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REBUILDING QUALITY OF CORPSE IN RESURRECTION AND RETURNING FROM SHIA AND SUNNI'S VIEWPOINT

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Abstract: Revival and resurrecting dead bodies (corpse) in the Day of Judgment is one of principle of the faith and what is implicated from totality of Imams' Hadiths and narratives under some of Quran verses' interpretation is that each human's main body is a Particulate body which is not decomposable and will remain even after decomposing of whole body parts and like a plant seed is capable to grow between two Blowing's of the trumpet by resuscitative rain fall, change into a complete human and get prepared to enter Day of judgment. Principle of Return, by the consensus of all Imagism scholars and infallible Imams' Hadiths affirmation, is of Shiite's beliefs necessities and of specific dignity and importance. Quality of Rebuilding Returners' Bodies, same as resurrection, is based on growth and development of Particulate body in grave under Life rain fall.

Key words: Day of Judgment, Return, Particulate body, Life rain

1. Introduction

Believing in return and revivifying corpse to be judged in God's presence in Doomsday from Shiite and Sunni's viewpoints is one of the Roots of the Law. Several verses in Quran with emphasis on God's absolute power have dealt with returning deads to life in order to take their deeds responsibility. But regarding decomposition of material body in a short time after demise this question is raised that what body human enters doomsday with? And how these bodies are reconstructed from decomposed components?

Principle of Return is of Shiite's beliefs necessities and means believing in this fact that in diverse intervals of worldly life specially concurrent with Imam Mahdi's (p.b.u.h) appearance ,and after that, all prophets and infallible Imams and saints of God their followers and a group of true believers and unbeliever will return to this world life in order to establish justice, lead Islamic global community, adjudicate trampled rights, achieve more perfection, and worldly punish unbelievers and oppressors and see their humility and abjection in this world.

But like the matter of Resurrection, here this question is posed as well that returning people (except prophets and saints of God whose pure bodies are free of any decomposition with God's permission with which body and how will return to world. In this study we explore how these decomposed bodies are rebuilded and returned to this world. We investigate the answer from Shiite and Sunni's resources.

A) Quality of body's reconstruction in the Day of Judgment

To clarify the quality of reconstructing bodies in resurrection, types of bodies should be known first. So we explain types of bodies:

2. Types of bodies

What is implicated from the totality of Quran and tradition is that human has three distinct bodies which play an important role in human's worldly and otherworldly life. These three bodies are: motherly body, imaginal body and Particulate body.

Motherly body is the one which is formed in mother's womb and its cells are composed of minerals like sodium, calcium… and we are born and live with this body

Imaginal body: Quran verses and Islamic narratives generally confirm imaginal body or Intermediate suprasensory world. In Quran and Hadith's viewpoint, sleep and dream and intermediate world are examples of subtle world which is same as a subtle matter. Imaginal creatures due to subtlety are not perceptionally sensed, although by change in human's perceptions (like what

exist intuition of saints of God and mystics) it's possible to perceptionally sense them.

On the basis of Quran and tradition restatement, imaginal world and its creatures, like intermediate body, its bounty and punishment, have their own specific material, time and place and types of motions, changes and transformations. Imaginal body has been made up of a type of subtle matter and is exactly same as motherly body, namely, has superficial organs like hand and foot, and head and … and also shape, color and dimensions. Imaginal body in general, is inside of motherly body and completely fits it. This body is completely similar to motherly body and has those superficial organs but more subtle than those of it. It seems that imaginal body's creation and formation is synchronous with creation of motherly body.

This body is exactly the one which separates from motherly body and moves while sleeping and is the one that we see in which due to its high subtlety and not being dense and massive provides possibility of motion and movement and some works in sleep for human that is not able to do it in awakening. From Quran verses and saints' hadiths view (Koleiny, 1983, Majlesi 1983, Toosi 1986) it's implied that mystics and saints of Gods' intuitions confirm this. Human passes intermediate world with this subtle imaginal body and all the bounties and punishments of the other world is conveyed through this body to the soul.

Particulate body: in Quran verses with delicate cues and in infallible imams' narratives, a type of body called Particulate body has been clearly mentioned, namely, each human before natural birth has existed – in a specific manner – and has made a covenant on God's Divinity. This body has the following characteristics: 1- is made up of very fine particles and is particulate. 2- Has been created thousands years prior to motherly body. 3- Is the human's true and constant body and the basis for motherly body formation and development? 4- Has been created from earth dust. 5- Is protected from decomposition and decay. (We will deal with some narratives confirming each of these characteristics as follows).

Reviewing Islamic Hadiths relevant to "world of pre-existence"(Az-Zar) proves that these hadiths is frequency, so accuracy of their content is not the matter of dubiety. This group of hadiths doesn't merely belong to Shiite resources and are abundantly and frequently found in Sunnis' resources (Ad-dor al-Mansur, by Jalal al-din Suyuti, Jami_at_tafsir by, Khale Ibn Abd-Al-Rahman

Definition of Pre-existence world: this world (worlds) is the level of human's existence in which human's soul with Particulate body has existed prior to motherly body and has spent particular levels of knowledge topside which is intuitive knowledge of God Almighty and has taken covenant on God's Divinity. World of pre-existence has several levels itself and is not limited to a specific world.

The most famous verse relevant to world of pre-existence is Verse 172 of Sura 7:

"When your lord took from the children of Adam, from their loins, their descendants, and made them testify concerning themselves, am I not your lord? They said: yes! We testify. Lest you should say on the day of resurrection: surely we were heedless of this**.**

Based on this verse (well-known as Alast verse) when your Lord took from the children of Adam - from their loins - their descendants and manifested his Lordship and made them make covenant on the knowledge of this divinity and they all testified it. A part of narratives related to world of pre-existence and particulate body follows this verse. Some of them are mentioned:

Imam Baghir (p.b.u.h): God Almighty brought forth from Adam, from his back, his descendants to take their covenant on his own

divinity. Then God said to Adam: look! What do you see? Then Adam looked at his descendants and saw them as particles. (Majlesi, 1983)

Imam Sadigh (p.b.u.h): Lord brought all offspring of Adam till Resurrection, as particles from his back and introduced himself to them and if it didn't happen, no one would know his Lord and then God said: am I not your God? They said: Yes. (Majlesi, 1983)

Imam Ali (p.b.u.h): when God created Adam, touched his back and brought forth from Adam, from his back, all his descendants as particles and bestowed upon them wisdom and made them testify that he is God and they are servants. They testified his divinity and admitted their servitude as well. (Majlesi, 1983)

Imam Baghir (p.b.u.h): when God wanted to create human, took mud from the earth and severely rubbed it… and they began to move as particles … then God said: am I not your God? They answered: Yes. (Koleiny, 1983)

3. The role of Particulate body in human primary creation

What is implied from the totality of Quran and Tradition is that as God has created seed to make tree and this seed inside the ground by nourishing from water, air and minerals and their absorption gradually grows and develops root, trunk, stem, leave, fruit and whole body, in order to create material (physical) body of all humans, either Adam or his descendant, many years before birth, an existential seed named Particulate body has been created from soil based on which motherly body emerges.

Firstly God has created Adam and all humans' Particulate body from soil (dust) and specific interactions done on it (which in Quran for this stage: dust, clay, firm clay, black mud, dry clay like earthen vessels, fashioned in shape have been used) and since Adam has been created without the presence of father and mother, his Particulate body like a seed has grown inside ground instead of mother's womb and gradually his organs emerged, grew, developed and completed. But Particulate body of each human under God's preordination and in its specific time is conveyed to father and by absorption of special materials in his body changes into semen and after moving semen into mother's body, by absorption of nutrients changes into embryonic form in mother's womb and after development is born as a newborn baby.

4. The role of Particulate body in reconstructing otherworldly bodies

Quran verses and narratives clearly prove that deads' corpse is rebuilded from this mundane ground and emerge from graves and get prepared to be judged. Some of these verses are mentioned:

From it we created you and into it we shall send you back and from it will we raise you a second time.

He (also) said: therein shall you live, and therein shall you die, and from it shall you be raised.

When he calls you with a (single) call from out of the earth, lo! You come forth.

Based on these verses the earth from which we will be revivified is the one from which our physical life has been shaped and in which we will bury after demise.

narratives clearly state the quality of formation and rebuilding bodies in the Day of Judgment: in the Day of Judgment after the first Trumpet blowing – when any type of life has wiped out on the earth – sending down a particular rain by God, called Life rain or Life water, human's Particulate body – which has been protected from decomposition and decay – like a human seed absorbing minerals inside ground and gradually develops and after second Trumpet blowing and its consequent earthquake, earth soil goes away and uncovers bodies and by breathing of the spirit, get prepared to be present in the Day of Judgment.

We mention some of narratives in this field:

Holy prophet Mohammad (p.b.u.h): God Almighty between two Trumpet blowings sends down a sea from heaven called Life sea whose water is similar to men's semen and God sends it down to the earth for forty years and this water splits the earth and penetrates beneath it and reaches decomposed bones and the bones affected by this water start growing as plants start growing by rain. And this is same as what God Almighty said in Quran: "he is the one who sends forth the winds bearing good news before his mercy… Thus shall we bring forth the dead as such", meaning that as God brings out plant by rain, the corpse is brought by life-giving water and bones, vessels, flesh and hair gather and still stay without soul, then souls enter bodies and each soul enters the body from which was separated in the world, and then the topside ground will crack and they will arise in resurrection stage.

Imam Sadigh (p.b.u.h): after demise, body as created from dust changes into dust again, then on the Day of Resurrection by pouring down resuscitative rain, dust on the ground grows and dust of each body accumulate and Soul enters inward it.

Imam Sadigh (p.b.u.h) was asked if dead body (corpse) gets decomposed. He said: Yes, in the way that no flesh and bone remains except his Original creation from which he has been created. This Original creation is never decomposed but remains in grave till (human's corpse) correspondingly it was created intially is reconstructed from which.

Imam Sadigh (p.b.u.h): when God wants to revivify human of demise, it rains forty days from heaven which results in gathering body organs and growing flesh.

Imam Hasan Asgari (p.b.u.h): God after first Trumpet blowing and between two Trumpet blowings sends down the rain similar to men's semen "from sea filled with fire" reaching decomposed deads and then they grow from dust and are revivified.

As could be seen these narratives confirm characteristics mentioned for Particulate body and explain bodies rebuilding way. Hadiths mentioning the quality of revivification of deads in other world don't merely belong to Shiite resources and can be found in Sunni resources as well. Sunni narratives are agreed with Quran and Shiite hadiths on this point that there is a part in human based on which his body develops and forms and this part remains after demise and in the Day of Judgment from which otherworldly body forms. This part is often called Ajb-az-zanab, we will refer to some examples as follow:

Holy prophet Mohammad (p.b.u.h): Dust decomposes all human parts after death except his Ajb-az-zanab. Others asked: what is it? He answered: it's like mustard seed from which human will be reconstructed.

Holy prophet Mohammad (p.b.u.h): between two Trumpet blowings, there is forty (days, moths or years) and God in this interval sends down a rain called Life rain, then the earth gets clean and human body grows as plants grow, then the second trumpet blowing happens and deads rise.

