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USING THE DATA ENVELOPMENT ANALYSIS IN EVALUATING THE TECHNICAL EFFICIENCY IN HOSPITALS: GENERAL AND NEW APPROACHES

Roman LACKO – Zuzana HAJDUOVÁ

Abstract

In abroad, DEA is the method frequently used for evaluation of technical efficiency in health care. The basic models are still widely used for the evaluation of medical devices. The environment in which medical devices are, however, requires new approaches in the DEA method. Based on the international trends, we summarize the most widely used modern approaches in assessment of the technical efficiency of health care facilities. We We focus on particular theoretical definition of newer models of DEA such as DEA's Bootstrap and Fixed sum outputs. These approaches could contribute to a more precise characterization and orientations in Slovak healthcare.

Keywords:

DEA, FSO DEA, WINDOW analysis, Bootstrap DEA, healthcare

Introduction

Whereas, in this work we focus on DEA method, but on a deeper perspective, we bring near several scientific papers in the field. Matranga et al. (2014) In his work has been analyzed 481 Italian hospitals. This analysis was divided into regions of Italy. Their analysis consisted of a two-stage bootstrap DEA. In a first step was determined the technical efficiency to define the differences in the efficiency of type of hospitals. There was used t-test to determine the statistical significance of differences by ANOVA regions. In the second step, the values of efficiency regress relative to the set of organizational and contextual characteristics which are not influenced by hospital management. These characteristics describe differences in demographics and cost in health care from the perspective of the region. Finally, use the regression TOBIT where explanatory variables were duration of treatment and "case-mix entropy". Finally, the demonstrated importance of the environment and the organization within the influence of the value in the efficiency of hospitals. Ferrier and Trivitt (2012) also used the double bootstrap DEA to evaluate the technical efficiency of 1,074 hospitals in the United States. In their work they clarified a different quality indicators and the models for the assessment of the technical efficiency in the value of technical efficiency. It has been shown that the outputs of higher quality have influence on the running efficiency as process quality indicators. Staat (2006) in his paper by the method of DEA bootstrap studied hospital in Germany. The average value of technical efficiency was approximately at 0.8. Weng et al. (2008) applied to hospitals in Iowa Window Analysis and Malmquist DEA method, was following a period of 5 years and 65 hospitals

studied. The work has shown that the Malmquist index appears to be a more appropriate method for determining the technical efficiency over time. Jehu-Appiah et al. (2014) investigated the effectiveness of health facilities in Ghana. To evaluate the efficiency of two-stage was used DEA. In the first step, determine the effectiveness of using BCC model output DEU. In a second step by TOBIT regression, taking as an explanatory variable according to the type of hospital ownership determine the impact of this variable on the value of technical efficiency. Also compared the effectiveness of the regions. It was found that the State ownership positively affects the value of technical efficiency, and the private hospital is the opposite. Du et al. (2011) evaluated by using an additive model DEA Hospital in Pennsylvania (USA). It surveyed 119 hospitals, with 31 of them were effective additive. Karadayi and Karsak (2014) examined the technical efficiency in public hospitals in Istanbul. A positive of the study was application of qualitative variables for modeling technical efficiency. Almeida and Figue (2011) analyzed the technical efficiency and its relationship with the indicators of quality in care in Portugal. Research has indicated that there is no relationship between patient satisfaction and the value of technical efficiency. Harrison and Lamb (2007) evaluated about 150 teaching hospitals in the US between 1998 and 2001. The average value of efficiency has been at around 0.7. There was 11% effective teaching hospitals in 1998 and in 2001 it was 16%.

NEW TRENDS IN DEA APPROACH

Malmquist Index

This model assumes comparison in efficiency units within two years. Understands changes in the light of changes in the efficiency of the unit (increase or decrease efficiency) while watching a change in boundaries of the production possibilities, and therefore the maximum (highest) level of efficiency within the group of units. In this case, therefore, track changes over time, and thus change behavior itself DMU (the improvement / deterioration), but also changes in the entire system (scroll up / down), as in the previous case analysis "Window" is impossible, since changes time has been abstracted as changes in the new units. (Alfonso - Fernandes, 2008, p. 14).

FSODEA

The heart of the method is that the output is limited. All this section is based on the work of Yang et al. (2011). Suppose that the effectiveness of the k-th DMU using BCC model can be expressed as follows:

$$\theta_k^{BCC} = \max \frac{\sum_{r=1}^s u_r y_{rk} + \sum_{p=1}^q w_p z_{pk} + u_0}{\sum_{i=1}^m v_i x_{ik}} \quad \text{s.t.} \quad (1)$$

$$\frac{\sum_{r=1}^s u_r y_{rj} + \sum_{p=1}^q w_p z_{pj} + u_0}{\sum_{i=1}^m v_i x_{ij}} \leq 1 \text{ for } \forall j,$$

$$u_0 \in R, v_i, u_r, w_p \geq 0 \text{ for } \forall i, r, p.$$

However, if we consider the outcomes as a fixed, therefore, that the increase in input one DMU must lead to a reduced input of another DMU, you have to insert the formula given. Let s_r, j is necessary to reduce inputs DMU j and we want to maximize the effectiveness of DMU k . Since the sum of the outputs y is always a constant number, the resulting value DMU k increasing output can be expressed as the sum of the individual fry, with $j \neq k, r = 1, 2, \dots, p$ and $j = 1, 2, \dots, n$. Let for any r , then the model with this condition can be expressed as follows:

$$\theta_k^{MODI} = \max \frac{\sum_{r=1}^s u_r (y_{rk} + \beta_r) + \sum_{p=1}^q w_p z_{pk} + u_0}{\sum_{i=1}^m v_i x_{ik}} \quad \text{s.t.} \quad (2)$$

$$\frac{\sum_{r=1}^s u_r (y_{rk} + \beta_r) + \sum_{p=1}^q w_p z_{pk} + u_0}{\sum_{i=1}^m v_i x_{ik}} \leq 1$$

$$\frac{\sum_{r=1}^s u_r (y_{rj} - s_{rj}) + \sum_{p=1}^q w_p z_{pj} + u_0}{\sum_{i=1}^m v_i x_{ij}} \leq 1 \text{ for } \forall j,$$

$$\beta_r = \sum_{j=1, j \neq k}^n s_{rj}, 0 \leq s_{rj} \leq y_{rj} \text{ for } \forall r, \forall j \neq k$$

$$u_0 \in R, v_i, u_r, w_p \geq 0 \text{ for } \forall i, r, p.$$

The problem is how to reduce output to achieve an efficient DMU. In general, there are three ways to achieve efficiency:

- Minimal reduction
- equal reduction
- Proportional reduction

For the minimum necessary increasing the output are rules in which the volume that is sufficient to achieve the efficiency with relatively minimal effort. To determine the minimum aggregate increase in output for DMU k use the following model:

$$\min \sum_{r=1}^s u_r \beta_r \quad \text{s.t.} \quad (3)$$

$$\frac{\sum_{r=1}^s u_r (y_{rk} + \beta_r) + \sum_{p=1}^q w_p z_{pk} + u_0}{\sum_{i=1}^m v_i x_{ik}} = 1$$

$$\frac{\sum_{r=1}^s u_r (y_{rj} - s_{rj}) + \sum_{p=1}^q w_p z_{pj} + u_0}{\sum_{i=1}^m v_i x_{ij}} \leq 1 \text{ for } \forall j \neq k,$$

$$\beta_r = \sum_{j=1, j \neq k}^n s_{rj}, 0 \leq s_{rj} \leq y_{rj} \text{ for } \forall r, \forall j \neq k$$

$$u_0, z, R, v_i, u_r, w_p \geq 0 \text{ for } \forall i, r, p.$$

If we want to achieve efficiency by other DMU take the same amount of output, we need to solve the following model:

$$\min \sum_{r=1}^s u_r \beta_r \text{ s.t.} \tag{4}$$

$$\frac{\sum_{r=1}^s u_r (y_{rk} + \beta_r) + \sum_{p=1}^q w_p z_{pk} + u_0}{\sum_{i=1}^m v_i x_{ik}} = 1$$

$$\frac{\sum_{r=1}^s u_r (y_{rj} - s_{rj}) + \sum_{p=1}^q w_p z_{pj} + u_0}{\sum_{i=1}^m v_i x_{ij}} \leq 1 \text{ for } \forall j \neq k,$$

$$\beta_r = \sum_{j=1, j \neq k}^n s_{rj}, 0 \leq s_{rj} \leq y_{rj} \text{ for } \forall r, \forall j \neq k,$$

$$s_{rp} = s_{rq} \text{ for } \forall r, \forall p, q \neq k$$

$$u_0, z, R, v_i, u_r, w_p \geq 0 \text{ for } \forall i, r, p.$$

3. In order to achieve efficiency by other DMU take proportionate amount of output, means each according to its effectiveness, then we have to solve the following problem:

$$\min \sum_{r=1}^s u_r \beta_r \text{ s.t.} \tag{5}$$

$$\frac{\sum_{r=1}^s u_r (y_{rk} + \beta_r) + \sum_{p=1}^q w_p z_{pk} + u_0}{\sum_{i=1}^m v_i x_{ik}} = 1$$

$$\frac{\sum_{r=1}^s u_r (y_{rj} - s_{rj}) + \sum_{p=1}^q w_p z_{pj} + u_0}{\sum_{i=1}^m v_i x_{ij}} \leq 1 \text{ for } \forall j \neq k,$$

$$\beta_r = \sum_{j=1, j \neq k}^n s_{rj}, 0 \leq s_{rj} \leq y_{rj} \text{ pre } \forall r, \forall j \neq k, \frac{s_{rp}}{y_{rp}}$$

$$= \frac{s_{rq}}{y_{rq}} \text{ for } \forall r, \forall p, q \neq k$$

$$u_0, z, R, v_i, u_r, w_p \geq 0 \text{ for } \forall i, r, p.$$

If we want to quantify the efficiency, respectively. inefficiency of the *i*th DMU denote the optimal solution as *a*. Then, to calculate the efficiency FSODEA use the following relationship:

$$\theta_k^{FSODEA} = \max \frac{\sum_{r=1}^s u_r y_{rk} + \sum_{p=1}^q w_p z_{pk} + u_0}{\sum_{i=1}^m v_i x_{ik}} \quad \text{s.t.} \quad (6)$$

$$\frac{\sum_{r=1}^s u_r (y_{rk} + \hat{\beta}_r) + \sum_{p=1}^q w_p z_{pk} + u_0}{\sum_{i=1}^m v_i x_{ik}} \leq 1$$

$$\frac{\sum_{r=1}^s u_r (y_{rj} - \hat{s}_{rj}) + \sum_{p=1}^q w_p z_{pj} + u_0}{\sum_{i=1}^m v_i x_{ij}} \leq 1 \text{ for } \forall j \neq k,$$

$$u_0, z, R, v_i, u_r, w_p \geq 0 \text{ pre } \forall i, r, p.$$

This model can be transformed by Chart - Cooper's transformation into the following shape:

$$\theta_k^{FSODEA} = \max \sum_{r=1}^s u_r y_{rk} + \sum_{p=1}^q w_p z_{pk} + u_0 \text{ s.t.} \quad (7)$$

$$u_r (y_{rk} + \hat{\beta}_r) + \sum_{p=1}^q w_p z_{pk} + u_0 - \sum_{i=1}^m v_i x_{ik} \leq 0$$

$$u_r (y_{rj} - \hat{s}_{rj}) + \sum_{p=1}^q w_p z_{pj} + u_0 - \sum_{i=1}^m v_i x_{ij} \leq 0$$

$$\text{for } \forall j \neq k, \sum_{i=1}^m v_i x_{ik} = 1$$

$$u_0, z, R, v_i, u_r, w_p \geq 0 \text{ for } \forall i, r, p.$$

Double Bootstrap DEA

Although the classical DEA method is very useful and convenient method for assessing the effectiveness of hospitals, has several limitations. For example, if the number of observations with respect to small sample size, the value of efficiency may be slightly inflated, since the fact that DEA ignoring stochastic components means that the statistical noise may distort the values of efficiency. Assuming that economies of scale are variable, then we can determine the efficiency of frequency range for each device. If we determine as CRS and VRS efficiency, technical efficiency values can be obtained using the CRS model divided into two components, namely: one value as a result of inefficiencies of scale and the second value as a result of pure technical inefficiency. If the difference between CRS and VRS efficiency, then there is a range-inefficiency. This inefficiency can be expressed as a proportion of the technical efficiency of constant returns to scale and technical efficiency under variable returns to scale. (Be sure to check, Papatahanassopoulos, 2012).

Weaknesses DEA method can be removed by DEA bootstrap method, which is the main method for sensitivity analysis of the measured values of efficiency due to sampling variability. The purpose of DEA bootstrap method to estimate

the distribution of the sample by imitating the process of data generation. Bootstrap procedure simulates data generation process (DGP) using the Monte Carlo method, and thus provides an estimate of the unknown data generating process. Consider the DGP Π , which generates a random sample of $\Phi =$. For the purpose of calculating technical efficiency, we use the available data. When we get a set of inputs and orientated frontier efficiency can be estimated technical efficiency. Although the DGP Π unknown, the bootstrap method is used to determine that a reliable estimate of Π . Estimates of effectiveness include a set from which we can choose a new dataset in order to define and. Monte Carlo simulation is required in order to obtain the probability distribution of sampling using a B value generating pseudo-effectiveness estimates. Empirical probability distribution of estimates provided by the Monte Carlo approximation of the unknown values of efficiency. The second step is to analyze the determinants of efficiency and technical as well as latitude and by means of relations (be sure to check, Papatahanassopoulos, 2012):

$$\widehat{SE}_m = \alpha + \beta W_{1j} + \varepsilon_j \quad j = 1, 2, \dots, n \quad (8)$$

$$\widehat{TE}_m = \gamma + \delta W_{2j} + u_j \quad j = 1, 2, \dots, n \quad (9)$$

Conclusion

We have to understand that the patient does not eat ordinary product. To produce consumer products, at the end of the production process we are interested in the low variability, thus quality. This is similar even in patients in the end would be any patient health, healed and happy. However, in the process of treating each patient is unique, and this is where it differs from the products. While in the process of production we strive to standardize processes, the process of treatment should be to treat patients individually. That is why we can not talk about effectiveness only in theory, always be adapted to assess the effectiveness of what a given hospital performs, what is its environment, what patients are treated. Nevertheless it is difficult to compare the university hospital and a general hospital. The university treating complicated medical conditions, therefore the evaluation of effectiveness is the need to adapt. Again, it should be noted, is very difficult.

On the basis of international scientific articles and literature, we also provide opportunities for evaluation of the technical efficiency of hospitals. This area of science offers plenty of scope for scientific activity in our country, as has been so accurately examined. The outcome of the practical part could be more valuable scientific papers in local and foreign scale.

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TOOLS FOR EMPIRICAL ANALYSIS OF MARKET STRUCTURE: EVIDENCE FROM SLOVAK FOOD INDUSTRY

Aneta BOBENIČ HINTOŠOVÁ - Lucia HLIBOKÁ - Zuzana KUBÍKOVÁ

Abstract

Evaluation of the market structure can be realized through a number of quantitative tools, from which, in practice, the most commonly used index is the concentration ratio and the Herfindahl-Hirschman index (or some of its modifications). However, in empirical studies, more or less frequent use of other indexes occurs. Besides the above mentioned two indexes the subject of our concern has been the dominance index, Hall-Tideman index, the entropy index, Horvath index and the variance. The aim was to compare the results obtained using selected quantitative measurement tools of market structure and the identification of indicators that provide relatively identical results. Results showed that most of indexes applied on food industry in Slovakia within 1998 – 2012 period provide relatively comparable results that was confirmed also by correlation analysis. Increase of aggregate concentration in the studied industry was reported by all of the indicators. The highest concentration was identified in 2009 or 2012 depending on used index.

Keywords:

market structure, food industry, concentration indexes

Introduction

In microeconomic theory, significant discrepancies in division and the main characteristics of possible market structures are not demonstrated. Based on the work of Fendek and Fendeková (2008), perhaps the most general division distinguishes perfect and imperfect market structures. Features of contemporary market economies naturally does not correspond with perfect structures, while we can distinguish two counterparts of imperfectly competitive market structures, fragmented and concentrated structures. In a fragmented market a large number of small, respectively medium-sized firms operates, none of which does have such economic power to achieve dominance. Fragmented industries are characterized by intense price competition and low profitability (Hill, Jones, 1989). In general, the growing number of competitors with diminishing differences in their size and capabilities is intensifying rivalry among firms. However, there are opinions correcting this assumption that are trying to prove that non-competitive behavior can also be detected in non-concentrated markets (Cesari, 2000).

Concentration as the process of producers concentrating in ever smaller number of large firms (Šíbl, 2002) means that the industry is moving towards an oligopoly market structure, or a monopoly structure in the most extreme case. There are several large firms (or single enterprise in extreme cases) in a concentrated market that depends on each other. Interdependence means that

one firm's competing goals will directly affect the profitability of other firms in the industry (Slávik, 2005). The nature and intensity of competition in concentrated industries is difficult to predict.

The general assumption is that concentration and competition are in antagonistic relation since with high levels of concentration, the expectation is that leading firms will be able to coordinate their activities, especially pricing and output. With lower levels of concentration, the expectation is that the industry will be characterized by relatively autonomous and competitive firm behavior, leaving interfirm coordination of pricing and output sporadic and weak (Shepherd, 1979).

Institutions with position of authority and competence in the field of the protection and promotion of competition in most developed economies use various analytical tools to exact definition of the degree of concentration¹ in the relevant market, in order to know his character and adequately regulate planned mergers of firms. These analytical tools are also used within various empirical works to assess market concentration eventually deeper analyze its relation to other chosen variables (see e.g. Hamilton, 1997; Donghwan, Marion, 1997; Sepúlveda, 2012).

The paper introduces and explains construction of selected tools for empirical analysis of market structure used most frequently by competition authorities and/ or within empirical works. The indexes are applied on Slovak food industry and the values of indexes are studied more deeply through correlation analysis with the aim to investigate their relationships and parallel applicability.

1. Overview of Tools for Market Structure Evaluation

Although quantitative tools described below are in most cases not part of general binding rules, they are often contained in various guidelines or regulations, which competition authorities work with. One of the oldest instruments used for market concentration assessment is the concentration ratio index (CR_m). This index serves as a measure of the concentration development of the largest firms in relevant market and reflects the percentage of the first m firms with the largest volume of production on the production of all operators in the market. However, the concentration ratio index is not authentically indicative on market structure, since it absolutely excludes the impact of small entities, which in broadly defined relevant market may be highly misleading.

To facilitate and simplify the application of the antitrust laws regarding mergers, in 1982 the US Department of Justice published new formal numerical

¹ In this case, the concentration in terms of statics is understood as a state of the structure of the market.

guidelines for horizontal mergers based on the Herfindahl-Hirschman index² (HHI) that replaced previously used concentration ratio. The HHI takes into account both the number of firms and the inequality of market shares. It is calculated by squaring the market shares of all firms in a market and then summing the squares. HHI thus gives much heavier weight to firms with large market shares than to firms with small shares (Rhoades, 1993).

HHI is also a very useful tool for the assessment of effects of intended acquisitions and mergers on the level of competition in the relevant market not only in Anglo-Saxon countries but also at European Commission level. Going out from *Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings* (2004) while the absolute level of the HHI can give an initial indication of the competitive pressure in the market post-merger, it is above all the change in the HHI that is a useful proxy for the change in concentration directly brought about by the merger.

In addition to above presented indexes which are or were included in many countries regulations, respectively methodologies governing the authorization of mergers and acquisitions, other quantitative tools that are applicable in the assessment of market structures can be met in the literature. Therefore we give them a brief overview at this point. Indexes such as the Hall-Tideman index (Hall, Tideman, 1967) and Kwoka's dominance index (Kwoka, 1977) have not significantly been used in decision-making activity of competition authorities and have gradually given way to the HHI and the entropy measure (hereinafter also only „E“), that has become increasingly popular in strategic management research (for example Raghunathan, 1995). However, the comparison of use of E and HHI leads many authors to conclusion that the HHI is specialized for measuring industry concentration while E for expressing firm diversity and thus there is a lack of full parallelism between the two indices (Acar, Sankaran, 1999). Other indexes specifically designed to assess the concentration on the level of industries are for example a complex index of concentration proposed by Horvath (1970), Hannah-Kaya index (Hannah, Kaya, 1977), Gini coefficient, Ellison-Glaeser index or Maurel Sedillot index (Naude, 2006). Specific place among those indexes with less frequent applications occupies dominance index³, used in parallel with HHI to assess mergers and acquisitions in Mexico. Ten Kate (2006) deals in his work with comparison of dominance index and HHI in more details.

² The index was developed independently by the economist A. O. Hirschman (in 1945) in his book *National Power and the Structure of Foreign Trade* as well as by O. C. Herfindahl (in 1950) who presented the index in his unpublished doctoral dissertation *Concentration in the U. S. Steel Industry*. For more detail on the background of the index see Hirschman (1964).

³The dominance index was proposed by P.G.Alba, one of the Commissioners of Mexico's Federal Competition Commission.

2. Material and Methods

Analysis of the evolution of the market structure was conducted for the 1998 – 2012 period for the food manufacturing sector and beverage sector in the Slovak Republic, which is consistent with a two-digit SK NACE Rev. 2 defined division 10 and 11⁴. Plenty of authors, such as Waldman and Jensen (2001) distinguish between aggregate and individual markets concentration. While aggregate concentration measure the role played by large firms in the economy or industry as a whole, individual markets concentration rather refers to structuralist model that underlies much public policy toward business. Numerous empirical works contain measurement of market concentration on different levels of aggregation, depending on the aim of the research as well as on public data availability. For example White (1981) analyzed aggregate concentration for individual sectors as well as for entire private sector. Similarly Rogers (2001) examined trends in both aggregate and market concentration within the food and tobacco processing sector. The present paper analyzes rather aggregate food industry concentration because our primary aim was to catch the general trend of aggregate concentration evolution within food industry and to analyze parallel applicability of different indices.

In order to construct indicators of market structure, input data on sales for investigated industry as a whole were taken from Industry Yearbooks published by the Statistical Office of the Slovak Republic. Given that the yearbook contains the results of the processing of corporate annual reports submitted by firms with 20 or more employees as well as firms with up to 19 employees, but reached yearly turnover of more than 5 million Euros, only those organizations were included in the research. To complete it should be acknowledged that we only worked with firms incorporated in Slovak Republic. Data on sales of the largest firms in the relevant sector were obtained from company annual reports published on the company website or filed with the collection of deeds at the relevant commercial register.

Nature of the market structure had been assessed on the basis of several selected indexes designed for the assessment of the market concentration, namely concentration ratio index (CR), the Herfindahl-Hirschman Index (HHI), the normalized Herfindahl-Hirschman Index (HHI*), relative Herfindahl-

⁴ Economic activities were structured according to OKEČ (Odvetvová klasifikácia ekonomických činností – Industrial Classification of Economic Activities) Rev. 1.1 until 31.12.2007. From this period is SK NACE Rev. 2 classification used in Slovakia. The revised classification of economic activities SK NACE Rev. 2 is fully harmonized with the European version of the NACE Revision 2 issued by the European Parliament and the Council Act No. 1893/2006. Using this classification or derived national version is in the field of statistics compulsory for all Member States of the European Union. Yearly data for 2008 were published in the structure of OKEČ Rev. 1.1 but at the same time were structured according to SK NACE Rev. 2, so the reference base for comparison of data was created.

Hirschman index (*a*HHI), dominance index (DI), Hall-Tideman index (HT), entropy index (E), Horvath index (CCI) and variance (σ^2). Results of the market structure evaluation according to various indicators were mutually compared in order to identify indexes that provide relatively identical results, and therefore are applicable in parallel.

Abovementioned indexes are working with a market share of firms in the particular sector. Market share calculation (s_i) was carried out on the basis of data on sales by the following equation

$$s_i = \frac{x_i}{X} \quad (1)$$

where x_i represents the volume of sales of the i -th firm in the industry, and X is the total volume of sales of the relevant market.

