract

Just as the popularity of social networks is growing, their use by the public administration increases as well with the development of information technologies. Czech citizens and businesses can communicate with the government and local authorities through e-mail, they can browse their websites, where required forms can be found, downloaded or directly filled in and sent electronically. The organization of the paper is as follows: firstly introduction is provided followed by described research methodology. Then a theoretical background with focus on definitions of key terms like social media and social networks, statistics results from utilization of Internet and social networks by citizens from the official authorities, and the website quality evaluations of municipalities in the Czech Republic are provided. The key part brings results from the questionnaire investigation and observation which was run at the first quarter of 2016 from the Faculty of Informatics and Management, University of Hradec Králové. Examined areas relate to the use of social software applications, specifically Facebook for communication purposes between municipalities and citizens. Conclusion summarizes the findings. The goal of this study is to explore the use of the internet and social networks by the selected Czech municipalities.

Keywords: Internet, municipality, social network

JEL Classification: H00, O35, R10

1.INTRODUCTION

Under the Act No 128/2000 Coll., on Municipalities is in § 35 written that "included in the independent competence of a municipality are matters which are for the benefit of the municipality and its citizens, unless they are bestowed on regions under the law, or unless they are part of the delegated competence of the bodies of the municipality or part of the competence conferred on administrative authorities under a separate Act in the scope of the performance of state administration, and matters which belong to the scope of the independent competence of the municipality under a separate Act. The independent competence of a municipality includes, in particular, the matters stipulated under sections 84, 85 and 102, with the exception of the issue of municipal ordinances. In the independent competence in its territorial district, and in accordance with the local conditions and local customs, the municipality also attends to the fostering of conditions for the development of social care and to the satisfaction of the needs of its citizens. This includes, in particular, meeting the needs for housing, the protection and development of health care, transport and communications, information, education and training, general cultural development, and the protection of public order."
According to the Act no. 106/1999 Coll., on Free Access to Information, § 2, the municipality has an obligation to provide information relating to their competence. That is the information that under this Act they are required to disclose and others intended for publishing, eg. under the law on personal data protection, building act etc.
Publishing of information allows to interested citizens in areas related to events, photos, municipal property, municipal budget, strategic plan development, promotion and funding of

public goods, what is happening in the municipality, companies engaged in the community, voluntary associations, and other areas. Published and understandable information can improve communication between people and municipality. Citizens can get information what is the municipality and public administration doing. Notice-boards before municipality authorities basically inform about opening hours, present the minutes of the meetings of the municipality authorities, building permits, tenders and other official information. Websites of the larger municipalities also generally contain information and guidance solutions to life situations, links to useful websites, for example Public Administration Portal, the Ministry of Regional Development and the Ministry of the Interior of the Czech Republic are as well as important for the citizens of the municipality as well as important. Other possible information that municipalities can publish on their website are described in Chapter 4. This is eg. budgets, strategy of the city, smart cities applications, virtual sightseeing, barrier-free maps and others.
Changes in the global information society affect all areas of communication, of publishing, delivery, display and search. Social networks are now one of the contact point for citizens, effective marketing tool for promotion, PR, direct marketing, openness town halls and others. Information attract attention, emotions, stimulate debate and encourage people to share it with the help of texts and graphics. Social networks are more and more used for communication between municipalities and citizens. They contain information about current events in the municipality, invitations to cultural, social, sports or other actions. Some municipalities use them for information about the weather, interesting places, to entice tourists etc. Also for this reason we have focused in the article on the use of the Internet and especially social networks to inform citizens in the Czech municipalities.

2.METHODS AND GOAL

Primary and secondary sources were used in the processing of the article. Primary sources were obtained within the survey, which was conducted by teachers and students at the Faculty of Informatics and Management at the University of Hradec Králové. The investigation was done from 26th of February to 12th of March 2016. A team of selected students was searching in social networks for communities which were created to meet the needs of municipalities. Students focused on presented information about municipalities on these networks. The results may include the fact that some of these municipalities do not use this kind of technology. Students were assigned to all regional (they are also statutory), statutory or district municipalities. In total there were 72 of those municipalities. Other municipalities were randomly selected in each region so that the sample of municipalities of the Czech Republic could be even more representative.
The cities went from section 3, § 1 of Act 128/2000 Coll. on Municipalities, where it is stated that the municipality, which has at least 3,000 inhabitants is a city. Section 4 § 1 of the Municipalities Act states 25 statutory towns, from which the survey, reflect. There were obtained 335 usable responses from a total of 6258 municipalities in the Czech Republic. Therefore, the results will be referenced to a given sample of respondents. For regional, statutory and district municipalities is the sample exhaustive.
As for secondary sources, they comprised websites of selected surveys and also official statistics from the Czech Statistical Office and Eurostat, technical literature, information gathered from professional journals, discussions or participation at professional seminars or conferences. Then it was necessary to select, categorize and update available relevant information from the collected published material.
The goal of the article is to analyze utilization of social networks by selected municipalities in the Czech Republic according to their size or region. Researched areas are: activity in the discussion, topicality of Facebook pages and published topics

Two scientific questions will be confirmed or refuted in the article:

1.Do surveyed municipalities use social networks by at least 50%?
2.Less than 5% of small surveyed municipalities, "villages", do not have their websites.

3.USE OF THE INTERNET AND SOCIAL NETWORKS IN THE EU AND THE CZECH REPUBLIC

Social media are a helpful force in the construction of internet public sphere and civil society. Dong, T., Liang, Ch., He, X. (2017). Social Media and Social network has been defined in several ways. Wilson (2015) defines a social network as a „social structure made of nodes that are generally individuals or organisations. A social network represents relationships and flows between people, groups, organisations, animals, computers or other information/knowledge processing entities. "Kaplan and Haenlein (2010) define social media as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and allow the creation and exchange of User Generated Content." According to studies and work by Kietzmann et al (2011), Social Media are eminently and exceedingly interactive platforms, which apply and engage the mobile devices and other web based technologies to facilitate individuals, groups and communities in developing, co-creating, sharing, transform and discuss the content produced by the user. In practice, social media refers to specific platforms through which people communicate, such as discussion forums, blogs, wikis, social networks, and multi-media sites, being some of the most popular Facebook, MySpace, LinkedIn, Google +, Flickr, Twitter, and Youtube (Bradley and Barlett, 2011). These specific platforms may change over time or be replaced by some others, but it seems valuable to address social media by looking at the specific platforms people use. Social Network Sites are defined as: Web based services that allow individuals to (1) construct a public or semipublic profile within a bounded system, (2) articulate a list of other users with whom they share a connection, (3) view and traverse their list of connections and those made by others within the system the nature and nomenclature of these connections may vary from site to site (Boyd, & Ellison. 2008). In terms of SNS history, the first social networking site (SixDegrees) was launched in 1997, based on the idea that everybody is linked with everybody else via six degrees of separation, and initially referred to as the "small world problem" (Milgram, 1967). Can, L., Kaya, N. (2016).
Over the last few years, online social networks (OSNs), such as Facebook, Twitter and Tuenti, have experienced exponential growth in both profile registrations and social interactions. These networks allow people to share different information ranging from news, photos, videos, feelings, personal information or research activities. (Adewole, at all, 2017)
ICTs have become widely available to the general public, both in terms of accessibility as well as cost. A boundary was crossed in 2007, when a majority (55%) of households in the EU-28 had internet access. This proportion continued to increase and in 2015 rising by an additional 2 percentage points compared with 2014 to reach 83%, 28 percentage points higher than in 2007. The highest proportion (97%) of households with internet access in 2015 was recorded in Luxembourg, just ahead of the Netherlands (96%), while Denmark, Sweden, the United Kingdom, Germany and Finland also reported that at least 9 out of every 10 households had internet access in 2015. The lowest rate of internet access among the EU Member States was recorded in Bulgaria (59%). (Eurostat, 2015)
Social networks have global popularity. One of the most common online activities in the EU-28 in 2015 was participation in social networking, see Figure 1. Half (50 %) of individuals aged 16 to 74 used the internet for social networking, for example using sites such as Facebook or Twitter. Around two thirds (66–68%) of people in the United Kingdom, Belgium and Luxembourg used social networking sites, in Norway the proportion reached 73% and in

Iceland it was 83% (2014 data). At the other end of the scale, there were three EU Member States where less than 4 in 10 people used such sites, namely France, Italy and Slovenia. (Eurostat, 2015) The Czech Republic and Poland were just ahead of them.

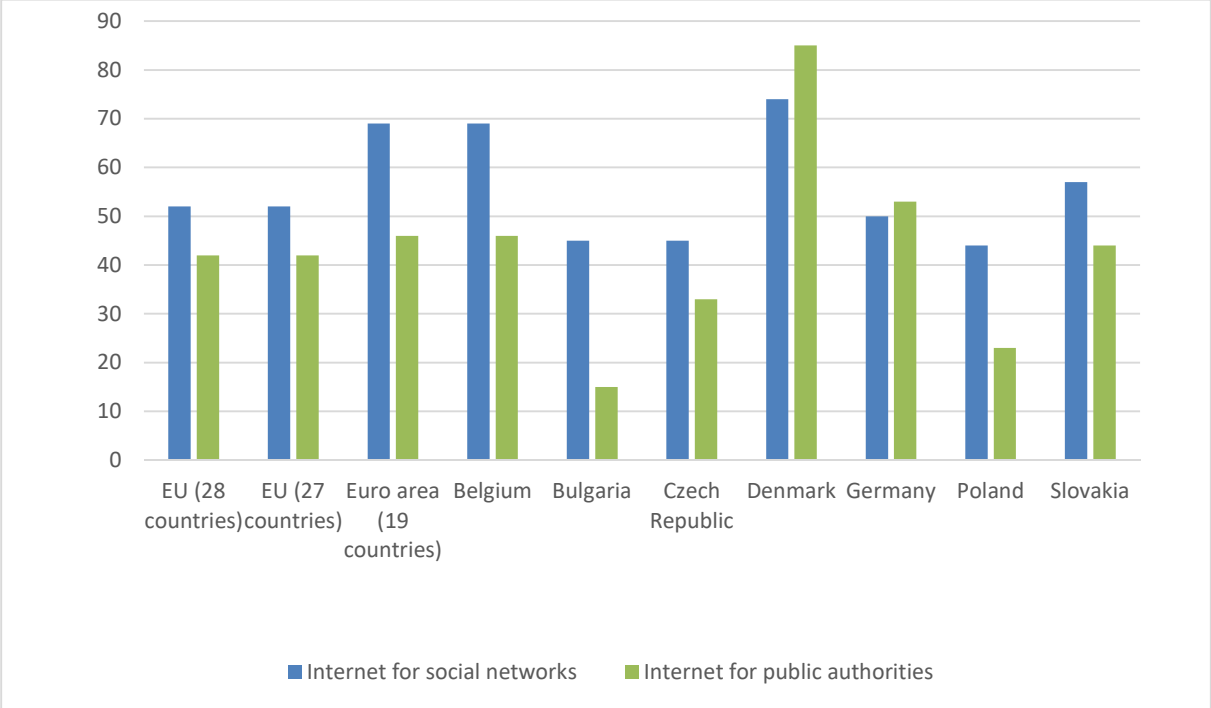


Fig. 1 – Individuals using the internet for interaction with public authorities, by type of interaction in 2016 (% of individuals aged 16 to 74) and Individuals using the internet for participating in social networks in 2016. Source: Eurostat, 2016, 2016b, own processing

According to the Czech Statistical Office, in 2014, 34% of Czech citizens aged 16 and over used the internet to communicate with the public authorities. According to the survey results, men and women aren't too different regarding the use of the internet in relation to public authorities. Men used the internet slightly more for that purpose. In 2014, 36% of men and 34% of women carried out at least one activity associated with ICT and public authorities. However, there are bigger differences in different age groups. Compared to other indicators of ICT, only 31% of individuals in the youngest age category (16-24 years) use the internet to communicate with the public authorities. In the older age group, i.e. between 25 and 54 years, it was 48% of the respondents. 28% of citizens in the age group of 55-64 years used the internet in relation to public authorities. Only 11% older than 65 years used the internet. In terms of educational attainment, the results are predictable, the Internet is mostly used by university students (68%) to communicate with the public authorities. (CSO, 2016)
The following table 1 and figure 2 show the development in the Czech Republic in 2016 regarding the use of social networks by individuals.

Tab. 1 – Using social networks by individuals in the Czech Republic, 2016. Source: Czech statistical office (2016a)

	Individuals who reported that they used SN for the following activities:					
	Participation in SN			Account security change on SN or its parts		
	in thousands	*%**	*%***	in thousands	*%**	*%***
Summary 16+	3 629.5	*41.4*	*54.1*	1 013.0	*11.6*	*15.1*

* Percentage of total number of individuals in a given socio-demographic group
** Percentage of total number of individuals in a given socio-demographic group, who used the Internet in the last 3 months

There is also a growing trend in using a social networks and internet. Around 10% of active participants used the social network in 2010 and over 40 % active participants in 2016 (see fig. 2).

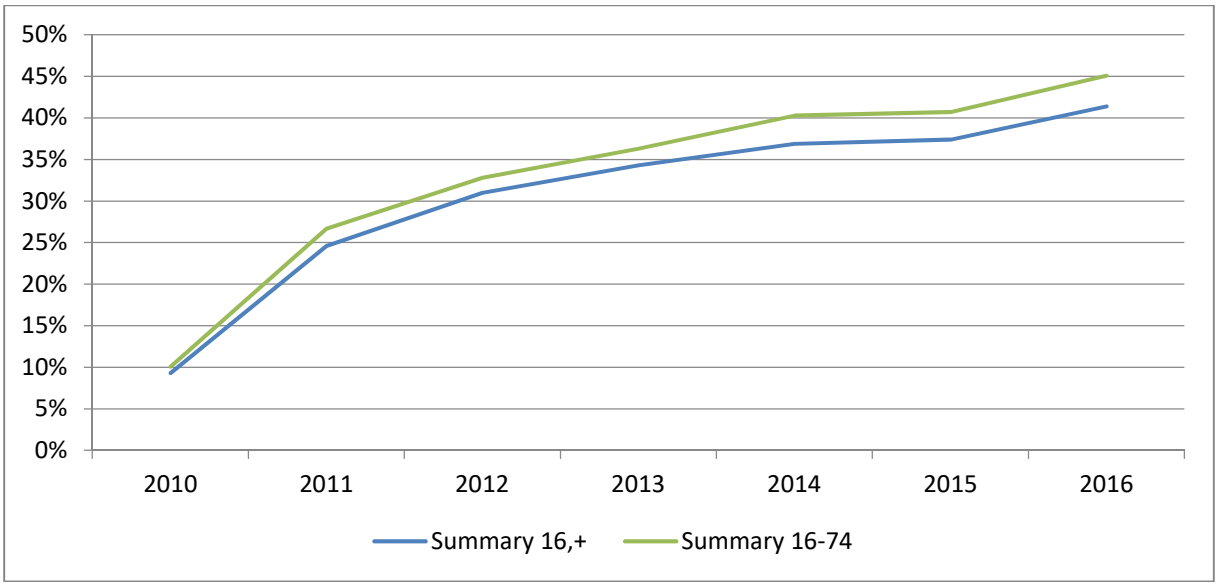


Fig. 2 – Active participation in social networks for private purposes in % in 2010-2016. Source: Czech statistical office (2016a)

3.1.E-Government in the Czech Republic

What is e-Government? (2017)

- The use of or application of information technologies (such as Internet and intranet systems) to government activities and processes in order to facilitate the flow of information from government to its citizens, from citizens to government and within government.
- Refers to the use of new information and communication technologies (ICTs) by governments as applied to the full range of government functions.
- Use of ICTs to enable citizens' access to government information and services.
- The use of ICTs to improve the efficiency and effectiveness of government operations.
- The use of internet technology as a platform for exchanging information, providing services and transacting with citizens, businesses, and other arms of government. e-Government may be applied by the legislature, judiciary, or administration, in order to improve internal efficiency, the delivery of public services, or processes of democratic governance.

e-Government is in the Czech Republic under the Ministry of the interior of the Czech Republic. On 2 November 2015, Czech government approved the Strategy for ICT Services Development in Public Administration. This awaited strategic document summarizes actual situation in the ICT governance in the public administration domain, including the gaps and inefficiencies of status quo. Specific measures are set up including a stronger role of the Government Council for Information Society. The document also introduces the idea to legislatively delegate to the Department of Chief architect of the eGovernment at the Ministry of the Interior the role of

"watchdog" to oversee the efficiency of public spending in public administration ICT area. Other measures include the design of the National architecture plan and the role of Ministry of Interior in the open data governance for the public administration bodies. (eGovernment in the Czech Republic, European Commission, 2016).
Main eGovernment infrastructure components will be presented below.
Portals

- Public administration portal
- Electronic portal of local self-governments (ePUSA)
- Towns and communities online portal (TCOP)
- Portal for data boxes

Networks

- Public administration communication infrastructure (KIVS)
- Czech POINT network

eIdentification/eAuthentication

- eSignatures
- ePassports
- Czech national verification authority (CVCA)

OSN done e-Government Survey 2016. Czech Republic ranks 50th worldwide, jumps up 46 places in e-participation index. The country obtained the best scores for the human capital component of e-Government, followed by the telecommunications infrastructure component (Percentage of Individuals using the Internet, Fixedtelephone subscriptions per 100 inhabitants, Mobilecellular telephone subscriptions per 100 inhabitants, Fixed (wired)- broadband subscriptions per 100 inhabitants, Wireless broadband subscriptions per 100 inhabitants). The Czech Republic obtained the lowest scores for the online service component.
The country ranked 76th in the e-participation index (e-information, e-consultation, e-decisionmaking).
Top 10 countries in e-government development index were United Kingdom, Australia, Republic of Korea, Singapore, Finland, Sweden, Netherlands, New Zealand, Denmark and France.
World average value of e-Government development index 2016 is 0.4922. Czech Republic gained 0.6454. Countries from Visegrad Group got better evaluation instead of Slovakia. Data and results from first evaluation in 2003 and from the last two surveys are presented in table 2 below.

Tab. 2 – e-Government development index 2016 – countries from Visegrad Group, 2016
Source: e-Government development index 2016

Country	Rank 2003	Rank 2014	Rank 2016	EGDI 2016	Rank Change (2014 / 2016)
Poland	32	42	36	0.7211	-4
Hungary	44	39	46	0.6746	-2
Czech Republic	36	53	50	0.6454	-14
Slovakia	40	51	67	0.5915	-27

Furthermore we can state insufficient use of the potential of social networks. Commercial entities use them quite commonly nowadays. The next chapter will focus on the evaluation of the use of social networks by individual municipalities and towns/cities.

4.RESULTS

It was obtained a total of 335 usable responses. Distribution of municipalities is shown in Fig. 3. The municipalities over 3,000 population were used for the classification of the city based on the act on municipalities. Regional, statutory and district towns were included into investigation all. All distributions of municipalities were also based on the act on municipalities. In our sample we have 156 municipalities, which can be described as a city. By "village" there are listed municipalities with fewer than 3,000 inhabitants. The graph shows that these municipalities are in a given sample of 53%, 179 respondents.

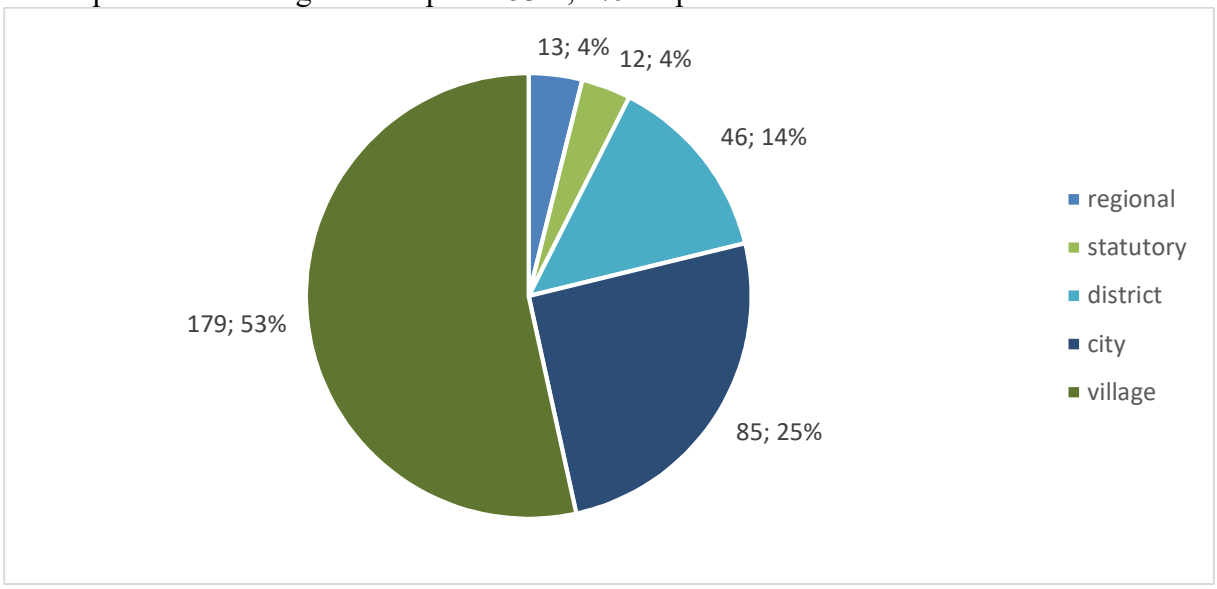


Fig. 3 – Distribution of municipalities. Source: own research

Figure 4 presents the distribution of municipalities in the regions of the Czech Republic. The highest number of the samples were obtained in the Hradec Kralove region, Central Bohemian region and Pardubice region. The smallest samples were obtained in the Olomouc region and Karlovy Vary region.

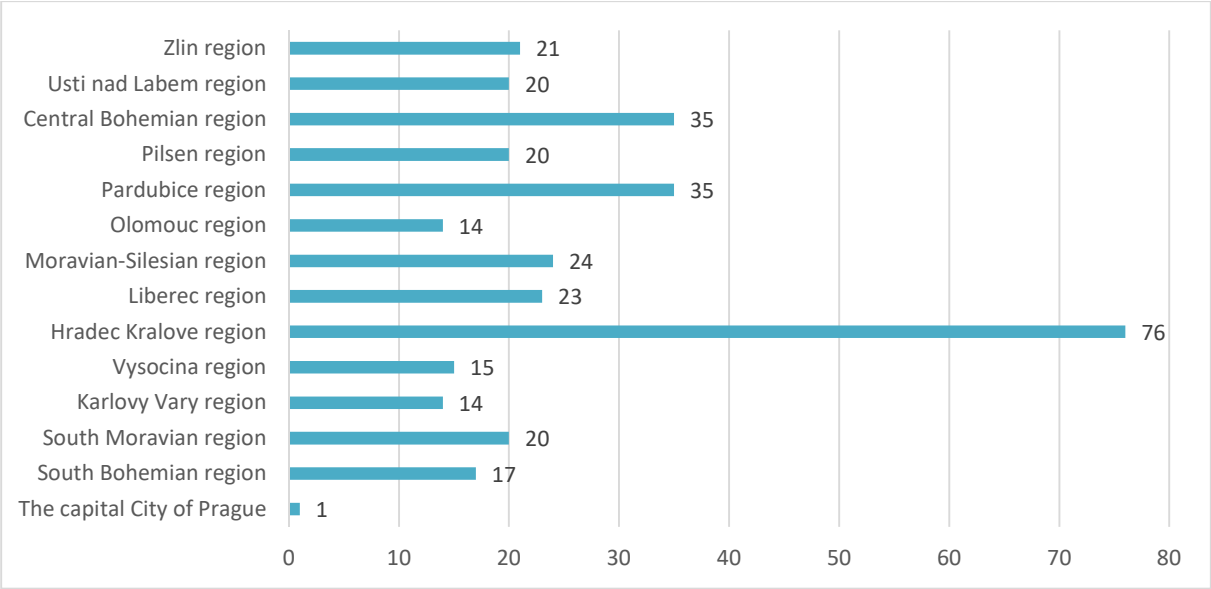


Fig. 4 – Number of municipalities in the regions. Source: own research

It was founded (Fig. 5) that only three of 335 analysed municipalities have not formed their own website, where they inform citizens about developments in the municipality. It was founded that 217 municipalities use social web applications. In case that municipality use social web applications use also www. The research focused also on the classification of the social web applications. Facebook uses 206 municipalities and 11 other uses another social web application (Youtube, Twitter or Instagram). Social networks are used more in the cities than in villages in the sample of respondents. 84% of cities and 48% of villages use social web applications. Even though not all the population in the Czech Republic uses the Internet and social application, we can recommend the use of clear websites that are outside the three municipalities in the sample used, but also social web applications.

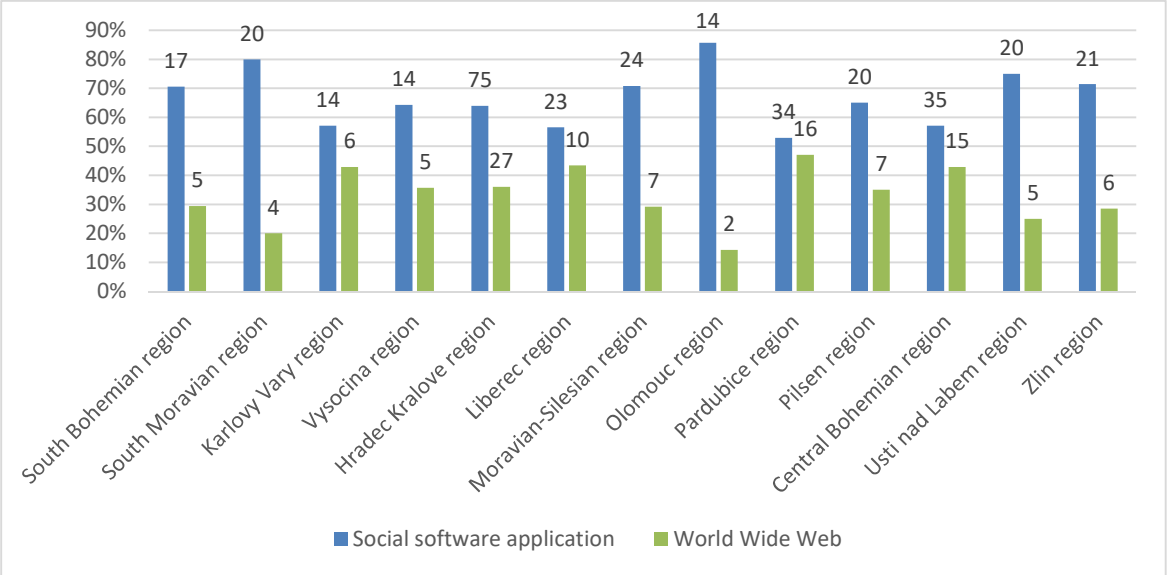


Fig. 5 – Municipalities and utilization of social applications and www. Source: own research

We have also focused whether or not are Facebook contributions up to date. It was founded that 162 of analysed municipalities have actual contributions on the Facebook and 44 have no actual contributions (Fig. 6).

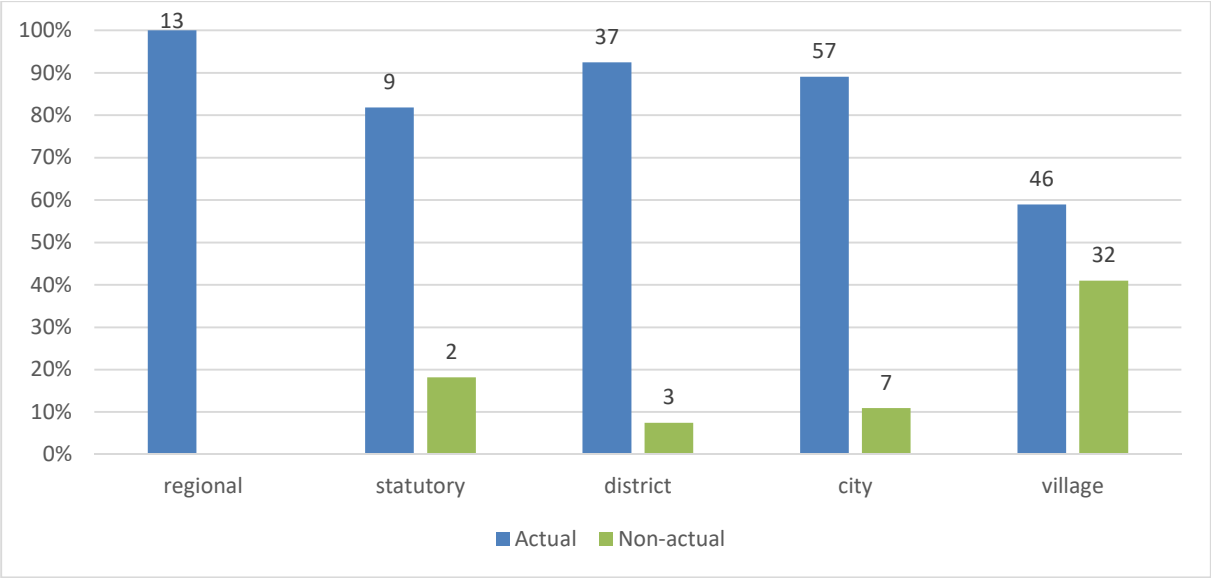


Fig. 6 – Actual and non-actual contributions on Facebook. Source: own research

It can also be noted from the results that the size of the municipality decreases topicality of featured articles. While in district towns has only 7% of outdated articles, in cities it is already 10% and in villages it is 37%.

It does not mean that citizens use information from Facebook, or they are active in the discussions in the case that the municipality has set up Facebook. We have focused on the discussion on the Facebook in the next question. Results are presented in fig. 7. It is possible to state that the largest municipalities have higher discussion than the smallest one. It is surprising that only in 46% of regional municipalities is the discussion active or rather active. In the statutory municipalities is the activity higher. In the 55% of statutory municipalities is the discussion active or rather active. In the next distribution of the municipalities discussion declines. Discussion is active or rather active in 44% of district municipalities, 28% of cities and 17% of villages.

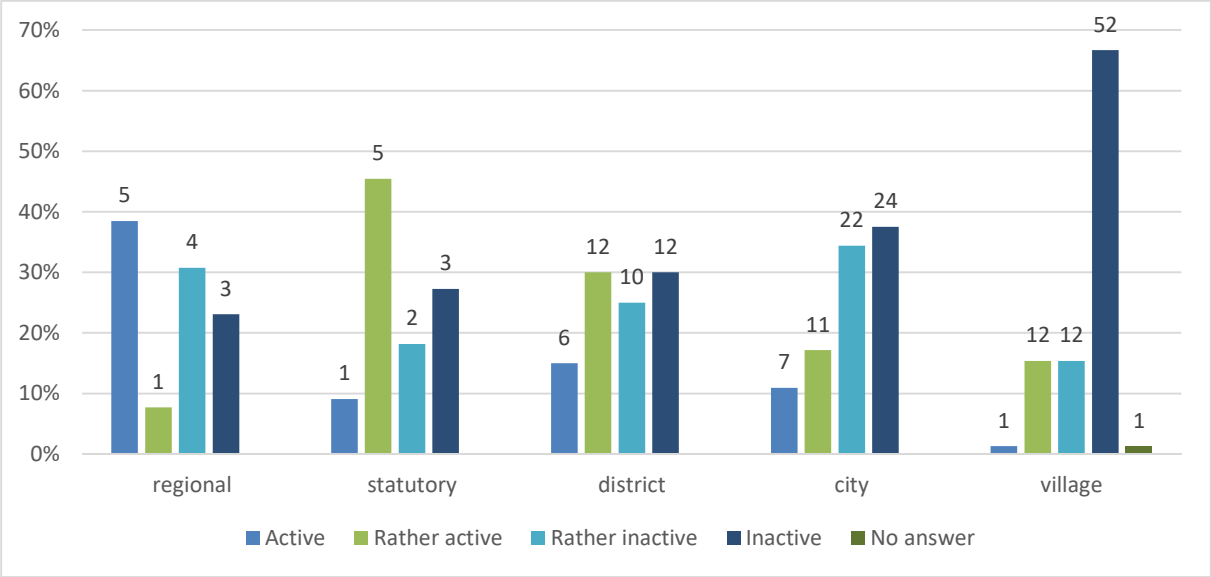


Fig. 7 – Discussion on Facebook. Source: own research

Next question is focused on the topics presented on the Facebook. Into consideration were taken culture, sport, investment, projects and applications, municipality and transportation, policy. Three most often presented topics are presented in the article (fig. 8). Culture is mentioned in

almost 91% of the municipalities that use Facebook. Sport is presented in almost 70% of municipalities and transportation is reported in almost 61% of cases. Investment is the next researched area, which was represented with 45% of the municipalities. Policy is represented with 43% and the last one issue projects and applications is represented with almost 40%. In this comparison is the same trend as in the discussion on the Facebook. There are less posts to each topics in the connection with the size of the municipality.

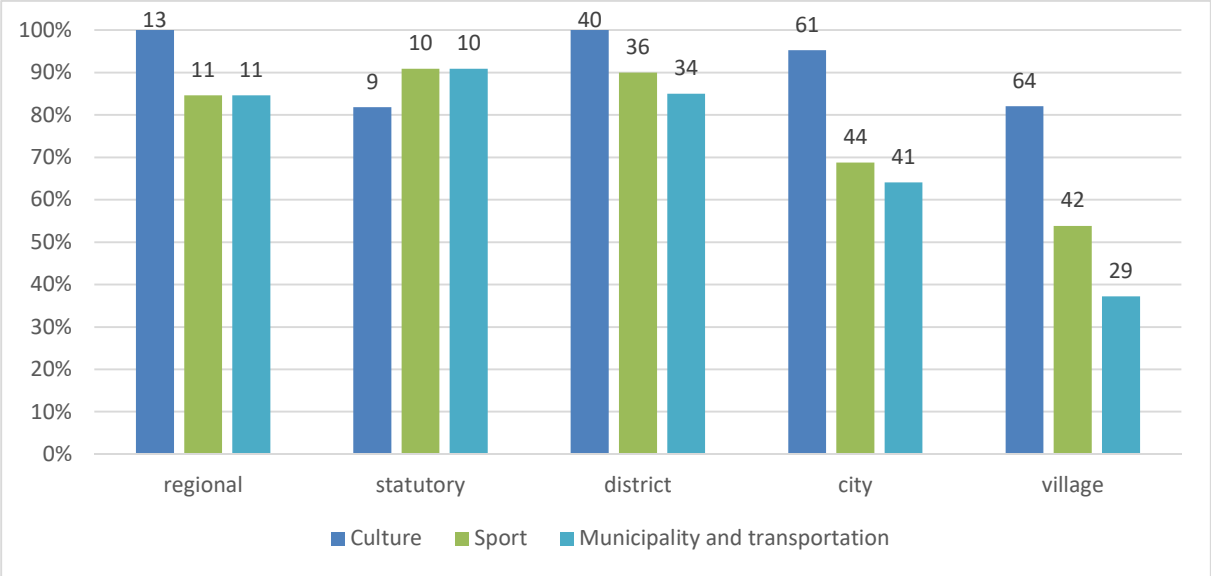


Fig. 8 – Contributions and topics on Facebook. Source: own research

The last topic solved in the article will focus on the publication of photos and videos on social networks. This topic is a big phenomenon not in the communication between municipalities and citizens but also only between people from their personal life. It is evident from figure 9 that the most often used tool on the social networks is placing of the photos and videos. Also in this field can be mentioned the same trend as in previous topics. The smaller is the town, the less photos and videos are by the municipality displayed.