Inb Abbas and Abou Horayreh have quoted from Holy prophet Mohammad (p.b.u.h) that when all humans die by first Trumpet blowing, a rain similar to men's semen comes down before second Trumpet blowing by means of which dead bodies grow in their graves as human grows in mother's womb and plants grow while watered, when bodies are completed and soul is blown the second Trumpet blowing happens and they come out of their graves.

Imam Ali (p.b.u.h) in interpretation of verse "The sea filled (with fire)" said: it's a sea under Divin Throne which has dense water and is called Life sea which rains for forty days on humans after first Trumpet blowing and they will grow from their graves.

Holy prophet Mohammad (p.b.u.h): God sends down a water on you (corporeous bodies) from his Divin Throne and commands heaven to rain, then heaven starts raining in such a way that twelve Zera (size of elbow; a measurement unit) covers you and God commands corporeous bodies to start growing like plants to complete their whole body. Then God commands Israfil to blow

Trumpet in order to revivify corporeous bodies, so the souls enter bodies and the earth uncovers you and you immediately exit and hasten to God.

The meaning of Sunni narratives about Particulate body and the way of otherworldly body formation is very close to Shiite narratives.

B) Quality of Reconstructing Returners' Bodies

Due to the importance of Return, first we deal with the position of this belief between Shia and Sunni and then the quality of reconstructing Returners' bodies.

5. Position of Return in Shia and Sunni's views

A) SHIA

Belief in return is the special characteristic of Imamism and is of prominent level, and it has special dignity in narratives. In some narratives Day of Return is considered as one of Divine days in which God's glory and power will be manifested.

Imam Sadigh (p.b.u.h) quoted from his father Imam Baghir (p.b.u.h) who said: there are three Divine days: the day in which Imam Mahdi (p.b.u.h) will arise, Day of Return and Day of Judgment. (Majlesi, 1983)

Special days are assigned to God while all days belong to God and this is because in such days God's glory and power differently emerges from other days.

In another narrative, belief in return is one of Shia characteristics: "the one who doesn't believe in return is not with us". (Majlesi, 1983)

And in another narrative belief in Return is sign of faith. Imam Sadigh (p.b.u.h) said that the believer is the one who admits seven things, one of which is belief in Return. (Majlesi, 1983)

Return is accepted by Great Shiite scholars. They have accepted this belief by following holy prophet Mohammad (p.b.u.h) and infallible Imams.

"Sadough" in the book "Beliefs" has said that we believe in Return as it is true to return to this world. (Sadough, 1992)

 "Mofid" knows principle of Return under consensus of all Shiite scholars and says: Imamism scholars have consensus on the necessity of Return for most of the dead bodies before the Day of Judgment.(Majlesi, 1983)

"Sayyed Morteza" claims consensus among Shiite scholars on Return and says: Shiite followers have no disagreement on this issue. (Majlesi, 1983)

"Toosi" (Toosi, 1983) and other great Shiite interpreters have accepted Teturn and know it as necessity to believe in it.

"Horr Ameli" knows the authenticity of Return from Shia viewpoint as an absolute and undeniable issue that the majority of Shiite scholars or all of them have accepted that (Ameli, 1983). And he has also known the narratives on Return innumerable and believes in frequency on this issue. (Ameli, 1983)

"Majlisi" at the end of Baab al Raj'a (Chapter on Return) of Bihar al Anvar mentions the names of knowledgeable scholars and great authorities who are the owners of books and compendiums on proof of Return and says: the one who believes infallible Imams' truth and legitimacy how can doubt in such a frequent matter quoted from them which includes 200 explicit narratives and more than 40 Shiite narrator authorities have referred to it in their books? If such a matter is not considered as frequents what matter is easy to be claimed as frequent? (Majlesi, 1983)

"Tabatabai" has accepted frequency in Return narratives and says: " narratives about the principle of Return is frequent so that opponents of Return from the early times of Islam have known this matter as Shiite definite and particular beliefs and frequency is not voided by putting conflict on each of narratives. In

addition some of Quran verses and narratives on Return have a total and reliable implication". (Tabatabai, 2001)

So it could be said that principle of Return from Shiite great scholars' viewpoint is a definite and absolute issue and based on many narratives from infallible imams there is no doubt on Return realization.

B) Sunnis

Reviewing sunni hadith resources and narratives of some Quran verses interpretations we find that belief in Mahdavism − namely belief in this fact that Imam Mahdi, son of 11th Imam, is alive now and will appear at the end of the time and establish justice and security in the world and Islam will overcome other religions and Islam enemies will disappear − is not limited to Shia, so Scholars of Four schools of Sunni Law have know this belief with reference to valid narratives as the same levels as frequent. But there is severe difference between Shia and Sunni on belief in Return.

Imamism scholars – as previously mentioned- have put belief in Return in the level of essential issues of Imamism but some Sunni scholars reject this belief and know the relevant narratives as Israeliat (Alosi, 1994) , And some know believers in Return as infidel, liar, Evil doer and heretic(Ghefari, 2009), And some Sunni interpreters consider Return inconsistent with belief in the Day of Judgment, Divin reward and punishment(Alosi, 1994) ,and some others refer to some Quran verses to deny Return. (Zamakhshari, 1986, verses 99 and 100 S23, and verse31 s 36) and many Sunni scholars entail the Return defined in Shia as transmigration, as Extremists belief, and on the basis of this wrong assumption, severely attack Imamism and condemn Return theory while ascribing such concept as Return to Shia is not only wrong but it is falsification of Shia belief (Kazemi 2012; Momenzadeh 2012).

What Sunni deny about Return is the concept which is unacceptable in Shiite belief as well and Shia Imams seriously have rejected it, known it as Extremists' and People of delegation's opinion and have called its believers as infidel and Polytheist. Since Extremists have had deviant ideas denied by Imams.

Although the majority of Sunni scholars have denied Return and known their believers as infidel, among Sunni scholars there are some who have accepted Return and presented reasons on its existence, as below we point to two examples:

"Ghortabi" says: so revivification of his parents is of his charismatic acts and virtues which had been granted by God to him and their revivification and testification has no intellectual and religious absurdity because revivification of a dead body in Israelites and unveiling his murderer has been mentioned in Quran and Jesus revivified corporeous bodies as God revivified a group of deads through our prophet. When this issue is proved then there is no absurdity on their testification (in God) for prophet's charismatic acts and virtues… by research I achieved a more clear argument in which The men of the Cave will rise at the end of the time, Ibn Abbas has narrated that The men of the Cave will be helpers of Imam Mahdi. (Salehi, 1993)

"Suyuti" in book "clarifying the possibility of meeting prophet and angels" claims that has seen prophet in consciousness more than 70 times, it is apparent from this statement that he knows Return not only as a possible act but a happened one, but doesn't specify his Return to a specific time. (Habibi, 2013)

6. The quality of Returners Bodies Creation

After stating Shia and Sunni views in Return, we explain this point that how Returners body is reconstructed and prepared for returning to the worldly life. There are three possibilities: 1. they immediately and at once are created inside grave. 2. Many years before their Return, their Particulate body is transferred to their parents' bodies and then they are naturally borne. 3. Their Particulate body grows in ground and then completes.

It is inferred from some narratives that at least some returner bodies are rebuilded in the way that the human bodies are rebuilded in resurrection, as mentioned earlier, so that in the year of Imam Mahdi's appearance in month "Jamadi as-sani" and the first ten days of month "Rajab", it continuously rains which leads to growing Particulate bodies in graves and completion of bodies. As it was previously mentioned about Particulate body, it is protected from decomposition and contains every human's specific information. So every human grows and completes his body like his material (physical) body in this world. We mention some narratives to confirm this idea:

Imam Sadigh (p.b.u.h) has narrated that:

when Imam Mahdi's appearance time arrives in month "Jamadi as-sani" and the first ten days of month "Rajab" a rain starts that humans haven't seen like it by which God grows flesh on believers' bodies in their graves and it seems that I look at them coming from tribe "Johaynah" and remove grave dust from their heads. (Majlesi, 1983)

This hadith is exactly quoted from the following books: Kashf al-ghommah, v2, p463 and, Elam al-vara, p 462, and, Ighaz men al-hajah, p249

In other hadiths, Imam Ali (p.b.u.h) in esoteric commentary of verse " o you who believe! do not make friends with a people with whom Allah is wroth; indeed they despair of the hereafter as the unbelievers despair of those in tombs " refers to a strange event between months "Jamadi as-sani" and "Rajab" and revivification of deads and their meeting with alives which in symmetry with the last narrative is pointing to revivification of returners:

It is narrated from Imam Ali (p.b.u.h) that in a sermon said: how amazing! All amazement is between months "Jamadi as-sani" and "Rajab". People asked: what is that amazing matter? He said: how I can't wonder when decree and preordination is applied upon you and what is stranger than it that deads draw swords on alives? I swear to God, who split the grain and created servants, as if I see them with drawn swords moving in Kufa alleys and hit whoever enemy to God and prophet and believers. This is the esoteric commentary of this verse: "do not make friends with people with whom Allah is wroth; indeed they despair of the hereafter as the unbelievers despair of those in tombs "(Ameli, 1983)

"Abdullah inb Khafghah" says that "Aban: said: I passed over a group who were criticizing me saying that I quote from Imam "Baghir" (pbuh), I told that how you reprove me for quoting from the one who answers all my question quoting from Mohammad (pbuh). One day children were passing and singing that: "there is something amazing between months "Jamadi as-sani" and "Rajab". I asked him: what is this matter (such common among people)? He said: it's meeting between alives and deads.

("Majlesi, 1983) and, "(Ameli, 1983)

"Ibn al-kavva" told Imam Ali (pbuh): what it means you say that "how amazing! All amazement is between months Jamadi alsani and Rajab." He answered: Gathering scattereds, revivification of deads and reaping plants and the other inexpressible events which destroy and eliminate. Neither I nor you will be there. ("Majlesi, 1983) and, "(Ameli, 1983) and (Saduq, 1982)

 "Saduq" infers the end of hadith: "Neither I nor you will be there" as concealment and says: since "Ibn al-kavva" didn't tolerate secrets of Household of Prophet, Imam Ali spoke with concealment, but it may not be concealment and means that some Shiites and some enemies of Household of Prophet will be raised between months "Jamadi as-sani" and "Rajab" and Imam Ali's Return happens after that and not between these two months.

7. Results

1. Principle of Doomsday is one of the main Roots of the Law and several verses in Quran emphasize that it's the consensus of two sects.

2. Based on Shiite and Sunni narratives after the first Trumpet blowing under God's permission for forty (day or month or year) a continuous rain is started (Life rain) in which Particulate body of buried humans (containing every human's specific information and protected from decomposition) start growing as a plant grows and every human body is reconstructed like its original form and prepared to enter Gathering at the Resurrection

3. Principle of Return including more than 200 explicit narratives from 40 Shiite narrator authorities is an absolute and certain issue and faith in it is obligatory and unbelieving in it leads to quitting from Shiite sect.

4. Based on several narratives, in the year of Imam Mahdi's appearance in month "Jamadi as-sani" and the first ten days of month "Rajab", such a continuous rain starts which results in growing flesh on Particulate bodies in the graves and human bodies will be rebuilded like their original forms.