Crucial to the construction of indexes was accurate measurement of the largest firms' shares, as these have the greatest impact on resulting value. We applied a hypothetical assumption that the market shares of "other" firms are the same and we divided the remaining market share equally among other firms operating in the industry, so as to avoid potential distortion of some indexes.

3. Results and Discussion

Food industry in Slovak Republic belongs among problematic sectors in terms of performance due to its long-term decline in its importance as well as in its share on GDP. In terms of the evolution of number of firms as one of the characteristics of the market structure, in reviewed period a downward trend in the number of these entities may be noticed. While in 1998 there were 336 firms in the food industry, in 2012 there were only 248 firms.

The market structure was firstly analyzed by the concentration ratio index (Concentration ratio, CR_m), which is calculated as the sum of the market shares of m firms and can be written in the following form:

$$CR_m = \sum_{i=1}^m s_i \quad (2)$$

where s_i represents the market share of the i -th firm in the sector and index m denotes the number of investigated largest firms in the industry. The subject of the investigation may be different number of enterprises, e.g. 2, 3, 4, 8, 10, 100 etc.. Most often, however, we can meet $m = 4$, whereas the concentration ratio index was originally part of the U.S. merger guidelines and the German law, in accordance with which the degree of concentration was defined as follows (according to Brezina, 1994):

- Concentrated market structure, where four largest operators unite more than 50% of the market production,

- Weakly concentrated market structure, where four largest operators unite 25% to 49% of the market production,
- Unconcentrated market structure, where four largest operators unite less than 25% of the market production.

Table 2 contains the calculation of indicators CR_1 (market share of the largest firm in the industry), CR_4 , CR_8 and MCR (i.e. $CR_8 - CR_4$, which indicates the market power of the second quarter of the most powerful firms in the industry). It is interesting to note the value of the relative market share indicator (R) for the largest firm in the industry in connection with the CR_1 index, which is in this case calculated as:

$$R = \frac{s_1}{s_2} \quad (3)$$

where s_1 represents the market share of the largest firm in the industry, s_2 market share of its nearest competitor. According to Slávik (2005), we talk about dominant company in an industry where the value of the R exceeds a threshold of 1.5.

Table 1: Concentration ratio index and relative market share

Year	1998	1999	2000	2001	2002	2003	2004
CR₁	2.62	3.95	4.99	4.89	4.94	5.19	4.97
R	1.11	1.54	1.20	1.18	1.11	1.14	1.09
CR₄	9.21	11.13	17.03	17.03	17.84	16.91	17.98
CR₈	16.50	18.83	27.10	27.91	28.93	27.58	28.92
MCR	7.29	7.70	10.08	10.88	11.09	10.67	10.94

Year	2005	2006	2007	2008	2009	2010	2011	2012
CR₁	4.53	4.80	5.75	5.46	7.38	7.41	6.03	5.53
R	1.06	1.00	1.13	1.01	1.16	1.31	1.14	1.02
CR₄	16.92	17.61	18.15	18.63	24.61	21.72	20.57	21.07
CR₈	28.67	26.89	26.45	30.17	38.50	33.88	32.00	34.76
MCR	11.75	9.28	8.31	11.54	13.88	12.16	11.43	13.70

Source: own processing

Table 1 shows that the largest firm in the industry during the monitored period reached the maximum market share (CR_1) 7.41% in 2010 and it was the Kraft Foods Slovakia, which is at the top of the list of food firms in terms of sales volume for last years. Indicator of relative market share (R) exceeded 1.5 within the 1998-2012 period only once, in 1999, when Nestle Slovakia achieved a dominant position. In the case that there is a small number of companies in the industry, of which one or a few of them have significant market share, the market takes the form of oligopoly (Severová, Bendl, 2013). However, there were on average 300 companies in the industry, so the industry based on the CR_4 indicator can be seen as fragmented for the whole mentioned period (CR_4 in

monitored period did not exceed 25%), although there is evident tendency towards increase of aggregate concentration of the industry. However, not only the top four firms in the industry increased their market share, but there was a slight increase in the market share of the second quarter of the strongest firms in the industry (while in 1998 the value of MCR was 7.29%, in 2012 it was 13.70%, which is an increase of about 6%). CR₄ index reached the threshold in 2009 (CR₄ = 24.61%) and in that year MCR index reached the highest value (13.88%).

The most frequently used indicator to assess the market structure in practice is Herfindahl-Hirschman index. It is calculated as the sum of the squares of the market shares of all firms in the industry:

$$HHI = \sum_{i=1}^n s_i^2 \quad (4)$$

If a single firm controls the industry (pure monopoly), HHI has a maximum value of 10,000. Conversely, in the case of fragmented industries with an infinite number of firms with the same market share, the value of HHI is close to 0. Based on that the value of HHI decreases when number of firms in the sector is increasing and increases when uniformity in size among a given number of firms is increasing. Classification of the degree of concentration based on the HHI value according to the revised *Horizontal Merger Guidelines* (2010) is as follows:

- Unconcentrated Markets: HHI below 1,500
- Moderately Concentrated Markets: HHI between 1,500 and 2,500
- Highly Concentrated Markets: HHI above 2,500

In addition, we can also meet with HHI modifications in the form of normalized Herfindahl-Hirschman Index (HHI*, which take values from 0 to 1) and the relative Herfindahl-Hirschman Index (α HHI, where the HHI is divided by the number of firms in the industry) that can be enrolled in the following forms:

$$HHI^* = \frac{HHI - \frac{1}{n}}{1 - \frac{1}{n}} \quad (5)$$

$$\alpha HHI = \frac{1}{n} \sum_{i=1}^n s_i^2 \quad (6)$$

Table 2 depicts the evolution of the food industry market structure as identified by the Herfindahl-Hirschman index and its modifications. According to the HHI values the food industry in Slovakia during mentioned period can be included among significantly fragmented industries. The largest market concentration was recorded in 2009, however in that year it was still well below the threshold value. Similarly, the highest values of modified HHI indicators have been achieved in 2009.

Table 2: Herfindahl-Hirschman index, normalized Herfindahl-Hirschman index, relative Herfindahl-Hirschman index

Year	1998	1999	2000	2001	2002	2003	2004
HHI_ %	60.87	73.89	127.86	128.14	137.13	132.6	144.73
HHI	0.0061	0.0074	0.0128	0.0128	0.0137	0.0133	0.0145
HHI*	0.0031	0.0045	0.0099	0.0097	0.0105	0.0099	0.0111
αHHI	0.000018	0.000022	0.000037	0.000040	0.000044	0.000045	0.000050

Year	2005	2006	2007	2008	2009	2010	2011	2012
HHI_ %	145.34	124.27	133.38	154.68	226.54	192.07	178.70	220.08
HHI	0.0145	0.0124	0.0133	0.0155	0.0227	0.0192	0.0179	0.0200
HHI*	0.0113	0.0089	0.0097	0.0118	0.0191	0.0153	0.0142	0.0160
αHHI	0.000048	0.000045	0.000049	0.000058	0.000083	0.000077	0.000067	0.000080

Source: own processing

Another index that serves to assess the market structure is the index of dominance (Ten Kate, 2006; Brezina, Oršulová, Pekár, 2009). The dominance index can be deemed as a hybrid between a concentration index and an inequality index. The main difference between the HHI and the dominance index is that while the former invariably increases when two or more market shares are joined together, this is not necessarily the case with the latter. Particularly when two small firms merge in the presence of a third big firm, the dominance index tends to decrease whereas the HHI would increase. The adoption of the dominance index as an additional tool for merger control reflects the intuitive belief that two small firms make a stronger competitor for a third big market player and consequently such a merger is presumed not to lessen but to enhance competition. When all firms in the market are of equal size, the dominance index coincides with the HHI. It is the inequality between firms that makes the former different from the latter (Ten Kate, 2006). Dominance index can be expressed by the following equation

$$DI = \sum_{i=1}^n \sigma_i^2 \quad (7)$$

$$\sigma_i = \frac{s_i^2}{HHI} = \frac{s_i^2}{\sum_{i=1}^n s_i^2} \quad (8)$$

Table 3 contains the evolution of dominance index in the 1998-2012 period in the food industry of Slovak Republic. The table also contains the minimum value of the index and the difference between the current value of the index of dominance in a given year and the corresponding minimum value, which may be entered in the form

$$DI_i \text{ difference} = DI_i - DI_i \text{ min} \quad (9)$$

Table 3: Dominance Index

Year	1998	1999	2000	2001	2002	2003	2004
DI	0.0479	0.0764	0.0989	0.1000	0.1028	0.1005	0.0964
DI min.	0.0030	0.0029	0.0029	0.0031	0.0032	0.0034	0.0034
DI difference	0.0449	0.0735	0.0960	0.0969	0.0996	0.0971	0.0930

Year	2005	2006	2007	2008	2009	2010	2011	2012
DI	0.0841	0.1065	0.1306	0.1082	0.1431	0.1425	0.1102	0.0949
DI min.	0.0033	0.0036	0.0037	0.0037	0.0036	0.0040	0.0038	0.0040
DI difference	0.0808	0.1029	0.1269	0.1045	0.1395	0.1385	0.1065	0.0909

Source: own processing

The highest value achieved by the dominance index can be seen in 2009 and the DI difference highest in that year. The results thus correspond with the results of previous findings by CR_4 and HHI indices. Slightly increasing HHI trend over the period was accompanied by stronger growth of dominance index that throughout the period reached higher values than HHI, which generally means that a slight increase in the concentration a greater growth of inequality between firms in the sector occurred.

The following table 4 contains rating of industry structure by additional 4 indicators. The first is the Hall-Tideman index (HTI), which can be quantified according to the following relationship

$$HTI = \frac{1}{2 \sum_{i=1}^n i s_i - 1} \quad (10)$$

Index reaches a value between 0 and 1, where 1 is the highest concentration where only one monopoly firm the market operates. Hall and Tideman (1967) pointed out that the HHI gives too much weight to firm's relative share on the market and lower weight to the rank itself and therefore formulated an index that takes into account the actual position on the market. Based on this indicator the food processing industry reached in the analyzed period the highest level of concentration in 2012 and throughout the period the index had a slightly increasing trend with significantly less fluctuation than HHI.

Another indicator used is the entropy index (E), which takes into account the number of firms in the sector and has a value between 0 and $\log_2 n$ (Baumöhl, Lyócsa, Výrost, 2011). Entropy index can be expressed by the following equation

$$E = \sum_{i=1}^n s_i \log_2 \left(\frac{1}{s_i} \right) \quad (11)$$

with higher index value meaning lower levels of concentration and vice versa. Entropy index in the food industry in Slovakia had a downward trend during the period and reached the lowest level in 2012. The food industry is also under this

index gradually concentrating and the highest degree of aggregate concentration was reached in 2012, similar like by the HTI index.

Horvath (1970) formulated the index, which takes into account the position of the firm on the market. We may encounter with mentioned index only in a limited number of studies, whereas the index takes value of the interval $(3n^2 - 3n + 1)/n^3$, $n \neq 2$ to 1. Value of 1 shall Horvath index (CCI) take in the case where the market is controlled by one dominant firm. Horvath index can be calculated by the following equation:

$$CCI_R = s_i + \sum_{i=2}^n s_i^2 (1 + (1 - s_i)) \quad (12)$$

According to the results in Table 4 Horvath index reached the highest value in 2009, as far as most of the indices used to assess the concentration of the industry. When evaluating the development slightly rising trend and a slight tendency towards increasing aggregate concentration of food industry may be seen.

To analyze the concentration variance can be also used, which can be calculated using the following formula

$$\sigma^2 = \frac{1}{n} \sum_{i=1}^n (s_i^* - \bar{s}_i^*)^2, \quad s_i^* = \ln s_i \quad (13)$$

where \bar{s}_i^* is average s_i^* . According to Baumöhl, Lyócsa and Výrost (2011) an attempt to identify a particular rule of the allocation of shares in the markets led to the use of this indicator and it was expected that the market share will be distributed by the so-called log-normal probability distribution. Applying this indicator to measure the aggregate concentration of the food industry variance reached scattering peak in the 2012, which corresponds with the results of Hall-Tideman index and entropy index.

Table 4: Hall-Tideman index, Entropy Index, Horvath index and variance

Year	1998	1999	2000	2001	2002	2003	2004
HTI	0.0037	0.0038	0.0045	0.0047	0.0049	0.0053	0.0057
E	8.0411	7.9662	7.5653	7.5266	7.4489	7.3988	7.2847
CCI	0.0316	0.0509	0.0702	0.0695	0.0715	0.0727	0.0730
Variance	0.1539	0.1763	0.2956	0.2615	0.2711	0.3053	0.3466

Year	2005	2006	2007	2008	2009	2010	2011	2012
HTI	0.0057	0.0054	0.0056	0.0061	0.0065	0.0070	0.0071	0.0088
E	7.2832	7.4118	7.3514	7.1979	6.9300	6.9485	7.0191	6.5584
CCI	0.0699	0.0679	0.0772	0.0792	0.1074	0.1010	0.0883	0.0945
Variance	0.3724	0.2612	0.2679	0.3343	0.3584	0.4318	0.4506	0.5647

Source: own processing

Further we analyzed comparability of results gained by application of different indexes through correlation analysis which results show table 5.

Table 5: Pearson correlation coefficients

	CR1	R	CR4	CR8	MCR	HHI
CR1						
R	0.01620					
CR4	0.92820 ***	-0.28447				
CR8	0.88389 ***	-0.30349	0.98351 ***			
MCR	0.71108 ***	-0.31126	0.85555 ***	0.93507 ***		
HHI	0.89297 ***	-0.26508	0.97228 ***	0.98732 ***	0.92078 ***	
HHI*	0.88807 ***	-0.25258	0.97056 ***	0.98923 ***	0.92962 ***	0.99838 ***
α HHI	0.88187 ***	-0.26123	0.94047 ***	0.94858 ***	0.87223 ***	0.98047 ***
DI	0.94911 ***	-0.00268	0.85802 ***	0.77190 ***	0.52803 **	0.75921 ***
HTI	0.69240 ***	-0.35154	0.80034 ***	0.82464 ***	0.79208 ***	0.87033 ***
E	-0.78514 ***	0.38318	-0.90562 ***	-0.92653 ***	-0.87741 ***	-0.94634 ***
CCI	0.95999 ***	-0.13515	0.97923 ***	0.96767 ***	0.85091 ***	0.97402 ***
Variance	0.63693 **	-0.31170	0.76485 ***	0.81432 ***	0.83208 ***	0.84679 ***

	HHI*	α HHI	DI	HTI	E	CCI
CR1						
R						
CR4						
CR8						
MCR						
HHI						
HHI*						
α HHI	0.96855 ***					
DI	0.75212 **	0.74358 **				
HTI	0.84807 ***	0.92863 ***	0.52309 **			
E	-0.93220 ***	-0.96692 ***	-0.64225 ***	-0.97231 ***		
CCI	0.96993 ***	0.95944 ***	0.86359 ***	0.83068 ***	-0.91419 **	
Variance	0.83479 ***	0.87206 ***	0.43197	0.95848 ***	-0.94329 **	0.79603 **

Source: own processing

Notes: ***, **, * denote significance at 1, 5 and 10 % levels, respectively

Among majority of indicators strong statistically significant relationships were detected. The only exemption are relationships with the relative market share indicator (R). It means that the growth of the largest firm in the industry do not necessarily leads to increase of aggregate concentration of the industry. The results also indicate that for purposes of empirical analysis of the market structure is the use of indicators substitutable due to relatively comparable results especially from the long term development point of view.

Conclusion

We have to understand that the patient does not eat ordinary product. To produce consumer products, at the end of the production process we are interested in the low variability, thus quality. This is similar even in patients in the end would be any patient health, healed and happy. However, in the process of treating each patient is unique, and this is where it differs from the products. While in the process of production we strive to standardize processes, the process of treatment should be to treat patients individually. That is why we can not talk about effectiveness only in theory, always be adapted to assess the effectiveness of what a given hospital performs, what is its environment, what patients are treated. Nevertheless it is difficult to compare the university hospital and a general hospital. The university treating complicated medical conditions, therefore the evaluation of effectiveness is the need to adapt. Again, it should be noted, is very difficult.

On the basis of international scientific articles and literature, we also provide opportunities for evaluation of the technical efficiency of hospitals. This area of science offers plenty of scope for scientific activity in our country, as has been so accurately examined. The outcome of the practical part could be more valuable scientific papers in local and foreign scale.

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CONSUMER ETHNOCENTRISM VS CONSUMER XENOCENTRISM - AN ATTEMPT TO IDENTIFY THE ANATOMY OF THE PHENOMENON

Andrzej SZROMNIK

Abstract

The decision making process of purchasing goods and services, its course and determinant, have been the subject of interest of economists, psychologists and sociologists representing different scientific communities, as well as practitioners of economic life communities, including traders, sales managers, specialists in the field of marketing or product designers. Appropriate attitudes and buying behaviour have been a very interesting topic of studies, analyses and modelling. The more complex and unpredictable they became, the bigger number of factors and circumstances determined the consumer's choice (Becker, 1990).

Keywords:

ethnocentrism, consumer ksenocentryzm

Introduction

In the conditions of global manufacturing, the opening of economics to the world and more and more efficient international logistics, domestic markets are filled up with unified, global goods offer, which has bigger and bigger quantitative and structural range. During the process of purchasing, consumers have to choose among hundreds and thousands of goods, which represent manufacturers almost from all over the world, items, which have unique features and utilities, which make traditional trading stock more attractive (Bartosik – Purgat, 2006).

When a considerable number of imported goods appeared on the market, a new phenomenon could be observed – the phenomenon of inter-product market competition, competition of certain manufacturers, suppliers and sellers to win customers. In practice, domestic products were superseded as the typical and traditional ones, but not innovative or distinguishable. Imported products, brought from abroad in limited numbers, met with interest of buyers. They were looked for and bought with pleasure, playing the role of not usual ‘liquidator’ of deficit of market supply, but they were the symptom of social status, possibilities and wealth (Kowalska, 2012).

The growing scale of international goods exchange and the phenomenon of massive inflow of foreign products connected to it, paid attention to negative effects of the full opening of economies to foreign countries – to the inflow of the capital and goods from one's own country, to the level of competition on the internal market, to the changeable situation on the domestic labour market. The ethnocentric phenomena are more and more often observed in different spheres and areas of human activity as a counterbalance of common presence of

“strangers”- people, products, institutions and norms, they are perceived and judged in different ways, but more and more often as a defensive reaction of market subjects, social and vocational groups, and even authority institution. Skilfully monitored phenomena of preferring one`s own material and spiritual possessions in different guises and strength can be (and are) the target of external stimulation from the interested social, political and economic authorities (Szromnik, 1998).

Ethnocentrism in social behaviour of individuals and groups, including consumers` ethnocentrism is not a fully explained and explored phenomena (Shimp, Sharma, 1987; Sharma, Shimp, Shin, 1995). In the present elaboration the authors make an attempt to identify consumer ethnocentrism and proper attitudes, behaviour and marketing decisions of individuals, which follow it. For that reason, they consider potential mechanism of shaping the consumers` decisions, who prefer their own, domestic products and certain brands, including its component elements and dependencies among them. A different phenomenon has been contrasted to it, which is connected to preferences in doing shopping and consumption of foreign products, in this case, called by the authors “consumer geocentrism” or „xenocentrism”.

1. From social ethnocentrism to consumer ethnocentrism

Behaviour of individuals and groups, which evinces itself in differentiating and preferential shaping of one`s own environment and proper structures, norms or ideas for it. The behaviour is registered and recognizable in different societies, in different phases and development. They decided about their organisation and functioning in different external conditions, above all about their ethnic, cultural and economic distinctiveness. Accepted predominance of one`s own social group has transferred to treating appropriate organisational and functional solutions as better than others, on distinguishing and recommending them.

Social ethnocentrism has evinced in different forms and moments of human behaviour. In every case, however, it meant obeying one`s own organisation, its features and structures as perfect and better, more efficient than other social systems. In practice, it was connected to rejection of different norms and programmes, not acknowledging them, as well as imposing one`s own order, customs, institutions and views (Falkowski, Roźnowski, Witkowski, 1996).

Not trying to explain the phenomenon of social ethnocentrism in a deeper way, only mentioned at this point, the following types of social ethnocentrism can be distinguished among others:

- ethnocentrism relating to customs,
- educational ethnocentrism,
- denominational ethnocentrism,
- political ethnocentrism,

- economic ethnocentrism.

In each area of human activity mentioned, it is connected to acknowledging predominance and practical usage of such evaluated rules and norms of behaviour, programmes and concepts, methods and technologies, which are perceived in a certain community as their own, domestic, the only ones appropriate, because they have been created and checked in this environment.

Economic ethnocentrism has a special character and expression. According to the essence of the ethnocentrism phenomenon, it evinces in acknowledging as the only correct and right. That is why it is worth implementation in practice of husbandry, concepts, ideas, recipes or one`s own technologies, offered by domestic institutions or the citizens of a country, thanks to this adapted to internal conditions and profitable to the whole economy. Therefore, economic ethnocentrism evinces itself in preferential treatment of one`s own country oriented programmes, economic thought, internal market, domestic enterprises and institutions. (Bogle, 2009). Appropriate solutions and decisions are connected to them in the processes:

- privatisation, restructuration and modernisation of enterprises,
- supply in producing factors,
- in investments localisation,
- in penetration of outlet markets,
- introducing new technologies.

By having everything one`s own way means displacing and omitting the decision-making options, which come from abroad or are also connected with people or institutions from different countries, they concern foreign capital, brands and technologies. This way of thinking and acting, such determined making-decision processes and appropriate products to them (also called “economic patriotism”) lead to closure of a country`s economy, isolation from external income, based the whole system on economic self-sufficiency (Szromnik, Wolanin – Jarosz, 2012).

Some manifestations of economic ethnocentrism have been known in the environment of economists, enterprises, as well as managers, scientists, social and political activists in different countries, especially in the ones of real socialism. They have also appeared to a small extent in the times of reforms and system changes, when the choices between “my own” or “foreign” were the essence of socio-economic changes (Bywalec, 2010).

The victory of a wide concept of economic union, the opening of the economy to the progress and innovations, in the result the inflow of foreign capitals streams caused coexistence of domestic companies sector and foreign companies sector in economy. Ethnocentric orientation in managing has received a new form, this time in the area of market decision making of consumers, by purchasing consumer goods in trade. The problem comes to the choice – to buy but in which enterprise, in which company invest one`s purchasing power – in a domestic or foreign one? The appropriate orientation to

buy in the shops of domestic companies, which have home capital and local sellers, can be called trade ethnocentrism.

Accenting local, regional or domestic origin of the trade capital and home property of the companies can be found in socio-political programmes of many party organisations, federal and collective ones. The condition of their success is the awareness of the subjects` ownership of market of commercial services – the knowledge about possessive attachment of trading companies, including especially big organisations of supermarket and hypermarket chains, the knowledge about trading cooperative activity and local franchising networks. Only then, decisions of the place choice where to do the shopping and appropriate organisation of retail trade will be decisions, no matter which country the institutional brand comes from, its name or marketing symbolism (Karcz, Kędzior, 1999).

Social identification of the trade companies` owners (possessive attachment) is not an easy case, mostly because of the fact that huge trading sales networks have a strategy of imitating the nationally sourced capital and the same companies, or taking into consideration multinational, their possessive structure (Gregory, 2013). Defining the country of origin of a super- or hypermarket, saloon, warehouse or shopping mall considerably obstruct and relatively often darken the sales of the sales points in the whole chains and enterprises among the participants of the global trade services market (Figure 1).

The decisions of consumers concerning the choice of the trading place – the places where people buy determine, to a large extent, the choice of the product bought. It results from the fact, that the foreign sales point usually offers imported products. There is a dependency, between the country of origin of the trade capital (the company`s possession) and the country of origin of the products sold. In the foreign networks of super – and hypermarkets, in which foreign product brands dominate, the buyers have limited possibilities of choice among the foreign products and the domestic ones. The decision making process itself is ambiguous and darkened. Ethnocentrically directed consumer, who looks for the products which come from their country, is on purpose deceived by marketing announcements – names, signs, symbols (Ruta, Wysocki, 2010).

Consumer ethnocentrism, as a general phenomenon, which often has massive intensity scale, has its deeper roots. It is connected, with general assessment and relations to foreign solutions and projects, recipes and technologies, to the presence of „strange” enterprises on the domestic market and their participation in the socio-economic changes (Figiel, 2004).