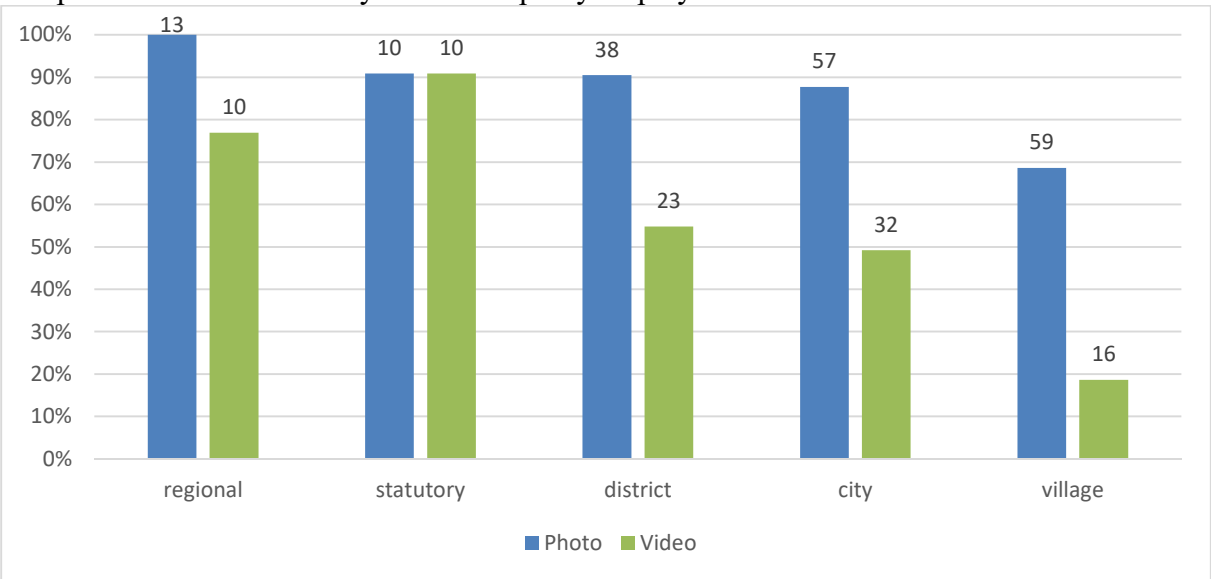


Fig. 9 – Photos and videos on social networks. Source: own research

5.CONCLUSION AND DISSCUSSION

The question for discussion might be 'how fast and in what direction web sites of individual cities and villages will develop'. Municipalities and cities, which compete for the best web sites, do not always use the potential of their sites to the full throughout the whole year and the best ideas for improvements to the site are not applied in other municipalities, although they are evaluated by citizens positively. Another issue is the use of social networks by municipalities. So the next question can be aimed at councilors 'how to stimulate councilors for greater involvement in utilization of these modern ways of communication'.
The research and its results presented in the article was done in 2016 at the Faculty of Informatics and Management, University of Hradec Králové. The research sample consisted of city and village municipalities, their ratio were 47% to 53%. 217 municipalities which represent 65% of the sample use social networks and internet and 115 municipalities do not use social networks but use internet for communication with citizens. 206 municipalities use Facebook and 11 other municipalities use another social web application such as Youtube, Twitter or Instagram. Only 3 small villages do not use internet and social networks. Based on the research findings the social software applications are used more often in the cities than in villages; 84% of city municipalities use social applications in comparison to only 48% of village municipalities where social apps are used. The other monitored issue was whether information presented on the social networks was regularly updated. It was found out that 75% of municipalities have up to date information. Roughly expressed a parallel between the size of the municipality and use of technology can be seen; the smaller the municipality is the less technology is also used. Alike situation is with updated information; the smaller the municipality is, the fewer current posts are presented.
While in 47% of regional, statutory or district cities the discussion is active or rather active, in small cities and villages the discussion is active or rather active in 28% of cases. Reasons might be: insufficient capacity of the village municipality staff to run discussions and lower competence in using the Internet and social networks, or the other significant factor could be the age because in small cities the older population prevails and citizens often prefer face-to-face communication. Municipalities published the most information on social software application about culture, sports and transport in the given sample. Also in this issue is the rule that the smaller the municipality is less posts are done. The last surveyed area deals with publication of photos and videos that are the most inserted as is based on the results of the sample of respondents.
Even though not all the population in the Czech Republic uses the Internet and social applications, it is desirable for the municipalities to have well-designed websites and introduce also social web applications since time cannot be stopped.

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THE MARKET ORIENTATION AS A TOOL OF BUSINESS PERFORMANCE MANAGEMENT: VIEW FROM THE BEHAVIOURAL PERSPECTIVE

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Abstract

Market orientation is considered as a part of marketing management and a significant determinant of marketing strategy development. The marketing literature has emphasized the importance of market orientation for achieving organizational objectives like competitive advantage and improved performance. Considering this, market orientation can be used for managing performance of businesses. The aim of this paper is to examine how the three components of market orientation influence the performance of businesses from foodstuff industry in Slovakia. In this paper, market orientation components are examined from behavioural perspective. Methods used in our research were based on studies of Kohli and Jaworski who are representatives of behavioural approach to market orientation. We used MARKOR scale developed for measuring the level of market-oriented behaviour of business. We applied correlation analysis (Spearman correlation coefficient) for measuring the dependences between variables. On the basis of results obtained by research conducted on the sample of businesses operating in foodstuff industry we have confirmed the correlation between components of market orientation and business performance measured through the various financial indicators. Novelty of the research consists in examination of three components of market orientation separately on the sample of businesses from foodstuff industry in Slovakia. This study is a part of complex research which was focused on investigating the relationship between market orientation and business performance.

Keywords: market orientation, business performance, market-oriented behaviour, foodstuff industry

JEL Classification: L20, L29

1.INTRODUCTION

Market orientation affects wide range of business processes including human resource management, marketing information system, customer relationship management, etc. For several decades, the topic of market orientation has been elaborated for studying and comprehending the behaviour of businesses. For businesses operating in increasingly intensive competitive environment has become necessary to efficiently generate, disseminate and use information about customers, competition and market. The aim of this paper is to examine how the three components of market orientation influence the performance of businesses from foodstuff industry in Slovakia. Significant relationship between components of market orientation and business performance may support assumption that there is possibility to manage business performance through the market-oriented behaviour. We used the method developed by Kohli and Jaworski (1993) who constructed the MARKOR scale in order to measure the level of market-oriented behaviour of business. We applied correlation analysis (Spearman correlation coefficient) for measuring the dependences between variables. On the basis of results obtained by research conducted on the sample of businesses operating in foodstuff industry we have confirmed the correlation between components of market

orientation and business performance measured through the various financial indicators. Our results indicate moderately strong or weak correlations between individual components of market orientation and selected financial indicators. Novelty of the research consists in examination of three components of market orientation separately on the sample of businesses from foodstuff industry in Slovakia.

2.THEORETICAL BACKGROUND

Several authors consider market orientation as a significant predictor of business performance whose implementation lead to achievement of long-term profitability (Narver and Slater, 1990; Ngai and Ellis, 1998; Deshpandé and Farley, 1999). McCarthy and Perreault (1990) and Caruana (1999) agree in opinion that market orientation is a consequence of implementation of marketing concept. Thus, the degree of market orientation of business depends on the range of the marketing concept implementation. There were elaborated two perspectives of market orientation, behavioural and cultural (Kirca, Jayachandran, Bearden, 2005). Behavioural perspective is presented by the works of scholars Kohli and Jaworski (1990). The representatives of second perspective are scholars Narver and Slater (1990) who have developed cultural perspective. Researches of these authors are considered as a key in developing the market orientation issue. Their different definitions of market orientation have become cited by many authors up to these days (Rojas-Méndez, Rod, 2012; Shin, 2012; Guo, Wang, 2013; Eslahnia, 2014; Jangl, 2015; Kajalo, Lindblom, 2015; Long, 2015; Widana, Wirjono, Purwanegara, Toha, 2015).

2.1.Behavioural Perspective of Market Orientation

A. K. Kohli and B. J. Jaworski (1990), the main representatives of behavioural perspective, in their one of the first research found out that market orientation entails more precise and detailed view on customer focus and coordination. Firstly, it involves one or more departments engaging in activities concentrated on the development of understanding of current and future customer needs and recognizing the factors that affecting them. Secondly, the market orientation is characterized by sharing the understanding of customer needs and wants across all departments in business unit. Thirdly, the various departments are involved in realizing activities devised to come across select customer needs. Authors synthesized their findings into the formal definition of market orientation as an "organization-wide generation of market intelligence, pertaining to current and future customer needs, dissemination of the intelligence across departments, and organization-wide responsiveness to it" (Kohli, Jaworski, 1990, p. 6).
Understanding of these three dimensions requires more detailed description of operations performed within the business (Varela, Río, 2003). *Generation of market information* refers to the degree to which business systematically collects and processes information about current and future needs of consumers and industrial end-users, as well as external factors, such as competition, technological and environmental changes, etc. All departments should be involved into this task because of their special relationships with the market agents. The speed dimension of market information generation is crucial. *Dissemination of market information* is accomplished through the three operations within the business. Firstly, through the interdepartmental meetings or informal chats about the tendencies of the market and its changes; secondly, through the generalized discussion about customers and competition, and thirdly, through the interactions and communications of marketing department members with the other departments in order to examine future needs of customers. Quick distribution of information and involvement of all member of business unit is the way how to maximize the value of generated information. *Responsiveness to market information* means to implement

marketing activities consistent with the accumulated market information about customer, competition and environmental factors, and planning the supply according to the customer preferences and wants. The changes detected in customers' and competitors' behaviour should be implemented into business decisions.

Piercy (1992) developed the behavioural-strategic approach to market orientation which is according to him comprised of three elements. The first element is *strategies*, related to the critical decisions about market definition, market segmentation and differentiation of products in comparison with competitors. The second element is *plans*, concerning the marketing mix policies development and the third element is *information* referred to whole market and used for strategy design, planning and control (In: Avlonitis, Gounaris, 1997).

In marketing literature there is also mentioned cultural perspective, which was developed by scholars S. F. Slater and J. C. Narver in the same decade like behavioural perspective. In their original study from year 1990 (p. 21) they defined market orientation as "organizational culture that most effectively and efficiently creates the necessary behaviours for the creation of superior value for buyers and, thus, continuous superior performance for the business". Ngai and Ellis (1998) characterize Narver and Slater's operationalization as closer to the mainstream view of market orientation, including customer orientation, competitor orientation, and inter-functional coordination. In our paper, we will not dedicate with the theoretical background of cultural perspective into the details, because we examine the market orientation only from the behavioural perspective in this research.

2.2.Consequences of Market Orientation

Market-oriented behaviour positively influences business outcomes (Kohli, Jaworski, 1993). Firstly, market orientation has a positive impact on employees; especially it increases organizational commitment and esprit de corps. Organizational commitment lies in loyalty of employees with the business and their willingness to stay work for it. Accordingly, committed employees used to spend more time, efforts and talent to their organization (Parasuraman, 1987). Meyer and Allen (1991) have categorized commitment into three dimensions. The first dimension is affective commitment represented by emotional attachment to the business. The second dimension is normative commitment which is characterized by socialization experience with other employees and the third dimension is continuance commitment which results in self-sacrificing when quitting a job (Zaman, Javaid, Arshad, Bibi, 2012). According to Boyt, Lusch, and Schuler (1997, p. 21) esprit de corps "consists of a set of enthusiastically shared feelings, beliefs, and values about group membership and performance, and manifests itself as a strong desire to achieve a common goal even in the face of hostility. At the work group level, esprit de corps exists when individuals in the same department or team enthusiastically share values and goals." Kohli and Jaworski (1993) conclude that both organizational commitment and esprit de corps are outcomes of market-oriented behaviour of business. Secondly, market orientation influences business performance. Many authors (Ngai and Ellis, 1998; Gaur, Vasudevan, Gaur, 2009; Gadimi, Hasanzadeh, Ajirloo, 2013; Eslahnia, 2014; Yadav and Tripathi, 2014) investigated the relationship between these variables. Business performance as a consequence of market orientation is mainly expressed by the level of customer satisfaction as a non-financial indicator and several financial indicators, including profitability, sales or overall performance. Vieira (2010) argue that market orientation is a source of differentiation on market and investments to marketing concept implementation should lead to superior business performance.

Relationship between market orientation and business performance is the subject of researches for many years. Majority of them confirm the positive relationship between market orientation and business performance. However, there are some studies (Bodlaj, 2010) which examine

negative or non-significant relationship between market orientation and business performance. We processed an overview of researches realized in different countries all over the world to see the results of these researches what could be useful for our primary research. This overview is shown in tab. 1. Tab.1 consists of four columns. In the first column are presented names of the authors and year of publishing the study. The second column includes the information about the methodology of research. Methodology could be based on the studies and measuring scales of Narver and Slater (N&S) or Kohli and Jaworski (K&J). The third column contains the result of research and the fourth column involves the objective of researches.

Tab. 1 – Researches on market orientation. Source: Own elaboration.

Authors (year)	Based on	Significant positive dependence	Objective of research
Avlonitis, Gounaris (1997)	N & S; K & J	yes	To investigate the impact of marketing orientation on performance of manufacturing businesses and B2C businesses.
Bodlaj (2010)	N & S; K & J	no	To examine the impact of a responsive and proactive market orientation on the degree of novelty, innovation performance and business performance.
Cervera, Mollá, Sanchéz (2001)	K & J	yes	To apply measurement of market orientation in public sector and political organizations.
Gaur, et al. (2011)	N & S; K & J	partly	To investigate the link between market orientation and manufacturing performance for small and medium enterprises in India.
Guo, Wang (2015)	N & S; K & J	partly	To examine how the three market orientation components influence industrial manufacturers' customer relationship management outcomes in a B2B context.
Jaworski, Kohli (1993)	K & J	yes	To investigate the impact of market orientation on business performance and determine which factors affect this dependence.
Kara, Spillan, DeShields (2005)	K & J	yes	To investigate the impact of market orientation on the performance of small businesses providing services.
Matsuno, Mentzer, Rentz (2000)	K & J	yes	To develop and improve MARKOR scale as a way of measuring marketing orientation.
Pitt, Caruana, Berthon (1996)	K & J	yes	To verify the reliability of MARKOR scale and examine the impact of market orientation on business performance.
Puledran, Speed, Widding (2003)	K & J	yes	To clarify the relationship between marketing planning, market orientation and business performance.

Rojas-Méndez, Rod (2012)	N & S; K & J	partly	To measure market orientation of wine producers.

As results from Tab.1, the majority of researches proved the significant and positive relationship between market orientation and business performance. Several studies partly confirmed the relationship between market orientation and business performance. It means that authors used different indicators of business performance and they proved significant relationship between market orientation and only some of business performance indicators, not all indicators. In following chapter we present the aim of this paper and methodology of our research.

3.AIM AND METHODOLOGY

The aim of this paper is to examine how the three components of market orientation influence the performance of businesses from foodstuff industry in Slovakia. In order to achieve this aim we have realized primary research. The method of data gathering was questioning. In our research, we used MARKOR scale developed by Kohli and Jaworski. Kohli and Jaworski (1993) have developed a MARKOR scale in their article as a tool for measuring market orientation. This measure was developed as a reaction of resurgence of academic's and practitioner's interest in market orientation concept and insufficiency of systematic effort devoted to developing a valid measure of market orientation. The MARKOR scale includes three components – intelligence generation, intelligence dissemination and responsiveness. The MARKOR scale appears to be able to gain information about specific behavioural reactions of business on critical aspects of a market such as competition, customers, regulation, social and macroeconomic forces (Day and Wensley, 1988; Jaworski and Kohli, 1996; Kohli, Jaworski, Kumar, 1993). Original MARKOR scale consists of 32 items. Later in 1993, Kohli, Jaworski and Kumar modified it to scale with 20 items. In MARKOR scale individual statements are predominantly evaluated by using the Likert scale (Caruana, 1999, p. 248). 20 items of MARKOR scale are divided into 3 groups corresponding with behavioural perspective of market orientation. The first 6 statements are focused on generation of market information, the next 5 statements cover field of dissemination of market information and the last 9 statements examine business ability to respond to market information. In our research we used 7-point Likert scale for expressing the degree of agreement (1=absolutely disagree, 7=absolutely agree) with individual statements. Several questions have reverse character, so average score of these items were recalculating in the phase of data processing. From the business performance point of view, we decided to choose four financial indicators which represent the business performance. Specifically, we selected sales, profit, return on investments (ROI) and return on assets (ROA). These indicators were also selected by the other authors in their researches (Avlonitis, Gounaris, 1997; Hooley, et al., 2003; Matsuno, Mentzer, Rentz, 2000; Kara, Spillan, DeShields, 2005).

Research sample consists of businesses operating in foodstuff industry. We collected data for primary research via online questionnaire. The research sample consists of 1 115 businesses. Respondents correctly fulfilled 62 questionnaires, thus the rate of return was 6.19 %. The structure of research sample was 33 manufacturing businesses (i.e. 53.2 %), 16 wholesales (i.e. 25.8 %) and 13 retailers (i.e. 21.0 %). Further criterion was the business size. There were 14 micro businesses with the number of employees from 1 – 9 (i.e. 22.6 %), 18 small businesses (i.e. 29.0 %) with 10 – 49 employees, 18 medium businesses (i.e. 29.0 %) with 50 - 249 employees and 12 large businesses (i.e. 19.4 %) with more than 250 employees. Respondents who were asked for fulfilment the questionnaire were marketing managers, owners of

businesses, heads of departments or employees at relevant positions. Businesses operate in different district of Slovakia and there were businesses with the Slovak, foreign and combined form of ownership (Šályová, Táborecká-Petrovičová, Ďaďo, Nedelová, 2015). In order to accomplish the aim of this paper we set the main hypothesis H_0:

H_0: The greater the market orientation components, the higher the selected financial indicators of business performance.

We also formulated twelve partial hypotheses which help us to confirm the main hypothesis H_0. Formulation of hypotheses are presented below:

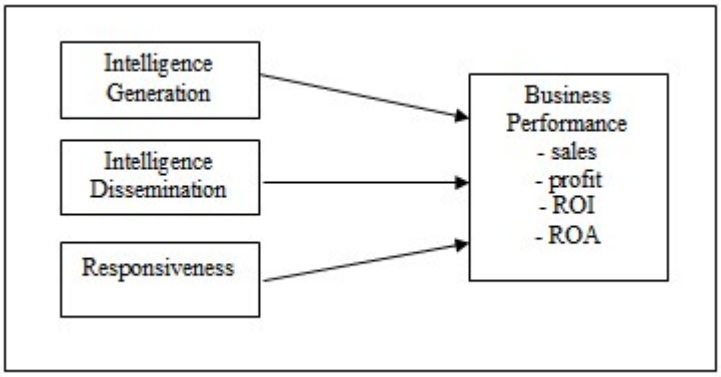
H_1: The greater the intelligence generation, the higher the sales.
H_2: The greater the intelligence generation, the higher the profit.
H_3: The greater the intelligence generation, the higher the ROI.
H_4: The greater the intelligence generation, the higher the ROA.

H_5: The greater the intelligence dissemination, the higher the sales.
H_6: The greater the intelligence dissemination, the higher the profit.
H_7: The greater the intelligence dissemination, the higher the ROI.
H_8: The greater the intelligence dissemination, the higher the ROA.

H_9: The greater the responsiveness, the higher the sales.
H_{10}: The greater the responsiveness, the higher the profit.
H_{11}: The greater the responsiveness, the higher the ROI.
H_{12}: The greater the responsiveness, the higher the ROA.

We illustrated the relationships between variables into the Fig. 1. This figure represents operational conceptual framework of our research.

Fig. 1 – Operational conceptual framework. Source: Own elaboration.



We incline to opinion of several authors (Gotteland and Boule, 2006; Lukas and Ferrel, 2000) who claim that the link between each component and business performance should be examined separately (Gaur, Vasudevan, and Gaur, 2011). The reason for this was that each business may achieve different level of adoption of individual components. They use this explanation in connection to cultural perspective. However we can implement it to behavioural perspective, too. For example, business may be good at intelligence generation and dissemination, but not good at responsiveness to this intelligence.

For verification of hypotheses we used statistical procedures. We used arithmetical mean and correlation analysis. We used Spearman's rho for identification the intensity or strength of dependence. In the next chapter we present results of research.

4.RESULTS

We examined dependences between variables. We calculated Spearman correlation coefficient for selected variables. We tested dependence between components of market orientation and financial indicators individually (Tab. 2). Correlations of all examined variables are significant at the set significant level. Thus, there are correlations between components of market orientation and financial indicators. Correlations differ by strength or intensity. Firstly, we examined correlations between intelligence generation (INTGEN) and financial indicators. The value of Spearman correlation coefficient of intelligence generation and sales is 0.266 and the value of Spearman correlation coefficient of intelligence generation and profit is 0.282. These correlations are significant at the level $\alpha = 0.05$. The value of correlation coefficients tells about weak dependence between intelligence generation and these financial indicators. There is correlation between intelligence generation and *ROI* (Spearman's rho = 0.406), and intelligence generation and *ROA* (Spearman's rho = 0.433). These correlations are stronger than correlations between intelligence generation and sales, and intelligence generation and profit. Secondly, we investigated correlation between intelligence dissemination (INTDISS) and financial indicators. Correlations between intelligence dissemination and sales (0.283), and intelligence dissemination and profit (0.351) are stronger than correlations between intelligence generation and these variables. On the other hand, correlations between intelligence dissemination and ROI (0.341), and intelligence dissemination and ROA (0.409) are slightly weaker than correlations between intelligence generation and these variables. Lastly, we examined the correlations between responsiveness to market intelligence (RESP) and financial indicators. Specifically, Spearman's rho representing correlation between responsiveness to market intelligence and sales is 0.319, responsiveness to market intelligence and profit is 0.341, responsiveness to market intelligence and ROI is 0.409, and responsiveness to market intelligence and ROA is 0.423. From the overall market orientation point of view (sum of three components), the strongest correlations are between components of market orientation and financial indicator ROA. Contrary, the weakest correlations are between components of market orientation and sales. The strongest correlation of all examined variables is between intelligence generation and ROA, because the value of Spearman's rho is 0.433.

Tab. 2 – Correlations. Source: SPSS.

			SALES	PROFIT	ROI	ROA
Spearman's rho	INTGEN	Correlation Coefficient	,266*	,281*	,406**	,433**
		Sig. (2-tailed)	,038	,028	,001	,001
		N	61	61	59	58
	INTDISS	Correlation Coefficient	,283*	,351**	,341**	,409**
		Sig. (2-tailed)	,027	,006	,008	,001
		N	61	61	59	58
	RESP	Correlation Coefficient	,319*	,341**	,409**	,423**
		Sig. (2-tailed)	,012	,007	,001	,001
		N	61	61	59	58

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Through the correlation analysis we verified the hypotheses. We confirmed all hypotheses, what means that there is significant correlation between components of market orientation and business performance expressed through the various financial indicators. Tab. 3 presents overview of the results of hypotheses verification. According to the value of Spearman's rho we conclude that there were confirmed 7 weak correlations between variables and 5 moderately strong correlations between variables.

Tab. 3 – Hypothesis confirmation. Source: Own elaboration according to SPSS.

	Sig.	Spearman's rho	Test result	Correlation strength
H_1: Intelligence generation → sales	0.038	0.266	confirmed	weak
H_2: Intelligence generation → profit	0.028	0.281	confirmed	weak
H_3: Intelligence generation → ROI	0.001	0.406	confirmed	moderate
H_4: Intelligence generation → ROA	0.001	0.433	confirmed	moderate
H_5: Intelligence dissemination → sales	0.027	0.283	confirmed	weak
H_6: Intelligence dissemination → profit	0.006	0.351	confirmed	weak
H_7: Intelligence dissemination → ROI	0.008	0.341	confirmed	weak
H_8: Intelligence dissemination → ROA	0.001	0.409	confirmed	moderate
H_9: Responsiveness → sales	0.012	0.319	confirmed	weak
H_{10}: Responsiveness → profit	0.007	0.341	confirmed	weak
H_{11}: Responsiveness → ROI	0.001	0.409	confirmed	moderate
H_{12}: Responsiveness → ROA	0.001	0.423	confirmed	moderate

Finally, we can confirm the main hypothesis H_0 *the greater the market orientation components, the higher the selected financial indicators of business performance*, due to confirmation of all partial hypotheses in our research.

5.DISCUSSION

We have confirmed all hypotheses which assumed the correlation between components of market orientation and business performance measured through the various financial indicators. According to results of research we can consider market orientation as a tool of business

performance management, because by increasing the market orientation, businesses can increase their performance.

Market orientation is understood as efficient intelligence generation, intelligence dissemination, and responsiveness to market intelligence. These activities are related to three elements, which are customers, competition and market changes. In our research we proved, that there is significant correlation between market orientation components and selected financial indicators of business performance. Therefore, it is possible to increase business performance through the intensifying market-oriented behaviour. We found out, that all three components influence business performance. It means that each part of market orientation is important for increasing business performance. There are some recommendations how to use the components of market orientation to manage business performance.

Businesses may affect their performance through the intelligence generation. Intelligence generation consists in meeting the customers and consulting products and services with them, doing in-house market research, active detecting of changes in customers' preferences, questioning the customers about satisfaction with products and services. It is also important to detect trends in the industry, monitor steps of competitors and changes in business environment.

Increasing of business performance through the intelligence dissemination is based mainly on the activities of marketing personnel in business. Marketing personnel may spend time discussing future needs of customers with other departments. In business should be organized interdepartmental meetings to discuss market trends, customers' preferences and steps of the competition. The period of time of dissemination of market information between employees of all departments should be as short as possible.

Intelligence generation and dissemination are important, but if business is not able to react on achieved market information, they are useless. In order to increase market orientation and subsequently business performance, business should react to price changes of competitors and campaigns of competitor targeted on its customers in short period of time. The findings about changes in customer needs cannot be ignored. Business should provide great customer service and try to file complaints of customers. During all these activities it is important to coordinate the work of all departments. Several departments should periodically get together to plan a response to changes taking place in business environment.

According to results of our research we recommend several activities for businesses from foodstuff industry following their objectives in the area of business performance. If business has the main objective to increase the sales volume through the market orientation, first of all, it is important to intensify the responsiveness to market orientation. It is mainly connected to speed of reaction to price changes of competitors and campaigns of competitor targeted on its customers. Slow reaction might causes decreasing of sales. The next important activity for achieving higher sales through the market orientation is to provide great customer service and try to implement changed customer preferences into the products and services. Secondly, it is important to disseminate information about customers and competitors among all departments. Specifically, it is important to deliver the information from marketing department to sales department, because the sales representatives should dispose with actual information about customers and competitors. Thirdly, businesses should generate information about customers and consulting products and services with them. It is also important to questioning the customers about satisfaction with products and services in order to avoid decreasing sales as a consequence of dissatisfaction. If business wants to increase the profit, the most important is to effectively disseminate the market information. When all employees are aware of the current market situation and customer needs, top management can implement some measures for increasing the profit more effectively. Interdepartmental meetings bring the opportunities for creating united strategy for achieving business objectives. Then, it is important to react to market information in the same way like the businesses which want to increase sales.

Generation of market information should be focused on competitors, while businesses can monitor margins of competitors and adapt their own margins. As results from our research, for increasing the indicators ROI and ROA, businesses should mainly focus on intelligence generation and responsiveness to market intelligence. Individual activities are similar to the recommended activities for businesses which want to increase sales and profit. There are some differences, but in general, all these activities indicate significant correlation to business performance.

6.CONCLUSION

The aim of this paper was to examine how the three components of market orientation influence the performance of businesses from foodstuff industry in Slovakia. On the basis of results obtained by research conducted on the sample of businesses operating in foodstuff industry we have confirmed the correlation between components of market orientation and business performance measured through the various financial indicators. We can conclude that our results are in line with the results of the other authors (Cervera, Mollá, Sánchez, 2001) who examined market orientation components from behavioural perspective as predictors of business performance. Methods used in our research were based on the works of Kohli and Jaworski, representatives of behavioural approach to market orientation.
Research has several limitations. The sample consisting of 62 businesses can be considered small. Larger sample could gain more reliable results. Our research sample also was not statistically random. In future research it could be possible to extend research sample by businesses from various industries. The selection of business performance indicators like sales, profit, return on investments, and return on assets reflects only financial performance. In future research there is the possibility to incorporate also non-financial indicators to achieve more complex results. Market orientation can be also examined from cultural perspective, what could bring different results.

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WELL DESCRIBABLE ACTIVITIES SUITABLE FOR ABANDONMENT TO SHARED SERVICE CENTERS

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Abstract

The article is focused on one aspect of firm´s activities and analyses if the well describable activities are good to transfer to the shared service centers. The analysis is based on on-line survey made through Czech companies. Based on an analysis of theoretical concepts, we formulate hypothesis related to this problem. Hypothesis is tested by appropriate statistical methods as odds ratio (OR) and Fisher's exact test. The results show that companies prefer to move codify-able and routine activities to shared service centers. The most common activity that is transferred to shared service centers is receivables management.

Keywords: Shared service centers, well describable activity, odds ratio, accounting model

JEL Classification: M41

1.INTRODUCTION

Development of shared service centers (SSC) was enabled by rapid development of communication technologies, which made the export of services simpler and cheaper. While there are still some barriers within the export of the goods - the marginal cost of transferring services is very low. Thanks to information technology the global market is accessible not only to big multinationals, but also to local companies. Such trend forced the global companies to use resources from the offshore locations.

The concept of shared service centers is not suitable for every company. For some companies, it is a question of their culture. Other companies are too small to realize the economies of scale. Some might be already too efficient to realize more savings. Before any decision is made, company should be fully aware of the associated cost related to the usage of shared service centers. We do not only mean the direct cost paid to a supplier of the services (internal or external), but also additional related cost of such relationship. Those costs are often hidden.

This paper aims to assess the usage of the shared service centers by Czech companies within various accounting areas concerning on one specific attribute of activities. This contribution builds on previous research and it´s goal is to analyze the concept of shared services in the case of accounting activities. Emphasis is on an assessment of which types of accounting services are most suitable for transfer to service centers. The introduction, which briefly define history, positive and negative aspects of the use of shared service centers, is followed by a review of the literature, which contains the definition of shared service centers and factors related to transferability of accounting services to SSC. This part is completed by formulating research hypothesis. The review of literature is followed by analysis of questionnaire survey using appropriate statistical methods for evaluation. Discussion shows the results of the empirical survey. The most important findings are summarized in the conclusion.

2.LITERATURE REVIEW

2.1.Definition of shared services

Shared services are an operational approach of centralizing administrative and business processes that were once carried out in separate divisions or locations (Oshri et al., 2011). In case such centers are well managed, they contribute to the cost savings and in some cases, they might even generate revenues. The concept is close to the market conditions. Bergeron (2003) offers the alternative definition of the shared services. He evaluates this concept as a concentration of the part of the services to a newly created semi-autonom entity, which should be able to compete in the open market. The aim is to increase efficiency, realize cost savings and create value while providing first class services to the internal customers.
Similarly, Shulmann (1999) defines the shared service centers as a concentration of resources in order to execute activities across the whole company (whole Group). Their aim is to provide top quality services with the lowest possible cost for the huge number of internal partners and eventually satisfy the external customers and increase the value of the whole company. Quinn & Cooke (1999) see the concept of shared services as the method of sharing the resources within the Group in contrary to provision the services in many multiple independent entities (subsidiaries) of the Group.

2.2.Factors and hypothesis related to transferability of accounting services to SSC

Understanding of each sourcing model is equally important as understanding of which types of accounting services are suitable for transfer to service center. Metters (2008) mentions that companies typically transfer such services, which are not critical for the company and which do not represent any competitive advantage. The main reason is that know-how related to transferred service is mostly lost.
Additional important factor in decision making process related to transfer of the service is a scale of such service. In case the scale is too small, cost related to setting up of a share center or looking for a proper supplier and cost related to new established processes will not be paid off. On the other hand, in case the scale of too big, transfer of the service might mean additional levels of management and therefore higher than expected cost.
Services, which are prone to constant changes of technology are a good candidate for transfer. The reason is that own department rarely has the capacity to cooperate with constantly changing technologies. The only exception is the situation, where such services are the critical source of the business or alternatively are the key source of competitive advantage. Additionally, good candidates for transfer are the services, which show a big variability of resource need during the cycle, e.g. activity which requires 50 employees one week and only 10 employees the following week. Such company need to recruit 50 employees however 40 of them have nothing to do during the second week. In such scenario, shared service centers might be able to use free resources for a contra-cyclic client.
Metters (2008) additionally states that services, which require constant communication between provider and consumer of a service, are not suitable for transfer. The main reasons are possible cultural differences, various time zones and additional communication barriers which might reduce the model efficiency.
Based on the research (Aron & Singh, 2005) we can see that companies pay a huge attention to the selection of place (location of shared service center) or selection of a potential supplier (in case of BPO). On the other hand, they do not pay enough attention to the selection of proper service suitable for transfer. It is visible that companies have difficulties in selecting the key

services for a company. This fact concludes also Owens (2013), who analyzed the positive and negative aspects of usage of shared service centers in the Group of companies. The recent research focuses on expenses (Ganti, 2016) and control of the shared service center (Kastberg, 2014). The research in the area of shared services is not only focused on business sector but also tries to find aspects, how to extend this topic to public sector (Raudla & Tammel, 2015).

2.3.Codification of services

In order to reduce operational risk related to usage of shared service centers it is important to assess the service to what extent it is codify-able. Codification is concentration of knowledge into structures, which allows transferability of a service (Boisot, 1986). Process of codification includes usage of various models, codes, flow charts etc. (Ancori et al., 2000) and means translation of activities or rules into procedures, specifications and documentations (Kogut & Zander, 1993; Lam, 1997). Possible level of codification depends on the type of knowledge to be transferred. Tacit knowledge is gained via experience. It is often hidden and hardly codify-able. On the other hand, explicit knowledge could be very well shared (Nelson & Winter 1982). Research in the area of information technology describes various tools used in business process codification in more detail. Malone et al. (1999) states that description of activities via flow charts and diagrams enabled evolution of so called process grammar. This resulted in the fact that even some more complex services could be codified. Codification as a mean of transfer of knowledge resulted in a change from classic ways of working into division of labor widely used in shared service centers (Cohendet & Steinmueller, 2000).
Codification is relevant in both domestic and foreign markets. It enables globalization of local knowledge and reduces the time needed for its transfer (Cohendet & Steinmueller, 2000). Process of codification via decomposition, analysis and synthesis of processes should lead to more efficient provision of services. Codification is an enabler of entering a service contract since it provides visualization and description of a service level which could be expected from a supplier (Boisot, 1986; Cowan et al., 2000). Codified processes are more easily measurable. Based on the above statements we concluded following hypothesis.

H: It is more beneficial to transfer well codify-able services rather than less codify-able services into shared service centers
We are aware that codification of services is not the only aspect of services that should be tested, but this paper is focused only on this aspect and we assume to extend this paper with other aspects of services.

3.METHODOLOGY AND DATA

This paper is created from wide research which has been performed through Czech companies. The data related to testing of above mentioned hypothesis are not publicly available. Due to this fact, the on-line survey method was selected. The advantages of such method are:

- Full anonymity of respondents allows to answer honestly and openly;
- In comparison to paper form of survey, respondents spend less time opening, filling and sending it (overall 8-10 mins in our case);
- In comparison to the sending the survey as an attachment to e-mail, on-line survey does not consumpt e-mail memory of respondent;
- Results could be automated.

3.1. Data collection

Research is focused on big and medium companies. Based on the theory and recent research the main users of shared service centers are the big multinationals (Oshri et al., 2011). Therefore, we focused on Czech companies in which at least one for the following conditions are met:

- number of employees higher than 1 000;
- yearly revenue higher than 150 mil EUR;
- total assets value higher than 500 mil EUR.

Such criteria fulfilled 361 Czech companies. We had used European database Amadeus. Due to the fact, that such database does not provide contact details of companies, we had to look for those details individually. We could not find contact details of 14 companies (4%).
Most of the companies was contacted via e-mail. Some companies do not provide e-mail addresses and prefer alternative ways of contacting them, e.g. on-line form. We respected this and contacted them via their forms. We also tried to avoid selecting our emails as SPAM therefore the maximum number of companies addressed in one e-mail (as blind copy) was 15. In total, we had contacted 339 companies.
We had used software Survio for creation of our on-line survey. Apart from standard survey statistics this software provides the information how many respondents click the link to the survey however did not fill it in. It was 133 respondents or 39%. Survey was filled by 63 respondents (19 %), however complete usable number of filled surveys was 38 (11%). Such return rate is within typical range (Lane, 2007). Tab. 1 shows the data collection process.