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ANALYSIS OF SMALL AND MEDIUM ENTERPRISES FUNCTIONING IN THE POLISH ECONOMY

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Abstract: Small and medium-sized enterprises account for 99.76% of all companies operating in the Polish economy. Their numbers directly affect the level of employment, and these entities have consequently an extraordinary impact on welfare and social wellbeing. With these arguments in mind, it is extremely important to analyze the SME sector from both scientific and practical point of view. Consequently, the general objective of this article was to analyze the SME sector both theoretically and empirically. Thus, the first part of the discussion is devoted to report theoretical aspects. In contrast, the second part of the paper focuses on the empirical approach of the SME sector. The selected indicators describing the situation and financial condition of small and medium enterprises were analyzed. Statistical analysis was supplemented with own calculations.

Keywords: analysis, Poland, MSP sector

1 Characteristics of the Company – Theoretical Implication

The concept of entrepreneurship has permanently occured in the Polish language during the transformation period. "Systemic economic changes at the turn of the 1980s and 1990s have given impetus to millions of people, and resourcefulness and economic activity have been activated, supported, created, stimulated, analyzed and researched" (Targalski, 2014, p. 21). Literature of the subject defines entrepreneurship in two aspects. In economics, it is treated as: "the effect of work, activity, behavior in the market, activity that translates into economic results" (Targalski, 2014, p. 21). In the case of management, entrepreneurship is understood as a characteristic of performance, which is expressed as steering efficiency. Entrepreneurship is also considered as a co-dependence of entrepreneurial and innovative activities aimed at pursuit of success. Although entrepreneurship has a wide range of issues, it is difficult to find in the literature a strict definition of this concept, because it is discussed in a descriptive way, it contains many meanings and ranges that are not a subject to scientific schemas. As it is described by J. Targalski, entrepreneurship is most often described as:

- the feature of human activity, the so-called, attribute definition;
- The activity of the small and medium-sized businesses sector, i.e. the SME sector or human activity, which is undertaken to meet their own needs and to eliminate discomfort, the so-called, subject definition;
- an activity that involves systematic work on the emergence, development and stabilization of one's own company, the so-called, process definition, functional.

The multi-faceted perception of entrepreneurship leads to define it as the result of the interactions of elements it consists of, that define its dimensions:

- business entity, i.e. entrepreneur,
- implementation of the entrepreneurship process,
- organizing business activities,
- Entrepreneurship environment (Grudzewski, Hejduk, 2006, p. 11).

Entrepreneurship can also be defined as a trait of character, or a set of traits that are characteristic for entrepreneurs. This concept is related to the business. This term is legal, as defined in the Act of April 26, 1964. Article 55 defines an undertaking as follows: "An enterprise is called an organized set of intangible and material components designed for business activity" (Civil Code, 1964, article 55). An organizational entity that is an enterprise may carry out both production and commercial or service activities. The purpose of an enterprise is to make a profit from its business.

The company includes in particular:

- the name of the company,
- the ownership of movable or immovable property belonging to the enterprise, including goods, devices, articles and other property rights in movable or immovable property,
- the rights arising from the leasing or letting of immovable or movable property and the right to use immovable or movable property arising from other legal relationships,
- receivables, cash and securities laws,
- permits, concessions, licenses,
- patents and other industrial property rights,
- related property rights and oroginal property rights,
- business secrets,
- documents and books related to running a business activity (Civil Code, 1964, article 55).

Businesses are the creations of civilization processes that have taken the form of economic organizations today. Their origin is due to the processes of development of economic, political, legal and social relations. The forms of enterprises vary widely and are constantly subject to changes that result from changes in their environment. Both the establishment of the company and its development are connected with the development of civilization, which consists of three stages:

- an agrarian era,
- an industrial age,
- information age (Białasiewicz, Marek, 2008, p. 26).

Literature of the subject lists several factors that shaped the present image of the company. They also affect the future. These are:

- the formation of joint-stock companies, i.e. corporations,
- changes in the territorial scope of the activity, e.g. from a local company to a global one,
- the change that has taken place over the years in the company - state relationship,
- changes in organizations management structures and systems,
- changes in companies' economics,
- changes in the company-environment relationship.

In the early period of the formation of enterprises the most popular form were the enterprises of the individual owner. In the 1980s, during the Second Industrial Revolution, which resulted in an increase in technical progress, there was a growing demand for capital, which could not be provided by individual entrepreneurs. The guarantee of such collateral was proposed by joint stock companies, which dynamically began to develop in the late nineteenth century. Transformation of companies into partnerships was an innovation in their development. The innovativeness of these partnerships in relation to individual enterprises enabled them (Białasiewicz, Marek, 2008, p. 27):

- trading in shares contributing to the expansion of the capital market,
- collection of distributed savings for production or service purposes,
- reducing the risk of economic activity,
- increasing production scale as a result of capital accumulation.

Companies can adopt different organizational forms that fit their business area, needs, and operating conditions. It can be a simple form that includes one workplace where there is a single management structure or a complex one, where a multilevel management structure that is composed of different

organizational units is distinguished. All this creates an organizational whole and is called the enterprise.

1.1 Classification of enterprises

The classification of companies depends on different criteria. The types of these criteria are very diverse and can result, for example, from the geographic area of activity, size, type of activity, organizational and legal forms or concentration level. In the case of a business profile criterion, this is already measurable as more and more companies are involved in the production of different products or services.

Companies can be divided considering:

- type of activity (Białasiewicz, Marek, 2008, p. 55):
    - manufacturing companies, that deal with the production of material goods, including industrial, construction and agricultural enterprises,
    - service companies which purpose is to provide services such as financial, health, tourism, catering, or forwarding services,
    - trade businesses that deal both in retail and wholesale trade.
- business ownership:
    - private, these are private companies, civil partnerships or cooperatives,
    - public, i.e. those owned by the State Treasury, mixed ownerships or local self-government (Lichtarski, 2009, p. 26).

Companies are also qualified in relation to economic law:

- taking into account the functional approach - the company conducts its business for profit;
- bearing in mind the subjective concept - the law treats the enterprise as a body of rights and obligations arising from its business profile, both on its own responsibility and on its own account and its risks. The company's operations are carried out in a sustainable way (Lichtarski, 2009, p. 32).

One of the most important criteria for the division of enterprises is the size of the enterprise. Due to this classification we can distinguish:

- micro-enterprises,
- small businesses,
- medium enterprises,
- large companies.

The division by size is most often related to the economic policy of the state that is protected but also supports micro, small and medium-sized enterprises. The mentioned types of companies contribute to the so called "SME sector".

Small and medium-sized enterprises can be defined both through qualitative and quantitative criteria. "The qualitative criterion describes the state or location of the company in the particular industry. The most common quality features are:

- company structure,
- the role of the owner,
- the type of financing,
- legal independence" (Targalski, 2014, p. 49).

Management structure plays an important role in the qualitative criterion. As P. Drucker writes, "the company is as large as the managerial structure it requires" (Drucker, 2008,   p. 252). The organizational structure consists of only one decision center. It is worth noting that both small and medium-sized enterprises are characterized by the role of the owner, who is a key factor in their structure. They take both the role of manager and entrepreneur.

The characteristic feature of small and medium enterprises is also the specific way of financing, as well as the use of own

capital. These companies make little use of loans or credits. "This feature plays an important role especially in the early stages of establishment, apart from finances, legal independence is also characteristic of small and medium enterprises" (Targalski, 2014, p. 50). These companies are also distinguished by the fact that they are mostly autonomous and independent. Literature of the subject, among qualities, also mentions the innovativeness of small and medium enterprises. Quality features include also small market share, small number and types of markets and customers dependency, local outlets, dependency on one or a few products, dependence on local resource markets, lack of sufficient resources to carry out extensive environmental research including market research, the importance of institutional local environment, clarity of ownership and direct management, unity of owner and control, simple organizational structure (Bednarczyk, 1998, p. 73).

Among the quantitative criteria used to determine the size of small and medium enterprises, absolute measures of size are used most often (Lichtarski, 2009, p. 27):

- employment level
- enterprise's turnover value, i.e. annual sales volume,
- total balance sheet,
- value of permanent property,
- annual net income,
- period of unit's business activity.

These are not the only size measures describing small and medium enterprises. At times, you can also use the size measures concerning a particular company's share in sales on a specicfic market. It should also be mentioned that the quantitative characteristics of SMEs are far more objective to define and much simpler to grasp considering the needs of the state and economic administration. "Quantitative criteria are used in the formal definition of the sector of small and medium-sized enterprises for various fields such as statistics, accounting, public aid. The reason for this is their measurability, as opposed to qualitative criteria" (Wolański, 2013, p. 21).

1.2 Presentation of the SME sector

The sector of small and medium-sized enterprises, so called the SME sector is a mix of both private and public sector, which consists of small, medium and micro enterprises. The term "small and medium enterprises" is used in the international business arena. It is used not only by the European Union countries but also by the World Bank, the United Nations and the World Trade Organization.

In the 1970s, in the United States, and later in Europe, the advantages of small and medium entrepreneurship were recognized. It was noted that the SME sector plays a large role in the economic development of the states. The United States has noted that the SME sector is the basis of the economy, while the Japanese have identified in this sector the element of very strongly developed corporate structure that supports the large industry (Piasecki, 1999, p. 103).

In Poland, the sector of small and medium-sized enterprises was discovered in the 1990s. "The government, in taking concrete steps to divert development and support those weaker market participants, implemented the following programmes: in 1995 Small and medium-sized enterprises in the economy, in 1999 Government activities towards small and medium enterprises up to 2002 and in 2002 First and foremost, entrepreneurship" (Wielgus, 2006, p. 128).

After the transformation period, Polish entrepreneurs gained access to various branches of the economy, which led to the development of private entrepreneurship sector. Because it was a period of dynamic growth of businesses, many small and medium-sized businesses emerged during this period. It was precisely thanks to the creation of the SME sector that the unemployment in Poland was limited, which allowed for the development of individual regions influencing the activation of

the whole economy. At present, the development of small and medium-sized enterprises is practically the only chance to increase employment and also effective competition (more: Marakova, Dyr, Wolak-Tuzimek, 2016, pp. 92-94) of the Polish economy on the international stage.

2 SME Sector - Empirical Approach

In order to emphasize the particular role that is played by the SME sector in the Polish economy, it was decided to examine the basic indicators describing this sector. Firstly, the number and structure of units belonging to the SME sector in 2015 is discussed. Essential statistical data is given in Table 1.