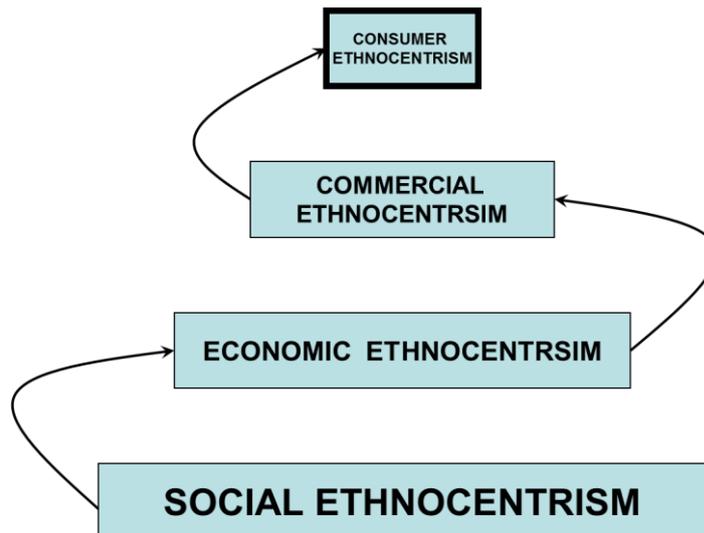


Figure 1 “The pyramid of ethnocentrism” – from social to consumer ethnocentrism
Source: own elaboration

2. Consumer ethnocentrism as an effect of influence of social and economic macropowers

Consumer ethnocentrism, its range and intensity in a given social group is the effect of influence of different factors, circumstances and social, political, technological and economical conditions, factors, which have different character and the direction of influence. In the long run, they shape behaviour and market choices of individuals and groups, which in the result, define dispersion of purchasing preferences in regard to domestic and foreign products. In the first case, when the buyers are clearly domestic products oriented, the phenomenon is defined by already analysed term “consumer ethnocentrism”, in the second case, when the customers have a different attitude and purchasing preferences, the term “consumer xenocentrism” is used. In this way, unlike the authors of many scientific- research works, two states of purchasing orientations of consumers can be distinguished. They are extremely different – orientation towards domestic products contra foreign ones (Szromnik, Figiel, 1997).

Acceptance and juxtaposition of two strictly connected phenomena, which have opposite direction of changes (inversely related dependency) allows to examine them exclusively as a unity, their mutual interdependency. The increase of ethnocentric behaviour on the market weakens xenocentric tendencies and on the contrary. It should be assumed, however, that there is one mechanism, which explains complex processes of the changes of consumer purchasing preferences. It reflects their attitude towards the products, which come from one’s country and the one from abroad. In this mechanism, which includes a “circle” of ethnocentric attitudes and a “circle” of xenocentric attitudes, certain driving and hampering forces exist. They change the dynamics of certain

phenomena, including the main considered phenomenon, which is for the authors consumer ethnocentrism (Figure 2).

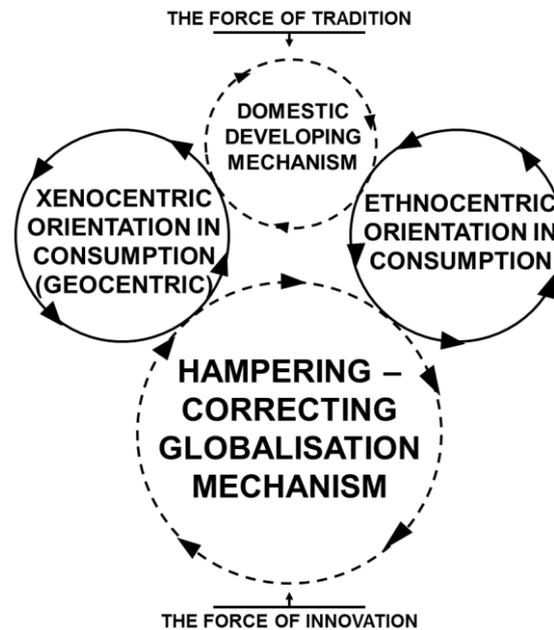


Figure 2 The main forces and mechanisms shaping consumer ethnocentrism
Source: own elaboration

The intensity of consumer ethnocentric attitudes is connected with the activity of developmental sub mechanism “powered” by the force of traditions and customs, additionally strengthened by:

- media campaigns of consumer organisations,
- marketing strategies of the companies, which stress the fact that “native” origin of the products, semi-finished products or raw material is the most important,
- supporting regional products and their certification,
- initiating and supporting social movement for development of domestic art, especially of small and middle businesses,
- performances and competitions of traditional cuisine – appropriate ingredients and food processing technology,
- informational actions of domestic trade retail organisations, above all, family and cooperative trade,
- involvement of political organisations and politicians` classes to promote domestic brands and trade.

In this way, behaviour and decisions of consumers directed to shopping and consumption (usage) of the goods, which come from one`s country and are made there, thanks to the use of domestic production factors, are created, animated and strengthened.

Maintenance of the high level of consumer ethnocentrism, and even further increase of appropriate tendencies, is dependent on the strength of influence of

the second instrumental macro-power, namely from the globalisation processes observed in the whole modern world. The globalisation processes and their basal progress, innovations and liberalisation of international flow of information, funds, people and material assets, changed domestic markets in geographical segments of the global market. Unification of stock offers of the companies in intersection of the countries of origin of the product and brands appeared on such regional markets. Taking into consideration the structure, trade offers are comparable on different continents. They are presented and made available by global retailers and wholesalers.

The effect of market globalization are fast changes of purchasing and consumptive habits of the inhabitants from different countries. They express, mainly in acceptance of foreign products, which have global dimension, their distribution substituting and supporting traditional, typical domestic brands. In this way, a traditional, home consumer, who is clearly ethnocentrically orientated turned into a global consumer with preferences and satisfaction of someone who buys foreign products, which have global character, by identifying with an aware ksenocentric buyer. The purchase of foreign products allows him or her to know the world, people, their customs and consumptive preferences. The fact of consumptive distinction in his or her own social environment and presentation of oneself as an enlightened and modern provides the person additional satisfaction (Mazurek – Łopacińska, 2011).

Summing up, the presented hypothetical mechanism of shaping consumer ethnocentrism, which includes two driving forces of shopping – consumption changes of purchasers, which have opposite activity, the role of state policy and legislative acts, which limit (exclude) the influence of one of the component mechanisms – the mechanism based on the strength of traditions and social habits, or the globalisation mechanism based on the progress and innovations, should be mentioned at this point (Chinen, 2010). The introduction of formal restrictions in supplying the market, isolating the market and society, barriers in media communication, difficulties in international flow of capital and investments cause external interference in functioning the mentioned above dynamic system, interfering in the whole mechanism. These specific “clutches in an engine” of consumers` social changes, changes in correctness of their shopping, decisions and market choices (Burgiel, 2010).

3. Ethno and consumer ksenocentrism – continuum of changeability

According to the characteristics previously mentioned, ethnocentrism and ksenocentrism are opposite poles allotting changeability of purchasing orientation of individuals and social groups, which make market choices – a domestic or foreign product? These are extreme points of changeability scale of consumer preferences, oriented on the country of origin of a given product,

including different sides of intensity of orientation on “home products” or on foreign products”. In this way, individual decisions and appropriate choices of buyers accompanied by them, can be registered, not as dichotomous decision making processes of the type “or or”, having the zero - one scale (0-1), which are related to the domestic or foreign product choice, but as one from many options shown on the continuous scale, introducing smooth passage from extreme consumer ethnocentrism to extreme consumer ksenocentrism.

Acceptance of continuous scale measurement of a consumer shopping orientation means, that his or her decisions of the choice of products can be related to any point on the closed scale with two extreme states, showing potential shopping orientation of an individual. Every choice and appropriate state of decision making consciousness can be defined on the continuous scale, which reflects intensity and changeability of considered, cumulated benefits – satisfaction connected to purchasing domestic or foreign products.

The level of ethnocentrism or consumer ksenocentrism of an individual or a group is determined by cumulative magnitude of values – benefits – satisfaction, which is connected to the purchase of a family or foreign product. Estimated, perceived and aware summary value, including utilitarian and additional effects, material and spiritual, direct and indirect, measurable and non-measurable connected to the purchase, manage the buyers` decisions (Lizurej, 2009).

Accepted in the present considerations, continuation of measurement scale of consumers` purchasing orientations or their groups, allows to indicate three appropriate decision making spheres – the areas of choice of products in intersection of their country of origin. They differ with the level of intensity of certain orientations, that is:

- sphere I – the sphere of domination of orientation on foreign products, appropriate for consumer ksenocentrism,
- sphere II – the sphere of decisive compromise, which balances xeno and ethnocentric tendencies – the sphere of indifference of influences, mixed purchasing orientation,
- sphere III – the sphere of domination of oriented on buying domestic products, the sphere of domination of consumer ethnocentrism.

Every point (X) marked on the horizontal axis on Figure 3 expresses different level of etno- or ksenocentric intensity, in fact, different proportion of distribution of forces, which decide about buying certain products, from extreme domination of one of them, by their relative balance, to domination of opposite forces.

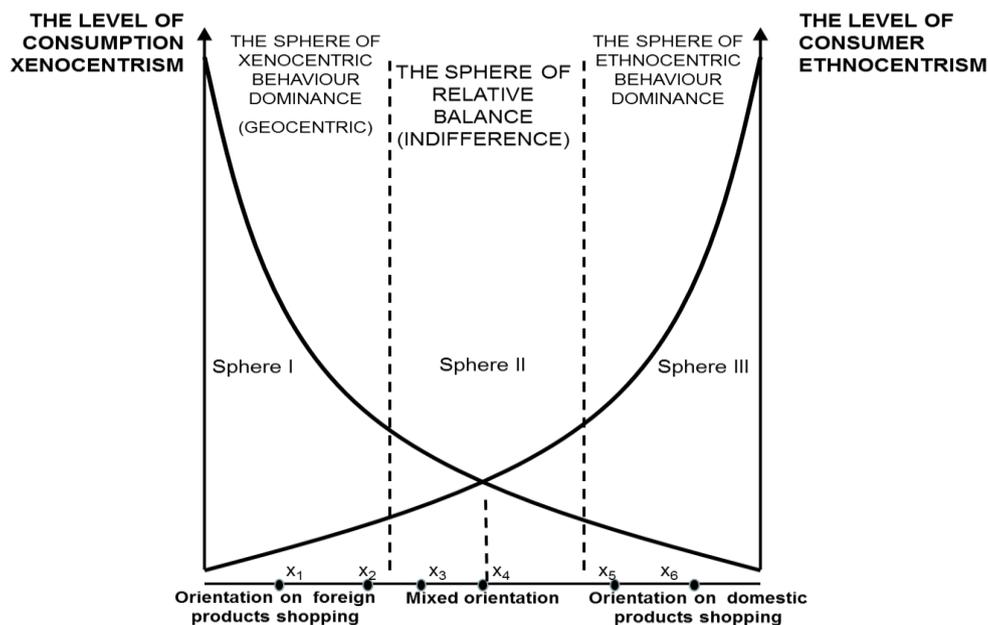


Figure 3 The spheres of consumer shopping preferences – the continuum of choosing products changeability

Source: own elaboration

The balance sphere takes a special place – the sphere of indifference, determined by relative comparable ethno affects – and xenocentrically. It corresponds those shopping decisions, which are a compromise of a steady market balance of powers, they express mixed, ambiguous and central buying preferences.

Full identification and ultimately measurement of attitude of consumers to the purchase of “native” products or “strange” ones, require introduction of more detailed differentiations of the intensity levels of ethnocentrism and consumer ksenocentrism. According to such assumptions, in each from two considered cases, six stage phenomena changeability has been introduced, that is:

- ultraethnocentrism / consumer ultraksenocentrism,
- strong ethnocentrism / strong consumer ksenocentrism,
- medium ethnocentrism / middle consumer ksenocentrism,
- moderate ethnocentrism / moderate consumer ksenocentrism,
- quasiethnocentrism / consumer quasiksenocentrism,
- trace ethnocentrism / consumer trace ksenocentrism.

The proposed verbal scale of differentiated intensity of ethnocentric or ksenocentric tendencies in shopping and material goods consumption can be clarified by additionally introducing interval quantitative scale properly reflecting changeability of the discussed phenomena and their interdependency (disappearance of ethnocentric behaviour leads to appearance of ksenocentric attitudes and vice versa). The most adequate, in this case, seems to be the two-

poles scale based on the point measurement from 10 to – 10 points. Taking into consideration that the values added would express the intensity of consumer ethnocentrism and the negative values adequately consumer ksenocentrism. The scale measuring division (2, -2) would refer to the “temporary” level of the phenomena and would be their changeability sphere, indefiniteness of consumers shopping behaviour. On the presented graphic conceptualisation (por. Figure 4) every level of changeability, according to the verbal scale of the intensity of the consumers orientation measurement would respond to two points of difference (10-8 p., which is consumer ultraethnocentric, 8-6 p. stands for strong consumer ethnocentrism, 6-4 medium, etc.).

In case of the use of American measuring tool to measure consumer ethnocentrism, in other words so called the CET-scale method based on 17-item questionnaire and 7-step Likert scale, the measured level of ethnocentrism with the use of points, can also be referred to six levels of the proposed verbal scale. If each result of an individual measurement is in the range of 17-119 points, then 17-point range will differentiate each one from the six levels of the verbal scale. Adequately consumer ultraethnocetrism can be referred to the people, who in the result of taking part in the CET-scale method questionnaire had the possible maximum – the range 102-119 points, strong consumer ethnocentrism 85-102 points, medium 68-85 p., moderate 51-68 p., consumer quasiethnocentrism 34-51 p. and strong ethnocentrism in case of receiving only 17-34 points (Szromnik, Wolanin – Jarosz, 2013).

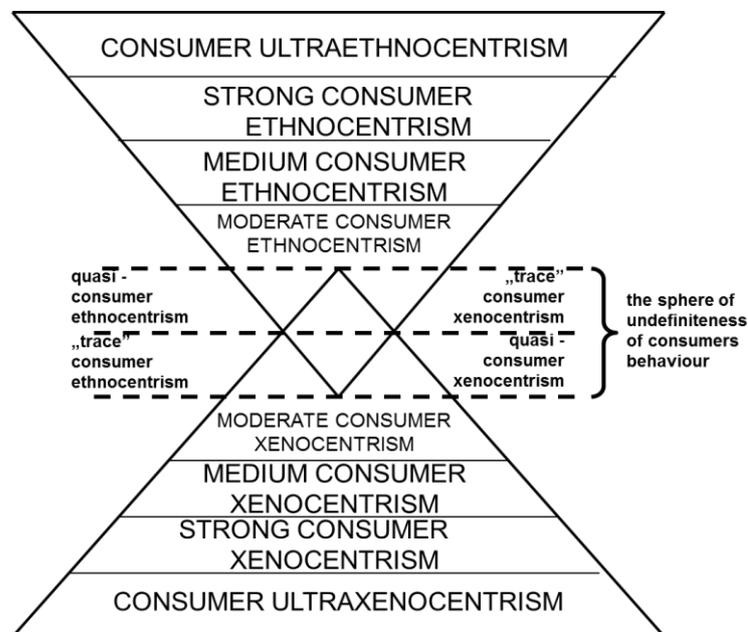


Figure 4 The levels of changeability of orientation on domestic and foreign shopping – from consumer ultraethnocentrism to consumer ultraxenocentrism
Source: own elaboration

4. A domestic product and a foreign product – general spectrum of e spectrum perceiving

Different associations, references, assessments or the ways and criteria of recognising, which function as stereotypes in certain social groups, are connected to a „domestic product” and to a „foreign product”. These are not only synonyms or related concepts in relations to the main category, but important psychological interpreters, which decide about positive, favourable, and even warm perceiving of the products, according to the places from where they come from. It refers especially to the “domestic products”, which can be defined as ours, close, known, local or other terms can also be used.

Eight associative terms in relations to the „domestic product” have been proposed to the aim of the present elaboration. They can undergo social assessment and arrangement.

The following terms have been introduced:

- close – accessible,
- own – native,
- certain – guaranteed,
- recognisable – known,
- traditional – habitual,
- easy in use,
- from this place – local,
- manufactured in our country.

All terms mentioned have a positive connotation, they express and are associated with positive features of a product. Their meaning range allows to accept, appreciate and value them because of the connection with one`s homeland. There is not always like this because sometimes for some people a “domestic product” can be associated with the features like out-of-date, low quality, deceptive, typical, unoriginal, boring. The quoted references widen the horizons of perceiving of home products in a double sense (Figure 5).

Analogically, just like in case of the characteristics of the associational features of the domestic products, the research- diagnostic approach can be used for the „foreign products”. Hypothetically, it has also been assumed that the group of eight statements, which synthetically characterise the essence of such products, synonymous statements, that is:

- being discovered – surprising,
- prestigious – distinguishing,
- hard to find – unique,
- profitable – advantageous,
- reliable – qualitative,
- new – unknown,
- original – special,

- enriching – broadening.

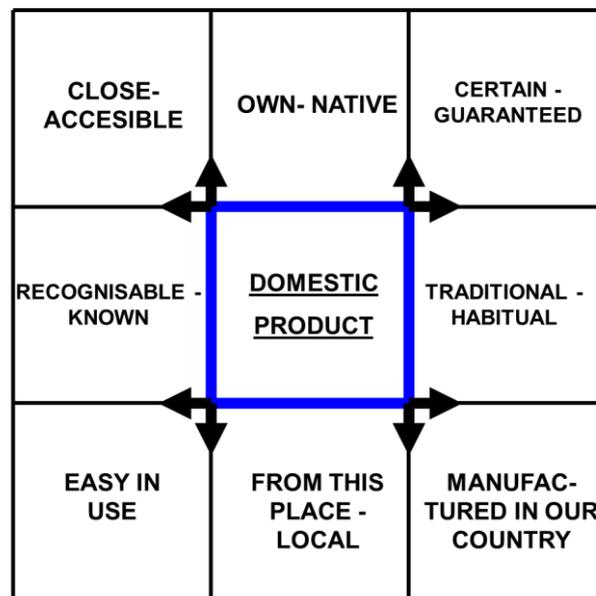


Figure 5 The meaning range of the term “Domestic product”
Source: own elaboration

In case of the „foreign product”, the quoted typical statements, generalisations and related terms. All of them create a set of positive features, however differentiated as far as the scale of character is concerned (Figure 6). In order to order them according to the social acceptance of the associations given, appropriate frequency of their appearances, they should also undergo representative survey studies by introducing additionally at least a few negative terms like unnecessary – threatening, expensive – unadjusted, unknown – difficult in use, strange as far as culture is concerned – bizarre or dangerous – risky (Gutkowska, 2011; Thomke von Hippel, 2004).

Perceiving the features of domestic and foreign products by consumers, usually in subjective, accidental and individual, to a big extent reflects in their interest in a certain product, and finally in its purchase and consumption (usage). That is why a deep analysis should be done to the way of identification and valorisation of products according to the countries where they come from, including the influence, so called the effect of the country of origin of a product (Lampert, Jaffe, 1998).

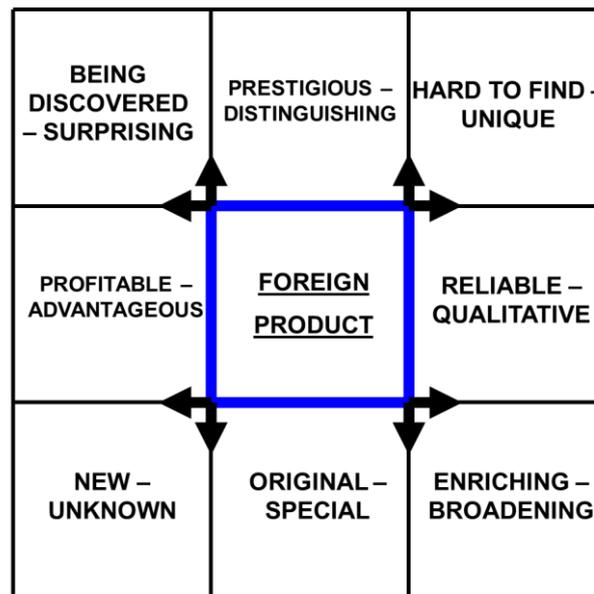


Figure 6 The meaning range of the term “Foreign product”
Source: own elaboration

5. A domestic or foreign product – identification of the country where the product comes from.

The basic condition of an aware purchase of a domestic or foreign product is relatively fast, easy and correct identification of a country of its origin. It is not an easy process because of:

- lack of direct announcement about the country where the product is from,
- information about the product is given in a foreign language,
- information about the country ,where the product is from disappear in extensive text,
- announcements are inconsistent,
- the names of the countries are often no longer used but their economic communities,
- deliberate hiding information about where a product is from,
- giving incomplete and even untrue information,
- difficulties with defining the country of origin of a product in case of production of subcomponents, parts, semi-finished products, in different countries.

Therefore, a question appears, on the basis of which features, characteristics and signs, a country of origin of a product can be recognised in a system – either domestic or foreign and if something is from abroad, which country is it from? All features, which are used to identify a product, are suggested to be divided into two big groups, that is:

- main identifiers,
- supporting identifiers.

In the first group of the features allowing to define the country where a product is from, there is some information about the country of origin of the product brand. On the basis of this knowledge, the country where the product itself is from can be shown with a big probability. In this case it is assumed that the country of origin of a given brand equals the place where the product itself comes from.

Additional information allowing to recognize the country of origin of a product brings the brand symbol – a characteristic sign, graphic code, which includes typical elements for a country, its location, geographical, social, religious, cultural features or official national symbols – emblem. The characteristic graphic sign – the brand symbol can suggest a country or a group of countries (Barska, 2011).

The brand name of a product brings important contribution to knowing the country where the product was manufactured – the name showing its basic use, the spheres of life or just its destination. It is especially crucial in case of specific, unique products, consumed or used only in strictly defined countries. Additional, useful information, which helps to identify the product, is the use of the country or region name itself in the name of the product. It also concerns additional information, which can be found on tags, labels, emblems. It completes and develops the name of the product (Rak, 2011).

The brand name, that is its verbal part, should be included as one of the main identifiers of the country, where the product is from. The word or words used, their meaning, construction or arrangement of the letters, the kind of font, can show directly or with some kind of probability, the country of origin of a certain product. It is particularly easy, when the brand name is popular and widely recognizable, because it refers to mass produced consumption goods sold almost all over the world. It should be taken into consideration, however, that firstly – brands change their owners and at the same time, they refer to the products which changed their geographical derivation, and secondly – the brand name can deliberately suggest the country of origin and prestigious features of its products, although they are not completely connected with this country. In spite of these objections, a brand name is an important component of the identification process of where the product is from (Oczkowska, 2008).

Finally one of the most important geographical identifiers of a product included to the main feature group, the bar code, that is a geographical signage of a product (graphic code). By appearing in different conformations of lines, additionally completed with numbers, it directly indicates the country where a certain product has been manufactured. The first three numbers are a numerical mark of the country where the product has been completed (Figure 7).