Tab. 1 – Data collection. Source: Own processing

	Number	Percent (%)
Number of companies based on criteria	361	100
Number of companies without contact details	14	4
Number of companies with contact details	**347**	**96**
E-mails sent	310	89
On-line form filled	37	11
E-mails undelivered – 1. round	17	5
E-mails undelivered – 2. round	8	3
E-mails delivered	302	97
Number of contacted companies	**339**	**100**
Remainder via e-mail	280	83
Remainder via phone	22	6
Number of companies entering survey without filling it	133	39
Number of filled surveys (incl. incomplete)	63	19
Number of usable filled surveys	**38**	**11**

3.2.On-line survey

During the creation of our survey we tried to stick to the rules related to on-line surveys (Dillman, 2011), mainly

- Survey should look simple and short;
- Survey should not include personal questions;
- Directive language should be avoided;
- Questions should not be embarrassing for a respondent (e.g. too complex or too professional);
- Questions should be straight forward - it should be clear what is being asked;
- Survey should be consistent and questions should build on previous ones;
- Navigation within a survey should be easy and quick.

There were 14 questions in our survey. Questions were consistent and build up in logical order. For clearer understanding accounting processes, they had been divided into the following areas in most of the questions (used in Fig. 2):

- Billing (invoicing to the costumers) – means activities associated with issuing of invoices;
- Accounts payable (management of commitment) – means activities associated with e.g. bookkeeping of incoming invoices or their payment;
- Fixed assets – means activities associated with bookkeeping of long-term assets;
- General ledger (fin. accounting) – means activities associated with the whole accounting process;
- Accounts receivable (receivables management) - means activities associated with e.g. bookkeeping of issued invoices or their payment;
- Travel & other expenses – means activities associated with processing and bookkeeping of business trips;
- Internal reporting/controlling/MI;
- External reporting (statutory, tax).

3.3.Methodology

Hypothesis was tested by using statistical methods. As appropriate statistical tools were chosen the Odds ratio test (the OR) and the Fisher's exact test. The Odds ratio describes the interdependence of two variables based on the following contingency table (Tab. 2).

Tab. 2 – Pivot table for Odds ratio Source: Own processing

Random variable X n = frequency of answers	Random variable Y		Total
	Y = 1	Y = 2	
X = 1	n_{11}	n_{12}	n_{1+}
X = 2	n_{21}	n_{22}	n_{2+}
Total	$\mathbf{n_{+1}}$	$\mathbf{n_{+2}}$	**n**

Risk ratio (RR) then represents the ratio of the probability of one possibility (event occurred) to the second (event not occurred). Thus, for example, RR shows the probability of abandonment of routine activity versus its disabandonment. For mathematical expression of odds ratio, we can apply this equation (1).

$$OR = \frac{RR_1}{RR_2} = \frac{n_{11} * n_{22}}{n_{12} * n_{21}}, \tag{1}$$

where n = *frequency of answers*

The Odds ratio (or the risk of occurrence) for two different values of the two variables is complementary in inverted value, e.g. OR of abandonment routine activities is direct reciprocal of disabandonment of complex activities. For statistical verification, we determine null (H_0) and alternative (H_1) hypothesis. H_0 says that the ratio of one variable is the same for different values of the second variables - the variables are independent. Then we can write:

$$H_0 : OR = 1$$
$$H_1 : OR > 1$$

For testing single-sided hypothesis of independence (when relatively small amount of measurement), the Fisher's exact test is used. The null hypothesis is, in the case of Fisher's exact test, the independence of the monitored variables. This means if H_0 is valid, the observed frequencies should correspond to the expected rates. Then we can calculate p^* value for all possible combinations in the contingency table while maintaining the marginal frequency (equation 2). The test statistics or p-value of Fisher's exact test is the sum of p^* probabilities lower than or equal to the value p^+ probability which belongs to the contingency table constructed from measured values (equation 3). To reject hypothesis H_0, we require the probability p below the level of significance ($\alpha = 0.05$).

$$p^* = p^+ = \frac{(n_{11}+n_{12})!(n_{11}+n_{21})!(n_{21}+n_{22})!(n_{12}+n_{22})!}{n!n_{11}!n_{12}!n_{21}!n_{22}!}, \tag{2}$$

where n = *frequency of answers*
p^* = *different probabilities while maintaining marginal frequencies*
p^+ = *probability belonging to measured values*

$$p = \sum\left(p^* < p^+\right), \tag{3}$$

where p = *the test statistics of Fisher's exact test*
p^* = *different probabilities while maintaining marginal frequencies*

p^+ = *probability belonging to measured values*

4.DISCUSSION

4.1.The profile of respondents in relation to the size of the company

The survey contained several questions that pointed to getting a basic picture of the analyzed sample. As the most interesting may be considered the profile of the respondents (companies) in relation to the size of the company. The size has been investigated related to the number of employees, annual sales and the total assets.
For example, the number of employees could be assigned to one of six categories. Based on the selected criteria it is not surprising that the largest share has of the companies with number of employees more than 1,000 (24%). Relatively high is also the category of 501 – 1000 employees (18%). A very high proportion is also in the category of 100 – 250 employees (21%). The detailed view shows that the companies with high revenues are very often in this category of 100 – 250 employees. At 18% companies remained this question unfilled. The situation is shown in the Fig. 1.

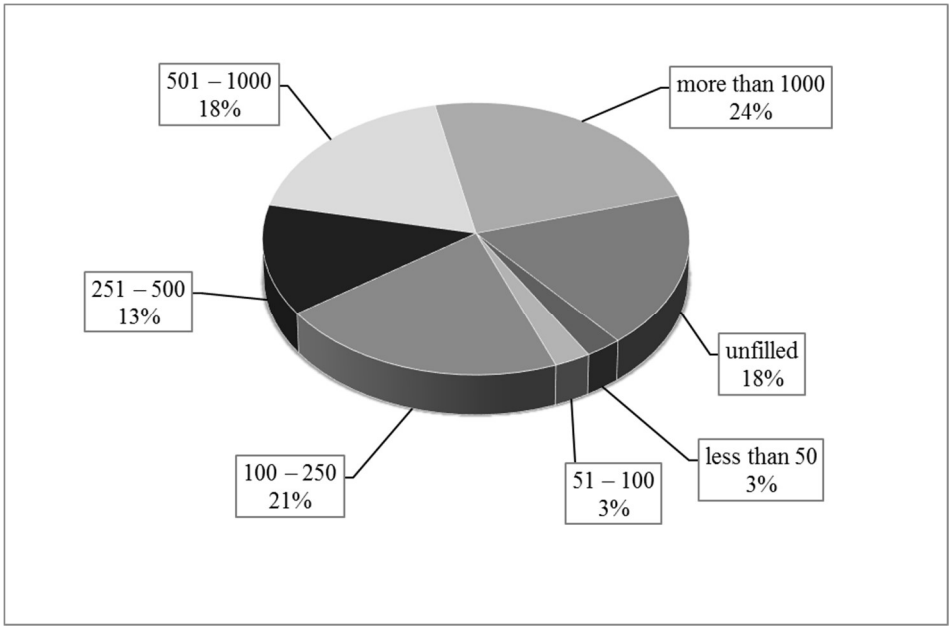


Fig. 1 – Respondents by number of employees. Source: Own processing

Clearly are the categories of the size of the companies listed in Tab. 3.
Tab. 3 – The number of respondents by category. Source: Own processing

Number of employees	No.
less than 50	1
51 – 100	1
100 – 250	8
251 – 500	5
501 – 1 000	7
over 1 000	9
unfilled	7
Total	**38**

Annual revenue	No.
less than 100 mil CZK	0
100 – 500 mil CZK	0
500 mil – 1 bil CZK	1
1 – 5 bil CZK	12
5 – 10 bil CZK	14
over 10 bil CZK	9
unfilled	2
Total	**38**

Total assets	No.
less than 1 bil CZK	7
1 – 5 bil CZK	10
5 – 10 bil CZK	5
10 – 50 bil CZK	5
50 – 100 bil CZK	1
over 100 bil CZK	2
unfilled	8
Total	**38**

4.2.Codification of services

Codification of services can be characterized as the densification of knowledge and experience in the structure of using different models and codes. The result of this process is transfer of activities into the directives, instructions, specifications and documentation. Activities are usually shown in a flow-charts, transition and destination diagrams and models. So called procedural grammar allows codification of some complex processes. Using of codification also allows the transmission of knowledge and experience, which is one of the pillars of the establishment of shared service centers, where is an obvious transition from the classical organization of activities to the structured division of labor. Well describable processes are therefore the ideal candidates to move to SSC.
To assess codification of services, respondents mark each activity separately. Under the worst-describable activity is marked the external reporting. Only 11% of respondents believe that external reporting is good to be described. As less describable is also marked internal reporting. On the contrary, receivables management is evaluated as the best to be described by 87% of respondents. Also, management of commitment is designated as a well-described activity (by 76% of respondents). Surprisingly, the imaginary third place is occupied by accounting of fixed assets, which respondents identified as well describable in 63% cases. Travel and other expenses (indicated by 55% of respondents) and invoicing to the customers (61% of respondents) can be also highlighted as well-describable activities. Clearly assessment is shown in Fig. 2, which shows the number of respondents.

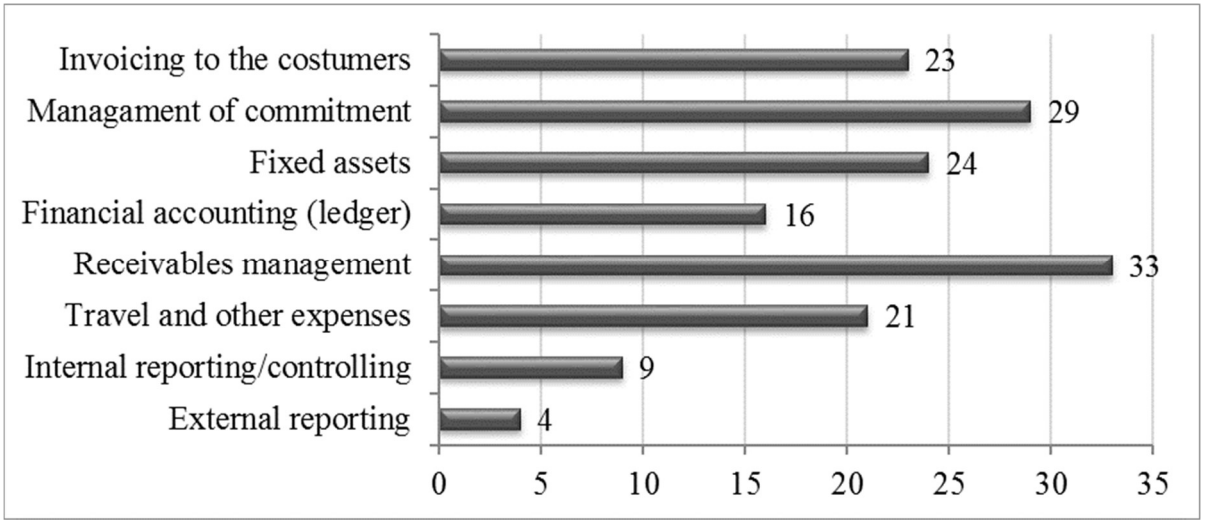


Fig. 2 – Well-describable activities. Source: Own processing

Tab. 4 contains information about for how many respondents it is beneficial to move the activity to shared service center in the context of whether the activity is marked as well describable or not.

Tab. 4 – Abandonment or disabandonment of well and harder describable activities. Source: Own processing

	Abandonment	Disabandonment	Total
Well describable activities	94	55	**149**
Harder describable activities	9	101	**110**
Total	**103**	**156**	**259**

From the table of frequencies Odds ratio (OR) is calculated. Than the lower limit of the confidence interval is given for Odds ratio respecting the chosen significance level ($\alpha = 0.05$). The result is statistically more significant if the lower limit is further away from 1 (Tab. 5).

Tab. 5 – The results of Odds ratio for describable activities. Source: Own processing

Odds ratio	Values
Confidence interval	[10,15; + ∞)
Odds ratio	19,18

The analysis shows that in well-describable activity is approximately 19x greater chance that these activities are beneficial to abandonment than disabandonment in comparison to harder describable activities. To verify, the Fisher exact test was used.

Application of Fisher's exact test:
$p = 6,777 \times 10^{-21}$

The relationship between codification of service and its abandonment to CSS is statistically significant. At the 5% significance level, we can reject H_0 in favor of H_1. The analysis confirmed the hypothesis H that the companies consider more useful to leave to the shared services center well-describable activities rather than harder describable activities.

5.CONCLUSION

During the decision process if to use shared service centers and to what extent, companies need to consider several aspects. Firstly, they need to assess what is their key motivation, why they would like to move part of their services into a shared service center. In most cases motivation is cost reduction. However, we could see that companies are using shared service centers due to access to qualified workforce or to access new markets. If a company wants to reduce its cost, most probably it would not place the shared service center into the location like Great Britain. Alternatively, if a company seeks for skilled and qualified workforce, it would not place its service center to a location where demand for a particular workforce is already higher than its supply. Therefore, situation of each company is different.
Additional aspect of the decision making is to select what type of services are suitable for the transfer to shared service centers. In general, accounting services, typically considered as support type of services, are good candidates. However, it is very important to select the appropriate activities and processes including their correct measurement and controls. Based on the theoretical background and combination of various theory schools, we could conclude that there are several key factors to be considered. Based on the economies of scale theory the most suitable are routine and repetitive activities. At the same time, based on the transaction cost analysis and resource based view, the most suitable are activities well codify-able and well definable in manuals and procedures.
The most essential characteristic of accounting activities, that are suitable for transfer to SSC is their codification. Well-describable activity allows distribution, readjustment and consolidation processes, which ultimately leads to make this activity more effective. Well describable processes are also better measurable. Codification enables the globalization of local knowledge and information, and shortens the time required to transfer them. Research has shown that companies abandoning to shared service centers rather the activities that are better describable. The statistical significance of this finding is very high. This means that companies realize the importance of selecting the appropriate activity to transfer to shared service center. Further analysis showed that the best describable activity is receivables management. As well-

describable activity was this activity chosen by 87% of respondents. So, the companies think, that activities as bookkeeping of issued invoices or their payment are the most suitable for to transfer to a shared service center. On the other side, the respondents chose the external and internal reporting as the least suitable for transfer to shared service center. These activities are related with complex processes and they are hard to describe.
After the main conclusions, we would like to recall the main limitations of the paper. The first is, that the analysis is based on questionnaire survey. There is a risk that respondents, who decide to reply to the questionnaire, will consider their position in the given area for premium and they want to present themselves in a certain way and will not be representatives of statistically neutral sample of respondents. This is described in the literature as self-selection bias (Ziliak & McCloskey, 2008). Mostly we tried to eliminate this risk by contacting the sample of respondents by phone. Another sticking point of the survey is the fact that not all companies surveyed could decide about the use of shared service centers themselves and they have to follow instructions of mother company. At the end, we would like to mention that this paper is only a part of the analysis of the survey.

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CALCULATION OF THE EXPECTED BENEFITS IN THE FORM OF COST SAVINGS IN INVESTMENT DECISION MAKING AND EVALUATION OF THE INVESTMENT PROJECT

Švecová Lenka, Šulc Kryštof

Abstract

This paper discusses a method for evaluating investment projects in manufacturing industry. The paper in chapter 2 briefly describes the criteria for evaluation of investment projects, which refers to research carried out in terms of usage of each evaluation criteria in business practice. In chapter 3, various types of manufacturing investment projects and their focus are described. Specifics of calculation of benefits of investment manufacturing projects are also discussed. Chapter 4 describes a case study for calculating cost savings (as a benefit) for assessing the effectiveness of the investment manufacturing project of new production machine shop in a specific company operated in mechanical engineering industry. For evaluation of investment, static and dynamic methods are used (average payback periods based on undiscounted and discounted savings).

Keywords: investment decision making, savings, payback period, NPV, WACC

JEL Classification: M10, M21, D01

1.INTRODUCTION

Investment decision making represents an important area of strategic decision making of the company. The reason is that new investment projects significantly affect the future financial results and the company's prosperity. The success of new projects can significantly contribute to the growth performance of the company and conversely failure can lead not only to a significant decrease of performance, but may also threaten the continued existence of the company. The success or failure of a project depends largely on the quality of training, assessment and selection of projects and particularly depends on the input data.

2.CRITERIA OF INVESTMENT DECISION MAKING

The investment projects could be characterized, in terms of quantitative outputs, by three main factors, namely:

- Cash flow or difference between the revenues and expenses arising from the investment.
- The real service life of the investment.
- Risks arising from the realization of investments.

For the evaluation of investment projects, there are many methods or criteria access to these three basic factors (cash flow; service life and risk) in various ways. Criteria for evaluation of investment projects can be divided into two groups, namely the criteria:

- Static. These mainly reflect cash flows; they take into account the time factor only limited; these criteria do not work (basically) at risk (e.g. the total income from investment, net income from investment, the average annual return; the average payback

period). The main advantage of static methods are speed, simplicity and comprehensibility for different stakeholders and simple interpretation. On the other hand, these methods are not able to take in account of time factor, and they neglect risk if unused the scenario approaches (Švecová, Scholleová, Fotr, 2012).

- Dynamic. It takes into account all three factors (cash flows; life time of the investment; and risk (such as net present value, internal rate of return, profitability index, benefit-cost ratio, the payback period of the discounted cash flows and others). The main advantage is ability to involve time factor (using discounted cash flows). Certain limitations hiding in a difficult prediction of future discounted cash flows, greater difficulty processing and worse interpretation for some groups of stakeholders. In the case of non-use of the scenario or simulation approaches to neglect of risk also occurs.

The important question is how during the evaluation process of some types of projects take into account the revenue side. In case of using dynamic methods, a specific concern is the determination of discount rate. The discount rate is used in discounted cash flow analysis to determine the present value of future cash flows. The discount rate takes into account the time value of money and the risk of future cash flows too.
Discount rate is focus on WACC (weighted average cost of capital), which is dependent on industry sector, but this is not always stable, as describe (Nečadová M., Scholleová H., 2013). WACC could be calculated directly or could be involve by industry sector Beta coefficients; for values, you can see (Damodaran, online).
As real applications show (Courtney, H.; Kirkland, J.; Viguerie, P., 1997); (Trebuňa et al., 2017); (Heydt, 2017) the most companies use to assess the payback period of the investment (based on discounted and undiscounted cash flows), especially in industry sector. For example, the Czech research results (Hájek et al., 2001) note, that 64% of companies used the average payback period (base on undiscounted cash flows), later research (2005) had similar results – 62% of companies (Hynek J.; Janeček V., 2007). Other research (Kolařík, R.; Pavelková, D.; 2007) even shows 72% undiscounted payback period and using of dynamic method (NPV) only 18%. The situation in European countries is similar, undiscounted payback period used the most of companies; in Sweden 78% (Sahdal G.; Sjorgen S., 2003); in Finland 63% (Liljeblom E.; Vaihekoski M., 2004) or in UK 68% (Hynek J.; Janeček V., 2007).

3.SPECIFICS IN THE EVALUATION OF THE PROFITABILITY OF PROJECTS IN MANUFACTURING

It is not possible to quantify clearly the benefits of a number of investment of projects realized in the manufacturing process. The reason for this is very difficult separation benefits of the project connected with innovation activities in the manufacturing, sales, and marketing activities. Most companies use "cost savings" for the calculation of the revenue side of investment projects in manufacturing (Heydt, 2017).
There is thus to calculate the cost savings especially in saving time, both the time of production (equipment) and savings in working hours. Further savings include the cost of storage (warehousing reduction), reduction defects etc. This savings are connected with elimination of waste, as we know from lean manufacturing. More about lean supply chain see for example (Myerson, P.; 2012) or lean and innovative company (Košturiak, J.; Frolík, Z., 2006).
We talk about eight wastes of lean manufacturing/management (Womack, J. P.; Jones, D. T., 2010), which are connected with transport, inventory, motion, waiting, over-processing, overproduction, defects and skills (we use acronym TIM WOODS).

Typical innovation projects in manufacturing focusing on some of waste are:

- Reduction of moving people, intermediate or final products, material, or information.
- Reduction of inventory costs connected with material, intermediate or final products, or documentation.
- Reduction of labor or machine intensive as less turning, bending, lifting, reaching etc.
- Reduction of waiting time for material, products, information, equipments or instructions.
- Reduction of defects and costs involved by it, it means reduction of re-working or repairing.

For evaluation of benefits or costs is necessary integrate scenario approaches. Scenario approaches could be characterized as images of the future (Švecová, Fotr, 2013). In connection with manufacturing, we can imagine key risk factors included into scenario approaches: production capacity (resulting from demand); unit costs; sale and purchase prices etc. Two ways are possible for evaluation of manufacturing investment project:

- Integrating as many risk factors (now, we recommended using simulation Monte Carlo). This approach is more accurate, but it is more time-consuming, more difficult and more sensitive for mistakes connected with the imprecision in estimates of future.
- Including only these risk factors, which have direct connection for investment, for example risk factor "price of material": it is correct integrated this factor only, if decision affect this price. This approach is easier and it allows examining only the impact of new investment.

4.CASE STUDY – CALCULATION OF BENEFIT OF NEW MACHINE SHOP – A BASE FOR INVESTMENT DECISION MAKING

The aim of the analysis was to decide the investment project to build a new machine shop based on the identification of the bottleneck in the production process. For this calculation was included overheads, transport costs and other costs. Simple scenario approaches was used, only one risk factor was included: production capacity.

4.1.Description of relevant items for calculation

In connection with costs per one product, company calculates five types of overheads:

- Overhead A: it represents the variable component of wages employee bonuses (night, weekend, environment, etc.), the cost of vacation and sick. All this for a manufacturing worker in every single operation.

- Overhead B: it represents the cost of other employees in manufacturing (master, engineer, fitter, etc.), a non-production workers and THP providing direct operation of production.

- Overhead C: it represents labor costs other employees (administrative employees as a business, purchasing, quality control economy etc.).

- Overhead D: distribution and administrative overhead.

- Overhead E: That includes machinery costs, which represent "reproductive machine price" (cost recovery machine) + tooling costs, servicing and maintenance of equipment. It is the crown rate per hour of machine work.

For evaluation of project, only Overhead E was used separately. Other overheads (A – D) are use as their sum ($COST_{B\&L}$).
The second important calculated item was transport costs. For exact determination of the cost of one piece of transportation for cooperation, it is necessary to know several factors that affect the final price. This is the weight of one particular work piece; distance cooperation; the number of trips; and the cost of shipping rate expressed as kg / km in monetary units. The weight of individual pieces (castings) is documented in the technological process; distance cooperation and the number of trips are saved in the information system. Cost of shipping rate was determined based on long-term monitoring by the financial department and its value is CZK 0,025 per kg / km. For calculation transport costs for each product (casting) see formula [1].

$$TC_A = \sum W_A \times D_{AB} \times N_{AB} \times SH \qquad [1]$$

where TC_A = transport costs of product (casting) A in CZK
W_A = weight of product (casting) A in kilograms
D_{AB} = distance of cooperation B for product (casting) A
N_{AB} = number of trips B of product (casting) A
SH = cost of shipping rate (in CZK per kg / km)

In tab. 1 you can see calculation of transport cost. For illustrating author chose only 10 representative technological processes from 71.

Tab. 1 – Calculation of transport cost. Source: authors

No.	Technological process	C_c [CZK/pcs]	N_{AB}	D_{AB} [km]	W_A [kg/pcs]	TC_A [CZK/pcs]
1	Q 00037602	37.60	2	42	0.56	1.18
2	Q 00038021	37.60	2	42	0.56	1.18
3	Q 00038673	37.60	2	42	0.56	1.18
4	Q 00038674	36.50	2	42	0.56	1.18
5	Q 00407882	35.80	2	185	0.81	7.51
6	Q 00408359	117.55	0	0	2.05	0.00
7	Q 00408360	128.54	0	0	1.91	0.00
8	Q 00408499	117.55	0	0	2.05	0.00
9	Q 00408500	128.54	0	0	1.71	0.00
10	Q 00411529	117.28	0	0	2.26	0.00

To determine the hourly cost per casting is needed to determine machining time (MT). Machining time is determined from experimental measurement of technologist engineer at which time is measured using a stopwatch, and this measurement is repeated. Subsequently, the measured times are averaged. All measured times were converted on hours.

4.2.The calculation of saving costs

Average savings in hourly cost per casting is calculated according to the formula [2]. This is the initial evaluation of selected processes.

$$\Delta HC = \sum [(C_c + TC_A)/T - (COST_{B\&L} + OH_E)/T] \quad [2]$$

where ΔHC = the difference of cost of manufacturing in cooperation to cost by own manufacturing
C_c = cost for manufacturing in cooperation in CZK
TC_A = transport costs per product (casting) A in CZK
T = time necessary for complete one casting in minutes
$COST_{B\&L}$ = overheads A – D in CZK
OH_E = overheads E (as a representative by factor which is influence by volume of production in CZK)

The representative technological processes are presented in Tab. 2. The final value of ΔHC is counted by formula 2. Interestingly, it was found that 16 of the 71 procedures did not lead to cost savings, contrary these led to increased costs. It is also interesting indicator of the contribution of individual castings relative to the total savings without affecting the size of individual series. In Tab. 2 is T (time necessary for complete one casting in minutes) converted to T_H and it is time necessary for complete one casting in hours.

Tab. 2 – Calculation of saving costs. Source: authors

No.	Technological process	$COST_{B\&L}$	OH_E	C_C	TC_A	T_H	ΔHC
		[CZK/pcs]	[CZK/pcs]	[CZK/pcs]	[CZK/pcs]	[hrs/pcs]	[Kč/hod]
1	Q 00037602	8.4361	1.6539	37.6	1.176	0.0297	966.9438
2	Q 00038021	24.5761	1.6539	37.6	1.176	0.0297	422.8989
3	Q 00038673	17.3853	1.1547	37.6	1.176	0.0297	682.1124
4	Q 00038674	17.3845	0.4655	36.5	1.176	0.0297	668.2921
5	Q 00407882	15.3524	1.1076	35.8	7.511	0.0248	1081.248
6	Q 00408359	73.4288	13.1012	117.55	0	0.0917	338.4000
7	Q 00408360	91.7428	14.8672	128.54	0	0.1167	187.9714
8	Q 00408499	84.7918	14.6482	117.55	0	0.1083	167.1692
9	Q 00408500	89.6118	15.2282	128.54	0	0.1167	203.1429
10	Q 00411529	85.6357	15.5743	117.28	0	0.1083	148.3385

4.3.Annual production capacity

For estimating the annual production capacity, the scenario approach was used. The annual production capacity was set to level 65 % (pessimistic scenario), 85 % (realistic scenario) and 100 % (ideal scenario). For illustration, you can see Tab. 3 where are showed lathe machines.

Tab. 3 – Annual production capacity of Machine Shops B&L Z-02. Source: authors

Equipment	Source	Ideal scenario	Pessimistic scenario	Realistic scenario
HAAS ST20Y	AL3001	5 500	3 575	4 675
INTURN 320	AL3002	4 200	2 730	3 570
HAAS ST10Y	AL3003	5 500	3 575	4 675

OKUMA 300	AL3004	5 500	3 575	4 675
OKUMA 450	AL3005	5 500	3 575	4 675
B&L Z-02	AL3000	26 200	17 030	22 270

Next critical parameter is setting the total capacity of each casting which are plan to producing in new machine shop. The total pieces in individual series are set from forecasting of the company. Total time capacity of individual series are compare with realistic scenario of each kind of machine in machine shop (lathe, milling machine and machining center). According the techniques specification is decided about type of machine for machining. After comparison, the realistic capacity of machine shop and the capacity of castings are deciding about machining plan. That mean which castings are able to machining according to the capacity.
The total capacity is set by formula [3] and their part of each value in this formula. The parts are representative by formulas [4 - 6]

$$TCap = TCap_L + TCap_{MM} + TCap_{MC} \quad [3]$$
$$TCap_{LA} = P_{LA} \times T_{HLA} \quad [4]$$
$$TCap_{MMA} = P_{MMA} \times T_{HMMA} \quad [5]$$
$$TCap_{MCA} = P_{MCA} \times T_{HMCA} \quad [6]$$

where $TCap$ = total capacity of castings
$TCap_{LA}$ = total capacity of castings for lather
$TCap_{MMA}$ = total capacity of casting for milling machine
$TCap_{MCA}$ = total capacity of casting for machining center
P_A = inumber of pieces in series and down index depend on the of machine
T_A = hours necessary to machining 1 part, down index depend on type of machine

The total capacity of castings per year is showed in Tab. 4. Tab. 4 also include the type of machine that is necessary for machining. In Tab. 4 are lathe (L), milling machine (MM) and machining center (MC).

Tab. 4 – Total capacity of castings per year. Source: authors

No.	Technological process	Type of machine	Lathe	Milling machine	Machining center	Pieces
			[hrs/year]	[hrs/year]	[hrs/year]	[pcs/year]
1	Q 00037602	MM	0.00	124.60	0.00	4 200
2	Q 00038021	MM	0.00	124.60	0.00	4 200
3	Q 00038673	MM	0.00	71.20	0.00	2 400
4	Q 00038674	MM	0.00	71.20	0.00	2 400
5	Q 00407882	L	129.13	0.00	0.00	5 200
6	Q 00408359	MC	0.00	0.00	513.33	5 600
7	Q 00408360	MC	0.00	0.00	291.67	2 500
8	Q 00408499	MC	0.00	0.00	92.08	850
9	Q 00408500	MC	0.00	0.00	350.00	3 000
10	Q 00411529	MC	0.00	0.00	422.50	3 900

The sum of total capacity by type of machine is compare with the realistic scenario (85 % of ideal scenario). The comparison is in Tab. 5.

Tab. 5 – Sum of total capacity by type of machine with comparison. Source: authors

Object	Lathe [years]	Milling machine [years]	Machining center [years]
Capacity 100 %	26,200.00	20,700.00	5,600.00
Capacity 85%	22,270.00	17,595.00	4,760.00
Capacity of castings	19,612.73	17,594.15	4,757.83
Comparison	2,657.27	0.85	2.17

According Tab. 5 two bottlenecks in manufacturing are showed. The bottlenecks are in milling machine and machine center. For next planning of manufacturing is necessary to count with this fact or reduce the number of total casting types. All technological processes are in realistic scenario, which is representative by 85 % of maximal capacity. When the first criteria is met (capacity required), than is possible counted with all 71 technological processes and it is not necessary to reduce their number.

4.4.Total saving from castings

The average payback period indicate when the investment is profitable. The average payback period is set by average savings per year depend on savings from costs. In these savings are different between cost for cooperation and cost in our machine shop. Rest cost, which are connected to manufacturing, are same then it is not necessary to counted with them.
Cost per cooperation work include the price from cooperators and the cost for transport. Cost for machine shop in a company include the overheads A – E where overhead E is influence by volume of production. The difference between these two costs is indicate net saving for the work.
The difference between cost cooperation and for company's machine shop had been counted in chapter 4.2 and it is only for one piece. For total difference is necessary to multiply this value by volume of production per year for every type of casting. Procedure is in formula [7].

$$\Delta THC = \sum (\Delta HC_A \times P_A \times T_H) \qquad [7]$$

where ΔTHC = total difference between the cost per year in CZK
ΔHC = the difference of cost of manufacturing in cooperation to cost by own manufacturing per exact peace in CZK
P_A = number of castings pieces in series per year
T_H = time necessary for complete one casting in hours

The total difference between the costs is 13 496 000 CZK. The example value in of exact castings are in Tab. 6.

Tab. 6 – Sum of total saving. Source: authors

No.	Technological process	Δ HC	Pieces	T_H	ΔTHC
		[CZK/hrs]	[pcs/year]	[hrs/pcs]	[CZK/year]
1	Q 00037602	966.9438	4 200	0.0297	119,438.96
2	Q 00038021	422.8989	4 200	0.0297	51,650.96
3	Q 00038673	682.1124	2 400	0.0297	48,150.59
4	Q 00038674	668.2921	2 400	0.0297	47,414.77
5	Q 00407882	1081.248	5 200	0.0248	138,177.13
6	Q 00408359	338.4000	5 600	0.0917	162,678.61
7	Q 00408360	187.9714	2 500	0.1167	49,235.42
8	Q 00408499	167.1692	850	0.1083	13,521.04
9	Q 00408500	203.1429	3 000	0.1167	64,229.63
10	Q 00411529	148.3385	3 900	0.1083	53,538.53

4.5.The average payback period based on undiscounted savings

The volume of investment is creating from two parts of total cost. The first one costs of own building which include material for building, labor cost, development, basic equipment for the operation of buildings etc. The second one is the purchase price of the new machines. After that the total costs of investment is 72 902 333 CZK.
The procedure how to set the average payback period is in formula [7].

$$APP = TCI / \Delta THC \quad [7]$$

Where APP = the average payback period in years
C = total cost of investment in CZK
ΔTHC = is total difference between the cost per year in CZK

From formula [7] is the average payback period equal to 5.4 years.

4.6.The average payback period based on discounted savings

To determine the discount rate had been used the values of WACC from the last ten years. The average WACC in the period from 2005 to 2014 was 5.36% (cost of equity was setting as average ROE). The second way (for comparison) is using for cost of equity the levered Beta coefficient for engineering/construction industry in Europe; its value is 4.67%.
The main inputs of NPV in this case are savings from each casting which are plan to manufacture in new machine shop and discount rate which is described above. These savings are included all overheads A - E (for definition see chapter 4.1).
Tab. 7 shows undiscounted saving, discounted savings (1) by discount rate based on company's ROE and discounted savings (2) by discount rate based on the levered Beta for engineering/construction industry in Europe.

Tab. 7 – Sum of total savings in thousand (discounted and undiscounted). Source: authors

In thousand CZK	0	1	2	3	4	5
Investment	-72,902	0	0	0	0	0
Undiscounted savings	0	13,496	13,496	13,496	13,496	13,496
Discounted Savings (1)	0	12,809	12,158	11,539	10,952	10,395
Discounted Savings (2)	0	12,894	12,319	11,769	11,244	10,742

In thousand CZK	6	7	8	9	10	Total
Investment	0	0	0	0	0	-72,902
Undiscounted savings	13,496	13,496	13,496	13,496	13,496	134,960
Discounted Savings (1)	9,866	9,364	8,888	8,436	8,007	102,414
Discounted Savings (2)	10,263	9,805	9,368	8,949	8,550	105,903

The payback period based on discounted savings (1) is calculated on 6.54 years in this case that discount rate is based on ROE; and 6.25 years in the case, that discount rate is based on the levered Beta coefficient for engineering industry in Europe.
The difference between both payback periods (based on discounted and undiscounted savings) is 1.14 years (respectively 0.8 years), which is difference close to 21% (respectively 15%). This different is significant and it express differences between using discounted and undiscounted savings (cash flows). Because the lifetime of investment was 10 years, the investment was accepted, because the payback periods was shorter than lifetime.

5.CONCLUSION

As seen from the above calculations, for determining benefits of investment in the manufacturing process, it is necessary to use the accurate data. These data are usually obtained from the technical documentation, own physical measurements, and long-term company statistics. Above example indicates the method of calculation of benefits in the form of cost savings, specifically transport costs and reduction of overheads.
The application of scenario approaches helps to integrate risk factors to the decision making process. Above example is simple and explainable for operational (foreman) and middle management (head of production) of company.
For strategic decision-making process with longer lifetime of investment, we recommended using dynamic criteria for evaluation of investment and for integration of risk factors simulation approaches a techniques. For calculation of WACC for using in dynamic methods we recommended our calculation, where cost of equity is based on accepted ROE by owners (while it is possible), or for calculation the cost of equity used industries sector Beta coefficients.