Table 1: Number and structure of entities from the SME sector in Poland in 2015

The size of the SME sector in 2015						
	micro	**small**	**medium**	**Micro structure**	**Small structure**	**Medium structure**
PL	1838365	56713	15631	96%	2,96%	0,80%
1	116362	3761	972	6,30%	6,60%	6,20%
2	332734	8529	2734	18,10%	15%	17,50%
3	170343	5611	1358	9,30%	9,90%	8,70%
4	207408	7847	1939	11,30%	13,80%	12,40%
5	76937	2409	562	4,20%	4,20%	3,60%
6	72915	2885	742	4,00%	5,10%	4,70%
7	44549	1358	353	2,40%	2,40%	2,30%
8	46832	1536	369	2,50%	2,70%	2,40%
9	45383	1396	396	2,50%	2,50%	2,50%
10	188298	5819	1763	10,20%	10,30%	11,30%
11	92319	2309	602	5,00%	4,10%	3,90%
12	147231	3959	1160	8,00%	7,00%	7,40%
13	37446	1355	335	2,00%	2,40%	2,10%
14	86969	2789	853	4,70%	4,90%	5,50%
15	120138	3503	1022	6,50%	6,20%	6,50%
16	52499	1647	471	2,90%	2,90%	3,00%

Legend: 1 Lodz Province, 2 Masovia, 3 Lesser Poland, 4 Silesia, 5 Lublin Province, 6 Subcarpathia, 7 Podlasie, 8 Holly Cross, 9 Lubusz Province, 10 Greater Poland, 11 West Pomeranian, 12 Lower Silesia, 13 Opole Province, 14 Kuyavian-Pomeranian, 15 Pomeranian, 16 Warmia-Masurian.
Source: (Local Data Bank, 15.04.2017); own calculations.

In 2015, 1.91 million entities qualified for the SME sector in the Polish economy accounted for 99.76% of all active enterprises. The structure of enterprises has remained unchanged for many years: micro-enterprises are dominant in the number of enterprises - 1.83 million, which constitutes 96%, then small 2.96% and the average of about 0.8% of the total.

Analyzing sixteen Polish voivodships it should be noted that the largest number of enterprises were located in the following provinces: Masovia (micro 18.1%, small 15%, medium 17.5%), Silesia (micro 11.3%, small 13.8% and medium 12.4%), Greater Poland (micro 10.2%, small 10.3% and medium 11.3%). However, in such voivodships as Opole, Podlasie, Holly Cross and Lubusz Province, the situation in terms of businesses size looked diametrically different. In these voivodships the structure of microenterprises did not exceed 2.5%, small 2.7%, and medium ones did not again exceed 2.5%.

After presenting the number of micro, small and medium enterprises, it is also appropriate to discuss the structure of SMEs according to the basic business area. The following pie chart shows the distribution that is under discussion.

Chart 1: Structure of SMEs in Poland by basic business area in 2014
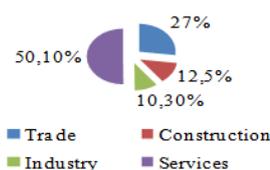
Source: (PARP, 2016, p. 32).

In 2014, more than half of Polish small and medium-sized enterprises operated in the service sector (50.1%). 27.0% of enterprises in the SME sector were active in the trade and 12.5% in the construction industry. Industry is the main business area for 10.3% of small and medium enterprises operating in the Polish economy.

Micro, small and medium enterprises are the main employer in the Polish economic arena. This is evidenced by the fact that in 2014 the SME sector was the workplace for over 6.3 million people - Tab. 2.

Table 2: Number of employees in the SME sector in the years 2010-2014 in Poland

	2010	**2011**	**2012**	**2013**	**2014**
micro	3399096	3508557	3459475	3371459	3495101
small	1143458	1181565	1203959	1218130	1223036
medium	1649103	1646415	1602448	1592360	1608324
SME Sector	6191657	6336537	6265882	6181949	6326461

Source: (PARP 2016, p. 145).

The number of people working in the SME sector is positively correlated with their size. So bearing in mind that the micro-enterprises are by far the most active, the largest number of people work there, over 3.4 million. Second place in this respect was medium-sized entities with the number of working people - 1.6 million, and at the end small enterprises - 1.2 million employees.

A slightly different situation occurred with the average monthly salary per employee - Tab. 3. Undoubtedly, it can be stated that the level of remuneration depends on the size of the economic entity, and precisely the larger the enterprise the higher the level of remuneration that is offered in it.

Table 3: Average monthly salary per one employee in the SME sector in the years 2010-2014 (in PLN)

	2010	**2011**	**2012**	**2013**	**2014**
micro	2006	2059	2172	2210	2315
small	2472	2583	2704	2799	2873
medium	3363	3568	3706	3850	4015

Source: (PARP, 2016, p. 145).

The average monthly salary in 2014 in medium enterprises was over PLN 4 thousand. The ceiling PLN 3 thousand was not able to get in small entities, because the average salary was the equivalent of PLN 2873 there. At the same time, employees employed in micro-enterprises got the least - PLN 2315.

Certainly, the indicator that perfectly describes the financial condition of enterprises is the value of earned revenues. So their value at the turn of 2010-2015 is shown in chart 2 below.

Chart 2: Value of revenues in the SME sector in 2010-2015 [PLN mln]
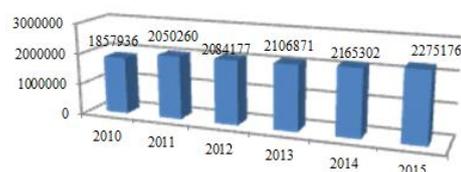
Source: (Bank for Local Data, April 15, 2017).

In 2015, companies from the SME sector increased their revenues and recorded the highest value of over PLN 2.2 trillion. This also resulted in record growth dynamics, as in 2010 these revenues amounted to more than PLN 1.8 trillion.

After presenting the level of revenues, it is also worthwhile to analyze in detail the value of incurred costs in the SME sector. The collected statistical data are shown in Table 4. In addition, an analysis is completed with calculations of basic statistical measures.

Table 4: Value of costs in the SME sector in 2010-2015 [PLN million]

	2010	2011	2012	2013	2014	2015	arithmetic average	Dynamics 2015/2010
Costs of the SME sector								
PL	1687878	1904113	1934277	1941440	1982793	2070354	1 920 143	22,70%
1	91 010	98 904	102 829	102 978	108 133	109 061	102 153	19,80%
2	437 214	502 789	505 676	502 807	520 781	546 614	502 647	25,00%
3	138 852	159 312	160 836	162 771	165 437	175 550	160 460	26,40%
4	209672	238 032	236 788	235 219	231 880	239 977	231 928	14,50%
5	53 775	66 824	65 895	66 630	70 568	69 967	65 610	30,10%
6	57 765	65 286	64 348	69 398	71 146	69 987	66 322	21,20%
7	35 757	39 995	41 461	40 896	42 856	44 826	40 965	25,40%
8	38 246	40 729	40 329	39 420	40 100	40 562	39 898	6,10%
9	33 601	36 675	37 417	37 563	37 340	41 145	37 290	22,50%
10	177 383	188 724	197 751	209 243	212 004	216 491	200 266	22,00%
11	61 023	67 775	70 948	66 776	68 876	79 200	69 100	29,80%
12	108 036	121 525	128 103	131 299	128 627	139 436	126 171	29,10%
13	33 517	37 129	38 321	37 778	37 437	37 926	37 018	13,20%
14	72 453	80 733	88 671	81 622	87 311	89 200	83 332	23,10%
15	103 024	118 467	113 051	116 240	119 038	126 123	115 991	22,40%
16	36 549	41 213	41 854	40 797	41 257	44 287	40 993	21,20%

Legend: 1 Lodz Province, 2 Masovia, 3 Lesser Poland, 4 Silesia, 5 Lublin Province, 6 Subcarpathia, 7 Podlasie, 8 Holly Cross, 9 Lubusz Province, 10 Greater Poland, 11 West Pomeranian, 12 Lower Silesia, 13 Opole Province, 14 Kuyavian-Pomeranian, 15 Pomeranian, 16 Warmia-Masurian.
Source: [Local Data Bank, 15.04.2017]; own calculations.

The analysis of the presented statistics undoubtedly shows that the costs of the SME sector systematically increase. For the first year of audit, i.e. 2010, they amounted to PLN 1.6 trillion and already in 2015 over PLN 2 trillion, indicating a growth rate of 22.7%. On the other hand, the average value of costs over the studied years was PLN 1.9 trillion.

The highest value of costs incurred by enterprises was described by three voivodships: Mazovia over 546 billion, Silesia 239 billion and Greater Poland 216 billion. The lowest costs were characterized by: Holly Cross Voivodeship 39 bln, Lubusz Province 37 bln and Opole Province 37 bln. It is worth mentioning that the regional ranking in the case of costs turned out to be analogous to the situation of the revenues achieved by the companies.

As regards the financial condition of the SME sector, the next step was to discuss the amount of profits according to the size of the entities, as shown in Chart 3. It is easy to see that gross profit was definitely highest among micro-enterprises (it is directly related to their numbers). In the last audited period, i.e. in 2014 it amounted to over PLN 120 billion and thus was more than double the profit achieved by both small and medium-sized businesses.

Chart 3: Gross profit of the SME sector by size [in million PLN]
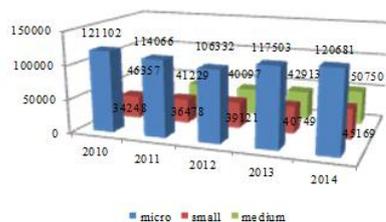
Source: own elaboration on the basis of: (PARP, 2016, p.147).

The situation of enterprises also provides another indicator, namely the amount of total investment outlays. The value of incurred capital expenditures in entities belonging to the SME sector in the years 2010-2014 is presented in the following chart 4.

Chart 4: Total investment expenditure in 2010-2014 [PLN mln]
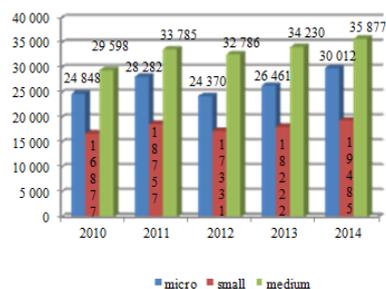
Source: own elaboration based on: [PARP, 2016, p. 148].

Investment expenditures were dependent on the size of the companies, but slightly different from the size of the wages. Because in this case, the lowest level of investment was characterized by small enterprises (in the amount of less than PLN 19.5 billion in 2014), followed by micro-enterprises with a value of over PLN 30 billion, and finally the highest level of capital expenditures was characterized by medium enterprises, as the amount of over PLN 35 billion was spent on this type of investment, which primarily can be attributed to the potential of such economic entities.

3 Summary and Conclusions

The small and medium businesses sector is the backbone of any economy. Their strength manifests itself mainly in the role they play in the labor market. Entities from the SME sector also have a significant influence on the emergence and development of the economy's innovation.

Undoubtedly, in Poland, the SME sector plays a significant role in the functioning of the economy, this fact is confirmed, among others, by the following statistics:

- in 2015 there were 1.91 million entities qualified for the SME sector, and the sector accounted for 99.8% of all enterprises; most of the companies were located in the Mazovia, Silesia and Greater Poland Provinces, whereas in Opole Province, Podlasie Province, Holly Cross and Lubusz Province the lowest number of enterprises was recorded;
- SMEs in 2014 most frequently engaged in service activities (50.1%), often also commercial (27.0%) and significantly less often construction industry (12.5%) and industrial (10.3%);
- the size of the labor market in Poland is determined by small and medium-sized enterprises. In 2014 the number of employed persons in the SME sector amounted to 6.33 million people;
- the average remuneration per one employee in the medium enterprise in 2014 was PLN 4015, people in small and micro enterprises earned significantly less;
- the revenues of small and medium-sized enterprises in the analyzed 2015 amounted to PLN 2.2 trillion and thus achieved a record high;
- the costs of the SME sector were increasing systematically and in the last studied year they reached the level of PLN 2 trillion;
- the highest gross profit was achieved by micro-enterprises (PLN 120 billion), while small and medium-sized entities generated at least half that results;
- investment expenditures were based on the size of enterprises, the highest level was recorded in medium-sized entities (over PLN 35 billion), then in micro enterprises, and the lowest level was in small enterprises.