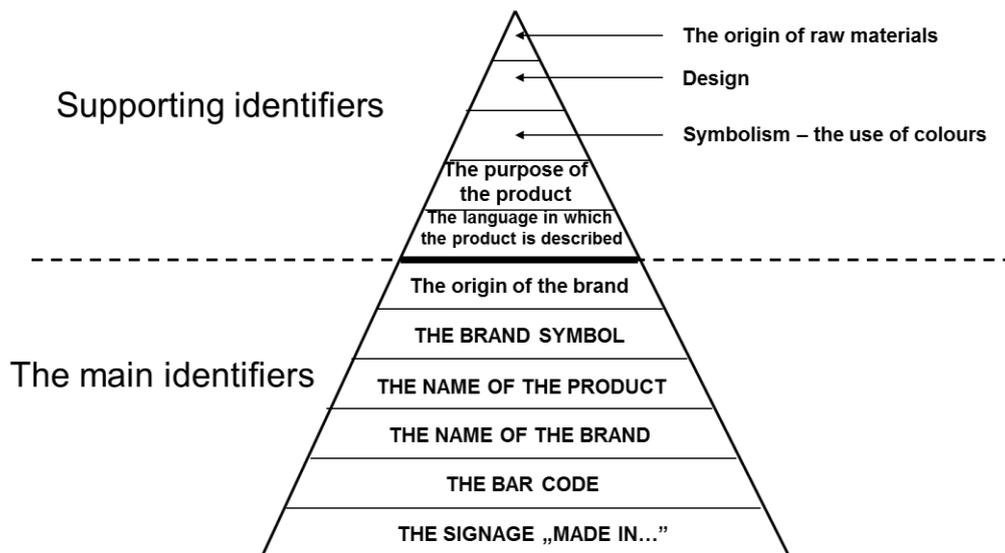


Figure 7 The pyramid of the identifiers of product's country of origin
Source: own elaboration

„Made in...”, widely used English expression, undoubtedly indicates that a product was manufactured in a certain place. On the grounds of it, it can be directly said that where, in which country a given product was produced, no matter what the pronunciation and identifications of other identifiers are. Not always, however, this expression, used obligatory in the international trade, can be found on the product itself, because it often gets lost when put on a label or wrapping, it is liquidated along with their rejection, intended to recycling etc.

Recognizing the country of origin of the product by relying on the accessible, noticeable information on the product itself, its wrapping or additional materials, can be strengthened thanks to the “team” of additional signs and symbols as the identifiers supporting the whole process. The information showing the country can be included to them according to:

- the origin of raw materials and subcomponents,
- design, where the idea comes from,
- characteristic symbolic use of colour,
- the use of product, its purpose,
- the language in which the product is described.

The identifying value of the product characteristics mentioned, is relatively small and can only serve for additional justification of a country where they come from. The consideration of the above mentioned characteristics, makes the justification, done by a consumer diagnosis, reliable and impinges on the spectrum range of the products features discussed (Figure 8).

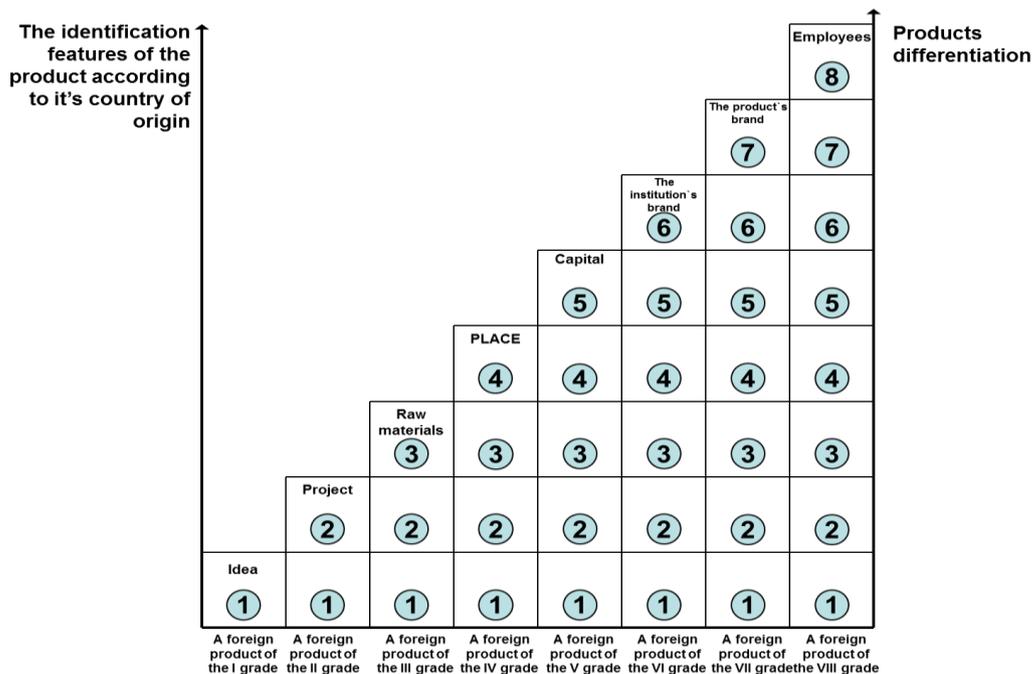


Figure 8 The anatomy of a product according to its country of origin – 8 grades of domestic products

Source: own elaboration

The characteristics of potential helpful features, being done while defining the geographical belonging of a product by a consumer or other interested person, allows to draw one conclusion – the correct identification of the country where the product is from, is not often an easy problem, all the more automatic. It is easy to make a mistake in this case by undergoing fragmentary and accidental verbal announcements and marketing symbolism. It is especially difficult in case of the foreign products, which have complex technological cycle, geographically dispersed production process and the development of the international enterprises cooperation (Khan, Rizvi, 2008).

Taking into consideration quoted circumstances the authors made an attempt to develop the issue of a foreign product „anatomy” by analysing structurally the production cycle of a potential product in detail – the object of geographical identification. The whole procedure is based on determining belongingness of certain components of a cycle of creating the product, using the two divisible “foreign country – domestic country” scale. 8-element cycle has been accepted in the analysis, which means distinction of eight phases of shaping its figure – market identity, that is:

- 1 – the idea for a new product,
- 2 – elaboration of the idea of the product,
- 3 – gaining raw material, semi-finished products, subcomponents,
- 4 – localisation of the assembly- production process,
- 5 – derivation of the capital, the property of the production company,
- 6 – the origin of the company brand,
- 7 – the origin of the product brand,

8 – dominating national affiliation of the company production labourers.

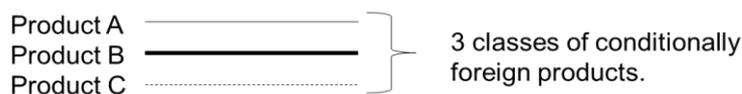
Depending on geographical assignment of every mentioned market features of the product (in the foreign country – domestic country system) its “genesis” can be defined by adequately grading connections with countries abroad. In this way, every product can be classified by being qualified to one of the eight classes. They respond to the following:

- a foreign product of the I grade (only one of the distinguished features is connected with countries abroad, the remaining seven come from a home country),
- a foreign product of the II grade (two features come from countries abroad),
- a foreign product of the VII grade (seven features refer to countries abroad and only one is connected with a given country),
- a foreign product of the VIII grade (all features – the production cycle phases refer to countries abroad).

Absolutely domestic product or absolutely foreign product are the products, in case of which every production phase, every element of its marketing concept is adequately domestic or foreign. In the verbal scale it equals with absolutely domestic product through the product, conventionally domestic and domestic conditionally to absolutely non-domestic products.

Table 1 Products profile intersection – the scenarios of market concept of foreign/domestic product

No		The origin	
		Foreign	Domestic
1	The origin of the idea for the product	●	●
2	The place of the product's project elaboration	●	●
3	The origin of the raw materials, semi-finished products, components	●	●
4	The localisation of the production process	●	●
5	The property of the company	●	●
6	The origin of the company's brand	●	●
7	The origin of the product's brand	●	●
8	The national belongingness of the work force	●	●



Source: own elaboration

By using the concept of the morphological table, different options of production organisation and shaping the market concept of completed products can be presented in the system 8x2, that is eight criteria of the product origin identification and two-dividable answers scale (foreign country – domestic

country). The presented profiles of intersections, correct production – market scenarios of the products, are broken lines connecting certain points. There are several dozen different combinations and concept of marketing preparation of the products. In a special case, that is, in relation to absolutely foreign or absolutely domestic products certain intersections profiles will be reflected as a straight line – straight seven - element segment (Table 1).

Conclusion

The condition of full recognition of a country, where the product is from, is possession, by interested people, potential buyers in this case, reliable and completed information about the product, its production – assembly process and marketing concept of introducing the product on the market. In this case, some additional information can be helpful like what is written on the product or attached label, previously gained environmental information and one`s own market experience (Baruk, 2008).

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PREDITION OF INDUSTRIAL PRODUCTION IN SELECTED CEE COUNTRIES

Ladislav PANČÍK

Abstract

The goal of the presented paper is to test whether Economic Sentiment Indicator (ESI) can be considered as a leading indicator of the growth of the real economy. The industrial productions (IP) of each of the four CEE countries (Czech Republic, Hungary, Poland and Slovakia) is predicted via a standard heterogenous autoregressive prediction model which is augmented by a weighted growth of the remaining IPs in the CEE region and lagged logarithmic differences of the ESI. The relative predictive power of the models is assessed in pairs using the mean squared errors of prediction models. Our results confirm that in the case of Hungary and Slovakia adding the information of ESI from past 6 and 12 months significantly worsens the prediction of the IP. On the other hand, in the case of the Czech Republic adding the same terms into the prediction model significantly improves the prediction.

Keywords:

industrial production, Economic sentiment indicator, heterogenous autoregressive model

Introduction

It is natural to suppose that sentiments of economic agents influence the development of the real economy. There are a large number of studies about the relationship between confidence indicators and the real economy. For instance, using confidence indicators Santero and Westerlund (1996) use various methods to predict the components of the real economy output. They found that the relationship between sentiment indicators and output differs with respect to country and confidence measure. They conclude that in general business confidence indicators are better predictors than consumer confidence indicators. Mourougane and Roma (2003) predict the real GDP growth rates in selected Euro area countries on the basis of European commission confidence indicators (ESI and ISI). They found that ESI is a particularly good predictor of the real GDP growth rates in certain countries (Belgium, Germany, France, Italy and the Netherlands).

Our approach is somewhat different. We use multiple linear regression (OLS) to predict changes in industrial production on the basis of its previous lagged logarithmic differences. Then we added various lags of ESI to the basic prediction model. We assess the relative prediction power of different models by mutual comparison of differences in mean squares errors of prediction.

1. Data

Our study is focused on four CEE countries, namely the Czech Republic, Hungary, Poland and Slovakia (also known as the Visegrad group). We used three types of data: index of industrial production (IP), gross domestic product (GDP) and Economic sentiment indicator (ESI).

The time series on industrial production (IP) were obtained from the online OECD statistical database. The data starts in January 1990 and ends in September 2014 for all of the four countries. The time series have monthly periodicity and each of them consists of 297 observations.

The time series on gross domestic product and ESI were obtained from the online Eurostat database. The ESI data start in 01/1995 for the Czech Republic, 01/1996 for Hungary, 10/1993 for Poland and 08/1993 for Slovakia and end in 09/2014 for all the four countries. The time series have monthly periodicity. The GDP data have yearly periodicity and for all four countries start in 1995 and end in 2014. The analysis for a given country starts at the time when the data on ESI is available.

2. Methodology

We used multiple linear regressions to create prediction models. Our goal was to find out whether the information contained in the ESI increases the predictive power of the basic model.

Logarithmic differences (with various lags) were used rather than the underlying values of time series. The logarithmic difference of variable x is calculated as follows:

$$x_{t-a,t-a-b} = \ln\left(\frac{x_{t-a}}{x_{t-a-b}}\right); a, b \geq 0 \quad (1)$$

Parameters a and b allow for setting different lags. For instance, a typically used logarithmic difference between two consecutive periods (months) $x_{t,t-1} = \ln(x_t) - \ln(x_{t-1})$ corresponds to $a = 0$ and $b = 1$. Similarly, the continuous return over six months is defined as $x_{t-1,t-1-6} = \ln(x_{t-1}) - \ln(x_{t-1-6})$.

We began with a model we call “basic” (hence the notation B) which was defined as follows:

$$B: IP_{t+1,t} = \beta_0 + \beta_1 IP_{t,t-1} + \beta_2 IP_{t-1,t-2} + \beta_3 WIP_{t,t-1} + \beta_4 WIP_{t-1,t-2} + \beta_5 IP_{t-1,t-1-3} + \beta_6 IP_{t-1,t-1-6} + \beta_7 IP_{t-1,t-1-12} + \varepsilon_{t+1} \quad (2)$$

This specification is similar to the heterogenous autoregressive model of Corsi (2009), which is successfully used for predicting market volatility. In the

model (2), IP denotes industrial production of one of four given CEE countries and its subscript denotes logarithmic difference in line with the notation introduced in (1). WIP denotes weighted industrial productions⁵ of the remaining CEE countries. For instance, when we predicted the industrial production of Slovakia, we computed the weighted average of industrial productions of the three remaining countries – the Czech Republic, Hungary and Poland.

$$WIP_{SK,t} = \frac{w_{CZE,t}IP_{CZE,t} + w_{HUN,t}IP_{HUN,t} + w_{POL,t}IP_{POL,t}}{w_{CZE,t} + w_{HUN,t} + w_{POL,t}} \quad (3)$$

Gross domestic products of individual countries are used as weights. The underlying idea of the approach is that a larger economy will influence neighboring economies more significantly. Since the data on GDP have monthly periodicity, we used the same sets of weights for all months in a particular year. For periods where the time series on GDP were not available (years 1990 – 1994) we used equally weighted average of IP s. After weighting procedure we calculated logarithmic differences of WIP s and then used them in the model.

Then we created a series of competing models (denoted C_i , $i = 1, \dots, 5$). The competing models were created by adding different lags of ESI to the basic model. The competing models were defined as follows:

$$C_1 : IP_{t+1,t} = \beta_0 + \dots + \beta_7 IP_{t-1,t-1-12} + \beta_8 ESI_{t,t-1} + \varepsilon_{t+1} \quad (4)$$

$$C_2 : IP_{t+1,t} = \beta_0 + \dots + \beta_7 IP_{t-1,t-1-12} + \beta_8 ESI_{t,t-1} + \beta_9 ESI_{t-1,t-2} + \varepsilon_{t+1} \quad (5)$$

$$C_3 : IP_{t+1,t} = \beta_0 + \dots + \beta_7 IP_{t-1,t-1-12} + \beta_8 ESI_{t,t-1} + \beta_9 ESI_{t-1,t-2} + \beta_{10} ESI_{t-1,t-1-3} + \varepsilon_{t+1} \quad (6)$$

$$C_4 : IP_{t+1,t} = \beta_0 + \dots + \beta_7 IP_{t-1,t-1-12} + \beta_8 ESI_{t,t-1} + \beta_9 ESI_{t-1,t-2} + \beta_{10} ESI_{t-1,t-1-3} + \beta_{11} ESI_{t-1,t-1-6} + \varepsilon_{t+1} \quad (7)$$

$$C_5 : IP_{t+1,t} = \beta_0 + \dots + \beta_7 IP_{t-1,t-1-12} + \beta_8 ESI_{t,t-1} + \beta_9 ESI_{t-1,t-2} + \beta_{10} ESI_{t-1,t-1-3} + \beta_{11} ESI_{t-1,t-1-6} + \beta_{12} ESI_{t-1,t-1-12} + \varepsilon_{t+1} \quad (8)$$

We write only $\beta_0 + \dots + \beta_7 IP_{t-1,t-1-12}$ instead of the whole model (2), in equations (4) to (8) in order to avoid unnecessary repetition. The added ESI terms are logarithmic differences of ESI computed as shown in (1).

An out of sample approach was used to assess relative predictive power of models (2), (4) – (8). We set the length of a moving window on 96 months (8 years). Therefore each prediction of the IP of a given country in time t was based on the values of lagged logarithmic differences of IP , WIP and (for models $C_1 - C_5$ also) ESI in previous 96 months.

⁵ It would be more precise to use weighted average of logarithmic differences. However, for small growth rates of IP is the difference neglectable.

Finally, relative prediction power was statistically assessed. We computed time series of mean squared errors for all the 6 models. The mean squared error of j -th model is given as:

$$MSE_{t+1}^j = (y_{t+1,t} - \hat{y}_{t+1,t})^2, \quad (9)$$

where $y_{t+1,t}$ is actual value of the logarithmic difference of IP and $\hat{y}_{t+1,t}$ is its predicted value. The difference of MSEs of two models in some time is given as:

$$\Delta_{t+1}^{j,k} = MSE_{t+1}^j - MSE_{t+1}^k. \quad (10)$$

Intuitively, if the expression (10) is positive on average, then the prediction error of model j is larger than the prediction error of model k and vice versa. If the expression (10) is zero on average, then there is no significant difference in prediction power of the two models. To test, whether a particular model has a significantly better predictive power we use the approach of Diebold and Mariano (1995) where the variable (10) was regressed against a constant and a HAC robust z-test test was performed on the γ coefficient⁶:

$$\Delta_{t+1}^{j,k} = \gamma + \varepsilon_{t+1} \quad (11)$$

3. Results

We present the results of our study in four separate tables, each for one of the countries. The rows and columns of the tables are named in a way that allows comparing each pair of models. The interpretation of a particular entry in a table is as follows: if a number is negative (and significance is indicated), then the model in a given row has a better predictive performance than the model in a given column and vice versa.

Table 1 Estimated average difference of mean squared errors (x 100 000), Czech Republic

	C_1	C_2	C_3	C_4	C_5
B	-2.38	-2.71	-1.66	0.73	1.87
C_1		-0.33	0.73	3.12	4.25 *
C_2			1.05 *	3.44 *	4.58 **
C_3				2.39 *	3.53 **
C_4					1.13

Note: *** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.05$

⁶ We used the R function `coefstest()` which is contained in the package `lmtest()` as described in Zeileis (2004). All the computations were done using an open source software statistical programming language R in the RStudio environment. Additionally, MS Office Excel was used for some auxiliary data manipulation tasks.

Table 1 presents the results for the Czech Republic. Looking at the row C_2 we see that models C_3 , C_4 and C_5 are better. Also models C_4 and C_5 turn out to be better than model C_3 . In general, adding $ESI_{t-1,t-1-6}$ and $\beta_{12}ESI_{t-1,t-1-12}$ improves the prediction of industrial production in the Czech Republic.

The highest number of conclusive test results was found in the case of Hungary. As we can see in table 2, the models C_4 and C_5 were outperformed by all four remaining models. The absolute size of error estimates and statistical significance levels are clear evidence of that. Recalling the regressors of models C_4 and C_5 we conclude, that adding the information about ESI 6 and 12 month prior to prediction period makes the prediction of IP even worse.

Table 2 Estimated average difference of mean squared errors (x 100 000), Hungary

	C_1	C_2	C_3	C_4	C_5	
B	0.64	-1.97	-1.91	-5.61 *	-38.55	***
C_1		-2.60	-2.54 *	-6.25 **	-39.19	***
C_2			0.06	-3.64 **	-36.58	***
C_3				-3.70 ***	-36.64	***
C_4					-32.94	***

Note: *** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.05$

Table 3 presents results for Poland. The number of conclusive results is modest. We see that model C_2 is better than C_1 and model C_5 is worse than the basic model (B) or model C_3 .

Table 3 Estimated average difference of mean squared errors (x 100 000), Poland

	C_1	C_2	C_3	C_4	C_5	
B	-6.60	-5.97	-5.37	-6.62	-7.99	*
C_1		0.63 *	1.23	-0.02	-1.39	
C_2			0.60	-0.65	-2.01	
C_3				-1.25	-2.62	**
C_4					-1.37	

Note: *** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.05$

The results for Slovakia are quite consistent and conclusive. Looking at the rows $C_1 - C_3$ we see that these models are significantly better than models C_4 and C_5 . The situation is similar to the case of Hungary. Adding $ESI_{t-1,t-1-6}$ and $ESI_{t-1,t-1-12}$ worsen the prediction power of a model. On the other hand, the fact that model C_1 outperforms the basic model, implies some prediction power of ESI in the horizon of one month.

Table 4 Estimated average difference of mean squared errors (x 100 000), Slovakia

	C_1	C_2	C_3	C_4	C_5
B	5.65 *	4.89	4.76	-0.52	-1.92
C_1		-0.76	-0.88	-6.17 ***	-7.57 ***
C_2			-0.13	-5.41 *	-6.81 **
C_3				-5.28 **	-6.69 **
C_4					-1.41

Note: *** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.05$

Conclusion

Relative predictive power of the introduced models differs among the countries. In the cases of Hungary and Slovakia, adding the information about 6 and 12 months change of ESI significantly worsens the predictive power of models. It seems not to contain any additional information but, on the contrary, creates noise in the model. On the other hand, in the case of the Czech Republic adding the same terms significantly improves the prediction power of some models. From this perspective, the decision whether in general it is good to include ESI into (self)prediction models is inconclusive. Recalling model C_1 in the case of Slovakia and C_2 in the case of Poland we infer that ESI is useful for short-term prediction.

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CAN CONFIDENCE OF GERMANY HELP TO PREDICT THE CONFIDENCE OF V4 COUNTRIES?

Veronika ILLÉŠOVÁ

Abstract

The aim of this paper is to explain the Economic sentiment indicators (ESI) of V4 countries by their own values and by German ESI, predict future values and compare prediction models. For this we use out-of-sample linear regression and models are tested by t-test.

Keywords:

Economic sentiment indicator, out-of-sample regression, prediction

Introduction

In general, confidence indicators are considered to be an important instrument for monitoring the development of an economy. As shown by Giannone et al. (2009) confidence indicators are good predictors of the GDP. Consumer confidence indicators can even forecast future changes in labour earnings (Ludvigson, 2004).

In this paper we study the inter-relationship between the Economic sentiment indicators (ESI henceforth) of the Visegrad group (V4) with that of Germany. More specifically, we have chosen the German ESI as an explanatory variable, which we expected to predict the ESI of the V4 countries. The ESI is a composite indicator that summarizes 15 individual components of confidence indicators by sectors, which are: industry, services, consumers, construction and retail trade.

Our basic idea is that the size of the German economy and large share of international trade of V4 countries with Germany might imply that the sentiment in Germany should lead that in V4 countries. Germany is the biggest single trade partner for V4 countries. In 2012, around 31 %⁷ of total Czech production was exported to Germany. Hungary, Poland and Slovakia exported around 25 %, 25 % and 21 % of their respective production into Germany in the same year. As a consequence German ESI should be a useful predictor of ESI in V4 countries.

Results of this study may be useful for policy makers as an estimate of future producer and consumer behavior. If we show that the German ESI is a good leading indicator of the ESI of the V4 countries, the policy makers can take it into account.

⁷ Get Insights by Country. [online]. [cit. 14.3.2015]. Available on the Internet: <<http://globaledge.msu.edu/global-insights/by/country>>.

1. Data

The values of the ESI for the V4 (The Czech Republic, Poland, Hungary, and Slovakia) and Germany, were obtained from the European Commission database. This indicator is reported with a monthly data frequency, and for this study we use data from August 1993 to September 2014. Data are described in Table 1.

Table 1 Description of the dataset of ESI: Data from August 1993 to September 2014.

Country	Average growth	Standard deviation	Minimum		Maximum	
			Date	Value	Date	Value
CZ	99.79	10.37	Jan 1999	72.5	Feb 2007	119.2
HU	99.52	10.76	Mar 2009	59.1	Apr 2004	119.9
PL	99.47	10.36	Mar 2009	77.2	May 1996	123.6
SK	99.43	10.06	Apr 2009	65.5	May 1996	122.4
DE	100.34	9.58	Mar 2009	71.8	Dec 2010	117.5

2. Methodology

The methodology we used is based on the out-of-sample regressions, where we predict the value of the ESI of V4 countries by their previous lagged values and lagged values of the ESI of Germany. First for each ESI we calculate (continuous) returns over a period from $t - a - b$ to $t - a$ as follows:

$$y_{t-a,t-a-b} = \ln\left(\frac{x_{t-a}}{x_{t-a-b}}\right); a, b \geq 0 \quad (1)$$

where x_{t-a} is a value of ESI at $t - a$, where t is the usual time index. For example if $a = 0$ and $b = 1$ we obtain a classic logarithmic difference over one period $y_{t,t-1} = \ln(x_t) - \ln(x_{t-1})$. Another transformation that we have done with data were logarithmic differences over 3, 6 and 12 months, i.e. $a = 1$ and $b = 3, 6$ or 12 .

In the next step we estimated a regression model using a sample of first 100 observations. The estimated model was used to predict the 101st observation of ESI for a given country (predictions are denoted as y_t^{Aj}). We repeated the process by re-estimating the regression where the first observation was deleted and a new 101st observation was added. The resulting new regression was used to predict the outcome of the 102nd observation. This process was repeated until all remaining observations were forecasted. For prediction purposes we considered several models and then we compared these models using the standard Diebold – Mariano (1995) method with HAC robust standard errors.