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METHODS FOR CALCULATING THE BRAND VALUE AND ITS IMPACT ON THE ENTERPRISE VALUE

Valachová Viera, Kráľ Pavol

Abstract

In the current market environment, it is the building and effective brand management the priority of the marketing activities. The priority of the company management should also be to measure brand value to find out its strength and competitive position. The aim of this paper is the explanation of the essence of each method for calculating the brand value and to determine the impact of the brand value on the enterprise value and therefore its financial performance. For the identification of correlation between the brand value and enterprise value were used the data of the company Brand Finance, which publishes an annual report about the 500 most valuable and strongest global brands. We quantified the correlation coefficient and reliability coefficient for 50 random enterprises and then we compared the results with a correlation coefficient and reliability coefficient quantified for 50 companies from the same sector and then we defined other determinants acting on the value of whole company. Result of the comparison highlighted the importance of a sector in which the enterprise operates, as in the random selection was the result only a weak positive correlation, but for the enterprises of the same sector was the correlation between variables strongly positive.

Keywords: brand, brand value, enterprise value

JEL Classification: M31, G32

1.INTRODUCTION

The issue of brand and its evaluation came to the fore at the end of the last century and although the brand is very important intangible asset, its place in the financial world is gaining very slowly, and it creates a significant part of the total capital of the company. Whereas the ability of creating a strong brand is invaluable as it distinguishes the company from its competitors, it is in the interest of each company to create a strong brand with great value to be in terms of customer perceived as a high-class brand. The way customers perceive the brand and associations that they associate with the brand is expressed as a value brand. (Kicova & Kramarova, 2013). The brand is the result of creative activity of managers and as part of intangible assets also affects the overall value of the company, because it provides significant financial value that can be quantified using different methods. (Kerin & Sethuraman, 1998). Brand value studies spread in the early 1990s and tend to concentrate on its conceptualization and measurement (Christodoulides & de Chernatony, 2010).

The marketing field has since come a long way in demonstrating that branding influences the shareholder value, with chief executive officers, chief financial officers, and boards now truly paying attention to building, developing, and maintaining their brands. By considering the impact of brand and for the value of the company, there were the amount of previous researches focused on evaluation in terms of market indicators such as price and market share. (Lehmann 2004). (Aaker & Jacobson, 1994) argue that indicators such as ROI (Return on Investment) and profit do not reflect the value of the company, because they ignore the importance of investment in intangible assets such as brand and therefore it is important to calculate its value. Valuation of the brand is certainly very actual subject which is still not sufficiently explored and there is

no clear consensus, which method is the best and most objective to determine the value of the brand, to ensure that the result will not be distorted and it would reflect the true value of the brand as well as its contribution to the value of the company. These methods have differences among themselves, particularly in relation to the scope and nature of the input data and reliability and validity of obtained results in relation to its further applicability in branding (Majerova & Kliestik, 2015). The calculation of the brand value is relatively complicated process, which consists of several steps in which it is difficult to determine the input values and therefore we focused on explanation of these methods in terms of the input variables. The aim of this paper is the analysis of the correlation between brand value and enterprise value, as in assessing the value of the company is essential to a comprehensive understanding of the interconnection with the brand value, which has as part of the intangible assets impact on the value and financial performance of the company. (Romero & Yague, 2015).

2.THEORETICAL BACKROUND

Many enterprises are aware that brand name that is associated with their products, is one of the most important and valuable assets. Nowadays, companies have increasingly less time to select suitable brand for their products. Creating a strong brand and expanding its power has become a kind of marketing imperative for managers. Therefore, the abilities of strong brands are invaluable. (Rego, Billett & Morgan, 2009).
The essential role of the brand is to identify a manufacturer of the product and enable consumers to assign certain responsibility specific manufacturer. A unique product, which must be supported by creative marketing activities, is the essence of a successful brand. Branding can be viewed as a strategic tool for managing a firms' risk exposure. A strong brand, for example, can encourage broader stock ownership, insulate a company from market downturns, grant protection from equity dilution in the case of product failures, and reduce variability in future cash flows (Frieder & Subrahmanyam, 2005).

2.1.Brand value

Brand value means ability to gain loyalty of customer. It results from strong associations (features and benefits), from loyalty, from perceived quality and so on. In other words, the value of the brand is value-added of products and services (Rao, Agarwal, & Dahlhoff, 2004). The main areas that create the brand value, and that the enterprise should focus its marketing activities are shown in the Figure 1, which shows the qualitative elements of the brand value of which immediately follow quantitative elements, such as revenue accruing from the sale of products marketed under a given brand, while if the brand is known and in view of customer is perceived as a quality, it is high expects that sales company will be high and will rise year over year (Majerova & Krizanova, 2013).



Fig. 1 – Elements, which create the brand value. Source: Own processing

Accordingly, each brand has a different value and the influence on market can be divided into several groups. Firstly, there are brands that are unknown. Next, follow the brands about which the customers have good knowledges, as also reflected in the fact that consumers are searching for them, recognize them, and they are loyal. Next there are brands that consumers like to buy, which are characterized by a high degree of acceptability. Then there are highly preferred brands and ultimately the brands with a high degree of brand loyalty (Choi, Ko, & Kim, 2016). With increasing degree of brand recognition, the revenues from the sale of such products are increasing too, and the value of the brand as well (especially in cases of brand valuation methods, which are based on the company sales).
According to (Aaker, 2013) the brand value depends on the extent to which a given mark is sought, what customer's associations are like and the awareness of the store brands quality, and many other aspects. While the high brand value represents many competitive advantages for owners, it is necessary to take care of it, to ensure that its value is not reduced. Marketing activities need to focus on those, to maintain the long-term credibility of the brand and its quality.

Building brand value
Building brand equity is a process that is dependent on any contact with the brand, whether the initiator is a consumer, marketer or someone completely different. Brand value, is the most common being built by creating the appropriate structure of knowledge from accurate consumers (Majerova & Krizanova, 2015). There are three sets of brand value factors:
1. The initial selection of brand elements which form it, such as brand name, URL, slogan, logo, symbol, music, package and representative.
2. Product, service and related supporting marketing activities and programs.
3. Other associations indirectly transferred to the brand associated with another entity (such as a place, person or thing).

2.2.Methods for calculating brand value

To assess the impact of branding on firm value, marketers need a clear understanding of brand value and the associated metrics. Brand value is a complex concept with many different applications and meanings among academics, marketing research professionals and marketing managers (Belo, Lin, & Vitorino, 2014). As brand value is a complex concept, we focus on three principle and distinct perspectives on brand value:

- customer-based brand equity (CBBE),
- market-based brand equity (MBBE),
- financial-based brand equity (FBBE).

Customer-based brand equity
This is the approach that is most commonly used for evaluation of the brand, and for which the brand is evaluated at the consumer level and reflects how consumers respond to the branded and unbranded products, while the main criticism of this approach is the lack of access to the markets and financial indicators (Gaus, et al., 2010). Consumer-oriented approach is based on the idea that the brand value exists when the consumer preferences for the brand are greater than the simple expression of the usefulness of the product, i.e. the brand value is resultant difference between those input values, which could be expressed:
Brand value = Declared preferences – Preferences predicted by the utility of the product (1)

(Fernandes & Pinuer, 2016) discuss the brand as a collection of memory associations that generate different reactions and positive brand value from a consumer´s point of view exists when the identification brand evocates a positive reaction and negative in the case of adverse reactions of consumers.
According to given the input factors determining brand value in this approach, the brand can be expressed as the sum of the following variables:
Brand value = brand awareness +brand associations + brand attitude +brand behaviour (2)
Popular indicators CBBE are EquiTrend that is focused on the perceived quality, Millward Brown's BrandZ indicator and Ipsos' Equity * Builder, which measure the emotional link between consumers and the brand, Young & Rubicam BrandAssetValuator which measures the value of the brand with the four main pillars, through the difference, relevance, esteem and knowledge. Since 1993, company Y&R conducted the research in more than 300,000 customers in 40 countries and approximately 19,000 brands, through which 56 parameters were examined consumer perceptions of the brand. BAV is a unique resource for comparative evaluation of brands on a wide range of information. I tis not focus only on narrow research, but BAV monitors global trends of the brands. It evaluates the financial indicators to determine what the value of the brand is in intangible assets.

Market-based brand equity
Evaluation of the brand on the level of product / market where the value of the brand is expressed as a value-added brand compared to unbranded products, it was established on the basis of allegations of authors that regardless of how the brand is measured and for which purpose, its value must be the derived from market. Market-oriented methods are applicable in case that the market economy is enough developed in trade with industrial rights, because it is necessary to have sufficient information about the sale and purchase of brands or trademarks, to be adequately analysed and based on them quantify the market value of the brand (Sun, 2010). In the absence of the mentioned information, their usage is questionable because of their explanatory power decreases with the amount of available information. Metrics that reflect market performance brands are price premium, revenue premium, increased advertising elasticity, and the ability to obtain distribution channel and shelf space, in addition to traditional market performance measures such as sales, profit, and market share. The most widely used metric is the price premium, which measures the premium resulting from the willingness of customers to pay more for a national brand as a private label. Price premium can increase profit of enterprise that can obtained funds to reinvest in the brand. MBBE is relatively easy to calculate, and fully reflects the level of the peak performance of the company, which is the main goal for most marketing managers.

Financial-based brand equity
At the level FBBE the brand value is expressed as net present value of future purchases of branded products. For financial access to the brand value it is necessary to define the life of the brand, however, new products replace old with the same brand name, brand crosses multiple life cycles of these products and acquires from them seemingly infinite life and a precise estimate of the future is therefore very difficult. (Wieslawa, 2015). If we looked at that methodology by critical eye, we would find that its explanatory power is to some extent distorted mainly due to the high degree of subjectivity in determining the input values and defining mentioned life signs. A major disadvantage of the method is that we do not take into account the perception of the brand from the perspective of consumers, their loyalty to the brand, its uniqueness, identity and marketing activities used by companies to promote the brand. To eliminate these shortcomings, it is necessary at the valuation of brand for which it is necessary to take into account economic aspects such as future revenues, weightings recovery

and so on., conducting valuation by expert with sufficient economic training and experience, but it may not be a sufficient guarantee to reduce the risk of misuse estimating brand value, because the determination of market development for many years ahead during which there may be different events that negatively affect the development of the market, such as the economic crisis and even different life brand, the attractiveness of products, etc., is really difficult.

Three different financial approaches to brand valuation can be identified:

1. Cost-based Approach: is based on the principle of recovery of the total costs invested for the creation or acquisition of the brand. The analysis is based on history and facts. Overall, the cost approach is more appropriate to value those assets that can be easily replaceable, such as softwares or customer databases.

2. Market-based Approach: the brand value is estimated by reference to open market values. This analysis is based on estimates or facts about the present.

3. Income-based Approach: the value of the brand is dictated by the future expected cash flows that will be attributable to the brand itself (Robinson, et al., 2016). This analysis is based on estimates about the future a zahŕňa mnoho metód, napr. Price Premium Method, Demand Driver/Brand Strength Analysis Method, Gross Margin Comparison or Economy of Scale Technique, Operating Profit Comparison Method, Royalty Relief Method, Excess Cash Flow Method, Marginal Cash Flow Model, Company Value With and Without Brand Method and many others (Wang, 2012).

Cost and market methods are suitable for the valuation of assets that are not unique and there are a sufficient number of similar comparable transactions in the market. The studies also confirm that all three approaches have direct links to the cash flows of the company and also directly affect the value of the company.
High resulting value of the brand calculated by any of the above-mentioned method from the perspective of the company and its performance can be considered as a positive, because the value is an added value to the overall value of the company (Li, et al., 2015). In practice, the valuation of the brand does not occur just because of the findings of the performance of individual companies and the prediction of their other marketing and financial activities, but also for reasons such as. division of property, or downfall of the company where there are a number of lawsuits due to the fact that different experts or companies involved in calculating brand value, quantify the different values of the brand, what is from the perspective of lawsuit unfavourable, because from the perspective of the privies lead to undercutting, or overestimation or brand value. In such cases, it is suitable to use methods based on solid facts and figures based on past performance of the company to ensure quantifying brand value objectively. One of the most important steps in the complex process of assessing brand is determining the correct values of input variables, not to distort the results and objectively reflects the true value of the brand and thus the impact on the value and financial performance of businesses (Chehab, 2016).
Relevant default of each approaches is that each is strictly focused on their area, based on which brand value is evaluated, in other words in CBBE approach is missing financial and market point of view, in the approaches MBBE and FBBE are missing assembly the perception of the brand from point of a customer view. Therefore, the creation of a new method which would involve financial, market and consumer perspective, it could be subject of the further research relating to the issue of brand valuation.

3.GOALS, METHODOLOGY AND DATA

The aim of this paper is the analysis of the correlation between the brand value and enterprise value on the basis of data obtained from the database of Brand Finance, which calculates the brand value using the method „Royalty Relief Approach" and the steps of whole brand valuation process of Brand Finance is shown in Figure 2. The part of its analysis is Brand Strength that most directly and easily influenced by those responsible for marketing and brand management. In order to determine the strength of a brand they have developed the Brand Strength Index (BSI). They analyse marketing investment, brand equity (the goodwill accumulated with customers, staff and other stakeholders) and finally the impact of those on business performance. Following this analysis, each brand is assigned a BSI score out of 100, which is fed into the brand value calculation. Based on the score, each brand in the league table is assigned a rating between AAA+ and D in a format similar to a credit rating. AAA+ brands are exceptionally strong and well managed while a failing brand would be assigned a D grade.



Fig. 2 – The steps of brand valuation. Source: brandfinance.com

First, we conducted a random selection of 50 companies from the database Brand Finance and we did not take into account their mutual differences resulting from the different sizes of enterprise, from different countries and industries in which they operate. For detection of correlations, we used the Pearson correlation coefficient, then we constructed a correlation diagram and quantified the reliability coefficient to ascertain what percentage change of the brand value affects the change of enterprise value. Then we selected from the database 50 enterprises operating in the same industry in order to compare the results reciprocally, to find out the impact of the industry in which the companies operate on the correlation between brand value and enterprise value (Input data for the two samples of enterprises are shown in appendix in Table 1 and 2).

4.RESULTS AND DISCUSSION

On the basis of the development of brand value and enterprise value from the database brandfinance.com we constructed a correlation diagram to find out, how strong is the dependence between the value of the brand and the value of the entire company, while we assumed that between those variables is positive correlation, which we have also confirmed and result is available in Figure 3. To calculate the power of this dependence we used PEARSON function in MS Excel and we calculated a correlation coefficient and after substituting the values its value was 0.3021, thus the brand value and the enterprise value are weakly positive correlated, it means, if the brand value is increasing, the enterprise value will be increasing too, but just small extent. Since our aim was also to determine what percentage change of brand value affects change of the enterprise value, we calculated the reliability coefficient by using RSQ function in MS Excel, which was after substituting the values 0.0913 (9.13 %), i.e. that only 9.31 % increase of the enterprise value is dependent on an increase of the brand value. The remaining 81 % consists of other factors, variables that have a much greater impact on the change of enterprise value than the brand value, e.g. mentioned company size, country in that the enterprise operates, but the enterprise value also depends on the phase of the business life cycle, in which the enterprise is and these determinants that affect the cross-correlation between the value of the brand and the value of the company are an areas that could be subject of further deeper research of brand valuation issues (Majercikova & Bartosova, 2012) .

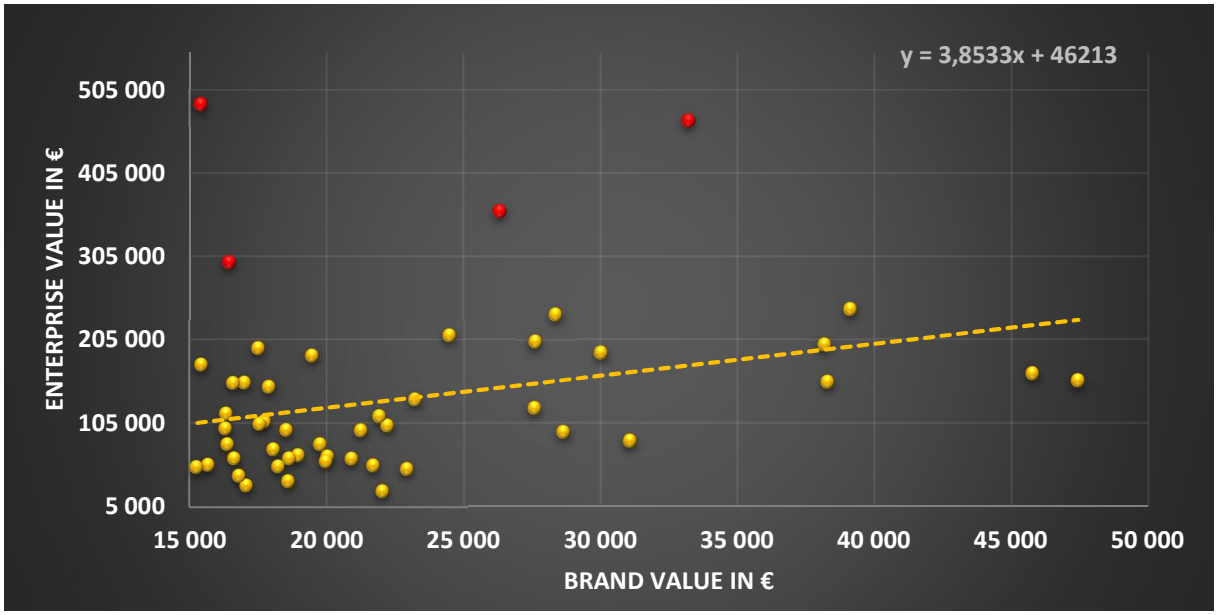


Fig. 3 – The correlation diagram showing the cross-correlation between brand value and enterprise value (random selection of enterprises). Source: Own processing

However, if we look closely at the correlation diagram, it is evident that a random sample includes extreme values that may significantly affect the result what we verified with recalculation after the elimination four extreme values (highlighted in red) of a random sample. After recalculating a new correlation coefficient was 0.5104 and reliability coefficient 0.2605 (26.05 %), i.e. if we disregard the extreme values, the correlation between the brand value and enterprise value will intensify. It must be noted the fact that the selection of companies from the database was random and therefore did not comply with the features of companies such as the sector in which they operate, and thus we assume that this fact also had a significant impact

on the final result, what we have subsequently confirmed by repeating the procedure for companies from the same industry (Fig. 4).

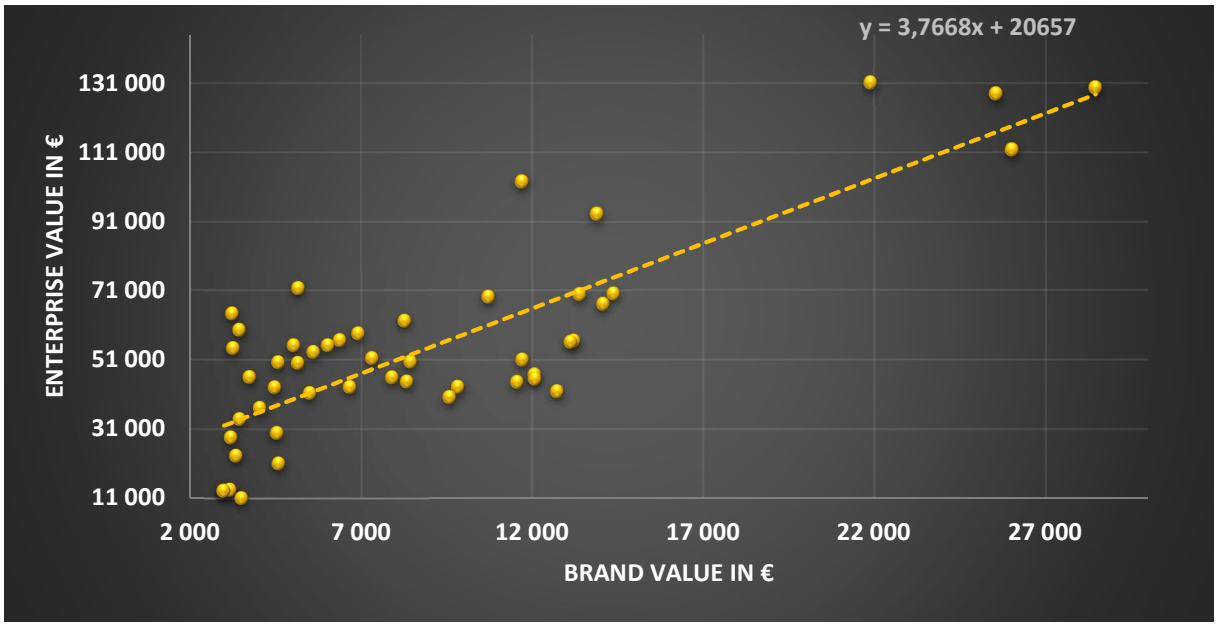


Fig. 4 – The correlation diagram showing the cross-correlation between brand value and enterprise value (enterprises from the same sector). Source: Own processing

Correlation coefficient for companies from the same sector was 0.8227, what is a strong positively correlation between the brand value and the enterprise value. Reliability coefficient was 0.6768 (67.68 %), i.e. that 67.68 % increase of the enterprise value depends on increase of brand value. If we compare these results with the results of the random sample of companies, there is a significant difference in the intensity of correlation between the brand value and enterprise value (difference + 0.3123), as well as in the intensity of reliability coefficient (difference + 0.4163). Based on the results, we can assume that the more characteristics are for examined companies similar or identical, then the higher is the correlation between brand value and enterprise value. This fact might be the subject to next examination, in which we would choose, for the purposes of cross-correlation detection, the companies that would meet three criteria and that they would be from the same industry, operating in the same country and would also be the same size company.
Because the issue of the brand is not sufficiently and comprehensively processed, as we have already mentioned in the paper introduction, and there is still in this area amount of untold issues that might significantly simplify the calculation of the brand value as well as its ability to reflect its impact on the enterprise value, (Srinivasan, Hsu, & Fournier, 2012) state the following questions, which should be explored in the context of the brand valuation issue:

- Which approach is the best for quantifying brand value and determining its impact on cash flow, growth and enterprise risk?
- When does the brand as asset dominate over the brand as information route?
- How does a brand's participation in social media drive shareholder value, if at all?
- How can firms mitigate the value-destroying consequences of brand crisis events?
- What is the theory of risk as it pertains to brands and brand equity?
- Does the notion of risk diversification apply to brand strategy and firm value effects?
- What are the mechanisms whereby brands create shareholder value?

5.CONCLUSION

In this paper, we have clarified the different measurement approaches of the brand value, while we cannot clearly claim, which approach is the best for the brand valuation, because each has its advantages and disadvantages, it is particularly true in the case of their comparison in terms of input values as well as in terms of the purposes for which is the brand evaluated. Another aim of this paper was to determine the cross-correlation between brand value and enterprise value, because this issue is the subject of many discussions and there is no clear view on this issue. Our calculations indicate that it is very important, not only for calculating the brand value, but also for evaluation its correlation with the enterprise value, to consider the amount of input factors if we want to dispose with the results that have a high explanatory power. The issue of brand valuation still offers a number of areas that may be subject to further examination, such as the examination of the correlation between the brand value and enterprise value for various enterprises samples.

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AGGLOMERATION ECONOMIES AND FIRM-LEVEL PERFORMANCE: EVIDENCE FROM THE INDUSTRIAL AND AGRICULTURAL SECTORS

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Abstract

Economic theorists such as Porter, Marshall, and Jacobs argued that the economic activity of one firm affects the economic activity of another firm because of their geographic proximity, which thus explains the growth of cities and industries. As regards to this, a number of papers attempted to estimate the influence of agglomeration economies on the performance of firms, industries, and regions. This paper provides a survey of peer-reviewed literature that relates the effect of agglomeration economies to the economic performance of firms from the industrial and agricultural sectors. Taken as a whole, the results of the studies were inconclusive.

Keywords: agglomeration, performance, localization economies, urbanization economies

JEL Classification: L25, R12

1.INTRODUCTION

In today's highly competitive global economy, greater mobility of capital, resources, and manpower should have rendered certain strategic considerations such as location choice of firms irrelevant. However, this does not seem to be the case as there has been a curious phenomenon where competing farms and factories agglomerate within a particular spatial region. The Silicon Valley comes to mind as an example of an enterprise cluster with a dense local expanse but with a vast global outreach, one that gathered thousands of tech startups as well as multinationals in the Santa Clara Valley in California and continued to attract other software development companies to this day. With this developing paradox, a number of empirical studies have sought to explain why firms agglomerate and how the geographic, infrastructural, and demographic attributes of their location influence the economic performance of firms, industries and regions.

This paper aims to provide a survey of these studies that relate the effect of agglomeration economies to the economic performance of firms from industrial and agricultural sectors. In particular, the paper accomplishes this by first assessing the methodological issues and empirical findings of these studies and then identifying gaps in the literature. Beaudry and Schiffauerova (2009) previously reviewed the literature on how agglomeration economies impact the performance of regions and attributed the differences in the findings with the measurement and methodological issues. This paper differentiates itself from the former by choosing to limit solely the discussion on firm-level economic performance for two reasons. First, economic measures are thought to be more objective and precise than non-economic measures. It cannot be denied that innovation and market performance are just as valuable to firms as profitability and productivity. However, economic measures offer a much straightforward interpretation and allow systematic comparison of firms. Second, firm-level analysis provides more significant insights on the influence of agglomeration economies as against industry- or regional-level analysis. Nakamura (2012) stated that the use of firm-level data can separate the effect of local agglomeration from economic measures such as productive efficiency where firms located in the same city or region share the agglomeration effect.

For this literature survey, peer-reviewed articles published until 2016 were selected from the SCOPUS database which is one of the largest abstract database of scholarly literature. In an attempt to produce a comprehensive list of papers while also mitigating the risk of selection bias, a combination of keywords on the subject such as "agglomeration economies," "industrial clusters," "economic performance," and other related text-string were used. Since the survey focuses on articles investigating the effect of agglomeration economies to the economic performance of firms, articles which discussed solely about agglomeration or firm-level performance were excluded from the study. Likewise, articles on agglomerated firms in the service sectors were also excluded given their unique nature and dynamics. Because of this limitation, the search yielded a total of 22 journal articles, all of which have been reviewed here. The list is by no means exhaustive but, in the authors estimation, provides sufficient sample for review. Unwittingly, the earliest paper on the subject was published in 1999 and thereafter, majority of the papers drawn from this search came the after the turn of the century. The authors reckon that most scholars began to pick up interest on agglomeration economies and firm-level performance as interdisciplinary fields such as economic geography and regional studies flourished.

The main results show that, similar to Beaudry and Schiffauerova (2009) in their study of regional-level performance, pooled results of evidence failed to establish a definite link between agglomeration economies and firm-level performance. Some studies observed agglomeration economies through localization and urbanization economies partly explain the variation on economic performance of these firms, while others found the benefits to be rather insignificant and even detected possible agglomeration diseconomies.

The paper is structured as follows. Section 2 and 3 analyzes the methodological parameters and considerations applied in the studies for both performance measures and agglomeration variables, respectively. Section 4 examines the empirical results, and finally, Section 5 concludes the paper.

2.SELECTION OF PERFORMANCE MEASURES

One of the most contentious issues related to gauging the economic performance of firms is the selection of appropriate performance measures. In the case of agglomeration studies, preferential treatment on their choice of performance measures depends on the range of assumptions and limitations relevant to the researchers.

Accounting-based ratios offer a simplistic approach to measuring corporate performance. Out of the many classes of financial ratios, those ratios related to profitability are more useful in the study of agglomeration economies since they measure the earning capability of firms. Specifically, return on total assets is one of the common indicators of profitability as used in a number of agglomeration studies. It measures the ability of firms to utilize its resources to produce earnings. In addition to ROA, return on sales provides supplementary and less biased indicator of profitability (Kukalis, 2010), that is, how much profit is contributed by net sales. The use of operating return on assets was also proposed (Ferreira, Goldszmidt, and Csillag, 2010) since the ratio eliminates the non-operating elements of profit. Financial ratios are not without limitations, however. They are derived from financial statements which are subject to company-specific accounting policies and estimates, possibly preventing objective comparison of firms. ROA was applied in Diez-Vial (2011), Ferreira, Goldszmidt, and Csillag (2010), Jennen and Verwijmeren (2010), and Kukalis (2010).

Another important measures of economic performance is technical efficiency, which refers to the capacity of firms to produce outputs using the least amount of inputs. Because firms use multiple inputs to produce multiple outputs, the use of frontier analysis techniques such as data envelopment analysis (DEA) and stochastic frontier analysis (SFA) has been advantageous in

this area. Like financial ratios, measurement of technical efficiency by means of frontier analysis has its drawbacks. While DEA does not require any assumption on the functional form of the input-output relationship, it is sensitive to the presence of outliers and may produce unreliable efficiency scores skewed by measurement errors. Meanwhile, SFA accounts for statistical noise and outliers but its restrictions on the functional form becomes a concern because the choice of functional form affects the quality of estimates. Technical efficiency was estimated using SFA in Charoenrat and Harvie (2014), Lakner, von Cramon-Taubadel and Brümmer (2011), Lall and Chris Rodrigo (2001), Mitra (1999), Nakamura (2012), Tveteras and Battese (2006), and Widodo, Salim, and Bloch (2015).

Productivity, a classical measure of economic performance, also calculates the relationship between a firm's outputs and inputs but whereas technical efficiency is static, productivity is dynamic. Depending on the number of observed variables, productivity may be analyzed at partial factor productivity or total factor productivity and can be further decomposed to reflect changes related to technology and efficiency. It relies on multi-period proprietary data which may not be readily available for access to the public. Also, computation particularly of total factor productivity ignores the cost of materials which may be inappropriate especially where the cost of materials represents a significant portion of the product cost. Labor productivity was estimated in Andersson and Lööf (2011) and Eriksson and Lindgren (2009), while total factor productivity was measured in Békés and Harasztosi (2013), Hu, Xu, and Yashiro (2015), Lall, Shalizi, and Deichmann (2004), and Widodo, Salim, and Bloch (2014).

Hazard rates were sometimes used to proxy firm performance. Sorenson and Audia (2000) applied an instantaneous hazard rate of plant failure using piecewise exponential model while Vaan, Boschma, and Frenken (2012) constructed a hazard risk model to account for failure and acquisition. Other measures of economic performance were export performance, which is the proportion of a firm's export sales to its total sales (Diez-Vial, and Fernández-Olmos, 2013), and growth in sales (Chyi, Lai, and Liu, 2012). In absence of prior information for entrepreneurial firms, DeCarolis and Deeds (1999) used market value, which is the total value of the offering firm's equity at the end of the first day of trading, as a signal of the market's evaluation of the firm.

3.SELECTION OF AGGLOMERATION VARIABLES

Each study cited in this paper adopted a set of explanatory variables that tried to capture the effect of agglomeration economies on firm performance. In economic literature, agglomeration economies refers to the benefits that firms derive when they concentrate in a particular area. These variables used to capture and qualify agglomeration economies relate to size of agglomeration (measured in terms of absolute number of firms in a region), density of agglomeration (the proportion of firms or employment in a given region and/or in a given industry), proximity of firms from competitors or a combination of any of these. In some cases, an aggregate score was used, as in the case of DeCarolis and Deeds (1999) who derived a score based factor analysis of eight location measures. In other cases, dummy variables to reflect association of a firm to a city, region, industry or cluster were employed.

Widodo, Salim, and Bloch (2014; 2015) adopted the taxonomy suggested by Glaeser, Kallal, Scheinkman, and Shleifer (1992) to guide them in their selection of variables. Glaeser et al differentiated three channels of agglomeration economies: Marshall-Arrow-Romer (MAR) externalities, Jacobs externalities, and Porter externalities. The first type, the Marshall-Arrow-Romer (MAR) externalities, claimed that knowledge is industry-specific and that externalities are derived where firms within the same industry agglomerated. Also called localization economies, the MAR externalities are attributed to the works of Marshall (1890), Arrow (1962), and Romer (1986). Under the second type, named the Jacobs externalities after Jacobs (1969),

the focus is on a set of firms from different industries that interact within a spatial concentration and benefit from their complementarity. This type of externalities is also called the urbanization economies. The last type, the Porter externalities named after Porter (1990), stemmed from the belief that interaction between firms within a geographically specialized industry allows them to innovate. But while the MAR externalities which favour local monopoly, the Porter externalities lean towards competition.

A related set of typology was used by Lall, Shalizi, and Deichmann (2004) and Eriksson and Lindgren (2009) to approach the problem of specifying the agglomeration variables. Three sources of agglomeration economies were identified: internal economies, which exist as a result of increased scale of production; localization economies, derived from intra-industry interaction (similar to MAR externalities); and urbanization economies, derived from inter-industry interaction (similar to Jacobs externalities). Lall, Shalizi, and Deichmann (2004) used employee-based location quotient, firm-based location quotient, log of the total number of all workplaces in all industries, respectively. Meanwhile, Eriksson and Lindgren (2009) used market accessibility (represented by transportation network and population weighted access) and access to transshipment hubs, location quotient in own industry, and urban density, respectively.

To isolate the influence of agglomeration externalities from that of firm-specific attributes, regression models used control variables such as firm's age, size, and ownership structure.

4.SUMMARY AND ANALYSIS OF FINDINGS

This section provides a summary and analysis of the research that attempts to establish a relationship between agglomeration economies and economic performance of firms from the industrial and agricultural sectors.

Andersson and Lööf (2011) found a positive relationship between the regional size and labor productivity of Swedish manufacturing firms. Using the two-step system GMM estimator, they noted that productivity tends to higher for firms located in larger regions, regardless of size of firm.

Békés and Harasztosi (2013) noted that the magnitude of influence of agglomeration on total factor productivity was greater for Hungarian firms engaged in international trade than those transacting locally. The elasticity of agglomeration was also greater for traders as compared to non-traders, suggesting that proximity to competitor firms may have varying effects on firm performance depending on the type and scope of its operations.

Charoenrat and Harvie (2014) observed that firm location partly explained the variation in efficiency of SMEs in the Thai manufacturing sector. Firms that were located close to municipalities and large regions were relatively more efficient, although the most of firms experienced decline in technical efficiency during the period under study.

Chyi, Lai, and Liu (2012) studied high-tech firms in the Hsinchu Science Park and provided supporting evidence that knowledge spillover as a consequence of local agglomeration has a positive influence on growth in their net sales. Aside from this, knowledge spillover arising from international sources also explains partly the variation in firm performance.

DeCarolis and Deeds (1999) concluded that location significantly influences performance of firms, as evidenced by analyzing the market value of entrepreneurial biotechnology firms in the US. They noted however how the results of their study could be generalized, given the attributed inherent to the biotechnological industry, which are capital-intensive and have long R&D and approval cycles.

Diez-Vial (2011) found evidence of a positive relationship between the geographical density of establishments and the return on total assets of ham-producing firms in the Iberian region in

Spain. They also noted that smaller firms that operating in close proximity to larger firms benefit from agglomeration.

In a similar study on the Iberian ham clusters by Diez-Vial and Fernández-Olmos (2013), the export performance of firms with better human resources tended to be higher as a result of locating in agglomeration areas. However, firms with higher R&D and advertising investment chose to operate elsewhere, possibly to prevent leakage of information and know-how.

Eriksson and Lindgren (2009) did not find evidence that linked labor productivity to the effect of localization economies, urbanization economies, and scale economies. In their study of workplaces in Sweden, they concluded that variation on firm performance could not be explained by the concentration of similar and related firms.

Arriving at the same conclusion, the results of the study by Ferreira, Goldszmidt, and Csillag (2010) indicated that industrial concentration had no effect on firm performance, particularly after analyzing the profitability of Brazilian firms. They remarked, however, that their choice of location significantly influences their performance.

The findings of Fukao, Kravtsova, and Nakajima (2014) established the positive relationship between firm population in Japan and the number of firms that are technically efficient. The concluded that firms performed better in terms of technical efficiency when they are located closer to their competitors.

Hu, Xu, and Yashiro (2015) claimed that increase in number of Chinese firms in the same industry and the same country did not improve their total factor productivity, possibly due to congestion and fierce competition. Moreover, they argued that the quality of agglomeration, such as when smaller firms operate closer to their larger counterparts, rather than the size of agglomeration caused firms to be more productive. Controlling for ownership structure, they found evidence that private enterprises were primary sources of agglomeration and enjoyed higher productivity when agglomerated with other private firms.