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Primary Paper Section: A

Secondary Paper Section: AH, BB, AE

MUSIC THEORY: CINDERELLA OF MUSIC EDUCATION

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Abstract: Since 1994, several educational framework programmes, concepts, reforms and evaluation reports have been developed in Slovakia in the field of education. In 2016, the pedagogical public was debating the thesis of the educational reform called Learning Slovakia (2017), which outlines how education should work (colourful and up-to-date teaching materials, pupils' individuality development, etc.). The contribution opens up a number of issues of musical education (the status and share of musical education on the all-round development of the youth, the status of music teachers and music education in the school system, etc.). It deals with the importance of music theory in the structure of musicology and highlights its importance for music education at all levels. Through the prism of publications issued, it notes the status of elementary music theory in the music education of music teaching at faculties of educations.

Keywords: musicology, music theory, music education

Introduction

Education and the school system have stood in the centre of public attention for several years. In the media, as well as in periodicals, articles have been appearing which deal with the accreditation of public universities, with the reform of state education programmes, or with the evaluation of the quality of education and of the knowledge level of the students by various agencies, e.g. by the ARRA (Academic Ranking and Rating Agency) or the OECD PISA (Programme for International Student Assessment by the Organisation for Economic Co-operation and Development), assessing education results from the aspect of the labour market. We hear of a low standard of education, of strengthening subjects related to natural history and those of a technical character at primary and secondary schools, of strengthening science (primarily it is strengthening natural history and technical sciences, since arts are often perceived as "pseudosciences", and this was one of the reasons why the Memorandum of Social Scientists and Humanity Scholars came into being at the end of 2016), of strengthening practice, of emphasis on the language skills of the students, of undervaluing the status of the occupation of a teacher and of a lack of teachers, while, paradoxically, we also hear of a large number of faculties of education and of their dissolution. Since 1994, several education framework programmes, concepts, reforms and, in some cases, evaluation reports have been developed in Slovakia: the Constantine Project (1994), the Millenium Project (2000), the Content Reform of Education (2008), the Report on the State of Slovak Education (2013), the Learning Slovakia reform of the school system (2017), and several other partial reports. However, all the good ideas incorporated into these documents by leading experts who have been connected to the school system for long years got stuck midway: they were terminated by a change of the government or of a minister. This year, Learning Slovakia, a reform of primary and higher education, resonates in Slovakia, about which the specialist public could already learn from the submitted theses. However, the presented reform, which drafts how the school system should work (colourful and up-to-date teaching materials, all-round support of a lifelong education of the teachers, development of pupils' individuality, etc.), does not mention anything about the real state of our school system. The goals are ideal, but what is reality like, and what will be actually achievable from these goals?

There are many unsolved and open questions in the education of children and the youth, while many questions connected to the presented reforms have not even been raised. What is the real case with music education? What is the status of art education and art pedagogical education in the system of disciplines, and what is the state of a music teacher and of music education at primary schools, primary schools of arts, and at conservatories? Who modifies the contents of music education at schools, and why? What does a decline in interest in art music and in teaching art music stem from? Is it only a consequence of a descending demographic curve, or do the reasons lie significantly deeper, e.g. in a decline in the status of an artist into the role of a mere "entertainer", and are they, consequently, also a manifestation of a decline in culturalism? Why is the subject of art and culture, which offer stimuli for thinking and tools against the manipulation of the youth by the media, not enhanced at grammar schools? Why does the time allocated to music education lessons keep changing? Why do parents, and competent bodies, not mind that children are taught art music by unqualified teachers, and that instead of music education lessons they solve maths problems or compositions? Why do school directors prefer to assign the teaching of music education to unqualified teachers amending their working hours, or to undergraduates, and why do they not support increasing the qualification of their employees and, instead, follow the instructions of local governments to save funds? Why do parents and parents' organizations not protest against this?

It appears solutions are being preferred in music education which do not solve anything, for they do not focus on increasing the quality of music education, they do not create optimal working conditions for qualified teachers, and they continue the sad practice that music education is assigned to many teachers who teach what they should not. The consequence? Decreasing interest in higher education in the field of art music teaching at faculties of education (even in art disciplines at universities of arts), and a gradually decreasing entry level for the candidates of higher studies in the given disciplines. While it was unthinkable twenty years ago that a candidate without an adequate background in music theory would apply for studies of art music teaching, or preschool education, or primary education (which provides the teaching of the music education subject on the first level of primary education), today it is not an exception that a candidate having problems with notation struggles in the first lessons of music theory. How can the condition and the standard of primary music education be evaluated if the question of how many lines does a staff have figures in the final of the most watched quiz show? This small example from the media tells it all.

The following text does not set a goal to answer all the above questions in detail. Many of them could be answered by initiating targeted research, experiments, case studies, or public discussions about the primary, secondary and tertiary school system with respect to arts and art pedagogy. The following paper ponders the status and role of music theory in the system of music education from the aspect of the existing teaching materials.

1 Music Theory in the System of Musicology

1.1 A Brief Outline of the Development of Systematic Musicology

Back in 1978, Ladislav Burlas noted in his publication *Music Theory and the Present* that "*... the current state of music theory is rarely theorised*" (Burlas, 1978, p. 11). This thesis is valid even today, since, in contemporary specialist and scientific literature, we can find ample volumes dealing with partial problems of music theory but no publications dealing with the conceptional and topical tasks of music theory in connection to the music educational and compositional practice, or related to contemporary musical and musicological thinking. The reason might lie in the polysemy contained in the term of music theory which brings together several areas and concepts. Indeed, music theory is perceived as: a) a part of several elementary music theories (general music theory, forms, harmony, counterpoint, etc.); b) the theoretical formulation of subjective composition techniques; c) the theory of a scientific theory and, lastly, it also

represents d) a set of music analysis methods. Ever since its conception, music theory has been struggling with the dilemma whether to be a practical and propaedeutic discipline or a scientific and theoretical one (Burlas, 1978, pp. 14 – 15).

Along with music acoustics, music theory is the oldest discipline of musicology, even though it was not assigned such a position in the early systematics of musicology. Friedrich Chrysander's system of 1863 was among the first systematics of musicology, assigning three areas of research to musicology in the *Jahrbucher für musikalische Wissenschaft I:* historical, acoustic and aesthetic. He excluded other practical and elementary pedagogical theories from musicology (excluding music theory as well). Guido Adler also dealt with the systematics of musicology (*Umfag. Methode und Ziel der Musikwissenschaft*, 1885). Adler divided musicology into a historical field (music palaeography, historical development of musical forms, historical development of regularities, history of musical instruments) and a systematic field which includes, inter alia, the field of music pedagogy and didactics with elementary theory, harmony, counterpoint, composition, instrumentation and methodology for teaching song and instruments. Music theory is connected here primarily with elementary doctrines, and has a propaedeutic character, although the research into the regularities of the structure of a musical composition (research into melody, rhythm, harmony, etc.) can be found in the systematic part. That is why he suggested that music theory should be approached in three ways, while maintaining the historical overview of the development of musical regularities: a) as it manifests itself in works of art, b) as it is treated by music theoreticians, c) as it is taught (Kresánek, 1980, p. 35). Somewhat later, Hugo Riemann in his systematics of musicology (*Grundriß der Musikwissenschaft*, 1908, 1915, 1918, 1928) strived for cleansing music theory from a propaedeutic accumulation, and presented it as a scientific discipline: instead of works of art, he made elementary theory disciplines the objects of research (which, however, are artistic in nature and have a pedagogical purpose).

Subsequent development brought a gradual atomisation of the scientific disciplines in order to grasp the heterogeneity of musicology in the most perfect way possible. New research widened not only cognition but also the range of musicological approaches and partial disciplines cooperating with other scientific disciplines. However, besides positive results, there was doubt and scepticism, as well as claims that the contemporary systematics of musicology was experiencing a crisis, that it was not possible to render the multidisciplinary character of musicology into the implications, and that there was no clear integrated concept. By time, however, the influence of ethnomusicology strengthened, and it gained a leading position in the development of the overall scientific and research concept of musicology thanks to its methodological and practical approach.

1.2 The Development and Characteristics of Systematic Musicology in Slovakia

In Slovakia, several musicologists began to deal with the issues of the systematics of musicology in the latter half of the twentieth century: Jozef Kresánek (*Introduction to the Systematics of Musicology,* 1980), Ladislav Burlas (*Methods of Musicology*, in *Musicologica slovaca IV*, 1973; *Music Theory and the Present*, 1978), Miroslav Filip (*Music Theory and Its Relation to Formal Sciences* and *The Contemporary Notion of Music Acoustics*, in *Musicologica slovaca IV*, 1973), Oskár Elschek (*Musicological Systematics and Ethnoorganology*, in *Musicologica slovaca I*, 1969; *The Systematics and Subject Matter of Today's Musicology*, in *Musicologica slovaca IV*, 1973; *Current Musicology*, 1984). A symposium in Moravany in 1970, with papers presented by leading Slovak and Czech musicologists and subsequently published in the fourth volume of the scientific journal *Musicologica slovaca IV* in 1973, became the basis for contemplations about the modern systematics of musicology.

Oskár Elschek presented to the specialist public several possibilities for the systematics of musicology. In 1969, he suggested dividing it into three areas: basic research of music (musical regularities), history of European art music, and ethnomusicology. At the same time, he divided these areas into special disciplines and general systematic disciplines. At a symposium in 1970, he proposed other alternatives: Alternative 1 divided musicology into theoretical and applied musicology, alternative 2 perceived musicology as a combination of systematic (theoretical) musicology and regional musicology (the music and musical problems of non-European cultures), alternative 3 referred exclusively to theoretical musicology, which included twelve scientific disciplines of natural historical, social or spiritual character, with a separate position assigned to music theory. To eliminate terminological ambiguities and problems, he further elaborated his ideas in his synthetic work, *Current Musicology*, where he again talked about three possible alternatives:

Alternative 1 represented a triple scheme: i. systematic musicology, or basic musicological research, ii. research of European art music, iii. ethnomusicology;
Alternative 2 complied with this triple scheme with minor terminological modifications: i. systematic musicology, or basic musicological research, ii. europomusicology (euromusicology), iii. ethnomusicology;
Alternative 3 relied on a division into only two fields of research, whose names, however, differed in his proposals.
The third alternative thus had two alternatives:
1. i. theoretical musicology, ii. applied musicology (A. euromusicology, B. ethnomusicology);
2. i. systematic musicology (theoretical musicology), ii. regional musicology with several disciplines according to major cultures (A. ethnomusicology, B. sinomusicology, C. indomusicology, D. orientomusicology, E. afromusicology).