Model A1 (the basic model): by this model we try to explain changes in the ESI only by their previous values. The following specification is similar as used

by Corsi (2009) to forecast market volatility, and is dubbed as heterogeneous autoregressive model:

$$y_{t+1,t} = \alpha_0 + \alpha_1 y_{t,t-1} + \alpha_2 y_{t-1,t-2} + \alpha_3 y_{t-1,t-4} + \alpha_4 y_{t-1,t-7} + \alpha_5 y_{t-1,t-13} + \varepsilon_{t+1} \quad (2)$$

where α_i , $i = 0, \dots, 5$ are regression coefficients and explanatory variables are lagged changes in the ESI as explained in (1).

Model A2 – A6 were created by adding logarithmic differences of the ESI of Germany to model A1. Their analytical expressions are shown below:

$$A2: y_{t+1,t} = \alpha_0 + \dots + \alpha_5 y_{t-1,t-13} + \alpha_6 z_{t,t-1} + \varepsilon_{t+1} \quad (3)$$

$$A3: y_{t+1,t} = \alpha_0 + \dots + \alpha_5 y_{t-1,t-13} + \alpha_6 z_{t,t-1} + \alpha_7 z_{t-1,t-2} + \varepsilon_{t+1} \quad (4)$$

$$A4: y_{t+1,t} = \alpha_0 + \dots + \alpha_5 y_{t-1,t-13} + \alpha_6 z_{t,t-1} + \alpha_7 z_{t-1,t-2} + \alpha_8 z_{t-1,t-4} + \varepsilon_{t+1} \quad (5)$$

$$A5: y_{t+1,t} = \alpha_0 + \dots + \alpha_5 y_{t-1,t-13} + \alpha_6 z_{t,t-1} + \alpha_7 z_{t-1,t-2} + \alpha_8 z_{t-1,t-4} + \alpha_9 z_{t-1,t-7} + \varepsilon_{t+1} \quad (6)$$

$$A6: y_{t+1,t} = \alpha_0 + \dots + \alpha_5 y_{t-1,t-13} + \alpha_6 z_{t,t-1} + \alpha_7 z_{t-1,t-2} + \alpha_8 z_{t-1,t-4} + \alpha_9 z_{t-1,t-7} + \alpha_{10} z_{t-1,t-13} + \varepsilon_{t+1} \quad (7)$$

where α_i , for $i = 0, 1, \dots, 10$ are regression coefficients and regressors z are logarithmic differences of the ESI of Germany computed by (1). The terms $\alpha_0 + \dots + \alpha_5 y_{t-1,t-13}$ represent the model A1 as shown in (2).

The accuracy of predictions was estimated via the following expression:

$$d_{t+1}^{kj} = \left(y_{t+1,t}^{real} - y_{t+1,t}^{Ak} \right)^2 - \left(y_{t+1,t}^{real} - y_{t+1,t}^{Aj} \right)^2, \quad (8)$$

d_{t+1}^{kj} is a difference of squared errors, $y_{t+1,t}^{real}$, is an original logarithmic difference and $y_{t+1,t}^{Ak}$ and $y_{t+1,t}^{Aj}$ are predicted logarithmic differences obtained by k^{th} and j^{th} model, where $k, j = 1, \dots, 6, k \neq j$.

To test the predictive ability of two competing models, we estimated the following regression:

$$d_{t+1}^{kj} = \beta^{kj} + \varepsilon_{t+1}^{kj} \quad (9)$$

If $\beta^{kj} = 0$ the two competing models have similar predictive ability. If $\beta^{kj} > 0$ model j has superior predictive ability compared to model k and if $\beta^{kj} < 0$ model k has superior predictive ability compared to model j . The significance of the β coefficient was evaluated using a t -test with Newey and West (1994) HAC robust standard errors.

3. Results

Results for every country are summarized into Tables 2 – 5. The values in tables represent the estimates of the t-test. For presentation purposes, we multiply the estimated coefficients by 100000. When two models are compared, the result of t-test in tables 5 – 7 is by comparison of model in row – model in column.

Table 2 represents results of the t-test for the Czech Republic. As we can see, only in four cases is the estimate of β significantly different from zero.

Table 2 Average difference of errors for the Czech Republic (*100000)

	A2	A3	A4	A5	A6
A1	3.16	8.29	5.79	5.68	4.17
A2		5.13 **	2.63	2.52	1.01
A3			-2.51 **	-2.62 *	-4.12 **
A4				-0.11	-1.62
A5					-1.51

Note: ** $p \leq 0.01$, * $p \leq 0.05$

From results in table 2, we can say, that model A3 is the best prediction model for the Czech Republic. When we compared this model with models A2, A4, A5 and A6 in any case squared errors of A3 were smaller than squared errors of these models. However, insignificant coefficients also suggest that model A3 does not offer superior predictive ability to the basic model A1. So we can conclude that the ESI of Germany does not help to predict the ESI of Czech Republic.

In the next table we displayed results of t-test for the ESI of Hungary.

Table 3 Average difference of errors for Hungary (*100000)

	A2	A3	A4	A5	A6
A1	13,12	9,57	12,05	13,71	13,25
A2		-3,55	-1,07	0,59	0,13
A3			2,48	4,14	3,68
A4				1,66	1,20
A5					-0,46

As we see in table 3, the ESI of Germany is not useful for predicting the ESI of Hungary. The average error between any two models is not significantly different from zero in any case.

Next we tested significant difference from zero of β for models, which explained the ESI of Poland. The results are in the following table.

Table 4 Average difference of errors for Poland (*100000)

	A2	A3	A4	A5	A6
A1	7,56	8,93	8,89	8,55	8,04
A2		1,37	1,33	0,99	0,48
A3			-0,04	-0,38	-0,89
A4				-0,34	-0,85
A5					-0,51

The German ESI does not help to predict the ESI of Poland, similarly to the case of Hungary. It means, that we cannot reject the hypothesis, that the average mean of squared errors of any pair of models is significantly different from zero.

The last country for which we tested the predictive ability of the German is the Slovak Republic. Results are presented in the following Table 5.

Table 5 Average difference of errors for Slovak Republic

	A2	A3	A4	A5	A6
A1	8,45	10,83	10,17	7,09	6,29
A2		2,38	1,72	-1,36	-2,16
A3			-0,65	-3,73	-4,53
A4				-3,08	-3,88
A5					-0,80

As we can see, even in this case, the ESI of the Germany does not help to predict the ESI.

Conclusion

In this article we attempted to predict changes in the Economic sentiment indicators of four countries of the Visegrad group, using their own past changes and that of the German ESI. Within our set of models we found only little evidence for the predictive ability of the German ESI towards ESI of the V4 countries. Except for the Czech Republic, the German ESI was not helpful in predicting ESI of the Visegrad group countries.

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COMPARISON OF TAX AND RELATED CONDITIONS FOR DOING BUSINESS IN V4 COUNTRIES

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Abstract

The article is focused on the comparison of the tax and social security contributions burden of the V4 group, which is represented by Slovakia, the Czech Republic, Hungary and Poland. It compares the tax systems of these countries with focus on direct taxes, and monitors the evolution of tax rates of personal income tax and corporate income tax for 2004-2013 period which is the period from the accession to the European Union to the present. The comparison of the V4 countries in terms of the tax and social security contribution burden is realized in the form of case studies that analyze three different scenarios. The article forms partial output of scientific project VEGA No. 1/0292/13 „Development and analysis of the financial performance of Slovak industry and the EU“.

Key words:

determinants of foreign direct investments, tax and social security contributions burden, V4 countries, labor costs

Introduction

Doing business abroad especially through foreign direct investments (FDI) has gained significant importance over the past years as the tool for accelerating growth and development especially within economies in transition. The politics of investment attraction and promotion of particular investors within the states and regions of Central and Eastern Europe has become sharpened and rival. Several empirical findings pointed out that among key determinant factors influencing attraction of foreign investors belong among others GDP size, host country risk, tax burden and labor costs. The present article deals specifically with selected determinants of foreign direct investment inflows based on analysis of previous empirical findings. The aim of the paper is to compare tax and related conditions (especially social security contributions burden) in Visegrad countries (V4) based on case studies and according to the results to formulate suggestions for selection of countries suitable for doing business abroad.

1. Literature review

Several authors have been dealing with identification of factors attracting investors for doing business abroad. Bevan and Estrin (2004) using a panel dataset of bilateral flows of foreign direct investments studied the determinants of FDI from Western countries to Central and Eastern European ones. They found that most important influences had unit labor costs, gravity factors,

market size and proximity. However, they not found country risk to be a significant determinant. Similar determinants were found also in the study of Jannicki and Wunnava (2004). They revealed that the key determinants of FDI inflows in Central and Eastern European countries are the size of the host economy, host country risk, labor costs in the host country and openness to trade. The recent study of Tintin (2013) verified the positive and economically significant of GDP size, trade openness, EU membership and institutions (measured by economic freedom, state fragility, political rights and civil liberties indices) on FDI inflows into Central and Eastern European countries. Seric (2010) considers market potential, labor costs and productivity as highly significant determinants of FDI inflows. Iammarino and Pitelis (2000) reported the most important motivations in determining the choice to invest in the following order: expected economic growth, geographical location, investment incentives, labor costs, increase in domestic market share, and increase in regional market share. The study of Sass and Fifekova (2011) established that the attractiveness of the CEE (and especially V4) region is apparently based on a number of factors, such as the availability of skilled labor with strong language skills, low costs, favorable business and stable political environment, well-developed infrastructure and geographical and cultural proximity to Western Europe. In Nexia International's report (2011) we can also find the availability of tax incentives, e.g. corporate tax relief for newly established or expanding companies, capital gains tax exemptions, tax allowances for SMEs, and tax reliefs for research and development mentioned as of important issues to consider when doing business in the region. The analysis performed by Bobenič Hintošová (2014) in the conditions of Slovak republic revealed that as most significant determinants of foreign direct investment inflows growth of GDP, country rating and the tax rate on corporate income can be considered.

2. Material and Methods

The article is focused on the comparison of the tax systems of the V4 group, which is represented by Slovakia, the Czech Republic, Hungary and Poland. It compares the tax systems of these countries with focus on direct taxes, and monitors the evolution of tax rates of personal income tax and corporate income tax for 2004-2013 periods which is the period from the accession to the European Union to the present, and the difference among the monitored countries and their gradual harmonization.

The comparison of the V4 countries in terms of the tax and social security contribution burden is realized in the form of case studies that analyze three different scenarios. The first case study focuses on individuals having income from dependent activities. It compares both the tax burden on labor and labor costs from the perspective of the employer. The content of the second case study is a comparison of the tax burden on personal income from doing business. The

third case study compares the V4 countries in terms of corporate income taxes and it also provides an example of introducing of common consolidated tax base of corporate income tax.

When calculating the tax burden on personal income tax, we have complied in accordance with applicable legislation in each of the V4 countries, which defines income subject to tax, the application of the tax-free allowance or tax discounts, and provides the appropriate income tax rate. On this basis, we calculated the amount of tax liability, and subsequently, the income tax burden as a proportion of the amount of tax liability on total income. Labor costs of the employer were determined as the sum of gross wages of employee and social security liability of employer.

The methodology used in calculating of the corporate income tax is based on the Council Directive on the Common Consolidated Corporate Tax Base (CCCTB), KOM (2011) 121 in the final version 2011/0058 (CNS).

The concept of CCCTB requires all EU Member States or just a group of them to develop a set of common rules for determining the tax base of companies with operations in several EU Member States. In every participating Member State corporations could subsequently opt for the adoption of this common European tax base to be used regarding all their activities within the EU. As framework for defining such a common European tax base the International Financial Reporting Standards have been suggested. Furthermore, the group's tax base is intended not to include intra-group profits.

The CCCTB replaces separate accounting by formula apportionment. The European Commission proposes a formula for corporate income tax apportionment based on three factors: capital, labor and sales. The labor factor includes wages and employees (at equal weights):

$$T_i = t_i \cdot \pi \left[\alpha_i^K \cdot \frac{K_i}{K} + \alpha_i^L \cdot \frac{L_i}{L} + \alpha_i^S \cdot \frac{S_i}{S} \right]. \quad (1)$$

- * i = state;
- * T_i = tax liability in state i ;
- * t_i = statutory tax rate in state i ;
- * Π = overall group profit;
- * $K_i/L_i/S_i$ = capital/labor/sales in state i ;
- * $K/L/S$ = overall group capital/labor/sales;
- * α_i^K = weight on capital in state i ;
- * α_i^L = weight on labor in state i ;
- * α_i^S = weight on sales in state i ;
- * $\alpha_i^K = \alpha_i^L = \alpha_i^S = 1/3$.

The data set needed for elaboration of the case studies was obtained from Eurostat database, OECD database, and the databases of statistical offices of the V4 countries.

3. Results and Discussion

Economic integration offers the opportunity for individuals as well as for companies to use foreign economic opportunities such as moving the foreign capital from one country to other countries in which foreign investor can gain benefits such as lower tax rates. It causes competition between countries to attract foreign investors.

The sovereign right of each State is to impose within its territory the tax obligations for tax payers, namely for individuals and legal entities without any restriction, and regardless of what are the tax systems of other countries. The amount of tax liability is determined by each state separately with respect to its economic policy; moreover, it should fulfill the needs and requirements of the state budget (Rylová, 2012).

Most of countries have introduced tax reforms to ensure that their economies continue to remain attractive for investment activities. Increasing tax competition caused that the government also adopted the trade rules to prevent residents and individuals to benefit from lower tax rates abroad (Edwards, Ruggy, 2014).

Tax competition among member countries exists mainly because some countries use various concessions to attract investment such as tax holidays, selective reduction of the tax base or tax rates.

3.1. The comparison of evolution of tax burden on labor and evolution of tax rates in the V4 countries

Currently, all member countries in EU are interested in tax burden on labor, because their efforts are to transfer tax burden from labor to consumption.

For this reason, many countries have decided to increase value added tax (VAT) at the costs of reducing income tax rates.

The main indicator of the tax burden on labor is called “tax wedge” It reflects the difference between total labor costs of the employer, and net wages paid to an employee. It is calculated as a percentage of total labor costs of the employer.

Following table represents the tax burden on employee whose wage represents average gross wage regulated in the country and valid for the employee who is single, childless, does not receive any benefits, nor apply for any bonuses.

Table 1 Tax burden on labor in the V4 countries

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
SK	23,75%	24,03%	22,41%	22,89%	23,64%	22,29%	22,49%	22,96%	22,90%	22,79%
CZ	34,44%	33,70%	35,30%	38,81%	38,26%	37,75%	31,18%	34,95%	35,13%	34,50%
PL	28,08%	28,38%	28,71%	27,79%	25,04%	24,42%	24,56%	24,61%	24,69%	24,75%
HU	21,81%	21,76%	22,13%	22,31%	22,81%	21,40%	21,49%	22,85%	22,79%	22,77%

Source: Eurostat

Table 1 reflects the evolution of tax rates of the V4 countries over the period of 10 years from 2004 to 2010. This period is characterized by the accession the countries to European Union.

Table 2 Tax rates in V4 countries

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
SK	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%
CZ	15%	15%	12%	12%	15%	15%	15%	15%	15%	15%
PL	19%	19%	19%	19%	19%	18%	18%	18%	18%	18%
HU	18%	18%	18%	18%	18%	18%	17%	16%	16%	16%

Source: own processing based on data from OECD

Figure 1 shows the evolution of the tax burden on labor. This indicator is annually measured by OECD which tries to formulate the proposals needed for corrective actions in the country, based on the evolution of “tax wedge”. OECD strives to reduce the burden on labor, and to fulfill the basic objective of transferred tax burden from labor to consumption.

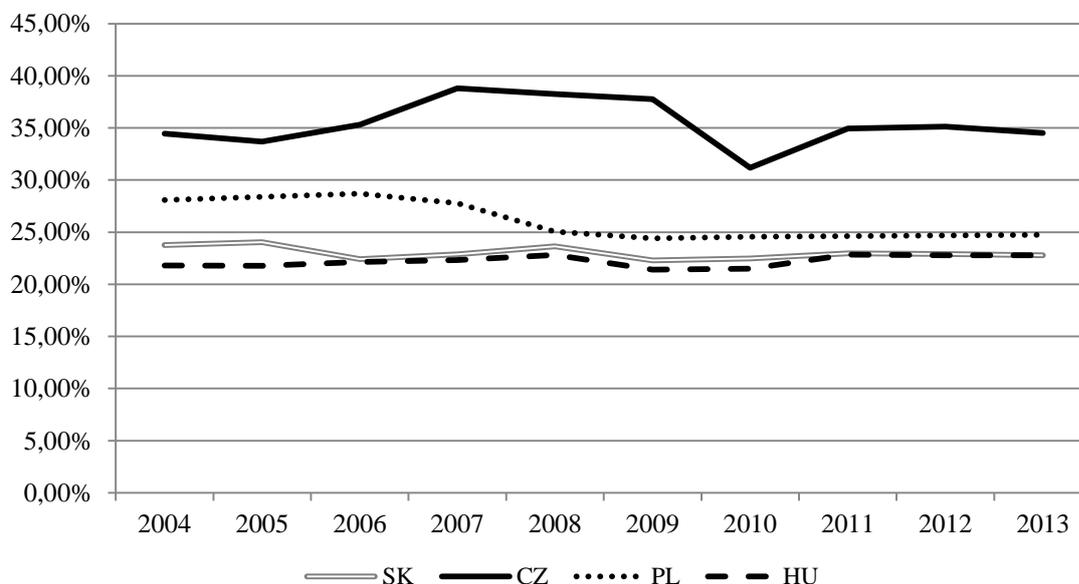


Figure 1 Tax burden on labor in the V4 countries in 2004-2013

Source: own processing based on data from OECD

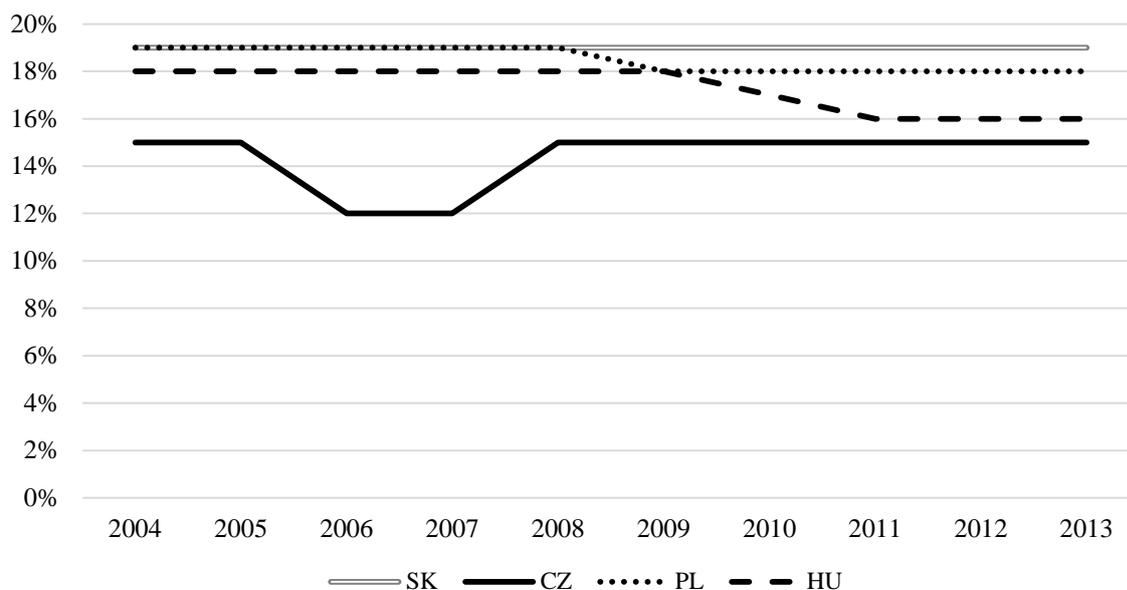


Figure 2 Tax rates in V4 countries in 2004-2013
Source: own processing based on data from OECD

Interestingly, the biggest difference between the evolutions of both indicators can be observed in the case of Hungary where evolution of rates for the past 10 years was decreasing, and as we can see the evolution of the tax burden was rather fluctuating.

The highest level of tax burden was achieved in 2007, and since this time the tax burden was decreasing until 2010, where the tax burden was at the level of 31.18%.

In following years tax burden was increasing again, but regarding the evolution of the tax rates there was recorded a contrary effect. In other countries the evolution of the tax burden of the V4 countries more or less follows the evolution of the tax rate.

Case study 1 – employee

Employee who has income from dependent activity, is single, and has neither children nor wife, thus, he has no maintenance obligation, is not entitled to tax bonus nor a non-taxable item for a spouse, and he is not recipient of any benefits. He is offered to choose a job in one of the foreign branches located in the V4 countries. Gross income will be in the amount of 1,000 €, and will be taxed according to the applicable tax and social security contribution system in the country. Information on the personal income tax rates and social security contribution burden in 2013 is shown in Table 3. The amount of gross income at 1,000 € level was chosen on the basis of the average gross wages in the V4 countries in Euros which are approximately at this level.

Table 3 Income tax rates and social security contribution burden in 2013

	SK	CZ	HU	PL
Personal Income Tax	19%, 25%	15,00%	16,00%	18%, 32%
Employer Social security contributions	35,20%	34,00%	28,50%	17,80%
Employee Social security contributions	13,40%	11,00%	18,50%	14,80%

Source: own processing based on data from the statistical offices of the V4 countries

Table 4 shows the results of the calculation of net income and the amount of labor costs of employer in each country.

Table 4 The calculation of net income of the employee and labor costs

	CZ	HU	PL	SK
Income brutto	1 000,00	1000,00	1000,00	1000,00
Employers contributions	340,00	285,00	178,00	352,00
Employees contributions	110,00	185,00	148,00	134,00
Tax base	1340,00	815,00	852,00	549,06
Tax	201,00	130,40	153,30	104,32
Net income	680,00	684,60	698,70	761,68
Total labor costs	1 340,00	1285,00	1178,00	1352,00

Source: own processing

The highest disposable income, when gross wage is 1000 €, remains to an employee in the Slovak Republic. The tax-free allowance deducted from the tax base has the highest impact on that. The second best country to work in terms of the amount of net income is Poland. Despite the lowest tax rate, the highest burden on labor, and simultaneously, the lowest amount of net wages are in the Czech Republic. However, the structure of the tax base is very different, and the tax is calculated from the so-called super gross wage. Slightly higher income compared to the Czech Republic is reached by employee in Hungary. The country with the lowest labor costs is Poland, which is influenced by social security contribution burden on the side of employer that is the lowest. On the contrary, in Slovakia the total costs of wages are the highest among the V4 countries.

3.2 The comparison of tax burden on the income of entrepreneur (an individual) in V4 countries

By EU accession the labor market was opened, and individual administrative duties were removed or simplified. Nowadays, there are no significant barriers to establish a business in any of the V4 countries.

"Every citizen of a Member State shall have the right to start a business freely or carry on a trade in another Member State. In each country, it is necessary to provide IDs and confirmation of competence to pursuit of the activity, and consequently, to register within the competent authority.

Case study 2 –entrepreneur (an individual)

Entrepreneur with entity in the territory of the Member State is authorized to do business. He fulfills following requirements- he is single, childless, and does not receive any others benefits. The purpose of the table was to find out his tax burden in each of the V4 country at the different level of the tax base (10 000 €, 20 000 €, a 40 000 €).

The calculation of the tax base is based on the formula: the tax base = income less expenditure with respect to current legislation regarding the taxation of personal income tax from doing business in the V4 countries. On the base of these calculations we identified which country is in the terms of tax burden advantageous for individual entrepreneur. The results are recorded in Table 5.

Table 5 Tax burden on the income of entrepreneur (an individual) in V4 countries

Tax base	10 000,00	20 000,00	40 000,00
Country			
SK	11,90 %	15,57 %	19,84 %
CZ	5,39 %	10,19 %	14,33 %
PL	17,59 %	24,23 %	31,65 %
HU	16,00 %	16,00 %	16,00 %

Source: own processing

The table shows that the tax burden is the highest in the case of Poland and when increasing the tax base still growing. Hence, the Poland is not appropriate country for individual entrepreneur to choose for doing business, in terms of the tax burden.