Jennen and Verwijmeren (2010) asserted that employment density had a negative impact on return on total assets, based on their study of Dutch firms. They further claimed that those firms experience decrease in average return by more than one percentage point when the employment density was doubled.

Kukalis (2010) studied the profitability determinants of clustered and nonclustered firms from the semiconductor and pharmaceutical industries in India and found no significant difference between the two groups while they are still in the early stages of the industry life cycle. Upon reaching the late stages, nonclustered firms performed better than clustered firms.

Lakner, von Cramon-Taubadel, and Brümmer (2011) examined how the technical efficiency of German organic pasture farms are affected by regional share of organic farmers, regional location, share of votes for the Green Party and distance to the nearest organic dairy. They confirmed that both localization and urbanization economies stimulated firm performance.

Plant-level data from four Indian industries (leather products, motor vehicles, machine tools, and electronic and tools) were the subject of analysis of Lall and Chris Rodrigo (2001). They found technical efficiency to be not significantly influenced by industrial concentration and spatial location, though certain industries benefited from locating within established clusters.

Lall, Shalizi, and Deichmann (2004) later revisited the study of Indian industrial firms to test the link between scale, localization, and urbanization economies and total factor productivity. While variation in productivity could be partly explained by agglomeration economies, the net effect differed from industry to industry. Also, contrary to their expectation, locating in dense cities did not improve a firm's productivity.

Mitra (1999) found a positive relationship between city size and the technical efficiency of firms from two industries, electrical machinery and cotton and cotton textiles. Although the link between firm performance and agglomeration economies is recognized, the relationship is not

monotonic. Also, firms in larger cities experienced lower levels of technical efficiency as a result of diseconomies of agglomeration.

In their study of firms in the European Union, Stavropoulos and Skuras (2014) noted that the effect of industrial concentration, diversity, and population density on profitability and labor efficiency, while significant, is negligible. Using fitted models, they calculated the quantitative effect of specialization to be small.

The results of the study of Tveteras and Battese (2006) on salmon aquaculture producers in Norway indicated that agglomeration economies, using regional employment and regional industry size as proxy, improved frontier output and technical efficiency of salmon farms. On the other hand, regional farm density had a negative effect on farm output despite a positive effect on technical efficiency, suggesting the costs of agglomeration outweigh the benefits.

Vaan, Boschma, and Frenken (2012) pointed out that both positive and negative localization economies grew in proportion to cluster size, resulting to a net-benefit. They studied firms from the global gaming industry and concluded that while the increase in number of gaming competitors in a region also raised the hazard risk of firms, its nonlinear effect was thought to be 'performance enhancing'.

Widodo, Salim, and Bloch (2014) probed how three measures of agglomeration (Marshall-Arrow-Romer externalities or specialization, Jacobs externalities or diversity, and Porter externalities or competition) explained the variance in total factor productivity of Indonesian firms. Performance improved as a result of specialization and decreased as a result of diversity, with competition providing mixed results.

A related study by Widodo, Salim, and Bloch (2015) considered the technical efficiency of Indonesian firms using the same measures of agglomeration. The findings were consistent with an earlier study, citing that effect of MAR externalities is greater than effect of Jacob's externalities in stimulating technical efficiency. They also cited how firms located in urban regions and industrial complexes performed better.

Taken as whole, the results of these studies show that a consensus regarding the relationship between agglomeration economies and firm-level performance has not been reached. Whereas some studies established the relationship as a source of performance variation, others estimated the relationship as insignificant. In a few cases, a single paper itself observed a positive and negative impact when firms from different industries are compared.

One explanation may be that each study approached the subject differently such that use of different combination of performance measures and agglomeration variables yielded different results. It is also likely that the extent of influence of agglomeration economies differs from one industry to another. Because of the nature of some industries such as the biotechnology industry which is capital-intensive and has long R&D and approval cycles, the findings on those industries could not be generalized.

5.CONCLUSION AND DIRECTION FOR FUTURE RESEARCH

The results of these papers may be refined in several ways. First, other types of economic measures such as economic value added, cash flow return on investment, economic margin or some other robust indicator maybe be used. Second, other sources of agglomeration economies maybe identified and qualified as a variable, such as those that proxy for inter-firm linkages, or constructed as an aggregated score.

Meanwhile, further insight on the relationship of agglomeration economies and firm-level performance maybe arrived when the scope of research are expanded to include other types of industries and when more recent estimation techniques are applied. Analysis may also be extended to include examining the performance differences in firms inside the same cluster and

performance variations between clusters in the same industry, as pointed out by Li and Geng (2012).

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MODEL ALGORITHM FOR EVALUATING SUPPLY CHAIN RISKS AND THEIR IMPACT ON CORPORATE FINANCE

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Abstract

This paper focuses on evaluating the impacts of supply chain related risks on operations and corporate finance. The main aim is to create a model algorithm designed to evaluate impacts of supply chain risks on corporate finance. The impacts of each risk are analyzed in terms of risk identification, risk assessment and risk treatment. Model algorithm results in creating a list of priorities which represent specific uncertainty affecting supply chain operations and their finance. Fifteen types of risks are considered and divided into two categories: supply-related risks and demand-related risks. Their evaluation is based on six criteria. Benefits of proposed model algorithm are demonstrated by its five applications. Managerial implications are also drawn based on achieved results.

Keywords: Supply chain, Risks, Corporate finance, Case studies.

JEL Classification: G32

1.INTRODUCTION

Supply chain management is a relatively newly developed field of study, however it has been the subject of considerable research over the last several decades (Grover and Malhotra, 2003; Wiengarten et al., 2016; Shukla and Jharkharia, 2014; Choi and Messinger, 2016; Lin and Tseng, 2016; Malhotra and Grover, 1998; Hjaila et al., 2016; Wang et al., 2016; Bozorgmehr and Tavakoli, 2015). It is highly necessary to focus on development of supply chains in current globalized conditions. Given the ever-changing business environment, resources that have historically sustained an organization's competitive advantage in business may no longer be viable. In today's globalized world, competition has gone beyond the boundaries of single organizations and extended across the full supply chain spectrum. Recently, the concept of supply chain has received considerable attention from both practitioners and researchers. According to Mula et al. (2010) a supply chain may be considered an integrated process in which a group of several organizations, such as suppliers, producers, distributors and retailers, work together to acquire raw materials with a view to converting them into end products which they distribute to retailers. Chuu (2011) offers a different characterization. According to this author, supply chain is a network of suppliers, manufacturers, distributors and retailers, through which raw materials are required, transformed, produced, and delivered to end consumers. Thus a supply chain involves the complex flow of materials, products, services, information, and money across multiple functional areas within and among the complex hierarchies of the participating enterprises. As competition intensifies and markets become global, organizations have begun to realize that improving efficiencies within an organization is insufficient, and their whole supply chain must be made competitive. Overall supply chains are becoming both more complex and structured in more detailed ways (Cohen and Mallik, 2009; Sodhi et al., 2011; Erkul et al., 2015; Malhotra and Mackelprang, 2012; Kleindorfer et al., 2009; Mackelprang et al., 2014; Cheng et al., 2014; Singh, 2016; Gligor and Holcomb 2012) which only increase the importance of their ability to provide quick response to stimuli and

consequently to adapt in constantly changing environments (Gligor et al. 2013; Liao et al., 2010; Závadský and Hiadlovský, 2014; Závadský and Závadská, 2014).
According to Das (2011) the two most crucial decision making areas in present competitive business environments are addressing supply chain uncertainties and improving market responsiveness. Developing appropriate strategies in these areas will allow supply chains to avoid most of the common business disruptions (Tang and Tomlin, 2008). It is an established fact that the inclusion of effective flexibility measures can make a business more responsive — resolving most supply chain uncertainty issues. While investment in supply chain capabilities increases the ability of each organization within their supply chain to be more responsive to supply chain disruptions and resilient by itself; this decision brings a whole new set of costs (Chopra and Sodhi, 2014; Juttner, 2005). Therefore, organizations are faced with the evaluation of the cost-benefit of investments into increase of supply chain capabilities in order to successfully address supply chain risks and its uniqueness.
It should be noted that assessment of the optimal supply chain configuration in terms of risk management is a great challenge, since many factors and objectives must be considered when creating strategies to address specific uncertainties under ever-changing global and local conditions However, the true challenge of properly setting the parameters of supply chain risk management is to overcome limitations set by the parameters of supply chains and specific costs of implementing such strategies. Many authors (Sawik, 2014; Ahi et al., 2016; Xu et al., 2014; Nuss et al., 2016; Felfel et al., 2016) focus on calculating costs of managing risks, however, their main focus in only risks which occur in specific company. There is a lack of research related to analysis of impacts of risks which affect whole supply chains on corporate finance. Our focus is therefore on impacts of supply chain related risks on corporate finance. We propose a model algorithm which when applied in practice enables detailed calculation of such impacts specifically designed for the needs of given supply chain.

2.LITERATURE REVIEW

The recent years have brought significant and major changes in supply chains due to ever-increasing level of globalization and more detailed focus on innovation. The growing role of global supply chains is associated with increased interconnectedness among members of supply chain regardless of its size and structure, which results in higher rates of dependency among organizations within their respective supply chains and a higher level of supply chain complexity. All changes mentioned above resulted in a whole new set of emerging uncertainties and hazards specifically related with supply chain operations.
In order to minimize the impact of such disruptions on supply chain performance, several attempts have been made to model and optimize supply chain design, mostly utilizing a deterministic approach to supply chain modeling and analysis (Juttner, 2005; Cantor et al., 2014; Gong, 2008; Esfahbodi et al., 2016). However, most real supply chain risk-related problems are characterized by multiple sources of risks and uncertainties inherent in global environment (Brusset and Teller, 2016; Sodhi and Lee, 2007; Nooraie and Parast, 2016).
Building on the facts mentioned above, one of the underlying foundations of supply chain risk management is that it implies that the concept of supply chain that can be efficient while responsive to disruptions is a significantly complex and challenging task. To address these issues, the concept of supply chain risk management has received significant attention in recent years (Kamalahmadi and Parast, 2016; Kauppia et al., 2016; He, 2017; Sun and Fang, 2015; Giannakis and Papadopoulos, 2016)
Although awareness is increasing among managers in practice, the concepts of supply chain vulnerability and its managerial counterpart supply chain risk management are still in their infancy. Many companies have recognized the need to conduct formal risk analyses and to seek

ways to manage that risk but the definition of risk is usually fairly limited. At an academic level there has emerged a growing body of research into risk from a number of different perspectives (Mavi et al., 2016; Li et al., 2015; Wang et al., 2015; Heckmann et al., 2015; Mangle, Kumar and Barua, 2015). However, much like other issues, there is a lack of consensus on what key characteristics can completely represent and their practical implications. Our paper focus on prioritizing supply chain related risks in order to help managers in their decision-making process. This research gap provides an opportunity for more thorough analysis of selected subject in terms of new set of lens applied to look at the problem.

3.METHODOLOGY

The main aim of this research study is to create a model algorithm designed to evaluate impacts of supply chain risks on corporate finance. Proposed model algorithm considers several supply chain risks related to both demand and supply. Moreover, the model algorithm does not omit various factors which influence company's decision to assign funds to address a specific risk.
The second step following the literature review is to create a list of risks which is included in the analysis. Possible risks associated with supply chain operations are provided in Table 1. Each risk is either supply-related or demand-related with the exceptions of unpredictable disruptions and facility operations failure which could affect both sides. This list was created as a synthesis of different classifications found in literature (Giannakis and Papadopoulos, 2016; Zhu, 2016; Nooraie and Parast, 2016; Kamalahmadi and Parast, 2016; Sodhi and Lee, 2007; Sodhi and Tang, 2012; Snyder et al., 2005; Chopra and Sodhi, 2004). Our list contains only the major risks which can be broken down into various more specific risks. However, our intent is not to provide as exhaustive list of supply chain related risks as possible; it is to provide baseline for evaluation of costs which are related with occurrence of major risks. These hazards need to be considered in terms of supply chain management and their costs need to be closely monitored.

Tab. 1 – The analyzed types of risks. Source: Own elaboration

Type of risk	Abb.	Category	Description	Values	Treatment
Capacity risk	KA	Supply-related risk	Supplier is unable to meet capacity requirements or existing facility is at any given time unable to produce desirable amount of product	<0;1>	Cooperate Share
Delivery failure	DF	Supply-related risk	Supplier is unable to deliver raw material in demanded capacity or quality on time; delivery is corrupted due to unforeseen circumstances	0 or 1	Prevent
Low quality of product or material	LQ	Demand-related risk	Quality of produced items is not perceived by customer as adequate	<0;1>	Avoid
Excessive handling	EH	Supply-related risk	There are delays, fees or other costs related	<0;1>	Prevent Mitigate

			with transportation of material and/or products		
Exchange rate changes	ER	Supply-related risk	Fluctuations in exchange rates can affect financial situation	<0;1>	Insure Share
Contract failure	CF	Demand-related risk	Customer cancels an order and/or is unable to pay for it.	<0;1>	Cooperate Reduce
Unpredictable disruptions	UD	Demand-related risk and supply-related risk	Natural disasters, political changes, terrorism and other unpredictable occurrences	0 or 1	Insure
Financial strength of customer	FS	Demand-related risk	Power of customer to influence conditions set in contracts may result in unfavorable conditions.	<0;∞>	Cooperate
Price elasticity of next level customer	PE	Demand-related risk	Sensitivity of next level customer in supply chain to changes in prices.	<0;1>	Reduce
Facility operations failure	FF	Demand-related risk and supply-related risk	Failure of operations in facility of any member of supply chain	<0;1>	Prevent Mitigate
Transportation failure	TF	Supply-related risk	Failure of any transportation mode	<0;1>	Avoid Mitigate
Substitutions	SB	Demand-related risk	Competition-related risk	<0;1>	Mitigate
Complementarities	CM	Demand-related risk	Competition-related risk	<0;1>	Mitigate
Inventory disruptions	IV	Supply-related risk	Any disruptions which can negatively affect the quantity and quality of inventory.	<0;1>	Avoid Insure
Technological changes	TE	Supply-related risk	New trends and innovations in technology which affect supply chain.	0 or 1	Mitigate

Each risk affects supply chain differently due to its occurrence and selected treatment. The effects of each risk are analyzed in terms of risk identification, risk assessment and risk treatment. In order to correctly define a formula for calculating the effects of supply chain risks, we propose a model in which each risk is assessed in terms of six scale categories. They were derived from research of Giannakis & Papadopoulos (2016) and Kamalahmadi & Parast (2016) modified to fit the aim of this study. Each assessment category has six scales provided in Table 2. This step in proposed model algorithm is crucial in terms of high rate of supply chains

individuality. Specific conditions must be evaluated in order to make a correct decision to prioritize supply chain risks.

Tab. 2 – The scale categories. Source: Own elaboration

Category / Stage	1	2	3	4	5
strength of effect	no effect	minor effect	moderate effect	major effect	critical effect
frequency of occurrence	almost never	rarely	infrequently	frequently	often
detection probability	100 % - 80 % almost always detected	79 % - 60 % simple to detect	59 % - 40 % moderately difficult to detect	39 % - 20 % difficult to detect	19 % - 0 % impossible to detect
treatment suitability	complete consistency	almost complete consistency	partial consistency	partial inconsistency	complete inconsistency
treatment success	always	most of the time	sometimes	rarely	almost never
impact on corporate finance	none	minor	moderate	major	critical

Proposed model algorithm consists of three stages (Fig. 1). Firstly, a list of risks is provided to company to assess which risk affects their supply chain. Secondly, based on the category scale every risk is assigned points in each category. The last stage of algorithm consists of defining the sum values and consequently creating a prioritized list of risks selected during the first stage. During the last stage company chooses an action to address particular uncertainty and considers the amount of funds needs for each risk treatment and/or mitigations in the future. This last part is crucial in managers' decision-making process. Model algorithm results in creating a list of supply chain related risks prioritized specifically on needs of each supply chain and the amount of attention each risk needs.

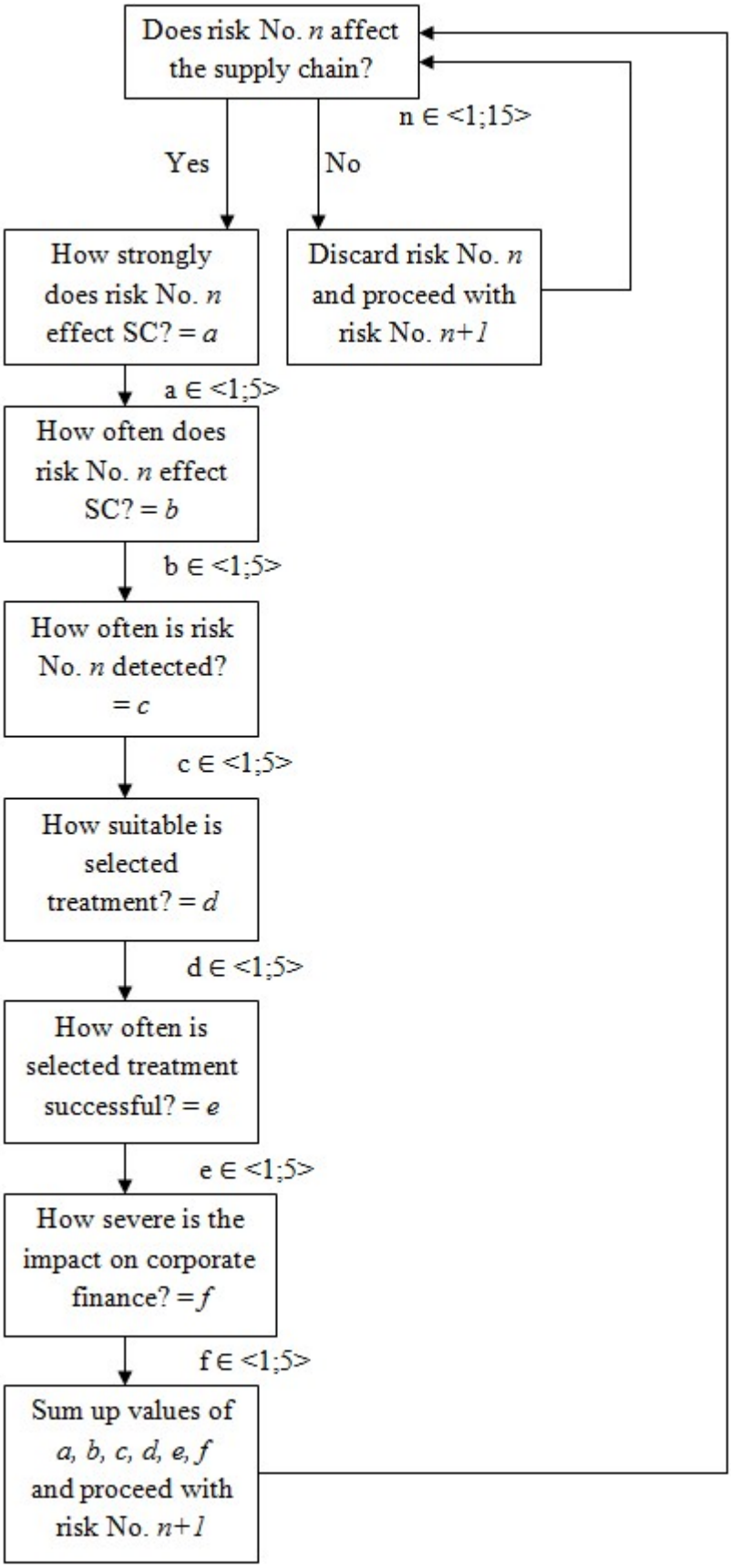


Fig. 1 – Model algorithm. Source: Own elaboration

4.RESULTS AND DISCUSSION

In this part of the paper, we present the results of five applications of proposed model algorithm in practice. These case studies illustrate how our model algorithm can serve as a useful decision-making tool for managers of very different companies regardless of position in supply chain, size or structure of their supply chains and various other factors. Based on these examples we can briefly describe managerial implications of our model algorithm utilization in supply chain risk management.

4.1.Model algorithm applications

We conducted five case studies to evaluate the accuracy of proposed model algorithm. Table 3 shows basic characteristics of selected enterprises.

Tab. 3 – The characterizations of selected companies. Source: Own elaboration

Company	1	2	3	4	5
Sector of economy	production of food products	production of cars	IT technologies	tourism	production of machinery
Size of company (no. of employees)	78	260	46	196	630
Position in their supply chain	seller	producer	supplier of components	seller	main supplier
Structure of their supply chain	divergent	convergent	network	network	network

Table 4 presents the results of 5 analyses performed in selected companies according to proposed model algorithm.

Tab. 4 – The characterizations of selected companies. Source: Own elaboration

Priority	No. 1		No. 2		No. 3		No. 4		No. 5	
	Risk	No. of accumulated points	Risk	No. of accumulated points	Risk	No. of accumulated points	Risk	No. of accumulated points	Risk	No. of accumulated points
1.	LQ	21	DF	28	DF	20	PE	24	DF	22
2.	SB	20	FF	25	TF	19	KA	21	IV	21
3.	PE	19	TF	24	EH	19	FS	21	TF	21
4.	FS	19	EH	21	TE	17	SB	20	SB	19
5.	UD	18	KA	19	KA	16	IV	17	EH	19
6.	IV	17	IV	16	FF	14	CF	16	FS	17
7.	TF	12	LQ	12	CF	13	UD	12	PE	16
8.	TE	10	FS	11	LQ	11	LQ	9	LQ	13
9.	EH	7	TE	11	SB	11	DF	8	ER	11
10.	CF	6	CM	11	UD	10	ER	7	UD	11
11.	CM	6	UD	8	FS	9	CM	6	KA	9
12.	-	-	SB	6	PE	9	-	-	FF	9
13.	-	-	-	-	ER	9	-	-	TE	8

14.	-	-	-	-	CM	8	-	-	-	-
15.	-	-	-	-	IV	6	-	-	-	-

Table 4 shows how each company prioritized their supply chain related risks. Moreover, the results indicate which risks should be taken into closer consideration based on assigned points and their cumulated values. The first company which produces food products is most severely affected by low quality of products perceived by next level customer. The risk of being substituted by other seller outside of its supply chain is also very high for this particular company.
The second company is a main producer of cars in their convergent supply chain. Its supply chain is at the risk of delivery failure. Out of all five companies this risk received the highest number of values (28) based on risk characterizations and its impact on corporate finance. The risk of transportation failure is also high on the prioritized list – the third place. This company also faces a risk of facility failure of any of the chain-link companies.
The third and fourth companies both operate in service sector; however, their most significant supply chain related risks are different. The company producing IT technologies is most severely affected by delivery and transportation risk, however, its list of supply chain risks is the most complex and diverse one of all analyzed companies. Company operating in tourism sector perceives as its most significant risk the price elasticity of next level customer. The capacity risk and financial strength of customer are also significant for this supply chain.
The last of the analyzed companies is a main supplier for production of machinery. Its supply chain is mostly affected by delivery, inventory and transportation failures. Overall, the majority of analyzed companies are severely affected by delivery disruptions and transportation issues.
Risks which had been assigned more than 15 points represent disruptions which are critical for supply chain operations. They are the risks managers should focus their main efforts on in order to mitigate their effects or to prevent them completely if possible.

4.2.Practical implications, limitations and future research

Our model algorithm includes two main objectives. The first one is based on analysis of risks which have impact on corporate finance. Risks are assessed in terms of their effects and occurrences. The second objective relates to impacts of these risks on corporate finance in regard to the nature of disruptions they cause and funds assigned to their treatments. Therefore, application of proposed model algorithm in company forces its managers to take a closer look on supply chain related risks and their impacts on corporate finance. Model algorithm creates a list of priorities based on specific circumstances associated with supply chain operations.
Proposed model algorithm provides an opportunity for managers to use it as a decision-making tool. In enables managers to look closely into risks which may affect the operations of their whole supply chain in both positive and negative ways. Managers can use this model algorithm in order to assess their previous state of company's finance related to mitigations of supply chain risks and to examine the effectiveness of selected treatments. Furthermore, proposed model algorithm allows managers to focus their future decisions on assigning funds to specific areas of risk management in order to properly invest funds into developing new capabilities of their supply chain. Moreover, the financial impacts on corporate finance influenced by the development of such new capabilities should target mitigation of those disruptions and risks in the supply chain which have priority. Proposed model algorithm provides a useful tool for managers to prioritize the risks, their affects on corporate finance and to act accordingly. As a tool this model serves as a guideline for designing a treatment for specific risk and more importantly, it helps managers determinate the amount of funds which should be assigned to each treatment based on the supply-chain risk priority.

By evaluating the nature of each risk and circumstances of their occurrence, manager would be able to decide how to design their supply chain with the purpose of mitigating specific risks which have the most significant impacts on their operations and consequently on their corporate finance. The results of proposed model algorithm create a clear image which helps the manager to decide on creating new partnerships with key providers and to design transportation routes accordingly which in addition makes their supply chain more flexible and responsive to disruptions.

Obviously, the methodology proposed algorithm is based on, relies severely on managers' previous experiences and their detailed knowledge of processes in their corresponding supply chains. Therefore, some errors can be made due to human factor which is the main limitation of proposed model algorithm. Furthermore, it does not calculated costs specifically related with supply chain risks. The following step in future research could be expanding model algorithm to include calculations of such costs and detailed impacts of risks on corporate finance. Presented case studies proved that model algorithm can be used to prioritize supply chain related risks. Such a list of priorities has significant utilization in managers' decision-making process.

Other limitation of model is related with its nature. This model algorithm examines only those risks which have their cause in supply chain related activities, therefore other risks which are caused by internal company processes or external factors are not included, thus, some important issues may be omitted. However, this limitation can also serve as a topic for further research in terms of designing an integrated model algorithm which would be able to analyze wider range of risks; therefore provide a complex image for company's risk management.

Other studies provide valuable sources to compare our results. Nooraie and Parast (2016) proved that decision models can assist managers to successfully manage the trade-off among investment, risk and costs within corresponding supply chains. Although, our models are not similar, they target the same issues and therefore, their conclusion provides further evidence to the assumption of practical applications of designed model algorithm. Kamalahmadi and Parast (2016) through their literature review provided evidence of relevancy of our research topic and also practical need for decision-making tool targeting the supply chain related risks. Giannakis and Papadopoulos (2016) highlighted the different nature of supply chain related risks and the need for an integrated treatment to deal with the negative consequences. Their achieved results also proved the need to focus on studying this topic further. Their objective of study was to identify specific sustainability related risks and through the development of a risk management framework and a systematic empirical research to propose strategies for their treatment. Similar methodology provided us with a useful framework to base our study on, however, the focus of our research was to provide a decision making tool for prioritizing supply chain related risk regardless of treatment necessary to deal with them. Zhu (2016) based his model on the assumption of asymmetric information. Our model algorithm faces similar problem since the date is collected with limitations of managers' knowledge of their supply chain and their past experience.

5.CONCLUSION

In this study we focused on creating a model algorithm designed to evaluate impacts of supply chain risks on corporate finance. Proposed model algorithm incorporates a wide range of possibilities for supply chain disruptions and takes a closer look on how each disruption can affect supply chain operations and corporate finance of companies involved. Model algorithm was verified by five applications in practice. Five different companies were selected to demonstrate the utilization of proposed tool and to explain the results which this model algorithm may provide for managers.

Every compiled list was presented to company's corresponding managers. They all agree to find the prioritized list useful and intend to incorporate this method into their future decision-making processes. Obviously such list is valid only for a certain period of time which is very short due to ever changing conditions in both external and internal environment. Afterwards, the model algorithm needs to be performed again since the situation and conditions may change for the supply chain and therefore, consequently the significance of risks would also change.

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CREDIT CRUNCH: A LITERATURE REVIEW

Vokoun Marek

Abstract

The credit crunch is widely used but hardly defined. The goal of this paper is to debunk the mystery of credit crunches in recent history. The review process was based on the selection of quality publications. The results suggest that the term is limited to the banking sector only and the credit crunch issue is mainly analyzed in the context of economic crises. Credit crunch is a process with historical roots (it is as old as state currencies). The current institutional infrastructure of state currencies is controlled by the private banking sector, which is allowed to introduce financial innovations and behave unethically without severe consequences. As a result, excessive and misplaced credits are provided. This leads to economic recessions. The downturn of economic activity is then characterized by a lower demand for credit. Credit crunch is predominantly defined as a leftward shift in the supply curve for bank loans (ceteris paribus). Supply factors are mostly moderate (capital crunch) and their severity depended on region and bank size. The paper proposes the regulation to be separated from the supply and demand factors as one separate factor, which should be analyzed at first.

Keywords: crises, banking, finances, funds, credit, state, money

JEL Classification: E51, G18, G01

1.INTRODUCTION

The following paper is a full review analysis of the so-called credit crunch. The credit crunch issue regained popularity after the last economic crisis. The goal of this full review is to demystify the term credit crunch and connected issues, which are related to the banking sector, money supply and role of the regulation and state policies. The review primarily focuses on the period of 1973 to 2016. The reason is that the majority of currencies evolved into the so-called fiat currencies in the 1980s. This new nature of money remains relatively same to this day. The review also explores the origin of the term; historical literature before 1980 is analyzed as well. Most of the world's currencies became unbacked by gold or similar goods after the end of the Bretton Woods system in the 1980s. By the accounting principles money is now backed by assets of commercial banks (Jílek, 2013). The label “fiat” indicates that modern currencies are backed by governments' fiat of legal tender now (Wray & Randall, 2012). This paper will build on these two facts and assumes that the vast majority of credit is created by commercial banks using official currency in the particular country. The first fact is that money creation and destruction (using official currency) are subjects to the accounting principles, such as national standards and especially Basel accords (Ramirez, 2016). The process of money creation and destruction, using official currency, is regulated by the state and agenda of monetary policy is given to the central monetary institution.

There are many credit products on the market and not all credit agreements generate financial funds in the national economy. The vast majority of credit products originate in commercial banks (or other fanatical institutions with the right to create many trough money lending). In this process a commercial bank gives a loan to a non-banking entity (f. e. households and private companies). In this moment new money is created. If we follow accounting principles, new money, using official currency, is exclusively created in commercial banks only. This new

money is labeled as M1 that is an abbreviation of money aggregate indicator, which usually includes only cash (M0) and checking deposits. This aggregate is tied to a unique state currency. Commercial banks are not limited in the process of credit creation (loans to non-banking entities) in modern Western economies. In the past, there were direct instruments of monetary policy that were applied to commercial loans (f. e. interest rate limits or limits to the amount credited). Recent decades of independent central banking led to limitations, which are currently characterized by the Basel accords. These limitations are aimed at preventing the capital crunch. The ability of banks to create credit is nearly unlimited (Jílek, 2013) and it depends heavily on their credit policies and credibility requirements.
In terms of Bank reserves we can speak of credit as well. In this case a bank, private or public (central), gives a loan to a banking entity. No new money (M1) is created in this moment because these reserves are not defined as money according to accounting principles.
A credit is also formed in the process of peer to peer (P2P) lending. Funds are lent to individuals or private companies through an intermediary company, which matches lenders directly with borrowers. No new money (M1) is created in this moment because the lent money is only transferred from account to account or given in form of cash, which was already in the M1 aggregate.
Finally, a credit is also formed using other than official state currencies. In this case, there are mostly Crypto currencies and Community currencies. This credited money is not included in the official M1 aggregate because these alternative currencies to the state currency have their own M1 aggregate.
The term credit is quite a broad term and we introduced its possible manifestations inside an economy. We live in a global world and money is sent abroad every day, which can complicate matters further. Credit of money can be created using foreign currency and provided using P2P loans as well. In case of P2P loans, M1 aggregate in one country decreases and in the country where money is sent increases. In case of bank loans over the border the M1 aggregate will stay the same in one country and increases in the other country where money is sent to a bank account.
Credit in the broad sense is not a simple term and not always associated with money creation in a specific country. Some of the credit agreements are not under a full control of the government (crypto currencies), and some are regulated only to an extent (community currencies).
The goal of this paper is to review current and historical literature and search for a definition and meaning of the term credit crunch. We explored the word credit to some extent and found several meanings of the term. The word crunch indicates that credit is somehow limited. This paper explores the causes of the problems associated with credit as well.

1.1.Method and data

The selection of documents was based purely on quality. The quality was judged by the existence of a peer review process. In case of papers, it was the inclusion in respected journals, which are at indexed by Web of Science citation database of peer-reviewed literature. In case of books and papers, the selection was based on the title, abstract and keywords, which had to contain the term credit crunch to enter the analysis. In terms of historical analysis, only the term credit was used and books that contained credit issues were selected. In case of textbooks, the selection was based on current most sold authors in the US; local textbooks were used as well.

2.RESULTS

This section is structured in three parts. The first part explores the term credit crunch using current textbooks, which are commonly used at US and European universities. The second part explores the historical roots of the term credit crunch. The last part explores current literature and recent development of the term credit crunch. After this section, the results are summarized and a new definition is suggested.

2.1.Text book analysis

Tab. 1 – Summary of resources, text book analysis. Source: 14 resources listed in table

Text books	**Credit crunch definition**	**Banking sector phenomenon**
Abel, Bernanke and Croushore (2013), Baumol and Blinder (2012), Blanchard and Johnson D. (2012), Blanchard (2017), Frank and Bernanke (2008), Mankiw (2008), Mises (2011), Pavelka (2007); Soukup et al. (2008); Holman (2002)	No definition or use of the term	
Dornbusch et al. (2010)	Definition by Bernanke, Lown and Friedman, B. M. (1991)	Yes
Krugman and Wells (2015, p. 94); Mankiw (2012, 2015, p. 173, 622); Hubbard and O'Brien (2017, p. 458)	Own definition	Yes

Only several textbooks deal with the credit crunch issue. If we look into textbooks of Abel, Bernanke and Croushore (2013), Baumol and Blinder (2012), Blanchard and Johnson D. (2012), Blanchard (2017), Frank and Bernanke (2008), Mankiw (2008), Mises (2011), we do not find the term credit crunch. Even the broadly used macroeconomic textbook of Romer (2011) does not include the term. In the Czech Republic the issue of credit crunch is not present in textbooks either (Pavelka, 2007; Soukup et al., 2008; Holman 2002). These authors deal with crises and quantitative easing or credit easing. But the term itself is not used. The term is however used in four textbooks.