In the above publication, this second alternative became a basis for the systematics of musicology, but the division of systematic (theoretical) musicology is also to be noted. In his systematics of theoretical musicology, Elschek presents twelve scientific disciplines, each of which has its own subject matter and research methods. He divides these twelve disciplines according to their character into three basic sets: a) natural historical disciplines (music acoustics, physiological acoustics, psychoacoustics, aural and musical psychology, organology); b) socio-philosophical disciplines (music sociology, music aesthetics, critique, music philosophy); c) technical musical disciplines (music theory, music pedagogy, music performance, musical palaeography). While natural historical disciplines are specifically theoretic (systematic) ones, the other two sets apply historical and regional, or stylistic and social approaches (Elschek, 1984, pp. 53 – 60).

We have to devote our attention to yet another concept of the systematics of musicology. Jozef Kresánek, applying the existing findings of European musicology, proposed (in contrast to Riemann as well as to Elschek) a division of musicology into four areas of research: a) systematic area, with music acoustics (organology), music physiology, music psychology, music sociology, music aesthetics and music pedagogy, while each subsequent discipline relies in its research on the results of the previous discipline; b) historical area, which is more homogeneous with respect to common methodology, and includes the following scientific disciplines: music palaeography, history of musical instruments, history of musical performance, history of music pedagogy, history of the social status of musicians, biographics, history of styles and trends, history of music aesthetics and views on music; c) ethnomusicology, which was to overcome eurocentrism; d) the area of music theory, which synthetically combines the systematic and as well as the historical aspect (Kresánek, 1980, pp. 25 – 41).

1.3 The Propaedeutic Aspect of Music Theory

In his *Introduction to the Systematics of Musicology,* Kresánek emphasised the need for music theory as the basis for musicological cognition from the systematic as well as the historical aspect and, at the same time, he outlined its further dimensions. That is why he defined music theory as a separate area in musicological research. He pointed to the fact that theory and practice do not always correspond, and that theoretical findings lag behind practice. However, theory has helped in every era to differentiate the essential features from less important ones and, in this way, it overcame the elemental stages of development. Many stimuli for creative practise arose in the field of theory. Theory often helped build rational creative methods. That is how it manifested its connection not only to creative practice but also to pedagogical practice. The preconditions for a creative development of the students' thinking were formed on the basis of the findings of music theory, although several pieces of knowledge had been simplified and generalised for propaedeutic reasons. Although, in the past, theory was often underrated and degraded exclusively to elementary subjects, even this pedagogical aspect of its scope must not be undervalued. Several specialisations ranked among the elementary subjects of music theory: elementary music theory, elementary harmony and counterpoint, elementary forms and genres of art music, elementary instrumentation, elementary theory of performance (with further subdisciplines: phrasing, dynamics, accents, colouristics). At the same time, within practically oriented elementary theories, there were talks of tonality, melody, metro-rhythmic relations, etc. The history of music theory formed a non-negligible part of propaedeutically oriented music theory. The division and the specialisation of the various elementary theories within the theory literature and in the compendia was given by the pedagogical and didactic aspects of teaching at schools of performing arts, and also at pedagogical schools. This type of literature presumes an abstraction of the findings from incentive determinants in the development of music, as well as from determinants of the social and cultural development or of a style. It appears to be a rigid and conservative area of literature. However, this type of the application of the findings of music theory may take into account the development of musical thinking, new findings and creative methods, or new didactic tools. It means that the methods of music historiography (taking into account the developmental aspect of musical thinking) and ethnomusicology (comparative method) penetrate music theory. (Kresánek, 1980, pp. 7 – 41)

Today, the relationship of the various areas of music theory is more than clear. The aim of propaedeutic music theory in the form of the above mentioned elementary theories has primarily, though not exclusively, a pedagogical and didactic nature. There is a connection between music propaedeutic theory and the theory of composition. A candidate of composition must first master compositional problems on the level of generally valid conventions, and individual creative solutions in the sense of overcoming tradition may be presumed only afterwards. The relationship of elementary music theories to the analytical area of music theory is also clear. No part of elementary music theories may do without a knowledge of the analytical procedures, whether with respect to the presentation of the material, or to the evaluation of examples and exercises. What remains is the relationship of propaedeutic music theory with scientific music theory. Scientific music theory scrutinises the essence and the specificities of the musical material, the essence of the poetry of music. It examines the constant (natural) conditions and the historical and developmental (variable) elements of music, and their organisation. By applying the historical and developmental aspect of scientific music theory in the field of propaedeutic literature, which usually presents the material as a set of invariable norms, these norms become dynamic, variable phenomena. For example, the elementary theory of musical forms becomes the history of musical forms and genres, the elementary theory of harmony becomes the history of harmonic thinking, the elementary theory of musical instruments becomes the development of the aural ideal of a

specific era. In this way, scientific music theory may revolutionalise the statically and conservatively perceived propaedeutic music theory, which faces a threat that it will become rigid, conservative and boring for the pupils and the students, and will not reflect the contemporary state of art music on all of its levels.

The interplay of all these four areas is indispensable for music theory as a part of musicological systematics. Only the mutual influence and interaction of propaedeutic music theory and the theory of composition with analytical and scientific music theory can move the development of music theory forward. The mutual interplay in the inside reflects also on the outside, as an interaction of theory and practice. (Burlas, 1980, pp. 11 – 21)

2 Elementary Music Theories

We find several names in propaedeutically oriented musical literature: general theory of music, elementary theory of music, music theory. Although they appear to be synonyms, the various theories should be explored in more detail.

The general theory of music, as a schoolbook, appeared already in the 19th century, and its authors pursued only one goal at the time: to create a work which would be the sum of all the existing pieces of knowledge in the field of music theory. The general theory of music could not match up to specialised theories in the depth of processing the subject matter, and it was not its purpose, either. It had to present an exposition of music on a basic level and, therefore, it contained chapters on musical sound, notation, metre, rhythm, tempo, intervals, scales and tonal sequences, tuning systems, diatonism and chromatism, enharmony, consonances and dissonances, and also on the basics of harmony, counterpoint, musical instruments, etc. At schools where specialised theories were taught, it formed the necessary general base for a knowledge of music. Therefore, it was an informative and summarising exposition of the system of music on various difficulty levels, depending on its function and orientation. Due to the swiftly developing science and the amount of new pieces of knowledge in richly differentiated and heterogeneous musicology, the general theory would have to present a significantly more extensive summary of the existing pieces of knowledge. In spite of the attitude of music teachers who often perceive the general theory of music as a system of pieces of knowledge on music given once and for all, the general theory of music cannot respond to the current state of knowledge. One of the problems of the conception of the general theory of music is the fact that it usually refers to European art music only, and does not inform, and does not present a picture, about the musical regularities of other music cultures (mentioned above). After all, it is equally difficult to fit all the various forms and expressions even of European music, e.g. archaic folk song, mediaeval liturgical music, or the latest experimental expressions in music, into a common denominator. Thus, the general theory of music would have to be transformed into an extensive encyclopaedia of music, presenting the ontology and gnoseology of music in light of the latest pieces of knowledge in the field of musicology. Therefore, is it possible at all to conceive a general theory of music which would contain all the existing pieces of knowledge about music? When pondering over the concept of a general theory of music, the author cannot avoid two tendencies: a) a tendency to consciously limit the scrutinised material in a historical, geographical as well as factographical sense; b) a tendency for the highest possible degree of generality within the limited system, so that the discussed pieces of knowledge could become part of a higher system. A general theory of music should be conceived as a dynamic system of pieces of knowledge about music, predetermined by the existing state of scientific knowledge of musical thinking and of the musical system. Consequently, a general theory of music heads towards a scientific concept of music theory.

Unlike the general theory of music, the elementary theory of music is expected to present only the most essential characteristics of music with a necessary limitation and

elimination of pieces of knowledge depending on the level of the education programme. It does not mean, however, that scientific music theory should diverge from the teachings of the elementary theory of music, or that the elementary theory of music should not accept the current state of scientific knowledge. The relationship between the scientific and the propaedeutic is not ruled out. Even seemingly static basic pieces of knowledge about art music may be presented in a novel way, by novel methods and didactic tools.

2.1 Propaedeutic Literature of Music Theory

It is not our aim to present a complete list of propaedeutically oriented works from the field of music theory. Instead, we would like to highlight the fact of little, almost no, publishing activities in this field, unless we take into account the official schoolbooks of music education for primary schools and for primary schools of arts. The question is, however, what literature represents music theory at faculties of education, preparing future teachers of art music and teachers of music education? What specialist literature in the form of elementary music theories (not specialised theories, i.e. of harmony, counterpoint, etc.) is available for them in the libraries? We will look primarily at Slovak titles post 1945, but we will also note certain titles produced by Czech authors.

The oldest titles include *General Music Theory [Všeobecná nauka o hudbe]. Notation* by Ján Valašťan Dolinský from 1946, dealing with basic information on sound and tone and its features, the musical alphabet (the names of the notes, octaves), notation (staff, clefs, shapes of the notes, shapes of the pause), metro-rhythmic system (division of rhythmic values, bar lines), beats, notation of melodic ornaments, tonal system (diatonic, chromatic, enharmonic notes), up to the notation of rhythm, tempo, dynamics, and various abbreviations. It represents the first part of a basic, elementary theory of music.

Elementary Music [Nauka o hudbe] by Peter Hýroš from 1957, first published back in 1950, is a lot more extensive. Based on feedback, as well as on his own teaching practice, he revised the second edition and added new examples to it because, as he himself notes in the introduction, since that time (i.e. from 1950 to 1957), no similar publication appeared in Slovakia, so he decided to publish the already sold out title again. Hýroš' *Elementary Music* begins with characterising music as such, and with the systematics of musical disciplines. He continues with the acoustic features of music (tone and its characteristics), and with notation. Through natural, inflected and enharmonic notes, he arrives at tempered tuning and scales (major, minor, enharmonic, mediaeval, chromatic, exotic, pentatonic, whole tone, Gypsy), also taking into account the connection of keys and modes, and the relationship between the keys. These are followed by intervals (inversions of intervals, enharmonic intervals, defining and resolving dissonant intervals), transposition, aliquot and combination tones, and progression in a harmonic movement. Subsequently, he treats tempo and the performance of compositions (dynamics, accents, melodic ornaments), then chords (from triads and their inversions up to ninth chords, Lydian triad, Neapolitan sixth chord) and the basics of musical forms and genres, including free forms and contrapunctal forms. Finally, he discusses musical instruments, types of orchestras, and scores, as well as the range and tuning of orchestral instruments. The above elementary theory is very extensive and relatively complex, definitely also due to the contribution of the editors of the publication, composers Andrej Očenáš and Dezider Kardoš.

Two years later, the Slovak Publishing House of Fine Literature published Ján Fischer's extensive *Music Theory* (1959), which perceives the basic areas of music theory also from a developmental aspect, e.g. it takes into account the developmental trends of notation. A significant part is dedicated to the field of music acoustics (sources of sound, free and forced vibration, sources of tone and the tonal area, sound propagation, etc.). Contrary to previous publications, it deals also with the

basics of harmony, and again from a developmental aspect (an overview of the chordal progressions from the Viennese classics up to the twentieth century). Of course, it does not omit the area of musical forms and musical instruments, either, and brings a glossary of the Italian terminology and the biographical data of the most significant composers in the conclusion. Andrej Očenáš was the editor of this, truly voluminous, publication, too.