The Czech Republic where the tax burden is the lowest for each amount of income is the most appropriate place for doing business.

Moreover, if individual entrepreneur has prospect of higher incomes relating to the amount of his tax base, then he can speculate that he could do business in Hungary where is the linear tax rate and at higher incomes he pays the same level of 16 % as he may ultimately pay.

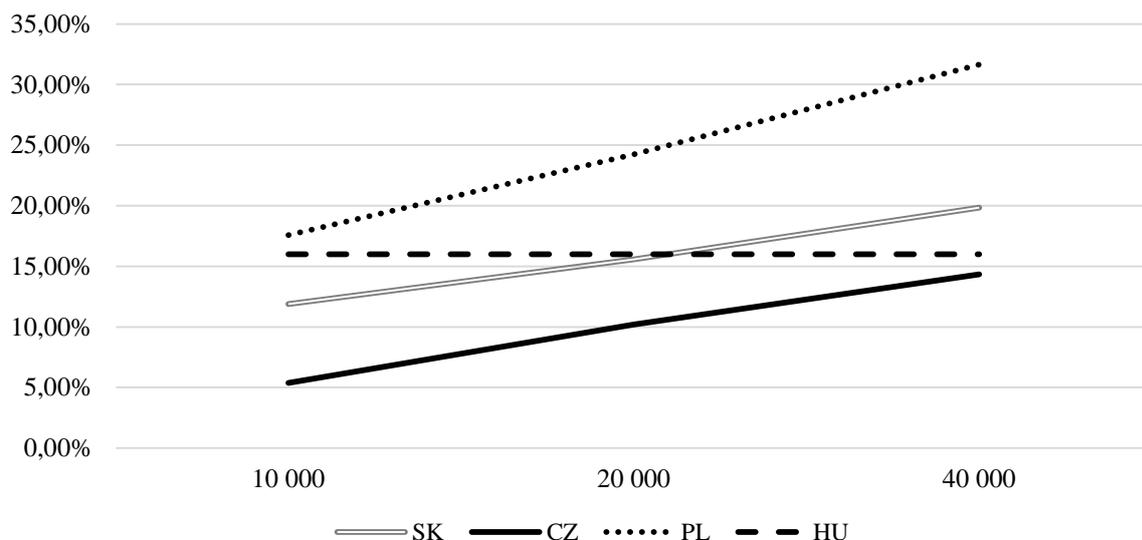


Figure 3 Tax burden on the income of entrepreneur (an individual) in V4 countries
Source: own processing

The evolution of the tax burden on labor depending on the amount of incomes in case of individual entrepreneurs is the same for both countries Slovak Republic, and the Czech Republic, although in the Slovak Republic individual entrepreneurs pay higher tax.

Simultaneously, with the growing income the income tax burden increases in the studied countries. Regarding the evolution of tax burden for entrepreneurs in Hungary, the amount of income does not change. This is due to the fact, that there is not applied any tax discount, and in the country linear tax rate is established.

Interestingly, the most significant increase of income tax burden on entrepreneurs is in the case of Poland, and it is caused by a progressive tax rate. Hence, entrepreneurs with higher incomes pay significantly higher taxes, and the difference above the determined level of income is taxed at a higher rate.

3.3 The comparison of the tax burden on corporate income in the V4 countries

The evolution of tax rates of corporate income tax in the Czech Republic passed since 2004 major changes and it had declining tendency. The gradual decreasing was stopped in 2010, when the corporate income tax was determined at the level of 19 %, and this is valid until today. In Hungary, the basic tax rate of corporate income tax by the end of 2010 was represented at level of 16 %. Moreover, companies in this country also pay innovation tax at the level of 0,3 %. The above mentioned tax increases the tax burden on subjects, but on the other hand, it is classified as tax deductible costs in full of amount. (Schultzová, 2010).

Since 2011 tax rate at the level of 10 % is applied to companies with tax base less than 500 million HUF. Companies with higher tax base apply 19 % tax. Due to the tax reform tax rate of corporate income tax in the Slovak Republic was at the same level of 19% from 2004 to 2013, when it increased to 23 %. In Poland, as one of the V4 countries the tax rate remained throughout the whole studied period without change at the level of 19 %.

Table 6 Corporate income tax rate in V4 countries

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
SK	19%	19%	19%	19%	19%	19%	19%	19%	19%	23%
CZ	28%	26%	24%	24%	21%	20%	19%	19%	19%	19%
PL	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%
HU	16%	16%	17%	20%	20%	20%	19%	19%	19%	19%

Source: own processing based on data from OECD

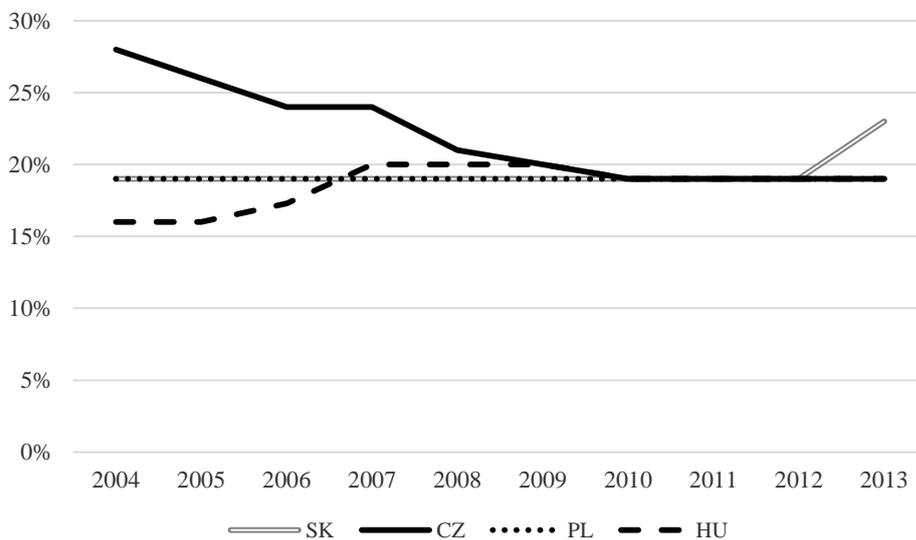


Figure 4 Corporate income tax rate in V4 countries in 2004-2013

Source: own processing based on data from OECD

According to the EU Commission the existence of 27 different methods of the tax base determining in the EU Member States hinders the efficient functioning of the internal market. Therefore, the subject of harmonization should not be taxes of companies (their amount should stay in the competence of individual Member States), but the tax bases (Schultzová, 2010).

The Working Group considered during proposing for the Directive the microeconomic indicators which would be the most effective way for the distribution of corporate profits.

A group of interrelated companies involved in the CCCTB have to use the formula for the allocation of consolidated corporate income among the Member States where it operates, in proportion to the share of the resulting economic activity in the country (Cockfield, 2010).

Three basic criteria that will be crucial for the distribution of the tax base - labor, assets and turnover - were included in the proposal for a Directive. These criteria have the same weight. The European Commission has identified these criteria in the way that companies pay taxes in accordance with their economic activity in the Member States (Karabinoš, 2013).

One of the basic rules in the Directive is that it will precisely determine the EU resident companies, which will be affected by the Directive. At the same time, other companies can choose CCCTB, if they have the permanent establishment in the EU. On this basis, the company becomes a member of the consolidated group, and it will use this scheme for at least five years. Afterwards, this period of time will be extended by 3 years unless the company decides otherwise. In application of this scheme it applies for all companies that they only deliver one tax return to tax authority at the seat of the parent company of the particular group, and the same tax period will apply for all companies.

Case study 3 – Legal entity

This scenario is focused on the calculation of corporate income taxes with participation in the consolidated group, and with the use of the CCCTB. The company is represented by limited company which is resident in the EU and has 4 permanent establishments located in the countries - the Slovak Republic, the Czech Republic, Hungary and Poland. The company's headquarters is located in the Slovak Republic. The tax base calculated in accordance with the Proposal for Council Directive on the Common Consolidated Corporate Tax Base, COM (2011) 121 in the final version 2011/0058 (CNS) is 800 000 € for the entire consolidated company.

As the company is EU resident, there is the possibility to automatically choose the CCCTB. The company's consolidated tax base is calculated on the basis of the allocation formula.

Table 7 Micro-economic indicators of the members of the consolidated company

	CZ	HU	PL	SK	Total
Capital (€)	20 000	10 000	40 000	10 000	80 000
Wages (€)	150 000	75 000	280 000	75 000	580 000
Employees	10	5	15	5	35
Turnover (€)	300 000	150 000	500 000	150 000	1 100 000

Source: own processing

The tax base of the entire consolidated company in the amount of 800 000 € must be divided into every single one of establishments through the allocation formula. This tax bases of each establishment will be multiplied by corporate income tax rate applicable for the particular country, on this basis the amount of tax liability in each country will be determined.

Table 8 Calculation of the share on CCCTB

Krajina	CZ	HU	PL	SK
Share on capital	66667	33333	133333	33333
Share on wages	34483	17241	64368	17241
Share on employees	38095	19048	57143	19048
Share on assets	72727	36364	121212	36364
Share on tax base	211972	105986	376056	105986
Tax rate	19%	19%	19%	19%
tax liability	40275	20137	71451	24377

Source: own processing

As Table 8 shows, the company has the highest tax liability in Poland, since there it has the biggest establishment with the largest amount of capital, with the largest number of employees, with the highest wages, and with the largest amount of assets.

The company has the second highest tax liability in the Czech Republic, where it also has the second largest establishment. In both countries, the same tax rate at level of 19% is applied.

The company has in Slovakia and Hungary the establishments of the same size in all micro indicators, which means that the tax base is the same. However, the difference is in the tax liability due to different tax rates, whereas Slovakia is the only country of the V4 which applies higher tax rate compared to the other V4 countries. The total tax liability of the company in the amount of 156 239 €, we determined as the sum of the tax liabilities in each establishment.

With the further calculations, we wanted to compare the amount of tax liability if the company was not engaged in the CCCTB, but had chosen a taxation system in the home country.

Table 9 The tax liability without involvement in CCCCTB

Country	CZ	HU	PL	SK
Tax base	800 000	800 000	800 000	800 000
Tax rate	19 %	19 %	19 %	22 %
Tax liability	152 000	152 000	152 000	176 000

Source: own processing

In the case of income taxation of the company in Slovakia, the total amount of tax liability would be 184 000 €, which is higher compared to the amount of total tax liability when engaging in the CCCTB. However, in the case of income taxation in the other V4 countries the tax liability is lower in the sum of 152 000 €. It should be emphasized that the company when applying CCCTB should reduce its costs of compliance with the laws that are different in each country. The comparison of probable reducing in costs with the difference in tax liability, and furthermore, the fact that its application is bounded for a period of five years could be critical.

Conclusion

Central and Eastern European (CEE) countries have attracted a remarkable amount of foreign investment already since the beginning of the 1990s. While in the first decade of the economic transition, these went mainly to the manufacturing sector, the importance of service sector FDI and, especially business service FDI has been significantly growing since 2000. CEE countries are becoming increasingly popular destinations for foreign investors seeking to expand into new markets or to enhance their efficiency and gain access to cheap resources.

The tax system compared countries are very similar, some differences can be observed in the tax on personal income. In the area of taxation of labor is important to monitor the relationship between higher taxes and its consequences. It is important to realize the impact a high tax burden on labor in the labor market, because increasing the gap between net and gross wages by reducing the supply of labor. Therefore, staff often migrates to work in the country where the tax burden is lower.

In each of V4 countries is different tax burden. The tax burden is in addition to the tax rate determined by the amount of tax credits, deductions and bonuses, which provides each country itself and thus create a competitive environment in this area.

Another phenomenon affecting the tax competition is progressivity in taxation. Groups with higher incomes, including in particular the staff to achieve a higher level of education, are taxed at a higher rate. This phenomenon could be observed in each of the V4 countries, except Slovakia, which, after joining the EU introduced a flat tax, but in the last reporting year 2013, returned to progressive taxation. In Poland this phenomenon persists throughout the period. The opposite effect is observed in Hungary and Czech Republic. These countries have gradually changed progressive taxation to proportional taxation. Progressive taxation can cause drain of skilled workers abroad, where their work is subject to lower tax rates.

In the area of taxes on corporate income, the EU strives for a high level of harmonization. These revenues bring a significant amount of money to the treasury of each country and, therefore, countries try to attract businesses invest into their territory. This often leads to collusion by the government. The EU seeks to prevent collusion with different instruments to avoid distortions of competition, different tax evasion and double taxation of income.

One such measure is the proposal for a Council Directive (COM (2011) 0121) on the Common Consolidated Corporate Tax Base CCCTB. Some Member States CCCTB Directive refused on the ground that the implementation of this Directive restricts national sovereignty and fear that the launch of this system could result in decreased government revenues, while increased administrative expenses of the state to ensure the functioning of the system. It should also be

pointed out that to take any corrective action in this direction would be very time-consuming since it would have to be addressed at European level, and this could ultimately lead to a reduction in competitiveness. Among the countries that rejected this proposal, respectively, have complaints against it, includes all states V4.

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POTENTIAL OF INDUSTRIAL PARKS IN EASTERN SLOVAKIA – KOSICE REGION PART I. (GELNICA, JAKLOVCE, KOJŠOV, ŠVEDLÁR, SNV PODSKALA, ROŽŇAVA)

Sergej STRAJŇÁK - Albína KOSTKOVÁ

Abstract

The main theme of the article is to present the potential of industrial parks in eastern Slovakia (not only) for foreign direct investments. Article deals with general information of industrial parks (namely industrial park Gelnica, Jaklovce, Kojšov, Švedlár, SNV Podskala and Rožňava) and with technical infrastructure (namely power, sewage and water).

Keywords:

Investment, Industrial parks, Eastern Slovakia

Introduction

Industrial parks are one of the most important factors supporting positive economy development. An industrial park is based on a philosophy of integration of relatively different functions (production function, and that of services, relaxation and education, too) into an industrial area with majority of industrial production and services with high economy turnover and high employment. It provides services independent of type and importance of a particular industrial park, i. e. standard and non-standard services. The examples of standard services are finance and law consulting, accounting, security of assets, operation and support of a transportation and technical infrastructure environment or public greenery support (Vidová, 2010).

1 General information of industrial park

An industrial park is defined as “a large tract of land, sub-divided and developed for the use of several firms simultaneously, distinguished by its shareable infrastructure and close proximity of firms” (Peddle, 1993).

An industrial estate is a specific area (tract of land) that is separated from urban and densely populated areas, and zoned specifically for the location of industrial facilities. Industrial estates must support proper infrastructure such as roads, power, water supply, and other utility services to all facilities located within the well-defined parameters of the estate. National and local authorities may support the promotion and establishment of industrial estates by encouraging foreign direct investment, redistributing employment and

production away from densely urbanized regions, and accelerating regional development. Industrial estates may attract industrial facilities by offering an attractive package of services (such as power and water) that can be supplied continuously, reliably, and at a cost that industrial facilities could not achieve on their own. This package of services is often complemented with various forms of preferential investment incentives such as exemptions from import or export duties, income tax exemptions, and various other subsidies. Furthermore, industrial estates also generally offer a “one-door” policy aimed at facilitating the licensing and permitting process of new industrial facilities (Lowe, 2001).

Types and synonyms of industrial parks include industrial estates, industrial districts, export processing zones, industrial clusters, business parks, office parks, science and research parks, and bio-technology parks. Eco-industrial parks have now been added to this list. As is the case with industrial ecology itself, there are several definitions of the term eco-industrial park (Côte & Cohen-Rosenthal, 1998).

The industrial policy of the European Union

During the last half century, in EU and EU Member States, objectives and instruments, strategies and practices in industrial policy were continuously enriched in close correlation with the history of EU Member States and the evolution of common policies evolving toward a close relationship with enterprise policy and regional policy. The bridge between them is, nowadays, innovation. European countries faced two World Wars on their territory and as a result had to pass through reconstructing industry – in the case of defeated (Italy, Germany), or, if we speak about victorious countries, besides reconstruction costs they had to add the costs of decolonization (UK, France, Belgium). In sixties and seventies, sectorial industries were hit by crises proving that local know-how and synergies cannot handle fast modifications of markets and technologies (Camagni, 1991; Bianchini & Labor&, 2006).

At that moment, Member States decided to take the integration process to a higher phase and eliminated progressively tariff and non-tariff barriers through Single European Act (1986) and through the Treaty of Maastricht (1992) that put for the first time emphasis on research and innovation in order to increase competitiveness. At present, the approach regarding EU industrial policy has changed significantly, especially with the introduction of Lisbon Strategy and recently the Europe 2020 strategy. The accent moves from the narrow understanding of industrial in relation just with industrial activity itself towards the capacity of economic activities to face competition. Taking advantage of sources of competitive advantages, increasing internationalization, increasing interest for innovation, creating and supporting innovation networks and

strengthening technical and scientific capacity of EU are the main challenges (Bianchini & Labory, 2006).

The paradigm shift in EU industrial policy consists in shift from selective support of certain industries considered able to produce more wealth than others to supporting business agglomeration generally, considering that all of them are able to generate wealth because of the rise of productivity they determine. Moreover, the paradigm shift in EU industrial policy reflects transition in EU policy styles from material to immaterial assets, from tangible to intangible factors such as network type factors etc., residing in the goal of “preparing territories for innovation” (Camagni & Capello, 2010).

Advantages for industrial facilities

For industrial facilities, the industrial estate is in a position to offer infrastructure and services for which there are significant economies of scale. One example is the use of a common wastewater treatment facility, which would allow for economies of scale to be gained from the collection, treatment, and disposal of solid and toxic waste. Use of such a shared facility would also allow for the provision of effluent monitoring and laboratory services. Industrial facilities may benefit from reduced monitoring and pollution-control costs by sharing a common set of environmental services. Owners and operators of industrial estates recover the costs of providing these environmental services either through their rental rates or by means of user fees set per unit of environmental services consumed (GNT, 2010).

Limitations

Industrial estates may thus offer important benefits for both the regulated community of industrial facilities and for environmental regulators. However, despite these apparent benefits, industrial estates are typically not presented as shining examples of proper environmental management. Two notable caveats will be discussed. First, not all pollution-control services offer the possibility of large economies of scale. Such is the case, for example, for the control of air pollution. Hence, the nature and extent of the benefits associated with reduced pollution control will vary greatly and depend on the specific nature of the pollutants of concern. Second, the concentration of a large number of industrial facilities in a specific and narrowly defined area may be a source of significant environmental damage, and may increase environmental health and safety risks if pollution discharges from the industrial estate are not strictly controlled. Hence, the environmental benefits that may result from industrial estates will not be realized unless there is a strong environmental management system for the estate and a willingness to implement the estate’s environmental rules. Owners

and operators of industrial estates are first and foremost industrial promoters working within the context of an industrial development strategy. Incentives are always oriented towards maximizing the value of industrial output. As a result, these environmental benefits will not be realized without sufficient capacity on the part of the environmental regulator to monitor pollution discharges along with the willingness to enforce environmental regulations. As an example, industrial estates competing with one another to attract new locators may have incentives to reduce environmental services fees thus jeopardizing the financing and delivery of effective pollution-control technologies. If this were to be of significant concern, it may be of interest for environmental regulators to establish minimum environmental service fees that all estates must implement (GNT, 2010).

2 Development of industrial parks

Development of industrial parks must pay attention to one of the basic aims of an economy that is to allocate both industrial production and services sector in such a way, that progress of a region where a park is built improves. Incorrect allocation results in an increase of existing differences among various regions, which is verified by regional development theories, be they convergent or divergent. The former ones (theories of regional balance), which say that the basic condition of development lies in balancing off differences among regions, prove that more developed regions accumulate capital faster and better, which leads to decrease in marginal product of capital and thus to lower profits. Hence, funds flow into regions insufficient with capital and therefore, the yield is even lower (Buček & Kováč, 2008; Vidová, 2010).

3 Why to invest in eastern Slovakia?

Comprehensive and deep structural reforms of the Slovak Government in recent years have focused on creating a business friendly environment for investors. The following is an overview of the main reforms, directly or indirectly, influencing economic stability (SN, 2013).

Reformed Social System

Among other things, new measures to avoid the abuse of the social system and better aimed targeting of social allowances were introduced. The introduction of employers obligation to pay sickness insurance benefits for the first 10 days of an employee's illness leave resulted in a decrease of sickness rate from 9% to 3% (SN, 2013).

Reformed Act on commercial registry

The amount of the time required to register a new company has been cut a maximum of 5 working days; the same applies to the issuance of a trade licence with a maximum allotted time of 7 working days (SN, 2013).

Banking & Finance

The banking sector was privatized with 97% foreign ownership and it underwent a dramatic recovery (SN, 2013).

Investment incentives programme

Act on investment aid enables a fast and transparent negotiation and describes the requirements that should be met in a more detailed way (SN, 2013).

Health care system reform

Market principles were introduced into the health care system (SN, 2013).

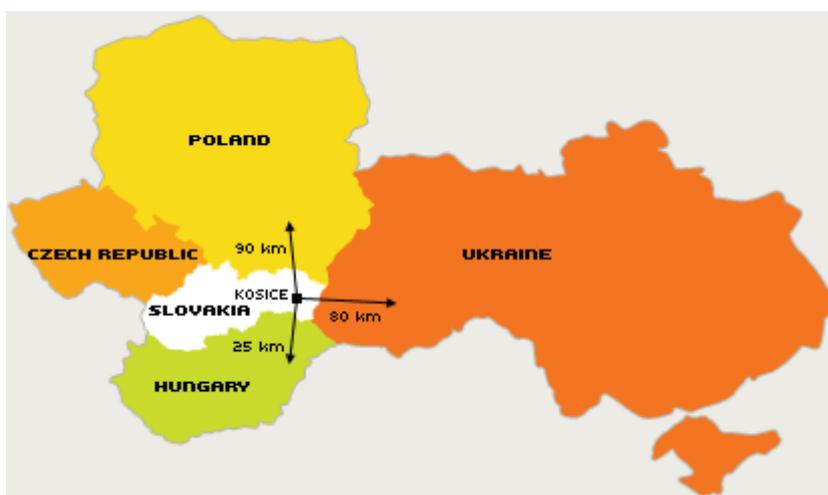


Figure 1 Eastern Slovakia

Source: <http://www.steeltrans.sk/images/map.gif>

4 Industrial parks

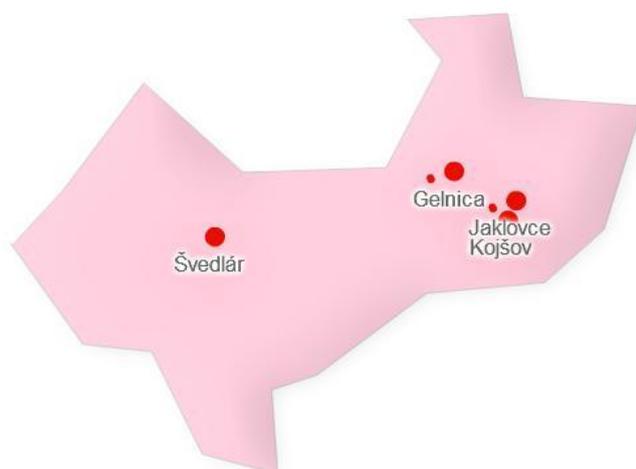


Figure 2 Eastern Slovakia
Source: www.mhinvest.sk

Industrial park Gelnica

Industrial park Gelnica is situated directly in Gelnica town.

Table 1 General information of industrial park Gelnica

General information of industrial park Gelnica	
Plot together	0,3 ha
Available plot (brownfield)	3075 m ²
owner	town
Highway access point	50 km
Technical infrastructure	
power	0,23 MW
water	2200 m ³ /year
sewage	3490 m ³ /year

Source: www.mhinvest.sk

Industrial park Jaklovce

Industrial park Jaklovce is situated directly in Jaklovce village.

Table 2 General information of industrial park Jaklovce (www.mhinvest.sk)

General information of industrial park Jaklovce	
Plot together	3.13 ha
Available plot (brownfields)	3756 m ²
owner	town
Highway access point	44 km
Technical infrastructure	
power	2x630 kVA
water	DN 100
sewage	Directly in industrial park

Source: www.mhinvest.sk

Industrial park Kojšov

Industrial park Jaklovce is situated directly in Kojšov village.