Three major textbooks deal with credit crunch. The first macroeconomic textbook is by Dornbusch et al. (2010). Their definition (Dornbusch et al., 2010, p. 417) describes credit crunch as the behavior of banks as "*the reluctance of banks and thrifts to lend*". This definition is taken from the paper of Bernanke, Lown and Friedman, B. M. (1991) who describe credit crunch as a banking sector phenomenon and it is a leftward shift in the supply curve for bank loans "*We define a bank credit crunch as a significant leftward shift in the supply curve for bank loans, holding constant both the safe real interest rate and the quality of potential borrowers."* (Bernanke, Lown & Friedman, B. M., 1991, p. 207)

Krugman and Wells (2015, p. 94) describe credit crunch as follows: "*The disruption of the banking system typically leads to a reduction in the availability of credit called a credit crunch, in which potential borrowers either can't get credit at all or must pay very high interest rates.*

Unable to borrow or unwilling to pay higher interest rates, businesses and consumers cut back on spending, pushing the economy into a recession."
Mankiw (2012, 2015, p. 173) describes credit crunch as the fourth element of financial crisis: "*With many financial institutions facing difficulties, would-be borrowers have trouble getting loans, even if they have profitable investment projects. In essence, the financial system has trouble performing its normal function of directing the resources of savers into the hands of borrowers with the best investment opportunities.*"
Hubbard and O'Brien (2017, p. 458) describe credit crunch as the tightening of the requirements for borrowers. "*Financial crisis led to a credit crunch that made it difficult for many households and firms to obtain the loans they needed to finance their spending. This drying up of credit contributed to declines in consumption spending and investment spending*."
The term credit crunch is not a commonly used term in university textbooks of macroeconomics (Table 1). It is described as a banking sector phenomenon (Dornbusch 2010; Krugman & Wells, 2015; Hubbard & O'Brien, 2017; Mankiw 2015, p.622). The financial system is disrupted and banks are reluctant to lend money (Dornbusch, 2010; Krugman & Wells 2015; Hubbard & O'Brien 2017; Mankiw 2015). The causality of the credit crunch can be described as follows (Figure 1):

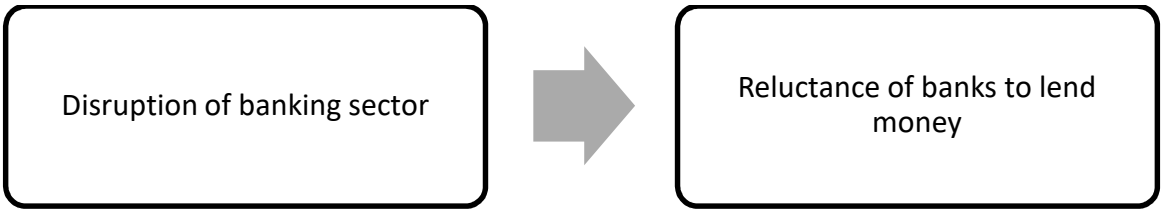


Fig. 1 – Textbook causality of the credit crunch. Source: own processing

We don't know much about the disruption of the banking sector, which leads to reluctance of banks. The disruption of banking castors can be caused by internal factors like bad managerial decisions in the past (f. e. capital and assets management, liquidity management) or by external factors (f. e. government fiscal and monetary policies, and law enforcement). The reluctance is usually happening in times of an economic crisis.
The issue of reluctance is complicated. Krugman and Wells (2015) and Hubbard and O'Brien (2017) argue that it is happening in form of tightening of the requirements for borrowers (f. e. higher interest rates and inability to provide a good collateral). Dornbusch (2010) and Mankiw (2015) argue that it is happening even though the quality of borrowers stays the same and there are plenty of profitable investment projects and even the safe real interest rate (low risk instruments like treasury bonds) stays about the same.
Banks are unwilling to lend money in times of economic crises. Many questions are still unanswered and the problem is just put into the context of an economic crisis. Why would banks be reluctant if their leverage ratio, capital and liquidity requirements according to Basel III were sound? Why is it not sound? Why would we care for unsound companies and banks, which are going bankrupt in the market economies? Are there plenty of profitable investment projects on the demand side? How to count them in times of economic crises? How to measure an average loan interest rate? What is the role of governments? What is the future of state money?

2.2.Historical roots of the term credit crunch

Tab. 2 – Summary of resources, Historical roots analysis. Source: 9 resources listed in table

Monographs	**Credit crunch definition**	**Excessive and misplaced credit**	**Unethical behaviour of creditors**	**State regulation problems**
Sherwood (1894); Westerfield (1938); Richards (1957); Sheridan (1960);	No definition or use of the term. Scarcity of credit is analysed.	Yes	Not analysed	Not analysed
Blackburn (1940); Roover (1942);	No definition or use of the term. Scarcity of credit is analysed.	Yes	Defined	Yes
Walker (1968)	Own definition	Not analysed	Defined	Yes
Meltzer (1974)	No definition or use of the term. Mortgages are analysed.	Not analysed	Not analysed	Yes
Wojnilower et al. (1980)	Own definition	Yes	Defined	Yes

The first book of Sherwood (1894) deals with credit and credit issues. Misplaced or excessive credit (bad investment, bad production decisions) is the cause of industrial crises. Then an unnecessary monetary panics arise and with it the scarcity of money. The importance of this work is that author describes money as credit. It is in times of gold standard and points out that money has no intrinsic value for producers. Gold or industrial production of goods is just collateral, which says nothing about intrinsic value of money. *Credit crunch as a term is not defined. There is scarcity of credit (money), which is caused by monetary panic in times of industrial crisis, which is caused by excessive and misplaced credit.*

Credit is a way to delay the onset of economic crises but the longer time the beginning of the crisis is delayed the more severe the crisis is (Westerfield, 1938). Credit is also a way to make natural economic fluctuation look worse than it would be without excessive credit (and bad investments on the market). Excessive credit has to be paid and it decreases the consumption and investment spending. Consumers and companies owe money to the banking sector. Banks are reluctant to give borrowers additional loans. Additional money is then sought outside the banking sector for higher interest rate. *Credit crunch as a term is not defined. There is*

reluctance of banks to lend money to the borrowers, which again is caused by excessive and misplaced credit in the past.

Excessive credit is something that can be hardly prevented (Blackburn, 1940). The concept of state money supports excessive and misplaced credit. Pyramiding debt is one example of providing consumer credit to low income families beyond reason. Banks are not motivated to prevent bad decisions of loan officers or to avoid giving a loan to credit delinquents. The author proposes instruments to avoid excessive and misplaced credit, such as financial penalties for bad decisions of bank officers who have to be obligatorily certified specialists. *Credit crunch as a term is not defined. The problems with credit are associated with the issue of excessive credit in the economy, the problem of pyramiding debt, and unpunishable banks and bank officers.*

Roover (1942) studied the credit in medieval Bruges. The money-chargers had to take an oath, which was a promise that they would comply with the monetary ordinances of public authorities. For example, picking or culling the money, clipping coins, exporting bullion, or even bringing forbidden coins into circulation were forbidden under severe penalties. *Credit crunch as a term is not defined. Problems with credit are associated with money-chargers*.

Credit issues, which are not caused by crises, were introduced by Richards (1957). Lending institutions are reluctant to provide loans to small and medium-sized enterprises (SMEs) because larger companies are given priority. The three reasons are the lack of contact, lack of marketability of the issues of small corporations and most importantly the high costs of maintaining a portfolio of small issues (Richards, 1957, p. 90). *Credit crunch as a term is not defined. There is reluctance of banks to lend money to the SMEs, which is caused by high costs of maintaining extensive portfolio of small loans in contrast to several big loans of large companies.*

The British Credit Crisis of 1772 was caused by extensive credit that was accompanied by credit swiveling and bad production decisions in the American Colonies (Sheridan, 1960). Then monetary panics arose, debts were not paid to creditors in the United Kingdom, and the crisis spread in the American Colonies. All social classes were indebted and new credits were hard to get. *Credit crunch as a term is not defined. There is scarcity of credit, which is caused by monetary panic in times of industrial crisis, which is caused by excessive and misplaced credit.*

Probably the first mention of the term in highly rated journal is to be found in Walker (1968, p. 815). „The unwillingness of the Federal Reserve Board to raise this maximum rate in the summer of 1966 was of great significance, and in fact was a major cause of the severe 'crunch' that hit credit markets in late August." In this paper Walker (1968) warns about the issue of the generalization process of formerly specialized financial institutions. It is an understandable step towards risk neutral portfolios of financial institutions. The regulators should proceed on methodical and years ahead planed basis, "we definitely should not proceed on an ad hoc basis with the danger that we may end up with institutions that, much like the savings banks, are neither fish nor fowl." Walker (1968, p. 818). *Credit crunch is defined as the issue of bad regulators who are unable to plan ahead and regulate changing behavior of financial institutions*.

Meltzer (1974) analyzed the mortgage market in the US and ask himself as to why banks are not raising interest rates in times of high demand. The reason is the policy of preventing the "credit rationing" and political interest of maintaining low interest rates of mortgages. Credit rationing, simply said, is a situation of a reluctance of lenders who are not willing to give a loan to a borrower who is willing to pay a higher interest rate. Households are sensitive to interest rate changes; terms and conditions of mortgages are not important. He found out that availability of credit in the US does not influence the housing market or the amount of mortgages. *Credit crunch is not defined; however, new term the "credit rationing" is*

introduced. But this term is referred to as exaggerated by politicians and there is unnecessary fear of "credit rationing" in the mortgages market.

The growth of credit (almost at every level of general level of interest rate) is always supply-determined or at least in times that are cyclically important (Wojnilower et al., 1980). Propensity to spend and demands for credit are inelastic with respect to the general level of interest rates. It can be explained by bad regulations and almost no rules in the banking system in the 1970s. He argues that the only interruption in the supply of credit is the fault of banks. The reason is the decline of solvency (liquidity issues) and bankruptcies of banks, which can be caused both intentionally (bad regulation of state, wrong monetary policy) and accidentally (bad portfolio management of bank's assets). He describes the banking system as perverse. This system enables excessive credit expansion and inflation because of the "narcotic attraction of borrowing and the related phenomena of gambling and asset-price speculation" (Wojnilower et al., 1980 p. 279) and adds: "No bank of any consequence looks to demand deposits as an important source of funds." (Wojnilower et al., 1980 p. 324). He argues that the crisis in the US in the 1950s was caused by bad state regulation of interest rates limits.

The next crisis in the 1960s was caused by bad state regulation as well. The interest rates and inflation increased but it did not lead to a significant decrease in credit activity. The inflation forecasts of "experts" only led to fear and banks were reluctant to lend money. But the inflation was not caused by bad investment of private sector but by the war public expenditures of the state. The state caused this fear that led to a credit crunch. This situation caused by the state is then "saved by the state" (Wojnilower et al., 1980).

State regulations also caused the next crisis in the 1970s. Thanks to new technologies, the banking sector was developing faster than state regulation. The oil crisis caused inflation and the same fear as there was in the 1960s arose again. The "experts", Wall Street, and even academic economists were forecasting imminent and inevitable recession. The growth of credit was not affected by the forecasts. New in the credit market is the second mortgage and mortgage-backed securities (MBS), which are assets without a perspective to earn more in time; nevertheless, this worse instrument in comparison to traditional instruments like stocks, commodities, and bonds etc. was booming. The change of minimum reserves and credit limits imposed by the state caused credit crunch and recession in the 1980s (Wojnilower et al., 1980).

Wojnilower et al. (1980) provided comprehensive evidence about credit crunches. *Credit crunch is defined as the interruption in the supply of credit. Wrong state policies are the cause. Firstly, it is bad overall regulation of banking sector, which led to the standard of immoral and bizarre behavior (excessive credit and asset gambling) in the financial sector. Secondly, their reluctance in times of high inflation is again caused by bad monetary policy, which is based on the misinterpretation of the inflation rate.*

In Figure 2, the causality of credit crunch (or scarcity of credit) is provided. It is caused by state regulation, which cannot deal with amoral behavior of bankers. Excessive credit and bad investment of firms leads to losses and inflation pressures. Fear of banking panics and bad response of state to inflation pressures leads to reluctance of banking sector to provide credit (Table 2).

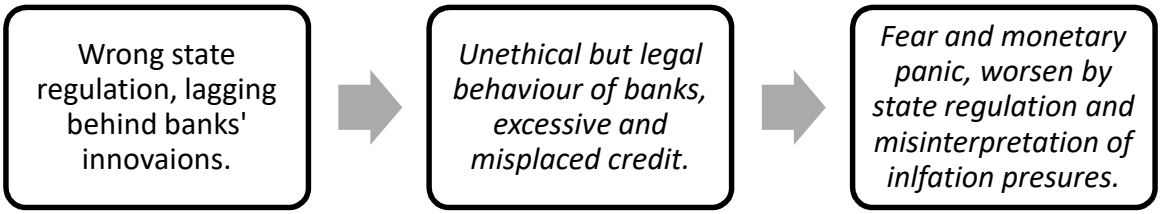


Fig. 2 – Historical perspective and the causality of the credit crunch. Source: own processing

2.3:Modern credit crunches

Tab. 3 – Summary of resources, papers 1980-2011. Source: 18 resources listed in table

Monographs	**Credit crunch definition**	**Wrong state regulation**	**Excessive credit and unethical behaviour of banks**	**Demand factors**	**Capital crunch**
Stiglitz and Weiss (1981);	No definition or use of the term.	N/A	Not analysed	N/A	N/A
Bernanke, Lown and Friedman (1991); Berger and Udell (1994);	Own definition.	N/A	Not analysed	Substantial	Moderate
Shrieves and Dahl (1995); Brinkmann and Horvitz (1995); Krebsz (2011); King (2011)	Crisis phenomenon	N/A	N/A	N/A	N/A
Peek and Rosengren (1995); Pazarbasziogl u (1997); Hancock & Wilcox (1998)	Crisis phenomenon	N/A	N/A	Substantial	Locally or bank type specific
Wagster (1999); Watanabe (2007); Mizen (2008); Brunnermeier (2009); Murphy (2009)	Crisis phenomenon	Yes	Not defined	N/A	N/A (regulation is the cause)
Agénor et al. (2004); Turner (2008)	Crisis phenomenon	N/A	N/A	N/A	Yes
Agénor et al. (2004)	Crisis phenomenon	N/A	N/A	N/A	Yes

Stiglitz and Weiss (1981) deal with the term "credit rationing" that is reserved for situations where borrowers are not given credit even though they would pay higher interest rate. They argue that the Law of Supply and Demand is not a fact in the credit markets. For example, banks are not going to fight for borrowers by lower prices they would only steal the worse ones from their competitors. *Credit crunch as a term is not defined. The issue of credit is that loan market is specific market where the Law of Supply and Demand does not exist.*

Bernanke, Lown and Friedman (1991) argue that credit crunch is not the cause of crises. Their definition of credit crunch, as stated before, is based on the leftward shift in the supply of credit (ceteris paribus) and they also limit their analysis to the banking sector only. There is a lack of consensus about the meaning of the term credit crunch. They analyzed the slowdown of lending in the US in 1991. They analyzed "capital crunch" in the banking sector and their findings state that it didn't play an important role (2-3 %). Unlike the simple falling demand for credit which was the major cause of the credit crunch. In this crisis the nonbank credits were not rising and crisis monetary policy didn't seem like a big problem. *Credit crunch is defined as the leftward shift in the supply of credit (ceteris paribus) in the banking sector. It is caused by the falling demand for credit and moderately by the capital crunch of banks.*

Berger and Udell (1994) analyzed data on all US banks between 1979 and 1992. They introduced many credit crunch hypotheses (risk capital requirements, leverage requirements, loan examination, voluntary risk-retrenchment, demand side, and secular decline hypothesis). Reductions in credit can be attributed to the demand side hypotheses (demand side and secular decline hypothesis). Only a moderate and non-substantial effect had voluntary and obligatory risk reduction requirements (risk capital requirements, leverage requirements, loan examination, and voluntary risk-retrenchment). „Large banks, banks with weaker capital ratios, and banks supervised by the OCC have much more substantial credit reallocation effects and greater lending reactions to perceived risk than other banks." (Berger & Udell, 1994, p.625). They suggest a time series approach because their cross-sectional approach wasn't able to determine factors precisely. *Credit crunch is defined as a significant reduction in the supply of credit available to commercial borrowers. The causes were both demand and supply determined, but supply side factors were non-substantial.*

The US crisis of 1990 attracted other authors as well. Shrieves and Dahl (1995) concluded that changes in regulation and bankers' assessments of risks were likely responsible for a substantial part of the credit contraction. Brinkmann and Horvitz (1995) agree with the impact of new capital standards, but the macroeconomic impact cannot be calculated. They argue that it is unlikely that smaller banks could meet all the credit needs of the larger (capital crunched) bank customers. Peek and Rosengren (1995) highlight the fact that there is no convincing evidence of practical importance of credit crunches. Even their analysis didn't bring compelling evidence, because the data is limited. But they found evidence of the *prevailing demand factors and important capital crunch in New England* where the situation was most severe. "To address whether a capital crunch in New England has caused a credit crunch requires data not currently available." (Peek & Rosengren, 1995, p. 637). Pazarbasziogiu (1997) came to the same conclusions a few years later: „the marked reduction in bank lending during the 1990s has been mainly in reaction to a *cyclical decline in credit demand*, reflecting partly the high level of indebtedness of the borrowers" and they added: „It also appears that banks have become less willing to supply credit during periods associated with a *deterioration in asset quality*." (Pazarbasziogiu, 1997, p. 325) Hancock & Wilcox (1998) analyzed the importance of size of the banks and companies. Their results were not strong. But it seems like in regional view of US banks small banks were more reluctant to provide loans than large banks. *The credit crunch was caused by demand factors and capital crunch.*

Basel accord restrictions were tested by Wagster (1999) who investigated banks in Canada, the United Kingdom, and the United States between 1990 and 1992. Hypotheses were aimed at supply-side credit crunches, which occur when "lenders maximize expected bank profits by rejecting applicants despite their willingness to pay a higher interest rate or post additional collateral" (Wagster, 1999, p. 124). The hypotheses were voluntary risk-reduction, risk-based capital hypothesis, higher regulatory scrutiny hypothesis, and unweighted capital ratio. "Out of four hypotheses studied, *only the 'higher regulatory scrutiny' hypothesis is supported* in all three countries." (Wagster, 1999, p. 123)

Credit crunch was tested mainly in the US, but evidence comes from other countries as well. In Thailand *the credit crunch seemed to be a supply-side phenomenon*, but demand factors were not tested (Agénor et al., 2004). *Regulatory driven capital crunch occurred in Japan* in 1997. „We found that banks cut back on their lending supply in fiscal year 1997 in response to a large loss of bank capital caused by the rigorous self-assessment of assets requested by the regulator…" (Watanabe 2007, p. 37).
There were authors who summarized the latest economic crisis of 2008 without econometric assessment (Mizen, 2008; Brunnermeier, 2009). Mizen (2008) points out that innovations and state regulation played important role but the main topic is the description of the process of the crisis, which at some point resulted in credit crunch. Brunnermeier (2009) points out that *credit crunch was caused by excessive credit, due to innovations and low lending standards, and the housing boom preceded the crisis*.
The economic crisis of 2008 interested many scholars. Murphy (2009) tries to unravel the credit crunch and connect it to the lifecycle of the crisis. Although the term itself is not defined it is described as a process. Firstly, there is a capital crunch (shrinking assets, losses) of banks. In the second phase comes the state monetary policy of the quantitative easing and bailouts that leads to bankrupts of selected banks. This view is strongly supply side oriented. *The cause of credit crunch is excessive credit, which originated from financial innovations.*
Turner (2008) defines credit crunch as downturn in lending, which was precipitated by distress at financial institutions. The lifecycle of economic crisis is described and credit crunch is caused by *capital crunch of banks*. Krebsz (2011) doesn't define the term and describes the lifecycle of the latest economic crisis. *Credit crunch is a manifestation of economic crisis*. King (2011) doesn't define the term as well and causal link is not very well provided "This turned into credit crunch as lending started to dry up, which in turn shifted the focus on to the solvency and liquidity of banks." (King, 2011, p. 86).

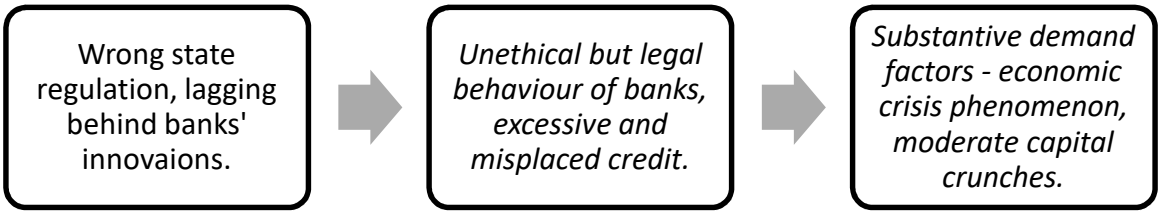


Fig. 3 – Modern perspective and the causality of the credit crunch. Source: own processing

3.CONCLUSION

The credit crunch is a term that is widely used in research but is hardly defined. Credit is identified and sometimes equated as new money in the economy. From our analysis the research of the term is narrowed to the banking sector only and the issue of credit crunch is analyzed in the context of economic crises. However, banks are also reluctant to provide credit to SMEs because of the portfolio and transaction costs. This situation does not only happen during economic crises. The issue of credit and SMEs in times of economic crises is well analyzed as well (Mulačová, 2012).
Credit crunch is a process and its roots are historical. It is a product of government failures. In this institutional infrastructure state money is controlled by the banking sector, which is allowed to introduce financial innovations and to behave unethically without severe consequences. As a result, excessive and misplaced credit is provided which leads to economic recessions. The downturn of economic activity is unsurprisingly characterized by lower demand for credit (money), i.e. demand factors always played a substantive role in the analyzed publications. Credit crunch is predominantly defined as a leftward shift in the supply curve for bank loans

(ceteris paribus). Supply factors were non-existent or at most moderate (capital crunch) and their severity depended on the region and the size of the bank. This definition is suitable for the research that can test both demand and supply factors.
This paper suggests the regulation to be separated from supply and demand factors as one separate factor, which should be analyzed at first. From the literature review, state regulation was the ultimate cause of all crunches and crises. The unethical and innovative behavior of bankers is to blame as well. But in terms of regulation their behavior characterized by excessive credit was legal or in the gray zone.
This paper is an output of the scientific work of the Institute of Technology and Business in Ceske Budejovice, Czech Republic.

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Appendix:

Tab. 1 – Input data for random enterprises. Source: Own processing based on brandfinance.com

Enterprise	Brand Value	Enterprise Value	Enterprise	Brand Value	Enterprise Value
1	47 463	155 895	**26**	19 488	185 654
2	45 812	165 151	**27**	18 964	67 064
3	39 135	241 208	**28**	18 639	63 133
4	38 319	155 189	**29**	18 619	35 634
5	38 197	199 331	**30**	18 557	96 884
6	33 214	468 287	**31**	18 231	53 475
7	31 082	83 696	**32**	18 083	73 750
8	30 044	189 232	**33**	17 919	148 323
9	28 665	94 398	**34**	17 758	107 435
10	28 379	235 495	**35**	17 559	104 207
11	27 616	203 306	**36**	17 511	194 473
12	27 597	122 741	**37**	17 096	30 606
13	26 324	359 332	**38**	17 031	153 429
14	24 461	209 855	**39**	16 809	42 347
15	23 229	133 473	**40**	16 661	63 207
16	22 910	50 527	**41**	16 598	153 267
17	22 230	102 389	**42**	16 419	297 853
18	22 021	23 867	**43**	16 391	79 885
19	21 908	113 435	**44**	16 343	116 642
20	21 707	54 454	**45**	16 320	98 674
21	21 262	96 483	**46**	15 692	55 368
22	20 902	62 521	**47**	15 464	174 952
23	20 051	65 520	**48**	15 405	487 887
24	19 969	59 551	**49**	15 392	4 968
25	19 762	79 821	**50**	15 267	52 484

Tab. 2 – Input data for enterprises from the same sector. Source: Own processing based on brandfinance.com

Enterprise	Brand Value	Enterprise Value	Enterprise	Brand Value	Enterprise Value
1	28 472	129 765	**26**	6 662	43 135
2	26 047	111 754	**27**	6 393	56 607
3	25 576	128 087	**28**	6 032	55 135
4	21 916	131 225	**29**	5 627	53 249
5	14 362	70 105	**30**	5 506	41 369
6	14 060	67 144	**31**	5 179	50 040
7	13 887	93 316	**32**	5 170	71 697
8	13 400	69 901	**33**	5 037	55 159
9	13 229	56 583	**34**	4 593	50 216
10	13 134	56 155	**35**	4 617	21 076
11	12 737	42 043	**36**	4 551	29 809
12	12 083	46 789	**37**	4 509	43 057
13	12 076	45 632	**38**	4 073	37 072
14	11 732	102 425	**39**	3 777	45 984
15	11 729	51 108	**40**	3 521	11 066
16	11 580	44 662	**41**	3 475	59 573
17	10 727	69 134	**42**	3 462	33 857
18	9 862	43 273	**43**	3 383	23 236
19	9 615	40 371	**44**	3 280	54 370
20	8 430	50 468	**45**	3 269	64 383
21	8 342	44 681	**46**	3 229	28 521
22	8 261	62 240	**47**	3 189	13 405
23	7 907	45 931	**48**	3 186	13 395
24	7 332	51 466	**49**	2 998	13 124
25	6 911	58 588	**50**	2 996	13 116

HOW TO EVALUATE INTENSITY OF A FIRM´S DEVELOPMENT

Wawrosz Petr

Abstract

The paper suggests a method for evaluating process and organizational innovation which does not require a great amount of input information—only data about company costs and revenues, which are, at least for the management of a company, easily accessible. The outputs of the method are the values of the dynamic parameter of intensity and the dynamic parameter of extensity. The first one evaluates the share of change in intensive factors on a firm's development, whereas the second one fulfils the same function for change in extensive factors. The parameters are able to describe all possible types of firm development, which are summarized in the paper. The proposed methodology is applied to Nike that is seen as an innovative company. Our analysis, however, shows that the development of most of Nike is based on extensive factors.

Keywords: Company productivity, efficiency, process and organizational innovation, intensity, extensity

JEL Classification: G30, M21, O10, O40, C33

1.INTRODUCTION

A successful firm innovates. Decision-making about how to innovate belongs to the most important areas of strategic management. But how it is possible to identify whether an innovation is viable? The answer, of course, depends on the type of innovation. It must be emphasized that there is no unique definition of innovation. We agree with the opinion declared in OECD (2010) that all innovation must contain a degree of novelty. The Oslo Manual for measuring innovation (OECD, 2005) defines four types of innovation: product innovation, process innovation, marketing innovation, and organizational innovation. This paper concentrates primarily on process innovation and partially also on organizational innovation at the enterprise level, both of which aim to increase the growth rate of a firm's output more than the growth rate of its inputs.

Generally, if a firm wants to increase its production, it has two pure ways of doing so: (i) through extensive growth, i.e., by increasing its inputs only, without any innovation or technological progress, and (ii) through intensive growth, i.e., by innovating and increasing its output without any growth of inputs. Real development usually contains some mix of extensive and intensive growth. A firm can also offset extensive factors with intensive ones or, alternatively, intensive factors with extensive ones without changing its production. If its output declines, a firm should know whether this decline is due to a fall in extensive factors or intensive factors alone, or whether falls in both factors contributed to the output decline and, if so, how much each factor contributed. The two factors can also change in the opposite direction at different rates (e.g. extensive factors can grow faster than extensive factors decline). Such development certainly affects firm´s production and a firm needs to know how. It is useful in all situations to measure and express the share of the change in intensive and extensive factors in the change in output. This knowledge is important and necessary for strategic and other management decision-making.

The aim of the paper is to introduce new simple method that is able to calculate the share of the intensive factors and the share of the extensive factors on the firm's development. The paper is

organized as follows. The first section shortly discusses usually used methods how to measure impact and efficiency innovation. The second section introduces our method of measurement of intensity and extensity for company development. The results of the method are so called dynamic intensive parameter and dynamic extensive parameter. The section discusses their possible values and what the specific value means for company development. The third section calculates the value of the parameters for Nike, which was declared the most innovative company of 2013 by the business journal Fast Company (Fast Company 2013). The section investigates whether Nike's performance really relies on intensive factors. The fourth section compares Nike's performance with the performance of some other companies which, according to Fast Company journal, rank among the top thirty most innovative companies of 2013. Conclusion summarizes main results..

2.STANDARD METHODS OF MEASUREMENT OF INNOVATION IMPACT

It is generally accepted that innovation is becoming more and more important, mainly as a result of three major trends: intense international competition, fragmented and demanding markets, and diverse and rapidly changing technologies (Wheelwright and Clark 1992; Eggink 2012a). A firm offering innovative products that satisfy the needs and wants of target customers faster and more efficiently than its competitors is in a better position to create a sustainable competitive advantage (Prahalad and Hamel 1990; Amit and Schoemaker 1993; Nonaka and Takeuchi 1995; Calantone, Vickery and Dröge 1995; O'Raghallaigh, Sammon and Murphy 2012). Competitive advantage is increasingly derived from knowledge and technological skills and experience in the creation of new products (Teece, Pisano and Shuen 1997; Wang 2011; Tidd, Bessant and Pavitt 2013).

Within this context, special attention needs to be paid to the measurement of innovation performance. However, there is no generally accepted method of measuring the innovation impact, neither on the national level nor on the company level (Alegre, Lapiedra and Chiva 2006). Relevant literature is characterized by a diversity of approaches, prescriptions and practices that are more often than not confusing and contradictory (O'Raghallaigh, Sammon and Murphy 2012; Eggink 2012b, Saunila and Ukko 2013) . We think that this situation is quite logic as we have to distinguish between different types of innovation (see introduction) with different goals and ambitions. Each type of innovation needs special approach including specific measurement methods.

In this paper, only the innovation measurement methods used at company level are discussed. One of the aims of innovation project at this level should be simultaneous growth of revenue per produced unit and reduction of costs (Wheelwright and Clark 1992; Greenhalgh and Rogers 2010; Dodgson, Gann and Philips 2014). That increases innovation efficiency. However, present used methods usually do not allow clearly to compare specific projects of different companies and to evaluate which one achieved better innovation efficiency (Eggink 2012a; Logacheva, and Kazantsev 2014). Further, efficiency should be, in the case of a company, calculated for its total performance and not only for some projects.

Other methods of innovation efficiency measurement concentrate on the output that comes from innovation (Saunila and Ukko 2013). This includes such data as new product/process announcements, new inventions and so on. If we want to measure efficiency we need to know the inputs. Expenditure on research and development (R&D expenditure) are usually used as an input and the methods try to calculate impact of this expenditure on innovation output. However, clear and direct connection between inputs and output doesn't necessarily exist. Not all R&D expenditure leads to innovation. This causes R&D to be a value that overestimates innovation (Audretsch 2004; Becheikh, Landry and Amara 2006; Greenhalgh and Rogers 2010). On the other hand, not all innovations are a result of R&D expenditure. For instance,

some innovations can be a sudden, clever idea of an innovator. Further, there may be a delay between the R&D expenditure and the innovation (Greenhalgh and Rogers 2010)). Adequate recording and tracking of R&D expenditure is not always available in all countries (LeBel 2008; Eggink 2012a).
Some studies are based on growth accounting and count the impact of total factor productivity (TFP) on firm's development (Chia-Hung 2005; Sergo and Tomcic 2006; Chang and Oxley 2009; Ray and Pal 2010; Therrien and Hanel 2011; Ay, Soydal and Yorgancilar 2013). TFP can be seen as the result of innovation activity and high value of TFP as the confirmation of innovation success rate (Barro 1999). Growth accounting was developed in the end of first half of 20th century to measure the impact of qualitative changes (technological progress) and quantitative changes (changes of the volume if labour and capital – generally inputs) on the change of output and it seems to be a good method of innovation efficiency measurement. However, growth accounting is based on many special conditions. Influence of technical progress can be calculated only for the growth of production induced by the current growth of labour, capital and technical progress and only roughly for slow rates of growth . It is further discussed (Herbertsson 1994; Čadil 2007) whether it is possible to separate the inputs on labour and capital (as in growth accounting) without biasing the result, as no factor alone can contribute to output and growth.
The method presented at this paper comes from growth accounting but it overcomes growth accounting disadvantages. Our method aggregates company inputs and uses costs as the base for measurement of efficiency. It deals with all possible combinations of extensive and intensive changes including decline of inputs and outputs. It is is therefore more widely applicable.

3.DYNAMIC INTENSIVE AND EXTENSIVE PARAMETERS AS THE INDICATOR OF FIRM´S DEVELOPMENT

A company's performance can be monitored using the relation between its inputs and output. Output can be expressed in the form of total revenue or some other suitable indicator that reflects the company's nature (e.g. revenue from sales of goods, or revenue from sales of company's products and services) - this indicator will hereinafter be referred to as *TR*. Inputs can be expressed as total costs or some other suitable cost indicator—costs of goods sold, costs associated with the company's production, etc. We will hereinafter refer to this indicator as *TC*. The ranges of the definitions for the two values are $TR \geq 0$ and $TC \geq 0$. The difference between the two values is the profit.

$$EP = TR - TC \qquad (1)$$

The quotient of *TR* and *TC* represents efficiency *Ef*, which shows the revenue per unit of costs invested.

$$Ef = TR / TC \quad (2)$$

In order to monitor the company's development over time, we use dynamic characteristics (relations shown for revenue *TR*; index 1 represents the current period, index 0 represents the period against which the current period is compared (i.e. the base period):

- absolute increase $\Delta(TR) = TR_1 - TR_0$ (3)
- growth rate $G(TR) = \Delta(TR)/TR_0$ (4)

- change index $I(TR) = TR_1/TR_0 = G(TR) + 1$ (5)

Statement (2) can be used to derive a dynamic statement for the development of revenue:

$I(TR) = I(Ef) \,.\, I(TC)$ (6)

If we wish to calculate how the development of intensive (qualitative) factors, represented by *I(Ef)*, and the development of extensive (quantitative) factors, represented by *I(TC)*, contribute to the development of revenue *I(TR)*, it is first necessary to use logarithmic calculation for statement (6).

$ln\, I(TR) = ln\, I(Ef) + ln\, I(TC)$ (7)

Statement (7) is the initial statement for deriving the dynamic parameter of intensity and the dynamic parameter of extensity. These parameters have the following form—the dynamic intensity parameter:

$$i = \frac{lnI(Ef)}{|lnI(Ef)|+|\ln(I(TC)|} \quad (8)$$

and the supplementary dynamic extensity parameter:

$$e = \frac{lnI(TC)}{|lnI(Ef)|+|lnI(TC)|} \quad (9)$$

The properties of these parameters are examined in detail in Hájek and Mihola (2009) and in Cyhelský, Mihola, and Wawrosz (2012). Statements (8) and (9) make it possible to express any type of development of the extensive and intensive factors (Mihola (2007) and their effect on the development of sales revenue (or output, as appropriate). All possible situations regarding the relation between extensive and intensive factors on the one hand and output (sales revenue) on the other hand are described in Table 1. Extensive factors still refer to factors that lead to a change in inputs, while intensive factors refer to factors that result in a change in efficiency.

Tab. 1 – Effect of changing extensive and intensive factors on the change in output
Source: own contribution

	Extensive factors	**Intensive factors**	**Output (sales revenue)**	**Value of parameters *e; i***
1.	Increase	Constant	Increase	$e = 1$, $i = 0$
2.	Constant	Increase	Increase	$e = 0$, $i = 1$
3.	Increase at the same rate as intensive factors	Increase at the same rate as extensive factors	Increase	$e = 0.5$, $i = 0.5$
4.	Increase at a higher rate than intensive factors	Increase at a slower rate than extensive factors	Increase	Both parameters positive, $e > i$
5.	Increase at a slower rate than intensive factors	Increase at a higher rate than extensive factors	Increase	Both parameters positive, $i > e$
6.	Increase; their growth rate is higher than the decline rate of intensive factors	Decline; their decline rate is lower than the growth rate of extensive factors	Increase	e positive, i negative, $e > \|i\|$

7.	Decline; their decline rate is lower than the growth rate of intensive factors	Increase; their growth rate is higher than the decline rate of extensive factors	Increase	e negative, i positive, $i > \|e\|$
8.	Increase; their growth rate is the same as the decline rate of intensive factors	Decline; their decline rate is the same as the growth rate of extensive factors	Do not change (stagnate)	$e = 0.5$, $i = -0.5$
9.	Decline; their decline rate is the same as the growth rate of intensive factors	Increase; their growth rate is the same as the decline rate of extensive factors	Do not change (stagnate)	$e = -0.5$, $i = 0.5$
10.	Decline; their decline rate is higher than the growth rate of intensive factors	Increase, their growth rate is lower than the decline rate of extensive factors	Decline	e negative, i positive, $i < \|e\|$
11.	Increase, their growth rate is lower than the decline rate of intensive factors	Decline; their decline rate is higher than the growth rate of extensive factors	Decline	e positive, i negative, $e < \|i\|$
12.	Decline at a higher rate than intensive factors	Decline at a lower rate than extensive factors	Decline	Both parameters negative, $\|e\| > \|i\|$
13.	Decline at a lower rate than intensive factors	Decline at a higher rate than extensive factors	Decline	Both parameters negative, $\|e\| < \|i\|$
14.	Decline at the same rate as intensive factors	Decline at the same rate as extensive factors	Decline	$e = -0.5$, $i = -0.5$
15.	Decline	Do not change	Decline	$e = -1$, $i = 0$
16.	Do not change	Decline	Decline	$e = 0$, $i = -1$

Row 1 in Table 1 represents purely extensive growth (parameter e equals 1, parameter i equals 0); row 2 shows purely intensive growth (parameter e equals 0, parameter i equals 1). Similarly, row 15 represents a purely extensive decline (parameter e equals -1, parameter i equals 0); row 16 shows a purely intensive decline (parameter e equals 0, parameter i equals -1). Row 8 depicts extensive offsetting (parameter e equals 0.5, parameter i equals -0.5), while row 9 shows intensive offsetting (parameter e equals -0.5, parameter i equals 0.5).