The still topical *Brief Theory of Music [Stručná nauka o hudbe]* by two authors, Eugen Suchoň and Miroslav Filip, for the general public and for music lovers, as well as for future professional musicians and music teachers, appeared first in 1962. As the title itself suggests, the authors limited the information to a significant extent (they mostly omit historical development and present only some essential facts). On the other hand, they devoted more attention to areas which had not been adequately treated in similar types of literature: the basics of music acoustics, tuning and ornamentation, relying on the latest pieces of musicological knowledge. Similarly, they changed the usual methodical procedure for presenting the material on scales and intervals, which was more efficient than in its previous treatments. This publication has been reprinted, and is available even today.

Ever since the publication of this elementary music theory, there have only been two more titles in propaedeutically oriented Slovak music theory: *Music Theory for Conservatories [Hudobná teória pre konzervatóriá]* by Juraj Pospíšil (1985), whose first volume came out in the form of cyclostyle copies, and which reflects exclusively the requirements of specialised secondary schools of arts (meant for the first year in conservatories), and a simple revision course of elementary music theory for pupils of primary schools of art, *Minor Theory of Music [Malá nauka o hudbe]* by two authors, Peter Šidlík and Božena Dlháňová (1994).

A similar situation, even if somewhat better, exists even in propaedeutically oriented Czech music theory. The most sophisticated introduction to the study of music theory was the *General Theory of Music [Všeobecná hudební nauka]* by František Pícha (1961), progressing from simple sound (explained in all aspects), through dyads (intervals), triads, tetrads, up to pentads (chords). Each chapter is concluded by a brief revision of the previous material.

In 1965, Adolf Cmíral's *Basic Musical Terms [Základní pojmy hudební]* was published, which is divided into three basic areas: a) general musical terms, b) chords and the basics of harmony, c) musical forms and genres. In the other parts, the reader can learn about the history of music and about selected composers and their oeuvre. Both publications have been re-edited as well. 1965 saw already the seventh edition, but without the author's personal participation. It means that there was a significant demand for this type of literature, whether at schools or among the public. Another proof of this demand is the constant interest (in Slovakia as well) in *The ABC of Music [ABC hudební nauky]* by Luděk Zenkl (1976), which presents basic information in the following areas: a) general theory of music: tones and the tonal system, notation, pitches and tuning systems, time and rhythm, performance and other symbols, scales, intervals, chords; b) music acoustics; c) musical instruments, human voices, musical ensembles and scores; d) introduction to the study of compositions; e) introduction to the study of the history of music.

In spite of a persisting interest in this type of music theoretical literature, suitable for studies at specialised secondary schools of art and at faculties of education, we find other available titles only in the twenty-first century. In 2003, the Faculty of Education of Palacký University in Olomouc published Pavel Režný's *Elementary Music Theory [Elementární hudební teorie]* and, two years later, the gap was filled by Věra Grigová's *General Theory of Music [Všeobecná hudební nauka]* (2005) which, similarly to Juraj Pospíšil's publication, was meant for the study of music theory at conservatories. Nevertheless, it is fit even for training future teachers of art music and of music

education, studying at faculties of education. As the editor noted, this is a type of publication which had not been published in the Czech Republic in such a coherent and detailed form for decades. It should be noted that propaedeutically oriented literature in the field of music theory had the same fate in Slovakia.

Conclusion

As we have pointed out, music theory has long been a discipline focusing on finding and explaining pieces of knowledge of music. This musicological discipline reflects the overall development of musical thinking, and of the methodology of musicology. From a description of the observed phenomena, the research of music theory heads towards a deeper cognition of the system of music, and towards understanding its essence from the aspect of the dynamics of its development in all its complexity. All new pieces of knowledge get inevitably reflected also into music pedagogical practice, including the exposition and understanding of the complex current musical practice with its diverse styles.

Nevertheless, primary schools often devote minimal attention to teaching music theory, and the time allotted to it at faculties of education does not suffice to cover all the shortcomings of the students' previous education in music. The shortage of generally available literature is also due to the fact that even scholars, i.e. musicologists and music theoreticians, who often criticise the state of music education, do not devote adequate attention to it, and do not contribute to the improvement of this state by their own publications. How else can it explained that, unbelievably, half a century has passed from the first edition of the *Brief Theory of Music* by Suchoň and Filip, and no one has filled the gap in propaedeutically oriented music theory in Slovakia for teacher candidates of music education. Compared to specialised theories, or histories, of music, music theory does appear to be the Cinderella of music education.

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MOTIVATIONAL FACTORS OF CZECH CORPORATE EXPATRIATES TO AN INTERNATIONAL ASSIGNMENT

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Abstract: Expatriation has become a natural part of internationalization process for many companies and a source of their global success. The article presents the results of research focusing on expatriates assigned abroad from their parent organization based in the Czech Republic. Dataset of 164 Czech expatriates was analyzed with the aim to identify the motivational factors to relocate. Based on the findings, the motivational factors can be summarized as personal growth, professional growth and financial benefits. Personal and professional development were quantified as the most important determinants for expatriation. Family reasons proved to be very disunited factor depending on an individual situation.

Keywords: adaptation, Czech, expatriate, international assignment, internationalization, mobility, motivation.

1. Introduction

International mobility of employees is becoming a part of companies´ global success and their tool of competitiveness. Nevertheless, international assignments can be very challenging thanks to its intercultural dimension and to fulfill corporate aims, firms require expatriates to devote a certain effort to adjust and perform effectively. Findings show that a large proportion of assigned employees fail to complete their assignments satisfactorily (Romero, 2002) which is a consequence of their difficulties in adjustment, lack of social and organizational support, and a gap between reality and expectations they had before arriving to the host environment. Failing to achieve company objectives is very costly matter, especially for the sending organization and it can critically affect a firm's bottom line (Lazarova and Caligiuri, 2001). Next to other factors that might influence the final outcomes, as Selmer and Lauring (2012) state, the intentions motivating a certain action most often have an impact on the results of the behavior. As such, motivation of an expatriate to cross-cultural context may play a significant role in adaptation process and performance during international assignment (Paik et al, 2002).

Although salary and financial benefits are indisputably important motives because they can increase personal status of an individual, Richardson and McKenna (2001) claim that these factors are usually secondary and the core of motivation belongs to the higher level of needs as stated by Maslow´s hierarchy of needs (Brooks, 2006).

According to annual survey of InterNations (2016), the most important reason (in 89 %) of employees to relocate was an impulse by the employer that sent them abroad. However, under more detailed examination, many other aspects usually play a part in the decision making. This applies to non-career-related reasons that every twentieth expatriate considered. Motives that are not related to career might be for example: looking for a better quality of life, an improved financial situation, the wish to live in their partner's country or to move to a particular destination.

Richardson a McKenna (2001) defined four main categories classifying the expatriates based on their primary motives to relocate as an explorer, refugee, mercenary and architect. These categories are briefly characterized as follows:

- Explorer – reflects the inner desire of an individual for personal fulfillment, development and living in a new country and experiencing its culture.
- Refugee – has a desire to escape from home environment and search opportunities, which are possible through expatriation.
- Mercenary – has explicit considerations about salary and financial benefits as the main motive to accept an assignment abroad.
- Architect – focuses on career building and the incentives to expatriate are linked to the professional life.

These motives can be generally organized as push or pull factors. Important to note, that four categories above depicting different reasons to relocate abroad are based on survey on self-initiated expatriates.

In contrast to expatriate assignments that are initiated and funded by the organizations themselves and with expectations of certain business goals accomplishment in a limited period of time; self-initiate expatriates and qualified immigrants undertake a work abroad by their own initiative, both long term or on temporary basis (Inkson et al, 1997; Suutari and Brewster, 2000). Of course, international mobility of human capital can have multiple forms overlapping for the same individual as well changing over time.

Maybe one of the most comprehensive approach exploring the motives to expatriation is done by research of Doherty et al (2011). This study compared motives of company-assigned and self-initiated expatriates. According to the findings, self-initiate expatriates are more influenced by the location and the host country reputation, while career factors are more influential among expatriates assigned by companies. Moreover, family situation plays very influential role in case of self-initiate expatriates, in contrast to push factors, such as economic necessity or unemployment in a home country (Doherty et al, 2011).

2. Research Method and respondents

The aim of the survey was to identify motives of assigned expatriates to an international assignment. Data for the present study were extracted from a mail questionnaire targeted at Czech expatriates. Targeted sample was chosen based on two criteria stated from literature review (Thomas and Lazarova, 1996) as well as consultations with experts from organizational department of international assignments. The sample of Czech expatriates consisted of two categories:

- Current expatriates with experience of minimal three months already on assignment.
- Repatriates with maximal 6 months after return from assignment.

By other words, the targeted sample were expatriates that have already got the experience of living abroad for at least three months and then repatriates that returned from assignment however their experience is still a living memory.

The sample was contacted regardless the host country of the assignment. In order to maintain the time stated criteria of the targeted sample, a snow-ball technique was not applied.

Distribution and data collection were carried out in three phases from March 2016 to January 2017. A total of 302 Czech expatriates received the mail questionnaire through the internal distribution system in the organization. Out of 302 Czech expatriates, 164 expatriates and repatriates completed the questionnaire. The response rate was 54,3 %.

For statistical purposes, the Kendall rank correlation coefficient was chosen as appropriate measure. It is a non-parametric test that does not depend upon the assumptions of various underlying distributions.

2.1 Research participants

The specific age was not investigated and therefore the exact average age cannot be calculated. The largest group of respondents (48 %) was in range 36-46 years old, next (40 %) in a range 35-35 years. This result corresponds with previous studies that indicate average age of expatriate as upper 30´ and lower 40´ (Bright, 2008; Shmueli et al, 2005).

The gender split was 85 % male and 14 % female, which is similar to other studies with foreign assignees (Bhaskar-Shrinivas et al, 2005; Hechanova et al., 2003). Findings of Brookfield´s study (2015) show that relatively constant share of assigned women worldwide is about 20 %. The dominance of men can be explained by certain prejudices of foreigners towards women, lower willingness of companies to relocate women, last of interest from women´s sight or their family reasons (Harris, 2004).

For better identification of respondents, the company department within organization was under examination. The majority of them worked in Technical development (32 %), Logistics (25 %), Finance, Informational technologies and Law (19 %). The rest of respondents were from Sale and marketing, Purchasing, Human Resources.

The host country that expatriates were assigned to was hardly surprisingly Germany (41 %), a traditional business partner of the Czech Republic, followed by China (23 %), Russia (18 %) and India (5 %). Other countries were United Kingdom, Slovakia, Spain and Poland. To a certain extent, the countries´ representation reflects company needs as well its business strategy.

Respondents also ranked the size of their social contacts with foreigners including for example friends, colleagues, and family members. This question aimed to examine the level of international and intercultural environment in which an employee live. Relationships with foreigners hold rather minor position (0-25 % share on total relationships) for almost 3/4 of respondents.

3. Findings

Respondents evaluated their level of motivation in total eight motivational factors: career growth, language improvement new country/culture, personal development, financial benefits, professional development, family reasons, other. Named motivators were ranked on the scale from 1 to 7, where number 1 stood for "completely without motivation" and number 7 symbolized "completely motivating".