Table 3 General information of industrial park Kojšov (www.mhinvest.sk)

General information of industrial park Kojšov	
Plot together	0.13 ha
Available plot (brownfield)	1300 m ²
owner	town
Highway access point	50 km
Technical infrastructure	
power	Directly in industrial park
water	DN 100
sewage	DN 300

Source: www.mhinvest.sk

Industrial park Švedlár

Industrial park is not complete.

Table 4 General information of industrial park Švedlár (www.svedlar.sk)

General information of industrial park Švedlár	
Plot together	28315 m ²
Available plot (brownfield)	28315 m ²
owner	town
Highway access point	43 km
Technical infrastructure	
power	Park is not complete
water	Park is not complete
sewage	Park is not complete

Source: www.mhinvest.sk

Industrial zone Podskala

Industrial zone Podskala is situated directly in Spišská Nová Ves town.

Table 5 General information of industrial zone Podskala

General information of industrial park Gelnica	
Plot together	62883 m ²
Available plot	56013 m ²
owner	town
Highway access point	11 km
Technical infrastructure	
power	100 kVA
water	DN 160
sewage	DN 600

Source: www.mhinvest.sk

Industrial park Rožňava

Industrial park Rožňava is situated in Rožňava city

Table 6 General information of industrial park Rožňava (www.mhinvest.sk)

General information of industrial park Rožňava	
Plot together	8.3 ha
Available plot	1.3 ha
owner	town
Highway access point	66 km
Technical infrastructure	
power	12 MW
water	DN 100
sewage	DN 1000

Source: www.mhinvest.sk

Acquisition to the reader

Reader has the opportunity to become acquainted with the industrial parks in eastern Slovakia, namely in the Gelnica town, Jaklovce village, Kojšov village and Švedlár village and too the reader has the opportunity to obtain information on the technical infrastructure in real industrial parks (with real problems of the industrial parks). Namely with the availability of industrial real estate, with unfinished infrastructure and the connection to the highway access point etc. .

Acquisition to the practice

The main contribution of the article is to present an overview of the possibilities of industrial parks (zones) in eastern Slovakia for potential foreign

(or domestic) investors. In Eastern Slovakia are many industrial parks, but the problem of industrial parks is, that they are empty or partially empty.

Proposal solutions at the university level

One of the main solutions is better propagation of industrial parks at the state level and too at the university level (especially at the international conferences related to economic, international relations, regional development and too investment topics). It is very important to connect the theory and practice. Doctoral researchers (students) in economics should be more interested in industrial parks in Slovak republic. It's possible through scientific article present the potential of industrial parks in Slovak republic for foreign investors.

Conclusion

As we can see (table 1, 2, 3, 4, 5 and 6) each of them (industrial park Gelnica, Jaklovce, Kojšov, Švedlár, SNV Podskala and Rožňava) has a free capacity. Available plot of industrial park Kojšov is 1300 m², Available capacity of industrial park Jaklovce 3756 m² and available capacity of industrial park Gelnica is 3075 m². Industrial park Švedlár is not complete, available plot of industrial zone of Podskala is 56013 m² and available plot of industrial park of Rožňava is 1.3 ha.

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REASONS AND DESIGN OF METHODOLOGY FOR EFFICIENT MANAGEMENT OF ORGANIZATIONAL CHANGES IN THE MINING COMPANY

Zuzana JURKASOVÁ - Igor ŠIMKO

Abstract

The main goal of article is to define organizational changes, their goals, processes and forms of implementation, as theirs perception from the perspective of enterprise management and employees. Mainly this time, which are reflected by constantly changes and uncertainty, as for employers as for employees, as for enterprise like a connected whole. At the time when the implementation of organizational changes is often only way how to solve enterprise problems, which are at crisis. Article also describe tools which allow watch and this way organizational changes effectively and on time manage.

Keywords:

organizational change, management, management processes, methodology design

Introduction

Still lasting global economic and financial crisis affected all parts of business. This crisis also affects acceptance of legislative rules, which describes relations between employers and employees. This is the main reason why the most affected place is employment market. Enterprises do not have contracts, they have to save money, dismiss people, also review opportunities. That is the way how to worsen of demand at employment market and also why the Labour Office has more and more unemployed.

Based on this argument some theoretical models show that demand is slack, enterprises try to introduce new management processes, also reorganize its own processes of production, which mainly lead to organizational changes implementation.

Through this changes are enterprises due to effectively and on time react to still lasting changes at market and also be facing to competition.

The main problem is that organizational changes bring together also stress, uncertainty, which are the main reasons why are people resistance to them. Only very good prepared projects of enterprise transformation, which are support by management and other key people have the chance for success. They also have to be prepared during the right culture of coaching and managing.

By this comprehensive view can be maximize and effectively use mineral deposits, since I focused to mining enterprises. Effectively use in this case, „by setting“ the part of mining and processing of raw material, which is governed by the law and in advance define regularities like location and method of using bearings. Also economic factors like size of the investment, the investment

structure, methods of financing investments, timing of investments and timetable mining, extraction size. Consequently, due to the changing external and internal conditions in the company required to effectively respond and adapt "internal structure" undertaking with respect to the emerging situation.

This comprehensive view of the enterprise in terms of personnel and financial management, provided the use of innovative, supportive and available tools requires the achievement of the main objective of the dissertation, which is a processing model for an effective management of organizational change.

1. Theoretical condition of organizational changes

Change in general is an element that is in today's society, also in the world economy, more and more inflected element. This is due to the fact that globalization and internationalization is more and more increasing. Especially nowadays it is essential that companies of all industries, not just mining enterprises implement change almost constantly and this way remain competitive. Factors such as globalization, and still evolving, and an increasingly technology are the main reasons that force businesses to respond to survive (Borovský, 2005).

Organizational change occurs when a company makes a transition from the current state to some desired state, while the management of organizational change is the process of planning and implementing changes in organizations, so as to minimize the resistance of employees, costs related to the organization and at the same time maximize the effect of the variation of intensity. Organizational changes often related to problems facing businesses. Organizational change is not just a change in the organizational structure, it is also change of the flow of information, powers and responsibilities. Organizational change is primarily a change in the behavior of individuals and individual organizational units. For organizational change is also considered a restriction or cessation of business of the employer, or part of them, merger, consolidation, distribution, the conversion of the employer (Antošová, Rakušan, 2009).

Organizational changes relate to the following areas:

- Changes in information flows and the way they are processed;
- Changes of direction;
- Changes in the division of labor, responsibilities and accountability;
- Changes in human behavior (changing the culture of the organization);
- Changes in the status of people - job roles (Neil, 2006).

2. Appropriate processing model for effective change management

In new conditions described above increases personal responsibility for the performance of work, autonomy in decision-making and creativity, of which then implies that in such an enterprise, any element changes more quickly

adaptable to changing conditions, which often causes the unsuccessful implementation of changes.

Several studies point to the fundamental reasons why changes fail:

- Lack of Support for understanding changes from the critical members of top management;
- Poor selection of team members, or underestimation of time to reconcile their views;
- skip key steps;
- revaluation of existing processes and centralizing the routines, their reluctance to leave;
- Improper or delayed use of the principles of change management (Neil, 2006).

The main reason for arising problems are lack of respect and the importance of the human aspect of change control, also a new culture and values, or incorrect recognition of new strategies and targets after implementing the change. Responses to new and constantly changing conditions caused by the environment, therefore, cannot focus solely on managing change, but also the behavior of the employees and the company as a whole. Likewise, a fundamental problem in this area can be considered as lack of time or need for rapid decision-making and reactions to the situation.

The main objective is therefore an overall transformation, which should lead to overall flexibility and permanent implementation of changes. In addition to that, the other main causes of unsuccessful changes include:

- Implementing change takes longer than planned;
- Implementation activities are poorly coordinated;
- Managers do not have the skills to implement change;
- Briefing ordinary workers does not produce the desired change in attitudes;
- Unpredictable external factors have a negative impact on the implementation changes (Neil, 2006).

Many of the processes of change management efforts are dying, or do not lead to the expected results. According to surveys, the failure rate changes of major projects is between 50% to 75%. Some studies even indicate that up to 80% of business change projects is unsuccessful. Project changes in these cases has several stages:

- Refusal;
- Defense;
- Depreciation;
- Adaptation;
- Integration (Beerel, 2009).

In other words, if efforts to change smaller than the efforts of the state to remain in the current circumstances, it is wiser to opt redrafting changes. As businesses are inherently complex systems containing many different elements with different tasks, technicians, systems, values and standards, among which there are many relationships, causing a change in one of them then invokes reflection in others. Therefore, we can say that the change in the organization's attempt to create a relationship where workers can act effectively and efficiently. If, however, the various activities carried out in isolation without considering the mutual impact results for companies may not be satisfactory (Kúkelčík, 2009).

Interest of each company focuses on the efficiency of not only the company itself but also its organizational units. Therefore, the main objectives of businesses include organizational development, which is necessary to create enough valid information, which in turn provide businesses and all of its employees a free choice of options, making enterprise to manage change facing.

For these shortcomings and aware of the needs and objectives of businesses within any changes so clear need to develop effective management model organizational changes in companies. Despite the fact that there are currently several models, but apparently do not produce the expected results, which are shown not only a high percentage of failure of introducing changes in organizations, but also the fact that many times after the introduction of the changes, the changes do not bring the expected benefits, since the overall results do not meet the specified objectives.

3. Suggested methods of effective management of organizational change in mining company

Management of many companies that need improving economic efficiency now concludes that it is necessary to undergo major changes, one of which may well move to process management. Since the introduction of elements of process management promises to flexibly respond to customers, but also to variable environments, many companies have high expectations into it. Additional generally expected benefits include the identification and detection of priority and strong processes, while even those businesses that do not add value, so they can be carried out by external contractors. Despite the fact that the whole process of implementation of process management is a long and difficult step in the action likely to be relatively firm in a difficult situation, its benefits can be substantial, in many cases for the new recovery firm.

4. Analysis of mining industry and management trends

Mining and statistics published by the Statistical Office of Slovak republic clearly show that mining in Slovakia constitute the most important "workhorse" of our economy. According to many studies from the period of the crisis in this

sector seems particularly as most critical in 2009, when the effects of the crisis showed the most sales. During this period, shown most negative impact on the accounting profit after tax value compared to 2008 decreased by almost 40%. While the value of sales fell by 20% in the following year 2010 continued to decline, while the industry has not reached pre-crisis levels (Rybár, Cehlár, Tréger, 2000). In times of crisis, the mining industry in Slovakia employed about eight thousand people. Another approximately 20,000 working in related or directly associated industries. Redundancies, which launched a year-long crisis caused a decline in employment by about 9.6%. Early 2010 to work in the mines 7,333 employees, which means a decrease by 10-year, 6% (see Fig. 1).

During this period, the mining sector was also one of the few industries with at least approximately the same growth at 1.7%. Total industry output declined, although production has recently increased, which in turn cannot be said about sales. Their perennial balance meant in comparison to two years 2008 and 2009, a decrease of about 12%. Similarly cheaper sales occurred even in the next year 2010. Contrast, the increase occurred in the nominal wages of miners, about 2.7%. However, further development is an incessant fluctuation, which is manifested by alternating rise and fall of wages. Currently, the average nominal wage is around 923 euros, depending of course on the particular job (Seňová, 2011).

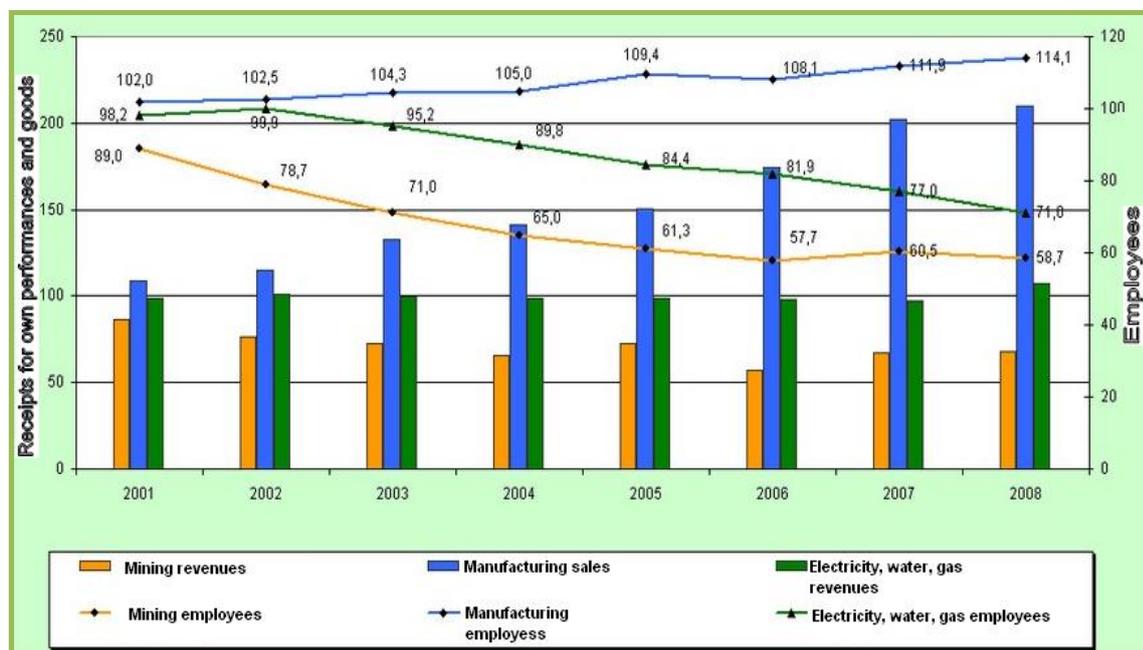


Figure 1 Development of employment and turnover in industry

Source: Štatistický úrad Slovenskej republiky, 2013

Use management resources of Bentonite in the construction of wind plants

Slovakia has sufficient resources of industrial minerals (like a Bentonite). In the construction of Wind turbines, as well as the use of wind power can contaminate land of the substances which are necessary for the operation of each wind power plant (oil, etc.). One of the best options is to create a subgrade with the Bentonite, because adsorption properties of bentonite can prevent the passage of harmful substances (that may arise during the installation and use of wind turbines) into the environment (Strajňák et al., 2013)

Analysis of renewable energy potential in Sobrance district in Slovakia

Another investment opportunity in Sobrance district is the use of renewable energy sources. Renewable energy sources are important in order to energy need, since fossil fuels are reduced. Areas that are completely dependent on import of these raw materials are at risk of failure to supply the energy needs for commercial or industrial purposes. Renewable energy sources are of extreme, almost existential importance for humanity. Due to their nature, in a matter of few years they will present the driving force of almost all individual economies whereas once the fossil reserves come depleted they will become one of the most important sources of energy. The whole area is specific for its geomorphological division, which determines the orientation of the renewable energy source. From the primary renewable energy sources, such as water, sun, wind, biomass, has the greatest potential in this district biomass, solar and wind, but a detailed study mapping utility of renewable resources should be developed (Pčolinská, Strajňák, Kostková; 2013).

Based on the analysis of the current state of research problems of organizational change management, process management and the description of its benefits particularly in addressing the research area, respecting the current situation and forecasts of further development of the mining industry, as well as current trends in management, specifications mining enterprises, process descriptions extraction and processing materials, I propose a methodology for processing effective management of organizational change in the mining company (see Fig. 2).

The proposed methodology assumes the effectiveness of organizational change management in the mining company, which is a prerequisite especially in these turbulent times allow efficient use of a large amount of information required for business management. Then use them for quality and timely decision-making, contributing to effective decision-making, in which case the money is to decide towards the desired output, and also the timeliness, which is limited to certain timeframe.

The methodology is based on the assumption that change management is important to understand how a complex system of integrated activities and relationships, and not just as individual steps performed. The whole process can be considered as a diagnostic approach to solve the problem, since the beginning is necessary to assess the current status and then create a vision of the future state. Description of how this will be achieved should be clear, but flexible enough that the proposed methodology assumes.

The proposed methodology is composed of seven logically interlinked steps designed to cover the whole area of thinking, planning, implementation and consequently the effective management of organizational change within the mining company. Taken into account and describes how the elements of the mining company, respectively, from the initial analysis of the transferred even before the commencement of mining, through the creation of organizational structure, then creating a process map describing the main processes (extraction and processing), through the evaluation of these processes based on the chosen method to evaluation of the results of the execution of organizational change and its overall economic impact on the continued functioning of the business. All this using the two available tools, applications InLook system ® and MINVEST whose use presupposes create instruments for efficient management of organizational changes in the company.

The first part of the proposed methodology for efficient management of organizational changes in the mining company takes into account the mining enterprise as the enterprise itself and in terms of mineral wealth as property of the Slovak Republic as well as laws, mining and geological, defining and governing the requirements in the field. Likewise, from the perspective of central government authorities, under which mining area falls.

Other parts of the methodology, SWOT and STEP analysis within the enterprise is an essential element, which contains important information for further decisions in the future and we can say that in this way the company creates the preconditions necessary documents and also to make the changes.

Part of the proposed methodology "organizational structure", which is from the perspective of organizational changes necessary, arises from the arrangement to determine the appropriateness of the organization, which should be consistent with the achievement of predetermined objectives. In assessing effectiveness should be taken into account several aspects such as differences in environments where individual companies carry out their operations, differences between products and services offered, influences people themselves, who form filling job positions within the organizational structure of the company and also the level of development of the company. Within these defined aspects and differences in the organization of the company, there are several models of assessment arrangements effectiveness of the organization. However, this is only a comparison of internal organization and not a comparison across different organizations and different organizational arrangements.

Within the other two parts of the proposed methodology "process map and process analysis" the mainstreaming process management, which also allows to verify the strategic vision (SWOT analysis), process enterprise strategy, define project objectives by reviewing processes, analyze processes (the document) and propose the necessary changes and then evaluate them, assign costs to process (ABC model) to determine customer requirements, whether external or internal to the process to select key processes, define boundaries and resources processes, assign process priorities and assess their impact on profit company and others. The main reason is that the process management approach enables the company to gain flexibility in responding to market changes, thus providing the ability to provide maximum value not only for business but also for the customer.

Part of the methodology "economic efficiency" discusses the subsequent economic evaluation of the proposed organizational changes on the continued functioning of the business and its overall economic outcome. From this comes the last part of the proposed methodology, which is "the decision to change." This section discusses the methodology of the decision as such, its terms and assumptions with respect to economic efficiency and the resulting report, that is the result of modeling.

The proposed methodology presupposes effective change management in the mining company, provided they use described in the next section using available support tools. Within it is a major input for modeling considers mining enterprise, the output of the individual reports in the form of economic indicators, assess them, and the decision to change.

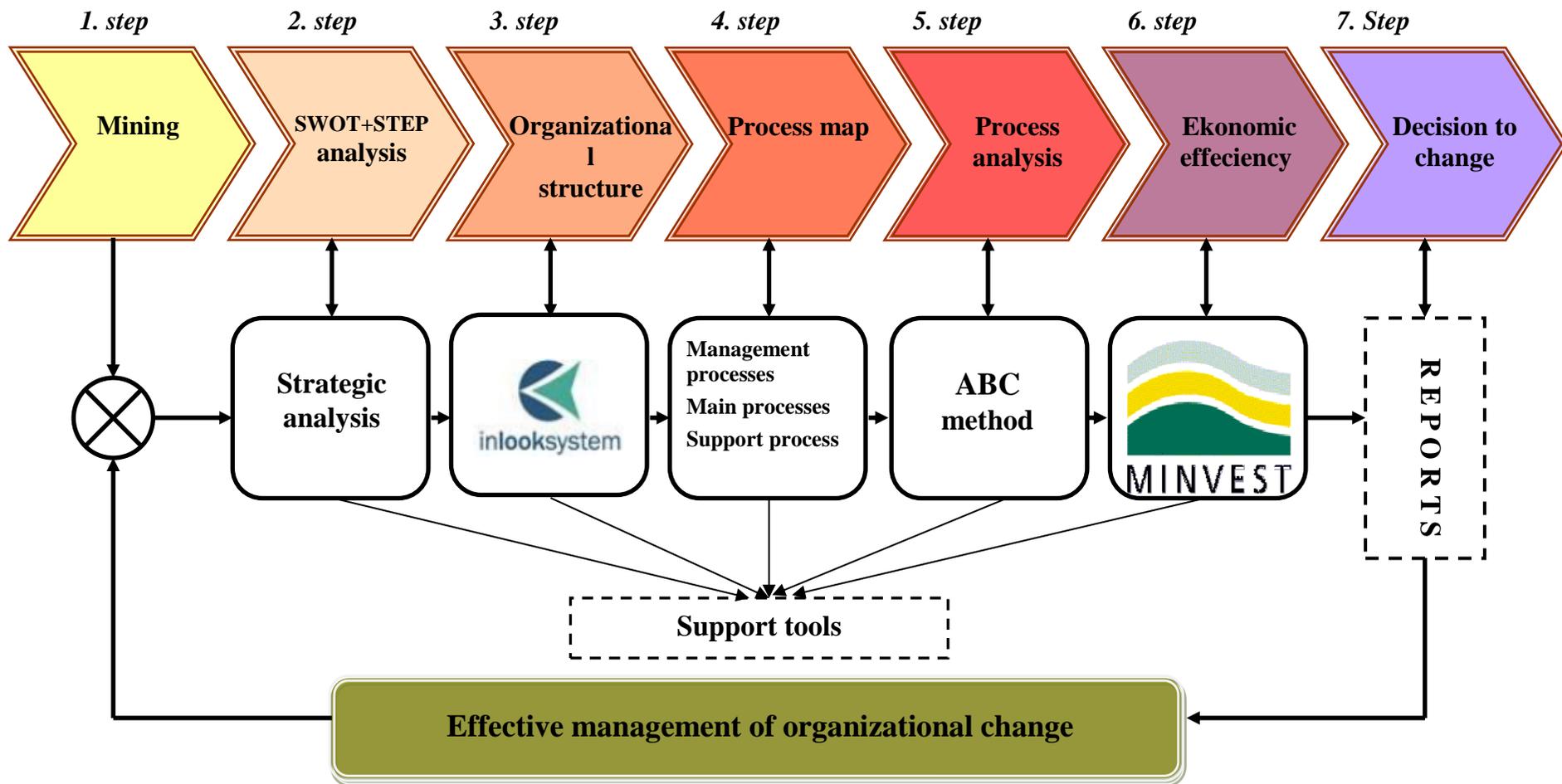


Figure 2 Designed methodology to effective management of organizational changes
 Source: Own processing

Conclusion

Based on the effective management of organizational change, but change is possible in general especially in the current rapidly and irreversibly rapidly changing society to respond to the constantly changing environment in which companies operated. Also available through constantly evolving tools to monitor not only effective decisions toward individual changes, but then also watching the behavior of the enterprise as a whole, employees and other workers, which changes concerned.

In this sense it is possible considered change management as one of the most important activities carried out by enterprises and companies, because changes are happening all the time, any new activity also causes changes and changes also affect other activities taking place in enterprises. Equally important, it is necessary management, managing the changes by experienced managers.

The present thesis shows especially the characters, objectives and benefits of managing organizational change and changes in general as well as the risks and barriers of their implementation and execution. It also describes options for monitoring and coordinating changes by available tools, thus streamlining their management, as well as opportunities to anticipate and timely respond to certain situations which give rise to the changes.

Thesis deals with currently very hot topic in theoretical definition by the classification and perspectives on organizational change. It also provides a useful assessment of facilitating and supporting change management applications. Subsequently, however, also define the needs of developing model of effective management organizational changes in the company arising out of identified and described facts and gaps. Based not only the analysis of the environment and trends in management, but also the development and forecasts for the mining industry also describes the methodology for capturing all this complex area of the business, for design use two available applications InLook system[®] and MINVEST.