Rows 3 to 5 show intensive-extensive growth (in the given rows, parameters e and i are positive, while both parameters equal 0.5 in row 3, parameter e is greater than parameter i in row 4 and, conversely, parameter i is greater than parameter e in row 5). Rows 12 to 14 show an intensive-extensive decline (parameters e and i are negative in the given rows, while both parameters equal -0.5 in row 14; in row 12, the absolute value of parameter e is greater than the absolute value of parameter i; in row 13, the absolute value of parameter i is greater than the absolute value of parameter e). Row 6 describes extensive and de-intensive growth (parameter e is positive, parameter i is negative, while parameter e is greater than the absolute value of parameter i).

Row 7 shows de-extensive and intensive growth (parameter i is positive, parameter e is negative, while parameter i is greater than the absolute value of parameter e). This row is particularly interesting, because the company's production increases in spite of declining costs. Therefore, the decline in extensive factors is more than offset by the increase in intensive factors. Row 10 shows, according to the above-mentioned logic, a de-extensive and intensive decline, while row 11 shows an extensive and de-intensive decline. In row 10, parameter e is

negative and parameter i is positive, while the absolute value of parameter e is greater than parameter i. In row 11, the situation is the opposite: parameter i is negative and parameter e is positive, while the absolute value of parameter i is greater than parameter e.

The following should apply for successful companies: their output and consequently their profits are increasing over time, while this growth is caused mainly by intensive factors. In general, companies should aim at ensuring a positive parameter of intensity, while maximizing its value in the long run. We understand that in many areas crucial innovations have already been realized a long time ago, and current innovations are only marginal compared to such crucial ones; consequently, the dynamic parameter of intensity cannot come near the value of 1 in the case of a successful company, where production (output) and sales revenue are increasing. However, it is still true that this parameter should be positive. A negative value of this parameter in the long term (for three years or more) signals that the company is in difficulty.

Our classification demonstrates that a company's profit may be positive and increasing even though the value of parameter i is negative. This situation is shown in row 6 of Table 1 and we called it extensive and de-intensive growth—the decline in intensive factors is offset by an increase in extensive factors. Similarly, the situation shown in row 8 is also dangerous, as intensive factors are declining, but extensive factors are increasing at the same rate, thereby offsetting the decline in intensive factors. In this case, the company's output does not change. This may cause the company's management to become complacent, believing that everything is in order. Neither extensive and de-intensive growth, nor extensive offsetting are sustainable on a long-term basis. Sooner or later, the company will hit the input barrier and be unable to outweigh or offset the decline in intensive factors, a situation which may even result in its dissolution. The two situations described above clearly demonstrate that profit alone is not sufficient as a company performance indicator.

Other situations described in Table 1 may also be alarming, such as:

- the situation in row 1, with an increase in extensive factors only;
- the situation in row 4, especially if the value of dynamic extensity parameter is in long term much higher rate than the value of dynamic intensity parameter. It must be here emphasized, that value of the extensive parameter can be higher that the value of intensive parameter. But, if the value of extensive parameters is about 90 or 95 % in long run, indicates that the impact of innovations in the company is quite low.

These situations represent a risk that the company will, sooner or later, also hit the barrier to further expansion of inputs, i.e., it will not be able to generate further growth in the existing manner.

A decline in intensive factors (a negative dynamic intensity parameter) is a signal that output may fall, with a subsequent decline in the company's profit. Row 11 of Table 1 shows the situation where the growth in extensive factors cannot offset the decline in intensive factors, rows 12 and 14 show a decline in both intensive and extensive factors, while row 15 describes a decline in extensive factors and no change in intensive factors. All these situations adversely affect the company's output. A firm should pay the attention to all above mentioned dangerous or alarming situations and try such steps increasing the value of the dynamic intensity parameter.

4.ANALYSIS OF DEVELOPMENT OF INTENSIVE AND EXTENSIVE FACTORS FOR NIKE

Company Nike is seen as an innovation company. For instance journal Fast Company declared it as the most innovative company of the world for 2013 (Fast Company 2013). It has long run history; it produces in traditional area where the changes in inputs and outputs are not affected

by accidental factors. Therefore we decide to counts its dynamic intensive and extensive factors for the period 1995 – 2015. The input data for the analysis, i.e. the companies´ revenues (TR), costs (TC) and profit (EP), were taken from public available resources (e.g. magazine Fortune (Fortune 2015), company´s annual reports and its web pages). It must be emphasized that Nike's fiscal year starts on June 1 and ends on May 31. For example, the year 1996 covers the period from June 1, 1995 to May 31, 1996.
Table 2 contains the year-to-year growth rates of revenue *G(TR)* and costs *G(TC)* for Nike in the period of 1995–2012. Furthermore, we provide the calculated values of the efficiency growth rates *G(Ef)* and dynamic parameters relating to the shares of the influence of intensive factors *i* and extensive factors *e* for each year and for whole period.

Tab. 2 - Dynamic characteristics of Nike for the period 1995–2012
Source: own counting based on Fortune (2015), company´s annual reports and its web pages

	G(TR)	**G(TC)**	**G(Ef)**	**i**	**e**
1996/1995	36%	36%	0%	1%	99%
1997/1996	42%	42%	0%	0%	100%
1998/1997	4%	9%	-5%	-35%	65%
1999/1998	-8%	-9%	1%	10%	-90%
2000/1999	2%	1%	1%	56%	44%
2001/2000	5%	6%	0%	-4%	96%
2002/2001	4%	4%	1%	13%	87%
2003/2002	8%	11%	-2%	-19%	81%
2004/2003	15%	11%	4%	26%	74%
2005/2004	12%	11%	1%	10%	90%
2006/2005	9%	8%	1%	6%	94%
2007/2006	9%	9%	0%	-2%	98%
2008/2007	14%	13%	1%	8%	92%
2009/2008	3%	6%	-3%	-32%	68%
2010/2009	-1%	-3%	3%	43%	-57%
2011/2010	9%	6%	3%	32%	68%
2012/2011	27%	28%	-1%	-3%	97%
2013/2012	16 %	17 %	-1%	-7%	93%
2014/2013	7 %	7 %	0 %	7 %	93 %
2015/2014	17 %	16 %	1 %	8 %	92 %
2015/1995	**9.6%**	**9.3%**	**0.3%**	**3%**	**97%**

Statements (5) and (6) were used to calculate G(Ef); statements (8) and (9) were used to calculate the values of the dynamic parameters intensity (*i*) and extensity (*e*).

Table 2 shows that Nike attained the highest *TR* growth rates of around 40% in the first two years of the observed period—1996 and 1997—as a result of pure extensive development, with *e* = 99% and 100%, respectively. The crisis year 1998 follows, with weak *TR* growth of 4% and extensive offsetting of *i* = -35% and *e* = 65%. In 1999, TR declines by 8%, with significantly predominant negative extensity, *e* = -90% and *i* = 10%. In 1998, the company was affected by the Asian crisis. This was the key reason for the higher growth rate of costs compared to revenue in that year. The company reacted to these developments in 1999 by reducing its costs; however, the crisis also resulted in a fall in revenue. The next year 2000, revenue increased again; the growth resulted from intensive-extensive growth (*i* = 56%, *e* = 44%), Intensive factors recorded their highest share in this year.

The period of 2001–2008 was characterized by a gradual increase in the *TR* growth rate to a high of 15%, while the minimum value of the *TR* growth rate was a respectable 8% (2003). Extensive development dominated in all cases, ranging from 74% to 98%. Intensity ranged from -19% to 26%. The causes of the negative or zero value of *i* were as follows (the causal analysis is based on Nike's annual reports for the years under review):

- in 2001, problems with the sale of low-price and medium-price goods in the U.S.;
- in 2003, a higher growth rate of *TC* than of *TR*; the higher growth of costs resulted from appreciation of the U.S. dollar (USD);
- in 2007, 2012 and 2013, the growth rate of costs was slightly higher than the growth rate of revenue.

The period of 2009–2010 resembles the situation in 1998–1999. In 2009, the company was affected by the global financial and economic crisis, with a resulting decrease in the growth rate of revenue, i.e., revenue growth lagged behind the increase in costs. The next year the company reacted to this situation by cutting its costs. However, the consequences of the crisis persisted, reflected in a slight decline in revenue. A positive fact is that the rate of decline of costs was higher than that of revenue. The year 2011 indicated a return to positive development, but the result for the period 2012-2015 is a little ambiguous—the cost growth rate was in all years almost similar as revenue growth rate. The company did not increase efficiency of its inputs..
The last row (all values in the last column of Table 1 were calculated as the geometric mean of the previous columns in the given row) of Table 2 shows that the contribution of intensive factors to the average year-to-year revenue growth rate of 9.6% in the observed period amounted to just 3%, with a 97% contribution from extensive factors for the entire period under review. In the given period, the growth of Nike was almost purely extensive. In terms of process and organizational innovation, it can be concluded that the company recorded only a minor advancement. This does not mean it was not successful in terms of product and marketing innovation. However, it is very disputable to say that Nike satisfies one of the generally characteristic properties of innovation, i.e., a costs reduction and simultaneous output increase. Nike produces almost all of its products outside the U.S., while the U.S. market accounts for more than 40% of its revenue on a long-term basis (42% in 2014). Nike can rely on a cheap and available labor force, which is probably the main reason for the low value of its dynamic parameter of intensity (*i*) - Nike can easily increase its production by increasing its inputs, and thus also its costs, without a higher share of intensive factors. Its current favorable production conditions, however, could change. Nike seems to be vulnerable from the point of view of our analysis. If the growth rate of its costs were to suddenly exceed the growth rate of its revenue due to a crisis, Nike would have few ways to respond. Both the Asian crisis (1998) and the global financial and economic crisis (2009) have the same pattern: unexpected growth in costs followed by efforts to push them down. These efforts were only partially successful in the short term. The drop in the costs was always accompanied by a decline in revenue. Although the company's performance stabilized at least two years after the start of the said difficulties, it is not clear whether it would be able to cope with a large rise in costs in the event of major problems.
The company's costs are clearly affected by the exchange rate of the dollar against the currencies of the countries where Nike produces its goods. If the dollar were to appreciate for a long period, cutting costs could be insufficient. Process and organizational innovation thus seems to be the best way of offsetting the growth in costs caused by such appreciation. From

our point of view, the company should target process and organizational innovation more—such innovation could be seen as one of Nike's new strategies.

5.CONCLUSION

The paper shows how time series of basic company indicators (revenue, costs, and profit) can be used to analyze whether the change in such indicators over time is caused mainly by extensive factors, reflecting a change in company inputs, or mainly by intensive factors, with changes in the efficiency indicator. Profit as the indicator of company development is not alone able to reveal either efficiency of innovation or possible problems of company in future. If a company performance is for long run based primarily on extensive factors, a company faces the law of diminishing returns. Further extension of inputs sooner or later brings slow or no growth of output and thus, if prices of company products do not change, slow or no growth of revenue. Management of a company or its owners should therefore pay attention whether company develops extensively or intensively. There is danger, in the case of long run extensive development that company does not succeed in competitive environment. The way how to solve the danger is innovation.

There are many types of innovation and management and owners of a company need to know whether innovations are successful. The article introduced so called dynamic intensity parameter and dynamic extensity parameter that are able to indicate whether the changes of revenue and profit come from the change of inputs or from the change efficiency. So it concentrates especially on the impact of process and organizational innovations in the sense of reduction of costs, respectively growth rate of costs and of increasing revenues or growth rate of revenues. However, the parameters at least indirectly reflect product and marketing innovations too. These innovations also should contribute to reducing of costs or growth rates of costs. The higher level of dynamic intensity parameters, especially in long run shows that company manage to reduce its costs development – its growth rate of cost is lower than growth rate of revenues. It can be concluded, from this point of view, that it is successful. It is not forced to increase their prices due to higher share of the costs. Generally, the positive and appropriate high value of dynamic intensive parameters can be seen as the sign of wealthy company development. Oppositely, low positive or even negative value of dynamic intensity parameter for long run indicates extensive performance and management of a company should pay special attention not only to such values but also the reason why a company develop mainly extensively or why intensive factors do not have higher share,

The parameters were calculated for Nike as the world´s most innovative company for 2013 by journal Fast Company for the period 1995 -2015. But our analysis revealed that Nike´s development was mainly extensive. Company did not succeed in increasing efficiency of its inputs and form this point of view it is questionable whether it can be seen as an innovative company. From our point of view, management the company has to carefully think about further firm's development. Nike is now seen as "number one" in the producing of sports cloth, shoes and other sports equipment. However, different companies had position "number one" in the past. They were overcome by more successful companies, including Nike, that were able to innovate and to come with new product, process and so on satisfying consumers need. Nike operates in quite competitive environment and its position need not be guarantee in the long run, Nike certainly was able to innovate in the beginning of its history. Our analysis show, however, that development from 90^{th} is little different. Nike´s success is based too much on using cheap labor force and on the fact that it sells most of its production in developed countries when consumers are able and willing to pay higher price for a good product – it must be emphasized that Nike offers good products. But the situation can change. From the point of

view of out analysis, future of Nike can be threatened by its mainly extensive development. Their competitors can develop more intensively and reduce Nike´s market share.

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RESEARCH ON PERFORMANCE MEASUREMENT UNDER THE CONDITIONS EXTANT IN BUSINESS PRACTICE

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Abstract

Measuring and managing of business performance is a complex and difficult process, which at the present time in the theory and corporate practice pass the significant changes. The paper focuses on the presentation of selected research results related to business performance measurement carried out in Czech and Slovak enterprises during the period of 2008-2015. There is an emphasis on intermingling and seeking out of mutual associations between theoretical presumptions, previously resolved projects, and realistic observations based on the outcomes of the research conducted and the methodology used. The theoretical part of the paper provides a detailed characterisation of the current state of affairs regarding the investigated performance measurement issue. The following part of the paper defines the basic research methodology and expected contributions of the study. The aim of the paper is also to analyse and synthesize findings regarding the chosen, mainly not traditional methods and models, which have started to be used for business process performance measurement in managerial practice recently. Alternatively, some of them are only been thought of being used in practice in the future. In the final part of the paper, results of the survey are introduced and confronted with those arising from professional studies carried out especially in Germany, Austria and the U.S.A.

Keywords: business process management, controlling, performance management, performance measurement

JEL Classification: L25, M21

1.INTRODUCTION

What to measure? How to measure it? Where to measure? When to measure? These questions make measurement and control of company performance difficult. The following statement: "*What cannot be measured cannot be managed*" may be therefore considered to be the starting proposition for the problematic of Business Performance Measurement.

The traditional heavily financially-oriented management concept that predominantly works on the basis of numerical figures and on the balance sheet and accounting statements is being faced by an ever-growing degree of criticism both by academic scientists and working practice. This criticism is directed towards many differing aspects. Apart from the neglection of non-monetary indices, it points up among others, the lack of inter-linkage with strategic planning, its overly-dependent orientation on the past and on the short-term, its woefully insufficient orientation on the customer, and incorrect index points for incentives (e.g. Neely et al., 1996; Bititci et al., 2005; Zámečník and Výstupová, 2012 or Pavelková and Knápková, 2011).

Based upon these deficits, the end of the nineteen-eighties saw the first attempts to create new concepts. Professional literature written in English in the fields of Controlling and Management began to use the term "Performance Measurement" in order to describe conceptual new beginnings as well as the use of these new concepts and indices for the management of enterprises.

Currently, we are seeing the growth in significance and emphasis of a range of new success factors – for the time being, under-used in Controlling, which are mutually interlinked and inter-

dependent (these are above all the following: quality, time, costs and customer satisfaction – i.e. utility). Even Czech and Slovak enterprises are beginning to increase their efforts directed at the systematic management of these factors. Performance Measurement tools can be successfully applied to the resolution of the above-mentioned problems. For this reason, this paper is oriented on the presentation of selected research results oriented on the measurement of business process performance in Czech enterprises. The outcomes of our research studies investigation are concurrently confronted with those arising from professional studies conducted above all in Germany, Austria and the U.S.A.
Comparison of the results of our research with research carried out in Germany and Austria is based on the following facts:

- Much of this research both in the Czech Republic and Germany and Austria was implemented with the help of the Controller-Institut, Contrast Consulting Praha, spol. s.r.o. (Prague, Co. Ltd.) using a similar research methodology and mathematical-statistical methods to evaluate the results obtained (e.g., Cluster analysis).

- An important part of our sample consisted of companies with German and Austrian owners. There was therefore applied a similar management style and approach to the surveyed issue as well.

- The first phase of research (2008-2009) was based on the assumption that performance measurement is one of the main tasks of enterprise controlling (note that the article is dedicated to controlling only partially). We consider Germany and Austria the "Mecca" of European controlling.

One of the objectives of the second phase of research (2009-2011) was the confrontation with the world's leading experts in this field. Part of the results is here compared with Marr's (2003) studies conducted in companies in the U.S. In addition, almost an identical structure of questions was chosen.

2.LITERATURE REVIEW

The world of business environments in modern economies and cities has changed dramatically the way of pursuing business and depends nowadays heavily on the performance in generating and utilizing new knowledge, imagination, creativity, innovations and technologies (Kourtit and Nijkamp, 2011). In order to stay competitive firms measure, monitor, and analyse their performance (Briš and Klímek, 2015).
The research conducted by Franco-Santos et al. (2007) revealed that after reviewing 300 documents focusing on the issue of performance measurement and management of enterprise and its processes (journal articles, books, conference papers) only 17 definitions of corporate performance measurement were found. This fact clearly points to inconsistencies in the definition of this important tool of corporate management. The aim of the introductory part of the paper is therefore to analyse the approaches of professionals dealing with this issue.
The term "Performance Measurement (Business Performance Measurement, Corporate Performance Measurement or Enterprise Performance Measurement)" means the creation and use of usually several indicators of various dimensions (e.g., cost, time, quality, innovation capacity, customer satisfaction), which are used to assess effectiveness and efficiency of the performance and performance potentials of different objects in the enterprise, the so-called

levels of performance (e.g., organizational units of various sizes, staff, processes), as indicated, e.g., by Reiss (1992), Neely et al. (1995) and Gleich (1997).
Performance Measurement System define Gimbert, Bisbe and Mendoza (2010) as a set of financial and non-financial measures to support enterprise decision-making by collecting, processing and analysing quantified information regarding its performance and presented in a brief review.
Performance Management Systems are regularly implemented as balanced and dynamic solutions requiring considerable human and financial resources, and offering support to the decision-making process by gathering, elaborating, and analysing information (Vukšic, 2013).
Performance transparency in the Performance Measurement System, which the definition of performance indicators pursues, shall improve performance at all performance levels through more efficient planning and management procedures. In addition, the performance measurement is to encourage increased staff motivation and communication processes that are more focused on performance levels and relations between them, and it is further to create additional learning effect. This operational view is also complemented by Bititci et al. (1997) who define Performance Measurement as a reporting process that provides feedback to employees as a result of the activities performed in the enterprise.
From a strategic point of view, it is possible to identify two different aspects of corporate performance measurement. On the one hand, it reflects the procedures used in dividing performance criteria applied to implement the strategy within the organization (Gates, 1999). On the other hand, business performance measurement provides the information necessary to verify the effectiveness of the strategy (Ittner and Larcker, 2003).
Pavelková, Knápková and Jirčíková (2011) state that a properly designed system for performance measurement provides the basis for an effective corporate performance management system and can be used as a management tool for strategic, tactical and operational management. Bititci et al. (1997) indicate the performance measurement system as an information system that is in the heart of performance management. Lebas (1995) further states that the performance measurement system supports performance philosophy as well as performance management and the performance measurement system should include performance standards that can be key success factors criteria for the detection of deviations, etc. Lynch and Cross (1991) point out that strategic performance measurement system is based on the concepts of TQM, industrial engineering and management accounting. Otley (1999) reminds that the corporate performance measurement system must provide information that is useful for managers in carrying out their work and the basic components should be: objectives, strategies, target values, reward and information flows (feedback and feedforward).
The term Performance Measurement thus indicates methods for performance measurement and evaluation, which through the use of multidimensional scales help to assess the effectiveness and efficiency of performance and performance potentials of different objects in the enterprise (Zámečník and Rajnoha, 2015a).
Based on a critical literature review, we identified the following most frequently used methods and performance management and measurement tools (Young and O'Byrne, 2001; Neely et al., 2002; Gleich, 2002; Strack and Villis, 2002; Tangen, 2004; Wulf and Hoboken, 2006; Neely, 2007; Briš, 2013; Knápková, Homolka and Pavelková 2014; Rajnoha and Dobrovič, 2011; Rigby and Bilodeau, 2011 and others:

- Management Accounting (based on the traditional absorption costing and alternative variable costing),
- Process management accounting method (including the concepts of ABM, ABC, ABB),
- Controlling,

- Classical financial performance indicators (especially indicators of the absolute value of earnings, cash flow and profitability indicators),
- Balanced Scorecard (BSC),
- Total Quality Management (including the concepts of European Foundation for Quality Management (EFQM), Malcolm Baldrige National Quality Award, Six Sigma, Benchmarking),
- Value Based Management (VBM),
- Theory of Constraints,
- Business Process Reengineering,
- Lean Production (including JIT and Kanban concepts).

German authors, e.g., Gleich (2002) supplement these methods with additional methods, such as: Data Envelopment Analysis, Tableau de Bord, Productivity Measurement and Enhancement System (PROMES), Performance Measurement Model, Quantum Performance, Performance Pyramid, Du Pont Indicator System, ZVEI Schema, Ernst & Young Concept, Business Management Window, JI Case Concept, Caterpillar Concept, Honeywell Micro Switch Concept, etc.

In the literature, there are gradual attempts to link the selected management and performance measurement concepts (e.g., Kaplan and Norton, 1996; Young and O'Byrne, 2001; Staněk, 2003; Petřík, 2007); however, the issue is not addressed from the perspective of comprehensive and systematic theoretical and methodological solutions.

Nowadays company managers utilize a number of concepts for the management of performance including Balanced Scorecard (BSC), Economic Value Added (EVA), Benchmarking and many others (Chodúr, Pavelková and Knápková, 2011). Menšík, Petera and Wagner (2012) deal with Performance Measurement and management Systems with focus on BSC and they found statistically significant difference between BSC adopters and BSC non-adopters as for utilization of Activity Based Management.

Sujová, Rajnoha and Merková (2014) confirmed that one of the conditions to maintain the competitiveness and performance of the company is the ability to work properly and timely with information not only about past and present, but also especially about the future.

3.RESEARCH OBJECTIVES AND USED METHODOLOGY

This paper sets out to present selected results and outcomes of three following research studies oriented on the mapping of the current situation in the field of activity performance measurement using Controlling in Czech and Slovak enterprises during the period of 2008 - 2015.

Our first research study (2008 – 2009) was oriented on encouraging and determining responses to questions which characterise the situation extant in the field of the evaluation the quality of the performance of the Controlling function in the enterprises we investigated. Our aim was above all to monitor the current situation regarding the given field of problems and issues in Czech and Slovak enterprises and, at the same time, equally to discover the potential opportunities, possibilities and interest of those questioned regarding their future implementation in the business practices of these enterprises.

The research study we undertook sought for answers to the following basic questions:

- What is the current state of affairs pertaining in the fields of performance measurement and evaluation and the optimalisation of the Controlling processes in the everyday practices of Czech and Slovak enterprises?

- Is the measurement and evaluation of the enterprise's process ranked as one of the fundamental tasks of the enterprise's Controlling activities?
- What indices can (best) be used to realise such measurement and evaluation activities?
- Does Performance Measurement (i.e. Controlling) contribute to growth in the enterprise's value?
- If yes, how and in what ways can this contribution be quantified?

The research study took place in two phases – the quantitative and the qualitative. Herein below, we will outline the results and outcomes of the quantitative phase.
In order to be able to create a sample, we used a technique based upon the Random Selection Method – i.e. a targeted selection. While the random selection method does not guarantee in and of itself the true representative nature of the sample, and also makes generalisation on the basis of the attained results more difficult – it is, in essence, the only way to acquire certain "sensitive" data. This research study included individuals or enterprises of other organisations that the researchers considered to be suitable for the purposes of this research study.
The user data-base of the company - Controller-Institut, Contrast Consulting Praha, spol. s.r.o (Prague, Co. Ltd.) was used for the purpose of identifying and selecting appropriate respondents. This database was deliberately chosen with a view to the character of the problems and issue to be resolved and to the narrowly sector-specificity of the investigative questionnaire – which presupposed (counted on) the existence of a Controlling department within the enterprises and organisations under investigation and which this database guarantees. The people addressed by our questionnaire were the Heads of the Controlling
The questionnaire was sent out to all of the above-mentioned 748 enterprises and organisations. We received 59 completed questionnaires. Relevant data for quantitative investigative purposes was contained in 56 of these questionnaires. Therefore, the so-called "return rate" amounted to not quite 8 %. We can therefore classify this as being a very low response rate. It is however necessary to take the very narrow orientation of the questionnaire into consideration as well as the "sensitivity" of the data under investigation. Were we to compare this response rate with similar research studies in the field of Controlling either in the Czech Republic or in Germany or Austria, we would begin to see the achieved rate in a somewhat different light. The Controller – Institut company shows a response rate of about 10 % for similar research it has conducted. Eschenbach (2004), mentions a response rate for research conducted in the field of Controlling in German-speaking countries for the period 1976 – 1993. This was within the range of 7 % to 47 %. These research studies were however much more general in their character and nature.
The actual subject of our first research study was therefore the 56 Czech and Slovak enterprises and organisations who filled in and returned our questionnaire and which were part of the Controller-Institut, Contrast Consulting Praha, spol. s r.o. `s database. The conception of the analysis of the individual responses to the questions was oriented on the determination of the basic indices for a given set – i.e. the absolute and relative frequency of the chosen distinguishing features. The results are presented in a descriptive, graphical form, accompanied by a statistical analysis.
Very similar research was performed during 2009 – 2011. In that time, the one of authors was a research team member of the grant project GACR 402/09/1739 (The Creation of a Model for Measurement and Management of Company Performance). Within the project an extensive questionnaire survey was carried out which was attended by 402 companies from the whole Czech and Slovak Republic. The outcomes consist of the ways how enterprises measure and manage their performance and of the level of their satisfaction with the concepts used for

performance measurement and management. The structure of the questionnaire was focused on the same objectives as in 2008 – 2009.
The achieved research results were further compared with results of the following surveys carried out abroad, for example:

- "Management Tools and Trends" studies by Bain & Company represent an overview of the management tools that are being used and the satisfaction of managers with these tools from 1993 to 2010. The survey is conducted regularly every year worldwide. The last questionnaire survey was carried out in 2010 (Rigby and Bilodeau, 2011) and reflects the behaviour of enterprises in 2010. Questionnaires were completed by managers of 1 230 firms from different sectors. They were focused on the use of 25 management tools.

- The study "Business Performance Management: Current State of the Art" was prepared by Bernard Marr (2003) based on the results from the questionnaire survey that was performed in 2003. Within the survey, data from 780 large U.S. companies were obtained. This study responded to the fact that only a few reliable studies have documented the status, common practices and benefits of corporate performance measurement.

The main goal of the third stage of our research (2012 – 2015) was to analyse the utilization rate of traditional and modern indicators, methods and models of an enterprise performance. This was done on the sample of randomly chosen enterprises and organisations in various industrial branches of the Czech and Slovak Republic. Based on the relevant mathematical and statistical methods, we are to identify causally subsequent connections and then determine their impact on an enterprise performance reached.
For the purpose of research, also due to the goals set, we decided to collect the data and information needed through an extensive on-line research questionnaire. In total, more than 1,500 enterprises and organisations were addressed via e-mail or phone communication, and above all by means of a directive interview. In the end, 164 enterprises and organisations filled in the questionnaires that were subsequently examined. Rather law rate of return is caused by the unwillingness of business entities, their negative attitude and scepticism regarding economic trends, lack of time, law interest and the like. Even though, we consider the research sample of 164 enterprises and organisations relevant with having a sufficient indicator value.
Data from three questionnaire surveys has been analysed in the research in order to get better and more accurate results and also because of a need to compare the evolution of the researched indicators. Table 1 shows the structure of statistic file.
When classifying businesses according to their sizes, the recommendation of European Commission 2003/361/EC dated 6 May 2003 (plus taking into account its modification from the year 2005) was used. The stated characteristics regarding the size of businesses (see Tab.1) fully correspond with the research goal focusing on small and medium- sized enterprises mainly (having annual turnover up to 50 million EUR).

Tab. 1 – Structure of the researched enterprises. Source: own study

YEAR/ENTERPRISE CATEGORY		TOTAL	RELATIVE
2008-2009			
	Micro	5	8,93 %
	Small	16	28,57 %
	Medium	17	30,36 %
	Large	18	32,14 %
2009-2011			
	Micro	40	9,95 %
	Small	109	27,11 %
	Medium	144	35,83 %
	Large	109	27,11 %
2012-2015			
	Micro	36	21,95 %
	Small	85	51,83 %
	Medium	21	12,80 %
	Large	22	13,42 %

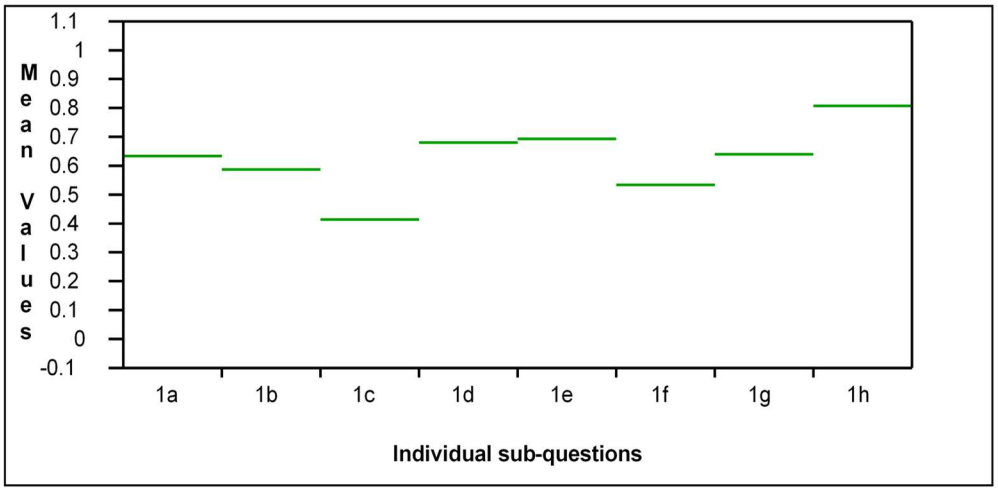
4.RESULTS AND DISCUSSION

This section contains the results and outcomes of our evaluation of the introductory part of the questionnaire, which were targeted on the discovery of the basic areas requisite for the successful measurement and subsequent evaluation of the performance of an enterprise's activities (i.e. of its Controlling) processes. The intent was to discover whether the enterprise/organisation in question applied Process Management techniques, evaluated its processes with the aid of pre-defined indices, what measurement and evaluation tools it used for the measurement and evaluation of their performance, etc.

Tab. 2 – Evaluation of Question № 1 in the questionnaire. Source: own study

	YES	NO
a) Has your company created a (complete) list of all of its processes?		
b) Are all of its activities a component of one of these company processes?		
c) Does each company process have its own defined indices, by means of which this process is measured and evaluated?		
d) Is there a set periodicity to the recording of the values of the given indices?		
e) Has responsibility for the evaluation of the given indices been allocated/defined?		
f) Have correctional measures been set in place to counter exceeding the set values for these indices?		
g) Does data regarding the cost of company processes exist for the last accounting period?		
h) Does company performance evaluation serve as the basis for its improvement?		

The first question in the questionnaire had a general orientation on the use of Process Management in the companies being analysed. This question is composed of a total of eight sub-questions (1a – 1h, see Table 2 above). In the course of the statistical evaluation, consideration was taken of the size of the company in question (1 – micro-enterprise, 2 – small enterprise, 3 – medium-sized enterprise, 4 – large-scale enterprise). This form of designation was used throughout the questionnaire for all of the other questions.
The results and outcomes of the analysis of the first question are presented with the aid of Figure 1, which only depicts a summary of the values for the whole multiple of the enterprises/organisations under investigation (i.e. the mean values for the individual sub-questions and the size of the enterprises/organisations are designated for their positive response).



Sub-question	Size				Overall Average
	1	2	3	4	
1a	0,60	0,50	0,76	0,64	0,63
1b	0,80	0,31	0,65	0,72	0,59
1c	0,60	0,25	0,53	0,39	0,41
1d	0,60	0,50	0,82	0,72	0,68
1e	0,60	0,50	0,76	0,83	0,70
1f	0,40	0,31	0,59	0,72	0,54
1g	0,40	0,50	0,71	0,78	0,64
1h	0,60	0,63	0,94	0,89	0,80

Fig. 1 – Relative frequency of responses – Evaluation of Question №. 1. Source: own study

As is clear from Figure 1, 63 % of the analysed enterprises/organisations have already created lists of all of their company processes. 59 % of the v questioned indicated that all of their activities are components of some other process. Despite this fact however, only in 41 of these enterprises/organisations has each of these company processes been allocated a defined index by means of which these processes are measured and evaluated. 68 % of these enterprises/organisations regularly record the values of the given index, and for 70 % of these enterprises/organisations, responsibility for the measurement and evaluation has also been allocated. 54 % of the enterprises/organisations we investigated set corrective measures for cases where the set values of a given index have been exceeded. The costliness of a given process is tracked in 64 % of these enterprises/organisations, and for 80 % of them the measurement and evaluation of its processes serves as the basis for their improvement.

The process survey was repeated in 2011 with the following results: 41% of enterprises in the Czech and Slovak Republic have a defined indicator for each business process by which they measure and evaluate. It was confirmed that larger enterprises have more often defined indicators to measure the effectiveness of the business process (large enterprises have defined indicators in 48%, medium in 45%, small in 36% and micro in 24%). 59% of enterprises in the Czech and Slovak Republic have the periodicity to record values of the given indicator and defined responsibility for the indicator evaluation. Again, it was confirmed that recording values and responsibility is defined more frequently in larger enterprises. Roughly half the enterprises have established corrective measures when exceeding the indicator. In this case, the corrective measures are often set by large enterprises (large enterprises 68%, medium-sized enterprises 59%, small enterprises 37% and microenterprises 19%). The process cost data are available in 69% of enterprises. The results are similar for small, medium and large enterprises, only in the case of microenterprises the knowledge of the process cost data is lower and reaches 48%. Evaluation of business processes is used in 73% for their improvement.

We would also like to mention that we will make use of the overall results of Günther and Grüning`s research study regarding the extent to which performance measurement systems (further PM systems) are in use in German and Austrian enterprises and organisations (the subject of this piece of research study conducted in 2000 was the 123 German and Austrian enterprises and organisations).

In 2000, 36 % of German and Austrian enterprises and organisations already made use of PM systems in their working practices, while 17 % of the enterprises and organisations were in the implementation phase of some sort of PM system. 15 % of the enterprises and organisations at the time were investigating the possibilities and opportunities of using one or more of these systems in their enterprises and organisations.

20 % of the investigated enterprises and organisations mentioned that they used another system for measuring and evaluating the performance levels of their processes. The most frequently mentioned were the ISO 9001 and 14001 norms and the EVA indices for value-added. Furthermore, enterprises and organisations usually make use of a set of their own specific indicators for these purposes. One of the enterprises and organisations we investigated indicated that it used the Variable Costs Method and the Surcharge/Mark-up Calculation Method (Günther and Grüning, 2002)

The research conducted in 2009 - 2011 showed that the most common reason for the implementation of a system of performance measurement and management of enterprises in the Czech and Slovak Republic is strategic planning (average evaluation 4.11), a need for controlling (average evaluation 4.10) and motivation and remuneration (4.04). Significant factors for the implementation of the performance measurement and management system can be seen in the need for communication (3.84), daily decision-making (3.75) and strategy verification (3.59). Managing relationships with stakeholders (3.21) and statutory duty (3.23) are in terms of the importance of corporate performance measurement perceived as less important (evaluation scale: 1 - insignificant reason, 5 - very important reason).