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EXTERNAL ENVIRONMENT AS IMPORTANT DETERMINANT OF BUSINESS STRATEGY

Erika DUDÁŠ PAJERSKÁ

Abstract

The present paper demonstrates the effect of the current business environment on internal area of company – creation of strategy. The primary cause of the connection between these two areas is constantly increasing diversity and dynamics of changes in the external circumstances of the company. To follow a reliable diagnosis of the current situation work provides overview of different approaches to the issue of external analysis of the company. Due to this paper is offering universal conclusions for the formation of the optimal strategy of the company. For practical application of results, the issue of external analysis in this paper focuses mainly on the macro-environment, by addressing the major developments (which are formulated with regard to verification by statistical data).

Keywords:

external environment, macro area, threats, opportunities, strategy

Introduction

At present, the external uncertainty is characterized by much remarkable character as external conditions are more dynamic and complex than in the past. This is also the scale and frequency of changes (which determine the dynamics), which has a direct impact on strengthening the diversity of impacts on existing business. The environment is so complicated that its factors are often blurred and inexplicable. It is difficult to spot them and recognize at first glance. This environment brings additional barrier to the smooth functioning of the company - the fact that any foreseeable changes in a number of cases are not characterized by apparent dependence. The current trends in environmental conditions are creating new challenges for companies operating in it. Therefore, if the company would like to successfully progressed, the main task today of business managers is to adapt company to an unstable and volatile environment through the optimal control strategy. Success is not guaranteed by recognition of factors and influences, but their appropriate use in the development of strategic business management. In creating such a crucial area of business management is essential to avoid one of the errors that managers of enterprises commit - underestimating of planning. The company has to serve one of the supporting management tools - external analysis of the company, i.e. examination of the external environment in which it operates.

For a comprehensive review of the nature of the alleged problems of corporate governance, the contribution focuses on providing an overview of the ideas and approaches to the external environment of the company by both

domestic and foreign authors. Attention is focused mainly on the macro-environment as a result of its universal effect for all companies. The whole is concluded by depiction of current trends (with underlying data), which operate outside the company and answering the main questions to each of the macro-environment types:

- What are the trends?
- What is their impact on the business?
- How can be these changes taking into account in the formulation of corporate strategy?

Based on the mentioned set of steps, at the end, results and recommendations for discussion can be enunciated.

1. External business environment

Entrepreneurship as the natural activity of human being cannot be done without the previous development strategy. The manager or owner of a business must be aware of where he wants to go and how it wants to get there. "The use of the strategy dates back many centuries, to management of companies it is written from 40 years ago. The strategy began to be used first in a conflict situation to one belligerent raised a plan to prevent the attack from the enemy, or possibly challenge him."⁸ Essence of strategy was maintained for business purposes too - we try to avoid winning competitor over our company.

Examination of the external business environment is a very important area of research in issues of strategy, but especially since the advent of globalization and internationalization of environment. By this time, the external area of firms was regarded as a constant variable with the minimum number of factors that could seriously affect the internal environment.

The onset of the era of examining external relationships of businesses is associated with realizing the seriousness of business links with the surrounding area. This link does not occur in the short time, but is the result of decades with a few key changes in the global environment, to which the company is responding. Due to this, the number of experts is increasing, as well as publications that begin to focus their attention on the internal environment, but in the context of examining the effects from the outside.

External business environment can be characterized in terms of levels as a lower sphere - environment that surrounds the company and further affects the operation or management of the company. Closer to this level it includes companies operating in the sector of the holdings (as competition, supply and downstream entities), here on the other side customers. Also this environment is determined by the products which can be selected to act as substitutes or complements. In terms of the focus of this paper is significant to monitor second-degree environment of company, which operates in a higher sphere of

⁸ HENRY, A. 2008. *Understanding Strategic Management*. Oxford: Oxford University Press, 2008. p. 4.

environment-industry company. Macro area is a set of variables that affect all businesses equally, although their effects can feel differently. Generally speaking, macro environment is defined with its subsystems⁹:

- *economic environment*
 - The economic mechanism and set of the economic policy of the state. Measurements by various macroeconomic indicators such as economic growth, interest rates, exchange rates, inflation, employment, tax system, the average wage, as well as transport and telecommunications.
- *social environment*
 - A set of methods, models and behavioral patterns of individuals and groups who are motivated by their attitudes, values, needs and requirements. Already this characterization is illustrating the image of the social environment in the form of a complex large number of different elements.
- *technical environment*
 - Institutions in this industry profit and non - profit.
- *demographical environment*
 - The number, structure and movement of populations, and track changes in the composition of the population.
- *legal environment*
 - In other words, regulating relations in the environment.
- *political environment*
 - To promote the public interest by a group of people.
- *ecological environment*
 - Formal and informal relationships and treatment effects between the enterprise and the environment, and vice versa.

The monitoring and analysis is more important because of various environmental factors affect all firms, rather than at sectorial environment where its impact is mainly driven by the firm carrying out its activities in this area.

„The role of external analysis is to identify opportunities and threats that are affecting the company from outside. About opportunities we can talk when external trends are potentially allowing achieving higher profits for firms. Threats arise when external trends disprove the existence of a profitable business.”¹⁰ It is very important to note the fact that the definition of such external opportunities as positive effects and threats as negative external influences is not easy. After all, a threat to one company can mean an opportunity to next firm.

It is almost necessary to compare the results of the external analysis of the company with strengths and weaknesses, which the company characterized in

⁹ Processed by SLÁVIK, Š. 2005. *Strategický manažment*. Bratislava: SPRINT, 2005. 403 p.

¹⁰ SLÁVIK, Š. 2005. *Strategický manažment*. Bratislava: SPRINT, 2005. p.58.

terms of the internal environment. Only such synthesis can provide a good decision-making basis for the implementation of business manager provisions.

2. Analysis of external environment of the current business

After theoretical analysis, putting the issue of external business environment, in this section the present document passes to the reliance on the current situation and trends, which are typical to current macro environment. The parts of the structure of wider external environment firms are characterized by answering of three key questions:

- What are the trends?
- What is their impact on the business?
- How can be these changes taking into account in the formulation of corporate strategy?

2.1 Economical environment

This subsystem of macro environment of company currently has most radical changes that are striking a colossal impact on the business. Leads to long-term stagnation in economic growth - one of the reasons is the escalating debt crisis in the euro area, which causes a reduction in business confidence in the soundness of the economy. Described situation of stagnation is illustrated by Table 1.

Table 1 Percentage change in GDP compared to the previous period (1995 – 2014)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
EU 27	1,6	1,8	2,8	2,9	3,0	3,9	2,1	1,3	1,5	2,5
Slovakia	7,9	6,9	4,4	4,4	0,0	1,4	3,5	4,6	4,8	5,1
	2005	2006	2007	2008	2009	2010	2011	2012*	2013*	2014*
EU 27	2,1	3,3	3,2	0,3	-4,3	2,1	1,5	-0,3	0,4	1,3
Slovakia	6,7	8,3	10,5	5,8	-4,9	4,4	3,2	2,6	2,0	2,8

* data on 2012, 2013 and 2014 are predictions

Source: own processing according to data from Eurostat

Negative state of the banking sector does not help to avoid negative expectations of companies operating in the economy. "The financial sector after the crisis in the years 2008 - 2010, but also in 2011 was given to the particular situation. On the one hand, the debate about the regulation fell silent, as part of a permission to use leverage for hedge funds, but the regulation of some areas such as commodity markets was not touched. On the other hand, segmentation in relation to the structuring of the financial sector was much deeper." ¹¹ Difficult situation on the financial market is not improved by rapid inflation that plagued global trade. Money is thus becoming less valuable, and the same applies to the value of the savings in the banks. On the other hand, it eases the situation of debtors.

In addition to the above mentioned processes, the current turbulent period occurs the decline in consumption, resulting in a reduction of production companies. On the other hand, reduced consumer consumption is also affected by the decline in the current account surplus (in other words, the decline in imports). In connection with the existence of enormous competitive struggle (when companies offer far exceeds demand) and saturated markets is such combination almost "lethal". Another possible solution is to focus on those segments of the market, whose potential can provide almost unlimited opportunities of saturation (for example cultural and creative industries¹²).

The mentioned facts stand out in every economy of the world, but not at the same intensity. Justification can be found in the existence of regional disparities, which, however, in today's period exacerbated and caused another significant phenomenon - strong interdependency areas.

According to the above mentioned description, current economic environment is very important to interact with the business. Due to stagnating economies are

¹¹ OBADI, S. et al. 2012. *Vývoj a perspektívy svetovej ekonomiky: Medzi stagnáciou a oživením*. Bratislava: Ekonomický ústav Slovenskej akadémie vied, 2012. p. 231.

¹² Cultural and creative industries (CCI stands steady - Cultural and Creative Industry) are operators in the sector of the economy, using the cultural and creative nature of each individual (theaters, galleries, museums, festivals, TV,...). Many multinational groupings such as the European Union or the United Nations or the OECD are starting to realize the potential of this industry to the point that many of statistics are showing the big share of CCI on total world product. This idea is popularized by regionalists Richard Florida and his impulse is based on idea to spread it to not only thinking of various other economists, but also to serious and official documents and structures of organizations.

the expectations of their businesses very negative. In relation to a closed position of the banking sector, companies cannot rely totally on the credit crunch and therefore they have to count with other sources of capital, if they want to finance their activities outside their own finance.

The correlation between weak and strong competition for business consumption creates an environment in which everyone has to strongly consider every step. As these processes vary from region to region, the company has a strategic focus on the optimal placement of business options. In the current globalization and internationalization is crucial to neglected firm that acts as an international body in different countries. It has besides the above-mentioned obstacles to adapt its strategy on specificities of national markets and a strong level of connectivity of individual areas.

The analysis of the first part of the broader external business environment - economic environment leads to the following main trends for corporate strategy:

- a company has to plan its production and sales reflecting the continuing state of global stagnation,
- the creation of financial strategy must compose sources of funding its activities with respect to the current situation of the banking sector and also by focusing on the alternatives (such as venture capital)
- due to strong saturation of the market, company has to assign an important place for the use of marketing in its business strategies,
- in terms of hyper competition firm has to formulate its business strategies necessary with consideration of the possibility of (legal) closer cooperation with other companies (whether suppliers or business the same direction) due to achieve a stronger position in the market,
- interdependencies dictates the conditions for corporate strategy in the sense that small firm has to keep in mind that while some process are not happening in the same place as its activity, because of the present nature of the economy is more than obvious that the effect of this process will be transmitted to the sphere of its action.

2.2 Social environment

Many authors describe the current period, in which the global economy is now, as a result of neglecting of the social aspect of the business. So we are seeing a variety of social unrest¹³, by which the citizens are responding to unsatisfactory or to unsustainable situation (and not only economic) in their country.

Social sector is closely linked to the previous macro-environment subsystem, which phenomenon, which is characterized by the economic environment - the regional disparity is reflected in the nature of social relationships - the difference

¹³ As an example, we can serve recent social discord and protests in Greece, Spain and Portugal, but also in France and the UK. Our country is also not exception.

between revenue and economic level of the population. 5% of the population owns most of the wealth, and are directed to the recovery of the financial asset. There is a strong polarization of wealth at the expense of the dying middle class (which is in terms of the most significant business results the most important).

This situation is linked with negative market situation, which is mostly affecting in the social aspect of the external business environment - in the labor market. Phenomena such as long-term unemployment, youth unemployment, poverty and inadequate compensation affect business every day. The problem of unemployment is offered by data in Table 2.

Table 2 The percentage of unemployment by age (1998 – 2011)

	1998	1999	2000	2001	2002	2003	2004
EU 27: age 15 – 24 years	14,2	16,9	18,3	17,3	17,9	18,1	18,6
Slovakia: age 15 – 24 years	23,2	32,0	36,9	38,9	37,7	32,9	32,8
EU 27: age 25 – 64 years	6,1	7,4	8,1	7,5	7,8	7,9	8,0
Slovakia: age 25 – 64 years	10,0	12,8	15,7	15,9	15,4	14,6	16,5
	2005	2006	2007	2008	2009	2010	2011
EU 27: age 15 – 24 years	18,6	17,3	15,5	15,6	19,9	20,9	21,3
Slovakia: age 15 – 24 years	30,1	26,6	20,3	19,0	27,3	33,6	33,2
EU 27: age 25 – 64 years	7,7	7,1	6,2	6,0	7,7	8,4	8,4
Slovakia: age 25 – 64 years	14,4	11,7	10,0	8,5	10,5	12,5	11,8

Source: own processing according to data from Eurostat

The company must therefore necessarily motivate the development of its business activities to the middle class, which should form the gro composition of the economy and solve the problem of the previous section - declining consumption.

Company operated on the labor market operates as a powerful business socializing agent where the firm acting as the employer strongly influences the nature and operation of the labor market. Therefore from this and previous observations we suggest the following facts for the creation of business strategy:

- influence the polarization of wealth through orientation on people with middle incomes (the incorporation of pricing and marketing to business strategy),
- induce a positive effect on the labor market in terms of employment of long-term unemployed, or conception of various cooperation programs with schools (as a strategy for educating their staff already in place through the internship experience),
- necessary orientation of business strategy to create a company as powerful socialization agent.

2.3 Technical environment

After clarifying of two subsystems of macro environment with their mostly negative phenomena, this subchapter currently goes through the analysis of technical environment. Technology as a result of merging of the rational thinking and the use of resources that are offered to us, posing as a factor with most of the positive aspects. Human creates new technologies to facilitate the life and due to this technical subsystem acts as a positive factor for the business.

The current trend in technology is characterized by accelerating the pace of technological change and shortening the time interval from the onset of the new invention, for putting it on the market. Even a simple indicator of the number of mobile phones (Table 3) shows us strong position of techniques.

Table 3 Number of mobile phones in million (1995 – 2012)

	1995	1996	1997	1998	1999	2000	2001	2002	2003
EU 27	202,7	210,7	218,6	225,2	228,8	233,0	234,5	233,4	230,6
Slovakia	1,118	1,246	1,392	1,539	1,655	1,671	1,556	1,403	1,295
	2004	2005	2006	2007	2008	2009	2010*	2011*	2012*
EU 27	233,3	235,3	234,1	226,3	220,5	216,9	218,5	219,1	222,1
Slovakia	1,250	1,197	1,167	1,310	1,289	1,220	1,231	1,236	1,241

* data on years 2010, 2011 and 2012 are predictions

Source: own processing according to data from Eurostat

Although technological innovations do not occur regularly, there is specific phenomenon of miniaturization - i.e. producing technology in a small size - nanotechnology. They are the cause of the growth of labor productivity, reducing transport and transaction costs, and almost unlimited use of ICT for the benefit of business activities (e-application).

The overall situation in the technical environment could be characterized by Moore's Law. He talks about "the power of computer chips will double every 18 months, while the price will be constant or decline."¹⁴

A successful business must therefore embark on one of the waves created by the globalization and the development of a strong stream of information - communication technologies. This objective is also necessary to adapt in the strategy of company:

- design target of strong using of ICT in every possible area of business in strategy,
- plan of reducing the costs of operation of the company through benefiting from the advantages of the technical environment,
- formulate the role of the company to act as producer of innovations to dictate the character of the surroundings in which it performs.

¹⁴ FIALA, P. 2008. *Síťová ekonomika*. Praha: PROFESSIONAL PUBLISHING, 2008. p.11.

2.4 Demographical environment

Another part of the wider external business environment is currently devoted to the development of the population and various changes in its composition - demographic environment. We are currently witnessing a radical change in the age structure, which is brought by the two modern phenomena and falling birth rates (which are described in Table 4) and increasing life expectancy.

Table 4 Number of live births in thousands (1995 – 2012)

	1995	1996	1997	1998	1999	2000	2001	2002	2003
EÚ 27	5 130,3	5 132,8	5 117,8	5 092,0	5 073,4	5 123,1	5 022,3	4 994,0	5 041,3
SK	61,4	60,1	59,1	57,6	56,2	55,2	51,1	50,8	51,7
	2004	2005	2006	2007	2008	2009	2010*	2011*	2012*
EÚ 27	5 117,3	5 135,0	5 223,8	5 282,5	5 427,7	5 371,0	5 289,6	5 265,4	5 223,1
SK	53,7	54,4	53,9	54,4	57,4	61,2	60,4	60,8	60,5

* data on years 2010, 2011 and 2012 are predictions

Source: own processes according to data from Eurostat

It does not change only in the composition and population, but in terms of demographics, it is important to examine the flows respectively trends of population - migration. You can also decisive two visible trends; firstly it's way from rural areas to urban areas, which is particularly significant for the less developed economies. The second stream is even more striking for the advanced economies, where the place of residence or work of the people is selected on the basis of options of city (increasing status of marketing of cities¹⁵).

It is essential to say that successfully functioning company in developing its strategy has to response significant facts:

- to plan offering such goods or services that respects the age structure of the area in which it operates in its strategy,
- to adapt the form of sales to consumer age structure (for example innovative and interactive selling associated with the younger generation),
- to adapt its strategy to the strategy envisaged by the city in which the company operates (to clarify what the group of people city wants to attract, what of the benefits are accruing from it).

2.5 Legal and political environment

Area of law and policy was for analyzing the problem of the external business environment intentionally connected to one section, because there is a strong coherence and continuity of these environments. In other words, law as a legal

¹⁵ In Slovak condition it is project USE THE CITY commissioned by the city of Kosice in the forthcoming year of 2013, when the metropolis of the East become European Capital City of Culture. The main objective of the project is to adapt the environment to young creative and cultural people and to promote the city of Košice as a suitable place for their existence.

way to regulate activities in the economy is mostly carried out by, or at least posed by the governmental authorities to carry out a variety of changes to the proclaimed economic policy of the state.

These spheres are very sensitive on operation of the business because every business is obliged to respect the laws and standards of country¹⁶. Most of legislation is the matter of taxes, on the one hand they act as an important source of revenue for the state budget, and on the other hand it is touching pages of profit of company very strongly. Unclear legislation may lead to increased tax evasion and ultimately escape from the revenue side of the budget of the country. With this issue is closely related to the policy area, the budget deficit, which is typical for most of the current economic policies of the country. Various restrictions by the state have, in many cases, impact on the operations of the business.

The current situation in relation to the above-mentioned problems is bringing another phenomenon of our times to business macro environment - political unrests or even geopolitical strife. Difficult solution of crisis or unpopularity of various remedial tools leads to variations in governments or to radical changes in legislation. In some cases, results are in the escalation of commercial or even political wars and these geopolitical situations detrimental to businesses not only those countries that are directly involved in this, but also other¹⁷.

A bit from a different sub-acts is issue of International Credit Rating Agencies (CRA - Credit Rating Agencies), which are valuating creditworthiness of the country and determining its operation both inside as well as in the international context. At this time, there is a discussion about accountability policies of these agencies to the current global crisis.

The company must be aware of the strong interdependence of economics and also politics as Alan Greenspan use to point out today that "the economics meets politics."¹⁸ For the formulation of strategies it must be included "all groups, including politicians, affecting the running of the business, because they have a significant share of potential changes in future business activities."¹⁹ Business strategy must therefore take into account:

- the legislation of country, company has to adjust basic documents (or articles) of firm,
- tax issues,
- in the international nature of business also CRA ratings,
- law enforcement,
- whether there are any legal instruments to promote business (especially small and medium-sized enterprises, contribution to employment, to

¹⁶ Currently under European conditions it is also European legislation.

¹⁷ Due to interdependency of countries marked by strong openness.

¹⁸ GREENSPAN, A. 2008. *The Age of Turbulence*. New York: The Penguin Press. 2008. p.64.

¹⁹ FREEMAN, R. 2010. *Strategic management. A Stakeholder Approach*. Cambridge: Cambridge University Press, 2010. p.46.

maintain employment, tax credits, loan guarantees, or structural funds) and incorporate them into the business strategy.

2.6 Ecological environment

The last area of the external environment, the company does not act at this point in terms of the least importance. At present, it is quite the opposite. Natural disasters such as the tsunami in Japan or snow storm in New York suggest that it is the ecological environment that dictates restrictions on our business.

Inefficient use of scarce resources of our planet has led to global warming and other various climate changes. The largest negative externality of our business - air pollution acts as the worst problem that affects the entire population of the Earth (regardless of whether it is in the area of strong concentration of economic and other activities).

Table 5 describes precisely marked pollution problem and points to the evolution of air pollution which is produced by all sectors of the economy. There is a visible trend of restrictions and regulations in order to reduce the level of pollutant discharge.

Ecological environment performs another issue that has notable influence on the running of the business, as we saw in the Slovak Republic. It is about energy security. Not so long ago, when our country was shut down on natural gas supplies from Russia and significant damage to the economy was calculated.

Table 5 Volume of air pollution in thousands of tones NO_x, SO_x (1995 – 2012)

	1995	1996	1997	1998	1999	2000	2001	2002	2003
EU 27	14 712	14 477	13 973	13 533	13 084	12 644	12 382	12 127	12 043
Slovakia	178,8	135,3	127,2	132,5	120,3	107,4	107,8	100,2	97,8
	2004	2005	2006	2007	2008	2009	2010	2011*	2012*
EU 27	11 841	11 587	11 275	11 006	10 137	9 294	9 162	9 059	8 990
Slovakia	99,1	101,9	96,5	95,6	93,6	84,2	88,6	89,5	86,2

* data on years 2011 and 2012 are predictions

Source: own processing according to data from Eurostat

In relation to the above mentioned, the company would have alluded to aware of the effects of their activities on the environment and to formulate it in its strategy:

- incorporate into their policy strategies reduction of pollution,
- establish an internal directive on waste recycling among staff,
- plan of reducing energy consumption in their buildings and operations and tailor the development costs,
- to adapt their strategy to gradual transition to alternative energy sources.

Specific features of the processes were characterized in this section through the impact of macro-enterprise subsystems. They could be characterized as a significant point in the development of the strategy - the company. The company must also take account of facts like that, "we do not know exactly the future development of factors that affect the strategy of the company, during the strategic period there are significant quantitative and qualitative changes in a twist. The third specific feature of the strategic process is the fact that global environment does not look very broad. It is also known that processes induced by strategic decisions are often closely opposed and also depending on the longevity standpoint."²⁰ Such awareness of the current situation and the external environment and its effects is crucial for a manager who wants to successfully lead businesses also in today's turbulent period.

Conclusion

Managers of current enterprises have to decide to think about the future through analysis of the past by using of intuition linking with the forecasting methods. It is therefore a combination often proclaimed as "art & science", according to which the management company must use not generalized methods which are often based on human nature in the context of rational thinking, which is bordered by a variety of patterns, or standards. This statement provides u an image of a new manager who has a flexible attitude.

Flexibility is more important that we find ourselves in a very turbulent period. It is necessary to start from the bottom and begin a reflection of new economic phenomena and to review various management theories and methods that managers use every day. "This is because the more adequate reflection of the quality of new economic phenomena and processes and review simplified unilateral approaches ... selective and specific rehabilitation or return some older socio - economic theories that have been displace, or simply ignored by contemporary currents and prevailing ideologies."²¹

Strategic management of the company would in the current turbulent period follow alluded reflection but also the principles that reflect current conditions as "absolute customer orientation, strong top management, management company as a whole, finding new markets, focus on high-end results, high performance and the right products, efficient portfolio, speed and flexibility, performance incentive system, innovation, using the most modern methods of management in connection with the use of modern information technologies, respect for the

²⁰ Worked by SOUČEK, Z. 2005. *Firma 21. století (Předstihněme nejlepší !!!)*. Praha: PROFESIONAL PUBLISHING, 2005. p.195 – 197.

²¹ OBADI, S. a kol. 2012. *Vývoj a perspektívy svetovej ekonomiky: Medzi stagnáciou a oživením*. Bratislava: Ekonomický ústav Slovenskej akadémie vied, 2012. p.286.

principles of ethics, social responsibility and environmental friendliness, qualified strategic management.”²²

Awareness of the nature of the wider external environment is for the development strategy almost existential step. The environment affects all companies equally, but the company as itself has to choose the respond individually and flexible and adapt its strategy to the optimal functioning of the whole society.

Finally I will help with statement of J. Welch - one of the leading management guru, who said: „*If the tempo of change within the company is surpassed by the pace of change outside the company - end of company is near. If the company does not change accordingly, firm will stagnate for some time and then will go bankrupt.*”

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²² SOUČEK, Z. 2005. *Firma 21. století (Předstihněme nejlepší !!!)*. Praha: PROFESIONAL PUBLISHING, 2005. p.17.

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