In Marr's (2003) research, the most important reason for the performance measurement and management was the need of business management (30%), strategic planning (19%), daily decision-making (18%) and strategy verification (12%). Less significant reason for the performance measurement and management was communication (8%), motivation and remuneration (7%), managing relationships with stakeholders (3.5%), and statutory duty (2.5%).

In the third stage of our research (2012 – 2015), we present the selected results regarding financial performance of enterprises based on traditional and modern indicators of an enterprise performance. Each one out of 164 enterprises examined use some type of a traditional financial indicator, most often a combination of these. Out of all the enterprises, there are following

numbers regarding the financial performance measurement. 139 enterprises (85%) measure it by means of various forms of profit, 90 enterprises (55%) by means of cash flow, and 58 enterprises (35.5%) by means of profitability. It is essential that each business entity monitors all these indicators together because each of the indicators assesses certain aspect of an enterprise performance (economy, solvency, etc.) This is the principal requirement regarding financial performance measurement. However, only 35 enterprises (21.5%) meet such requirement. As emerged from the research, the enterprises and organisations had followed, or at least once had used the following modern indicators regarding financial performance:

- EVA – Economic Value Added
- MVA – Market Value Added
- CFROI – Cash Flow Return on Investment
- KPI – Key Performance Indicators

40 enterprises (24.5% out of all the enterprises) use the EVA indicator, 15 enterprises (9%) use the MVA indicator and 3 enterprises (2%) use the CFROI indicator. 1 enterprise uses the system of key performance indicators KPI. Due to various combinations, just 53 enterprises (32%) monitor, or at least once have used modern indicators of financial performance. 111 enterprises (68%) do not monitor any indicator at all (Zámečník, Rajnoha, 2015b).
We also examined whether it is possible to see any connection between monitoring modern indicators and return rate of capital employed. The group of enterprises with return of capital employed 7 – 10% (50%) has the highest proportion of monitoring the modern indicators, whereas in other groups this does not cause any significant changes. Even the group of enterprises with negative profitability shows a slightly higher proportion of using modern financial performance indicators (32%) than the group of enterprises with the highest return rate of capital employed which is more than 10% (31.5%). Regarding these results, it is not possible to draw any relevant conclusions.

5.CONCLUSION

Today´s world brings in many new pulses for enterprises not to focus on well-established performance management tools used in the past. There is an obvious need to use new methods of performance management within strategic oriented management.
Comparison of results of different field surveys has its advantages in comparing different researches and enriching discussion of results of individual researches. On the other hand, there are very serious limits and difficulties arising from different samples of enterprises (their specialization, size, "age", etc.) within each survey. Another problem lies in different approaches to understanding the performance of companies, not only from the theoretical conception but also from the perception of the business managers themselves.
The outcomes of researches focused on performance measurement and management of enterprises in the Czech and Slovak Republic and their comparison with researches in the world confirm that although firms in the CR and SR have been gradually accepting a number of concepts and tools to measure and manage performance and are more familiar with them and apply them as well, the strong majority of their usage is still limited in comparison to the rest of the world. An important tool for the performance measurement and management in most companies are financial indicators. A number of especially large firms use outputs from the management accounting and controlling; a high utilization rate is also evident in quality management tools.

Another part of our research (2016-2017) is aimed at identifying synergetic effects between the individual concepts of Performance Measurement and Management that were identified in the previous phase of the research.

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HOUR COST TARIFF METHOD – A SIMPLE TOOL FOR MANAGERIAL USE

Zralý Martin

Abstract

The paper deals with a simple but powerful managerial tool named Hour Cost Tariff (HCT) Method and its alternatives, for a different application conditions, after their last completions. The HCT-Method links together the indirect, mostly capacity, costs of the enterprise entities, which are summarized in the operational budget, with their utilized time capacity. The HCT-Method offers wide application in enterprise management control system, primarily in time oriented applications. They are three major application areas, where it acquits oneself well are (1) as a cost-capacity measure of each entity, (2) by product costing - it offers plausible allocation of the indirect costs and (3) in motivation schemes, in relationship to the staff responsibility for the size of the cost items and capacity utilization. But there are many other implications of HCT-Method utilization, namely in the relation to the Target Costing, Investment Decisions, etc. The key application features of the HCT-Method are mentioned, namely the quite original, for specific conditions developed, the Controlling alternative which is based on a comprehensive statistical theory. The latest version of the Model-3P is briefly described, as well.

Keywords: performance, costs, capacity, hour cost tariff method, controlling alternative, decomposition of the statistical indexes, activity, process, managerial tool, time measures.

JEL Classification: M21

1 OBJECTIVES OF PAPER

There are two major objectives of this paper. Firstly, to refresh understanding of the Hour Cost Tariff (HCT) Method which is unfortunately not widely applied despite its beneficial managerial effect brought by its application.
Secondly, to summarize its contributions to the Enterprise/Institution Management Control, not only for the area of Activity Based Cost Management - see Cokins, G. (2001). HCT method described in this paper reflects the most recent research innovations. To its alternatives, for specific application conditions, belongs also a quite original, specifically developed the Controlling alternative of the HCT-Method which is based on a comprehensive statistical theory. The method of the decomposition of the statistical indexes was applied by its developers – see Belsley, D.A., Kuh, E. and Welsch, R.E. (1980), Belsley, D.A. (1991), Whittaker, J. (2009). Application of this specific, originally developed alternative of the HCT-Method, offers extensive managerial application, through the incorporation factors such as productivity, unplanned time losses, capacity time utilization and possibly also other factors, according to the application conditions, together with the costs of operational budget.
Enterprise Management Control is getting more and more time-oriented and focuses on the concerned activities, processes and resources - see e.g. Cokins, G. (2004), Drucker, P.F. (2005), Horváth, P. (2002), Kaplan, R.S., Anderson, S.R. (2004), Fotr, J., Švecová, L. (2010). Time measures are one of the key measures of recent management control. Time as an exact, measurable characteristic has an essential role in entrepreneurship since its very beginning. However, the role of time control is rapidly increasing in recent period due to permanently

growing influence of some important factors. Probably the most influential are increasing costs of resources (human, tangible, intangible) and at the same time even more rapidly increasing productivity of these resources. With the increasing costs of the resources, their time is getting more expensive. That is one of the reasons why to emphasize the role of their effective time utilization and in some cases even searching after the time optimization. The other very important factor is the controllability of the time. Cost optimization focuses primary on two time characteristics: the time consumption per production unit (minimizing) and the capacity utilization expressed in hours (maximizing).
In this paper, the focus is on in which way to control the role of a time in linkage with other key factors, namely the size of the unit costs of activities, processes, centers or even resources, but also of the other entities, and finally on the unit costs of a product. Namely the linkages among time, capacity of the resources and their costs are considered in relation to the activities, processes, products and at the end to the enterprise performance. The core contribution of the Hour Cost Tariff Method application lies in its support to transparent management of these linkages. Besides the basic alternative of the HCT-Method, three other alternatives are introduced to make the HCT-method more fit to different types of the activities and processes and to specific managerial requirements.
Application of the HCT-method closely corresponds with the recent emphasis on the activities (Activity Based Management Approach) and on the processes based management control – see e.g. Cokins, G. (2005), Zralý, M. (1999).

2 STORY OF DEVELOPMENT AND APPLICATION OF HCT-METHOD

When I started my own consultancy work in the Enterprise Management Control (MC) area in the nineties, I soon recognized the weaknesses of the used product costing methods at that time – see e.g. Johnson, H.T., Kaplan, R.S. (1991).
Inspired by prof. Vysusil, I began to seek inspiration in publications of the leading managers of the top Czechoslovak enterprises in the in the twenties and thirties of the last century. The consequence of this searching as a result of this research, first version of HCT-Method (at that time labeled as the Hour Overhead Tariff Method) was created. My first application in the enterprise took place just in Zlin (what a coincidence) for the ZPS Company in 1993. It was a starting, very simple application.
Many other application projects implemented by my team followed since that time. These implementations in enterprises or institutions contributed to the practical verification of the HCT-Method and to its development and further adjustment for practical application. Above mentioned projects were focusing either on HCT-Method application only or the HCT-Method was a part of complex solution delivery of the enterprise management control system. Also, consultancy with many other practitioners in enterprises, where I was invited, debates with participants of my external courses contributed to the formation and configuration of the recent form of the HCT-Method as well. Further adjustments were made after discussions and reviews on the international forum, namely by Gary Cokins, prof. Horváth and prof. Kaplan. At last I must mention the discussions with my students at the university during the lectures or during working on the student's thesis or doctorate dissertations.
Wider research was enabled by the GACR research project, which I had the privilege to lead – see Zraly, M., et. al. (2005): First version of the software models for illustrating the HCT-Method was prepared within the context of this project. One of the later versions of the software model called, Model-3P, is now in the third version and, is shortly introduced in paragraph 5.

3 HOUR COST TARIFF METHOD – WHAT IS IT ABOUT

HCT Method and its alternatives are simple but powerful managerial tool, which supports the above-mentioned linkages - see Zralý, M. (1995), Zralý, M. (2007). The key point of this brief explanation of the HCT-Method is to show in which way the HCT-Method can contribute to the effective time control and consequently to the cost control and thus assist in fulfillment of performance management requirements. The application of the HCT-Method in management control system leads to integration of the capacity costs of the used resources (as they are summarized in the operational budget) and their time capacity, expressed in time units for each enterprise entity, for which is HCT calculated into one measure (indicator). Note: Capacity costs keep mainly the character of the time fixed costs.
The basic element of the HCT method is a rate of an entity capacity costs (COSTS) in financial units [CZK, €, $, etc.], which are the numerator of the rate and the capacity (CAPACITY) of the entity in the time units [hour, or also 100 min.], which is put in the denominator of the rate.

$$\mathbf{HCT} = \frac{\mathbf{COSTS}\,[\mathrm{CZK}, \$]}{\mathbf{CAPACITY}\,[\mathrm{hours}]}$$

This rate can be constructed for whichever entity of the enterprise/institution managed system. This rate, is in the terminology of the HCT-Method called tariff. The HCT is calculated either as planned/budgeted or as an actual one. For planned/budgeted HCT the numerator includes mostly the sum of the COSTS stated by the operational budget for the designated entity. And the denominator includes planned CAPACITY for the same designated entity. The actual HCT is constructed from the actual size of the costs and the actual number of the hours used.
The entity is a common name for a component type of managed enterprise system, such as a process, activity, center, department and in specific cases also a single resource, workplace, profession, worker, etc.
Hour Cost Tariff is an integrated cost-time-capacity measure for designated entity. It is used for many managerial purposes, primarily for plausible product costing, but it has many other important utilizations. Paragraph 4 contains further description of this issue.
Recently HCT is calculated preferably for activities and processes, rather than for centers or departments. That responds recent orientation on the activity and process oriented enterprise management control system – see Cokins, G. (2005), Zralý, M., et. al. (2005), Zralý, M. (2007).
HCT does not include direct variable costs and in most cases also does not include mostly direct fixed costs because of the following reasons:

- Direct costs can be allocated directly to the cost driver (product, part).
- Direct costs often differ significantly for each modification of the basic version of the product.

3.1 Alternatives of HCT-Method

As a result of continuous research, prototyping and practical verification in real business environment, specific alternatives of HCT derived from the basic one as described above. Basic alternative has one common hour cost tariff for each entity. Three other specific alternatives, which can fit better some specific managerial needs, derived from the basic version. These are:
(a) Items alternative
(b) Vertical alternative
(c) Controlling alternative.

(a) Items alternative

- One figure of the costs in the HCT of a designated entity is itemized into more partial items, e.g.: depreciation (lease costs), personal costs, overhead material costs, maintenance costs, other costs. The number of items can be the same as the number of items in the operational budget of the designated entity. But for practical purposes more aggregated versions with only few items (4 - 8) are mostly used.
- Managerial benefit: Reasons for application of this alternative are mostly driven by managerial request to know more exactly:
  - What is the size of each partial cost item.
  - What is the cost-size responsibility of the responsible manager of the entity.
  - Which items are unchangeable in a short time period (e.g. depreciation, leasing payments) and which are manageable (e.g. overhead material, some service costs).
    How much can a change of a single changeable item (e.g. personal costs) influence the total HCT size.

- Application of this alternative is reasonable in case of high sized HCT (expensive numeric machine, expensive software + hardware equipment, …)

Conclusion: Items alternative offers more detailed information about the single cost items in which the total HCT is split. It is a bit more labour intensive than the basic alternative, but with a higher managerial utilization in planning and assessment process.

(b) Vertical alternative

- **No common HCT for a designated** entity is set, but the HCT is split into mostly two partial HCTs (into two levels of the HCTs), each of them characterizes a distinct part(s) of the entity. The most common solution for the manufacturing process is that the entity is split into single workplaces (machines or a group of machines) and into common parts of the activity/process/center. Each single workplaces and common parts have its own HCT. Another used variation, e.g. for engineering, research or development activities/teams is as follows: HCT of a single worker (or groups of workers, profession), if each of them is linked with the significantly different costs or capacity utilization and HCT of the common costs of the team/activity.
- Managerial benefit: Managerial reasons for application of this alternative are linked to these requests:
  - To know, what is the size of the HCT of each part of the entity in case that these parts significantly differ in costs and/or capacity utilization. That is important for innovation decision-making or decision-making on purchasing/sale of cooperation or services, which is linked only with this part of the entity.
  - To be able to plan and assess the HCT of each part of the entity autonomously, not to operate with the average HCT of the whole entity.
  - To make the product costing more precise, if the product is developed or manufactured on specific (and expensive) workplaces.
- The major areas for application in an industrial company are two: Expensive manufacturing centers or processes and research and developmental activities, teams, centers and processes. Generally expressed: Major benefit can be expected by applications, where within one entity (activity, process, center) are partial entities (workplaces, machines, staffers) with either significantly different costs or capacity

utilization or with both. Also, if these partial entities can be applied also for different processes.

- Application in the manufacturing center or process is reasonable if:
  - There are specific and expensive workplaces (machines).
  - Costs and/or capacity utilization of the workplaces (machines) in the center differ significantly.
  - It is reasonable to use some workplaces (machines) in a different mode than others. For example, for different processes and in different capacity scope.
- In the development, research, design or consultancy department or process: Staff is divided into more groups (senior consultant, junior consultant, assistant consultant) based on their costs and production capacity.
- Application in the development, research, design or consultancy department or process is reasonable if there are significant differences in personal and equipment costs and available capacity.

- For product costing the following relation can be used:

Indirect costs allocated to the k-th product:

$$\mathbf{PROC-COST_k} = \sum_{i=1}^{n} \sum_{j=1}^{m} (\mathbf{t_{kij}} \cdot \mathbf{HCT_{WKPj}}) + \sum_{i=1}^{n} (\mathbf{HCT_{CTRi}} \cdot \sum_{j=1}^{m} \mathbf{t_{kij}})$$

where:
$PROC\text{-}COST_k$ calculated process/activity costs to the k-th product
t_{kij} time consumption (laboriousness + other needed time, like workplace preparation, etc.) of the k-th product at the j-th workplace in the i-th center
HCT_{WKPj} hour cost tariff of a j-th workplace
HCT_{CTRi} hour cost tariff of the common indirect costs in the i-th center

Indexes:
i … activity/process/center
j … workplace/staff member/machine
n … number of the activities/processes/centers
m … number of the workplace/staff members/machines in each of the activity/process/ center

This alternative offers a very truthful indirect process costs allocation. It uses the hour costs tariffs, which are created because of strict allocation of the costs and capacity to the entities or parts of them, according to the real conditions.

Conclusion: Vertical alternative is proportionally laborious to the number of subjects, which have its own HCT - but it is a very precise method for integrated capacity-cost assessment of the entities, as they are very expensive centers, processes, activities, workplaces, workers, etc. and for an accurate approach to product costing if it is required.

(c) Controlling alternative (CA)

Controlling alternative of the HCT-Method is the most sophisticated alternative of the HCT-Method. It offers a possibility to identify the size of influence of the partial decisive factors

causing the deviation of the actual HCT size from the planned one. This alternative has an ability to determine how influential are the single key factors, which can affect the size of the HCT deviation between its planned and actual value.

Which factors can be considered? The answer is evident from the basic relation of the HCT: Costs and capacity factors. In each application, an analysis can be done to identify the factors, which are decisive for the size of the deviation. The practical condition for factor selection is: It must be measurable. In practice the emphasis is on the partial factors influencing capacity utilization. The total value of the costs is behaving in a very fixed way. Partial decisive factors influencing the size of the costs are traditionally assessed by regular cost budget evaluation. That is the reason that in practice the major concern is on the capacity factors. Prototyping and real practical application confirmed it. As the factors determining the difference between the planned and actual capacity, the most often the factors like higher or lower utilization of the total planned (available, expected) scheduled working time (higher or lower), unplanned time losses and higher or lower productivity are considered. If the number of workers (staff) is changing significantly, then the total planned scheduled working time splits into two factors: number of workers and average working time of each worker.

Managerial benefit: Direct identification of the decisive factors and their cost size influence the deviation between the actual and planned value of the HCT. That is a significant information for managerial decision-making in following areas:

- What to do to support positive trends caused by decisive factors and to reduce negative impact of these factors.
- Application in staff motivation.
- Decisions on possible changes in the set of the decisive factors (add or omit some of them).

Theory in background: The comprehensive method of the decomposition of the statistical indexes – see Belsley, D.A., Kuh, E. and Welsch, R.E. (1980), Belsley, D.A. (1991), Whittaker, J. (2009).

Other notes:

- Graphic presentation of the factor's influence is helpful and makes results more understandable.
- Only influential factors should be considered.
- The credibility in recording actual values of variables required for identification of factor's influence must be obtained.
- If the influence of some factor is getting less significant, the factor should not to be considered any more.
- If any factor has a dominant position, then it can be effective to think about splitting it into more partial factors, if it is reasonable.
- It is useful to make assessment of the figures, including the deviations, on the monthly and cumulative (= since the beginning of the period - year) base.

See the simple controlling application of a four factors case in paragraph 3.2.

3.2 Illustration of HCT-Method: Controlling Alternative

A brief illustration of the HCT-Method-Controlling alternative is included in this paragraph, to show the managerial effect of its application. The illustration is done on the case of an Engineering team/department/activity (Eng-team).
In this case the HCT is calculated for the Eng-team in the planned size of 160 €/hour. The actual values of the HCT and its deviations are recorded for 6 months.
Four factors that are expected to significantly influence possible difference between the planned and actual value of the HCT are considered:

- Utilization of the working time (of the available capacity).
- Unplanned time losses.
- Productivity.
- Cost deviation.

Brief explanation of the factors:

- The first factor - Utilization of the working time, which is planned (scheduled, expected) for this entity (working time - scheduled) is considered as the first factor influencing HCT. In fact, the actual number of the hours will differ from the scheduled (planned, expected) working time. This factor expresses, how much the deviation between the planned and actual utilization of the working time will influence the HCT size. This deviation can be positive - causing a decrease in the HCT size - if the number of the working hours is higher than planned ones or negative - causing an increase in the HCT size, if the working time utilization was lower than planned.
- The second factor measures the specific influence of Unplanned time losses on the size of the HCT. Unplanned time losses may be a part of the previous measure, but also can be autonomous, as in this case. Practical application confirms that it is highly useful to distinguish between the deviation of planned time losses, which are considered in the framework of the first factor and the unplanned time losses, which are not expected, which are undesirable, e.g. if the components for operation (e.g. assembly) are not prepared in time or if the worker is not prepared at the workplace in time, etc. The deviation in this case can only be zero or negative.
- The third applied factor is linked with the level of Productivity. Productivity, which is expressed as the rate between planned (expected) time of actions and the actual time duration of the actions (the time spent for the actions). It reflects the fact of a faster or slower actual work duration in comparison to the planned time (standard time, time expectation). Deviations in both directions can occur. Faster work has a positive influence on the HCT (HCT decreasing), slower work negative (HCT increasing).

The sum of the deviations of these three factors together determines the total deviation caused by the capacity factors for this entity.
The fourth factor is Cost factor, which reflects the influence of the difference between the planned (budgeted) costs and actual costs on the HCT size. Higher size of actual costs than budgeted naturally influences the HCT size negatively (HCT increasing). Lower size of actual costs than budgeted, influences the HCT size positively (HCT decreasing).

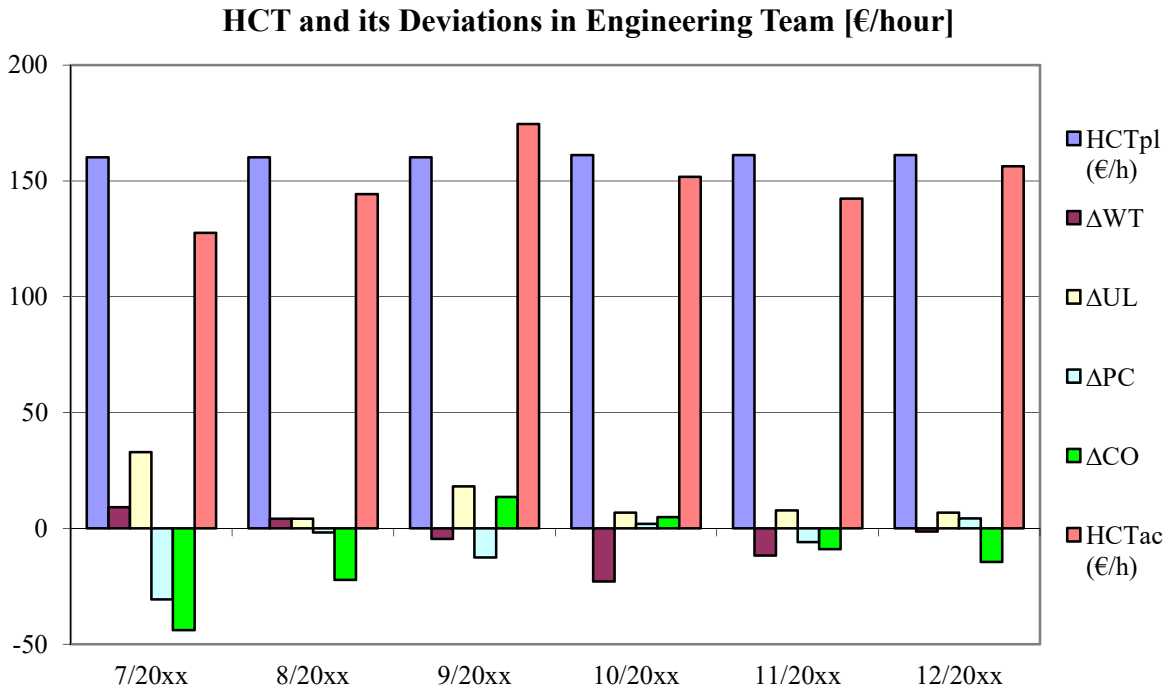


Fig. 1: HCT planned and actual and its deviations in Engineering Team. Source: Author.

The result of the application of the Controlling alternative in this case may be illustrated in a table form (not included due to limited scope of the paper), and graphic form – see Fig. 1. where absolute and deviation figures are presented.

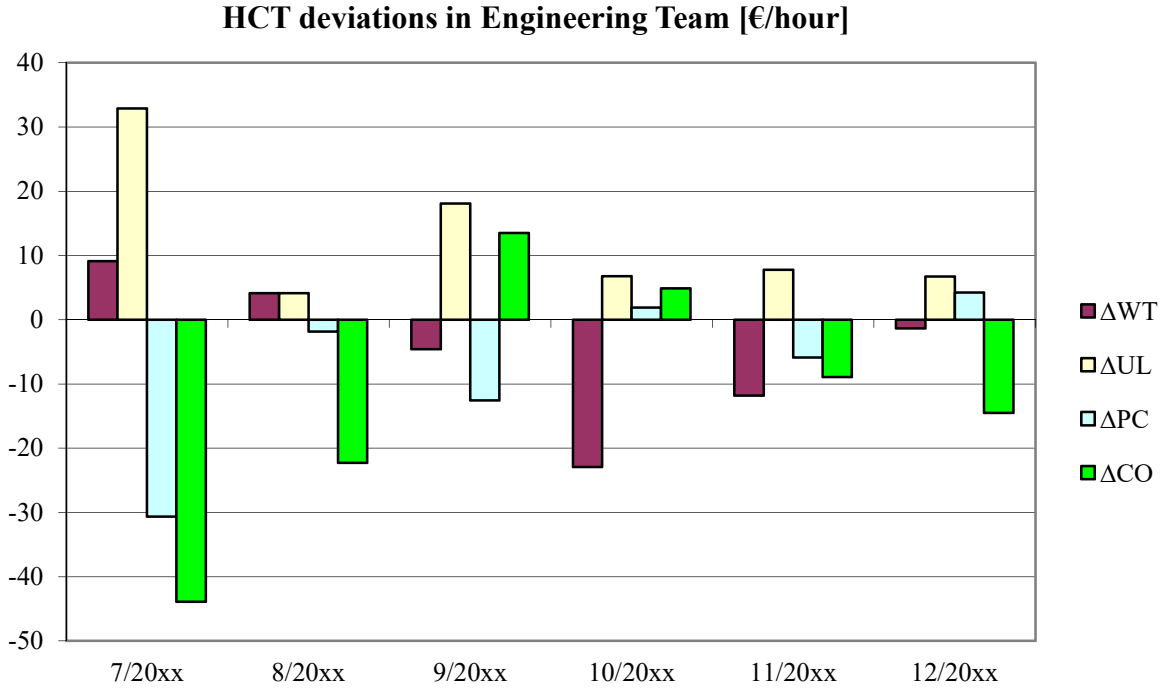


Fig. 2 - HCT deviations in Engineering Team in detail. Source: Author.

Deviations are separated into an extra graph with a more suitable scale in order to show clearly the size of deviations caused by each factor in each month period – see Fig. 2.
Comment to Fig. 2: E.g. for the month 9/20xx we can see:

- Higher Utilization of the working time than was originally planned caused the deviation in the size of app. 4,5 €/h, which is positive, because of it saves the hour costs in this size.
- Unplanned time losses caused increase in the size of the HCT by app. 18 €/h, which is a negative message.
- Higher level of the Productivity resulted in a positive (saving) deviation in the size app. 12,5 €/h.
- Higher size of the Consumed costs caused increase in the size of the HCT by app. 13,5 €/h, which is a negative message.

This result can be highly helpful to the managers, because it indicates on which factors he/she should focus, either to strengthen positive trend (Utilization of the working time, Productivity) or to solve reasons which cause making the production hours more costly (unplanned losses, cost consumption).

4 HOUR COST TARIFF METHOD – ITS KEY CONTRIBUTIONS

By application of whichever method, methodology, approach, technique, technology, etc., rationale manager always considers what it offers and what should be the positive effect of the application.
There are three major areas of HCT-Method utilization:

- As a cost-capacity measure for each entity. It shows the cost size of one hour for a designated entity, for the appointed costs and capacity utilization. It may be either planned or actual figure. It is a prerequisite for a lot of managerial procedures: benchmarking the size of the HCT with other entities, including external; for part and product costing, for calculation of the cost consequences by counting the investment project consequences; it is applied in Target Costing calculations, etc.
- For product costing, it offers plausible allocation of indirect costs of entities (process, activity, center, single resource, etc.) in dependence on the size of the time of the entity consumed by a product. It considers the recent emphasis on the time characteristics in management control – see Cokins, G. (2001), Kaplan R. S., Anderson, S. R. (2007), Zralý, M. (1995), namely on decreasing (minimizing) the time per production unit and maximizing the time capacity utilization.

Product costing procedure:

- HCT value is multiplied by time consumption for each entity, which is used for designated product and the total sum of them is calculated.
- Direct costs are added.

Calculation formula for Activity/Process/Center cost allocation to product:

$C_{Product} = DC_{Product} + \sum_{i=1 \text{ to } n} (HCT_i \cdot t_i)$

where:

$C_{Product}$	costs allocated to the product
$DC_{Product}$	direct costs of the product
HCT_i	hour cost tariff of the designated entity (process, activity, center)
t_i	time consumed for a product of the designated entity (process, activity, center)
i	entity identification
n	number of entities

In motivation schemes, in relationship to responsibility for the size of the cost items. And even more to responsibility for the maximizing the capacity utilization for productive activities.

Integrative linkages of the HCT-Method are important.
Hour cost tariff links:

- Data from the operational budget (they are in the numerator of the HCT) with the data from the capacity plan (which are in the denominator); these are two basic documents (data sources) required for enterprise management, even in a very simple business.
- Note: The lower/higher budget, the lower/higher HCT. The lower/higher capacity utilization, the higher/lower HCT.
- Financial data (operational budget) with technical (non-financial) data (capacity plan).
- Because the operational budget includes the costs of all kinds of resources, it links the data of resources to the time capacity utilization.
- By costing it links operational budget and capacity utilization with the product size of costs, through the calculated HCT and the time needed for the product.
- By costing HCT with the time needed for producing the product.
- Note: The size of allocated costs to the product depends on the activities/processes affiliated to its production and its scope. Decreasing/increasing time consumption of the activity/process or even of the single recourse results into decreasing/increasing costs/product.

These points can be considered as the principal reasons for HCT-Method managerial application:

- Capacity costs are increasing, economical use of resources is hereby even more important (economies of scale and scope are more important).
- Capacity (and indirect) costs are even more and more (or entirely) time costs (their size is proportional to the length of the time period).
- If indirect costs are mostly (entirely) time costs, then their link to the hour capacity of the entity is a consistent and reasonable approach.
- Indirect (capacity) costs, capacity of the resources and time consumption belong to the key items in the company management control. It is required to control them in their interaction.
- Recent company management control is more and more about time management – see Cokins, G. (2009), Drucker, P.F. (2005), Kaplan R. S., Anderson, S. R. (2007), etc.

- The basic rate of the HCT-Method = Hour Cost Tariff (HCT) expresses what is the cost size of one hour of an entity. This is a very clear, understandable, comparable and manageable measure, which reacts directly on each change in entity costs or in capacity utilization.
- Allocation of the indirect costs to a product according to the time consumption is reasonable, credible and consistent approach (compared with the allocation according to e.g. direct cost size drivers or other techniques).
- Product costs are determined not only by product features (incl. product design), but more and more are determined by activities/processes and the conditions of these activities/processes, applied by the product development, manufacturing and distribution (capacity utilization has the key role in these processes!).

HCT-Method can be beneficial for managerial applications of these types:

- Cost calculation in Target costing procedures application. The cost consequences can be calculated, if parameters of the product or processes are changed. HCT-Method supports the selection of suitable technical, technological, organizational solution, which fulfils the cost target. See the Model-3P solution.
- Calculation for decision making about purchasing of activities, services or components instead of producing them.
- Calculation of the product (or order) cost size changes by process (center's) equipment innovation or any other change of the budget (additional equipment purchasing, wages growing, and so on) or by the change in capacity utilization.
- Application in motivation (stimulation) system for staff according to the HCT planned and actual values assessment.

5 MODEL-3P: BRIEFLY ABOUT RELEVANT FEATURES

In order to demonstrate how the HCT-Method alternatives can be applied in integration with other methods and methodologies to support time-oriented management approach, the Model-3P has been developed.

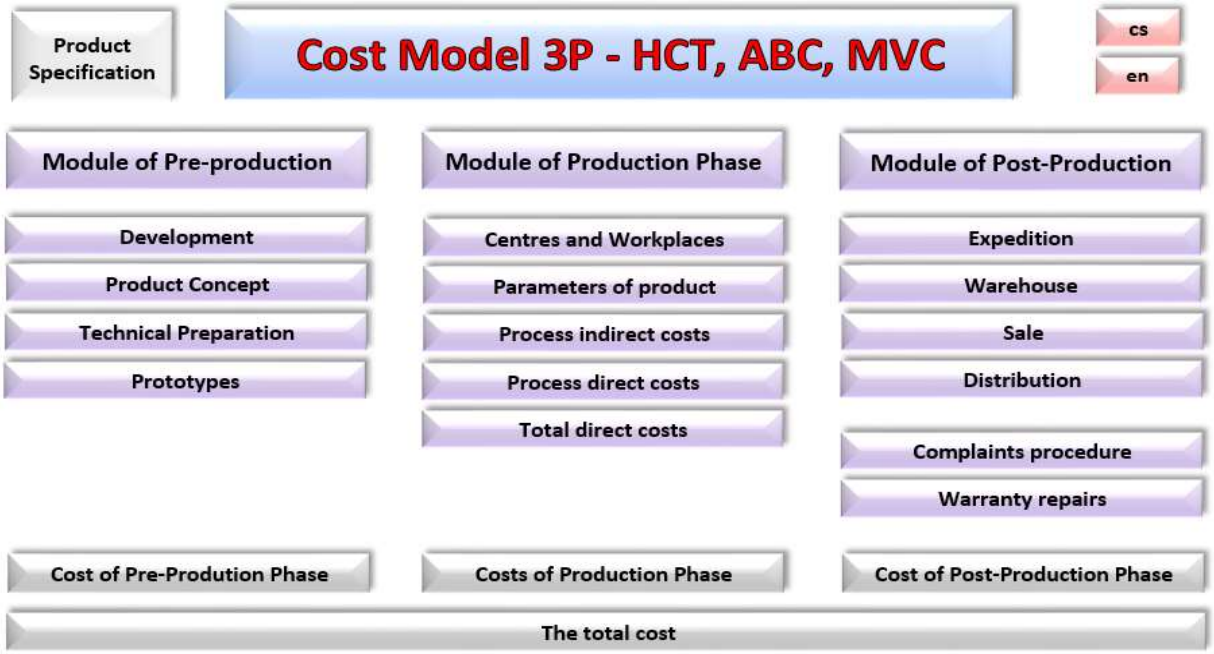


Fig. 3 - Basic Structure of the Model-3P. Source: Author.

The Model-3P is a simple model developed in MS-Office Excel environment. The Model-3P incorporates the basic and vertical alternatives of the HCT and multilevel variable costing method. It is designed for activities/teams in pre-production and post production phases. In production phase, it works with the production centers and their workplaces. That means it respects the typical framework of the Activity Based Management Approach and Target Costing procedures. From the integration point of view the Model-3P shows the tight integration among technical (with special emphasis on the time, but not only on the time) characteristics and cost characteristics of the products and processes (activities).
The Model-3P is filled with the technical data of a Paddle Wheel Fan (materials and purchased parts, etc.). Also, technical and economic characteristics of the production facilities (machines and other equipment) are included.

It deals with the cost control phases of the product life cycle: In pre-production, production and post-production phases (stages). Model-3P focuses on the modeling of how the technical characteristics of the product design, manufacturing and post-manufacturing activities (processes, centers) influence the final costs of the product.

The structure of the Model-3P is shown on the Fig. 3, which is a copy of the model entry menu. Each rectangle on the figure shows the single part - entity included into each phase of the Model-3P.

This entity can be considered as an activity/process/team/center/department or a group of them or a combination of them, which can participate in a product development, manufacturing or servicing.

6. CONCLUSIONS

To control enterprise performance under the situation of fast growing costs and risks it is required to use efficient time-cost control tools. HCT-Method offers a way how to control time consumption of each process, activity or center for each product in the linkage to the cost size. It also offers a cost-capacity integrated assessment of the entities like activity, process, center, workplace, etc.
The HCT-Method in a tailored combination with other recent managerial tools such as Activity Based Management, Enterprise Process Control, Target Costing, Multilevel Variable Costing, Balanced Scorecard, etc., serves as an excellent managerial tool.
From the managerial point of view the most helpful is the Controlling alternative of the HCT-Method which is described in this paper. This alternative also incorporates other essential factors such as productivity, unplanned time loses, capacity time utilization and possibly as well as other factors, according to the application conditions, together with the costs of operational budget.

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