Tables no. 1 and 2 display the statistical characteristics for variables of motivation that help to interpret the results. Firstly, the table 1 shows total motivation averaged from eight motivation factors with the same given weights, next table presents results for single motivational variables.

Tab. 1: Statistical characteristics for total motivation

	Min	Max	Modus	Median	Average
Total motivation	2,25	6,25	4,75	4,62	4,57

Note: Scale 1 to 7, where 1 is completely without motivation, 7 is completely motivating
Source: Own calculations

Tab. 2: Statistical characteristics for single variables of motivation

Category	Modus	Median	Average	Variance	Deviation
Career growth	6	5	5,22	2,20	1,48
Language improvement	7	6	5,63	2,29	1,52
New country/ culture	7	5	4,98	2,70	1,65
Personal development	7	6	6,05	1,33	1,15
Financial benefits	5	5	4,73	2,15	1,47
Professional development	7	6	6,01	1,23	1,11
Family reasons	1	2	2,40	2,89	1,70
Other	1	1	1,53	1,68	1,30

Note: Scale 1 to 7, where 1 is completely without motivation, 7 is completely motivating
Source: Own calculations

The most important motivator for expatriation is Personal development with the highest average value 6,05 and then Professional development. Moreover, these two variables have the lowest variance. Contrary, the highest variance was calculated in Family reasons. Language improvement and New country/culture follow the personal and professional developments which only naturally supports the importance of those first two incentives.

Financial benefits that is undoubtedly interesting part of the expatriate package showed an important to be slightly above average (value 4,73 on scale 1 to 7). This factor might be also influenced by the wage policy in single companies. Considering the fact that 62 % of respondents were on their first assignment, it is possible to state that the absence of financial benefits can be felt more after their return to home country.

A given factor "other" offered in case if other options were not sufficient is characterized by the value of modus 1. It is the same as in variable of Family reasons however variance is significantly lower. We can therefore claim that there is a minimal of other factors influencing the expatriates´ motivation to international assignment.

Following figure no. 1 illustrates the average motivation of each examined variable. Its shape clearly displays the motivational structure of the corporate expatriate.

Fig. 1: Average motivation to expatriate

Source: Own calculations

Human resource managers should pay attention to every single factor that might influence the motivation to foreign assignment and consequently their performance abroad. Family reasons is actually a determinant that can make expatriate´s situation more difficult, and this concerns not only to a decision to relocate but also the adaptation process afterwards. It could be said that younger employees that do you have own family yet or their kids are of pre-school age have easier circumstances. Moreover, the adjustment process of the accompanying family plays a crucial role as well.

Variables Professional development and Career growth have been proved to be significant motives and therefore a professional career path after repatriation should be clearly defined and agreed in a home company so the expatriate does not suffer from job uncertainty after repatriation.

Highly evaluated factor of Personal development shows how assigned employees are aware of benefits that work stay in foreign country and different culture can mean to them. This

finding can be related to the development of intercultural competences and importance of intercultural trainings including language courses, as supported by Language improvement variable.

To conclude the results, the motivational factors can be summarized into three categories:

- personal growth,
- professional growth and
- financial benefits.

Moreover, size of social relationships with people of different nationality (foreign social network) was examined as a determinant of motivation to relocate abroad. Respondents identified this size as percentage share of their relationships (friends, colleagues, family members) that are with foreigners. The linear dependency between variables was not confirmed.

Based on this finding we can draw the conclusion that the size of foreign social network is not a factor influencing the decision of corporate expatriates to relocate. Values are displayed in table no. 3.

Tab. 3: Relation between size of foreign social network and motivation to relocate

Category	Kendall coefficient	p- value
Career growth	0,168	0,060
Language improvement	-0,075	0,409
New country/ culture	0,137	0,119
Personal development	0,131	0,173
Financial benefits	0,041	0,642
Professional development	0,087	0,362
Family reasons	0,062	0,502
Other	0,030	0,825

Source: Own calculations

As suggestion for future research, it would be interesting to investigate this factor further in terms of self-assigned expatriates where we can assume that foreign social network could be more significant determinant of expatriate motivation.

4. Conclusion

International mobility is a significant trend accompanying globalization and internationalization of labor markets. In recent years, multinational companies rapidly demand skilled professionals, globally available and flexible. Not every talented employee is however willing to relocate abroad, as for personal reasons and family situation.

Professionals that are motivated to relocate by their own are therefore becoming an important asset of the organizations. In order to attract the right people and take advantage of their mobility, to know their motivation is crucial. Moreover, importance of particular motivational factors can change over generations. With this regard, these changes can be expecting in the generation of so called millennials (born between 1980 and 2000) that are currently reaching the top stage of their economic activity.

Naturally, the situation of potential corporate expatriates is deeply influenced by company´s will. A future international assignment is often a part of the job contract and then employee´s motivation does not matter that much. However, motivation determinates the adaptation process in foreign location. The overall adjustment then influence the expatriate´s performance and consequently the (in)ability to reach organizational goals abroad.

As this study revealed, the development, both personal and professional is the most important motivational factor. This finding is supported by the above-average values of language improvement and motive of meeting new country and culture. Although low values of a variable of family reasons prove to be rather disincentive factor, together with the largest variance

suggest an important influence and therefore the attention of human resource managers should be directed to family situation of assigned employees as well.

These findings extend understanding of determinants of expatriate adjustment identifying their motivation. From a practical point of view, some implications can be drawn from the results of the study. Any company may want to inquire about the reasons of their employees to relocate abroad. Knowledge regarding to their motivation or demotivation could contribute to selection process.

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Primary Paper Section: A

Secondary Paper Section: AE, AH

DETERMINING A STRATEGY FOR PROBLEM SOLVING BASED ON EYE MOVEMENTS

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Abstract: Success in solving problems depends on the strategy that we choose when looking for the right solution. In identifying strategies, we used records of eye movements during test problems, inspired by Raven's Progressive Matrices. The participants in research had to choose the right solution from 6 alternatives as part of 10 different problems. The results of the research showed that a strategy in which the person tested spends more time looking at the task itself (rather than the alternative solutions) is a more successful strategy. We can therefore predict success of resolution based on the ratio of time that we devote to the task before us to our interest in possible solutions.

Keywords: Eye tracking, problem solving, strategy of problem solving, Raven's Progressive Matrices

1. Introduction

We solve countless problems and tasks of various types every day. There are so many of them that we often do not even term them problems or tasks. However, all problems that we solve have one thing in common – the fact that there is a task, a problem to be solved, based on which we try to find the right solution. Psychologists, in the main, have for many years tried to discover which strategies used in problem-solving lead to the successful solution of tasks and problems or to increasing the likelihood of success. In our research, we decided to use eye tracking technology, to compare the characteristics of eye movements in successful and unsuccessful solvers and to find a strategy that increases the likelihood of success.

2. Method

The research method involved a specially set-up experiment in which the persons tested were sat in front of a monitor to solve test problems. We developed a special camera to measure eye movements, a camera that captures the face of the tested person and is able to precisely detect the place on which that person is training his/her sight. The coordinates of the pupils and other points of interest are detected in the image using machine learning. Geometric transformation is calculated based on calibration measurement and converts the position of the pupils to the position of view on the monitor. The equipment makes it possible to capture a high frame rate. We used a sampling frequency of 50 Hz in the research, which made it possible to capture normal "tracking" eye movements. All eye movements were recorded during test problems depending on what was happening on the screen.

A total of 62 people took part in the research – 31 men and 31 women – and measurements were carried out at various places in the Czech Republic from October 2016 to January 2017. The average age of the persons tested was 36.3 years. Participants were mainly managers and personnel officers from governmental and private companies.

The content of the test situations, and the task provided to the persons tested, was to solve 10 logic tasks inspired by Raven's Progressive Matrices, which were routinely used to test intelligence[1]. In each task, an incomplete image was shown on the left-hand side of the monitor. Part of the image was missing.

On the right-hand side of the screen, 6 possible images were shown, of which only one was a perfect fit for the missing part on the left-hand side (Figure 1).
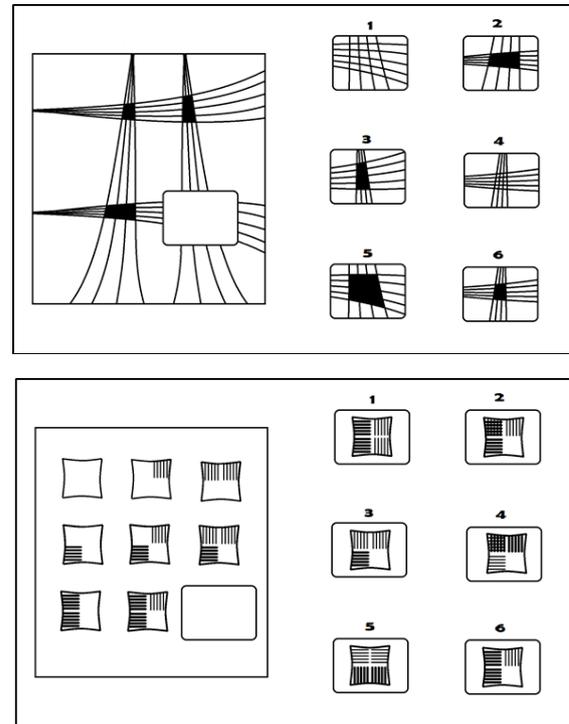
Figure 1: Examples of test problems

Persons were tasked with finding and choosing the one correct image that is to identify correct combination of partial subtasks. Earlier studies with eye-tracking have confirmed that the test persons identify these sub-tasks sequentially[2]. Individual problems varied in difficulty and there was no time limit placed on solving. Participants informed the experimenter present of their answers verbally. After stating their chosen image, the participant immediately moved on to solving another problem. Throughout the test part of the experiment, we recorded the eye movements of the participants and subsequently analysed these, with the aim of identifying the strategy of tracking (problem-solving).

In our analysis of eye movements, we concentrated on finding differences between successful and unsuccessful resolvers. We compared speed, fluency, structured nature, systematic nature and other selected characteristics. Two separate groups were therefore created during the analysis – successfully and unsuccessfully solved problems. We compared a total of 593 sub-problems (we had to omit a total of 27 problems from the original 620 measurements due to the participant's inability to answer or due to erroneous records of data). Of the 10 problems, we chose the 5 that best differentiated between correct and incorrect answers. We then compared the strategy of solving and the success rate / failure rate of solving for these 5 problems.

3. Results

We identified the selected characteristics in relation to eye movements and the connection between these and successful/unsuccessful problem-solving using a t-test for two independent samples. One interesting finding was the significant difference ($p = 0.002$) in the ratio of the overall time spent solving problems to the time which participants devoted to the task itself.

The proportion of time that successful participants devoted to the task itself was higher than that recorded among unsuccessful solvers. This longer time "spent on the task" (in proportion to the overall time) is positively correlated to finding the correct answer, i.e. success in problem-solving. To provide an illustration of this, Graphs 1 and 2 show examples of our records of eye movements for individual measurement zones (the task itself and the 6 alternative answers on offer). Graph 1 shows the record of eye movements in an unsuccessful solver who only spent a relatively short time on the task itself (in relation to the answers) – 38 % spent tracking the task and 62 % tracking the possible answers.
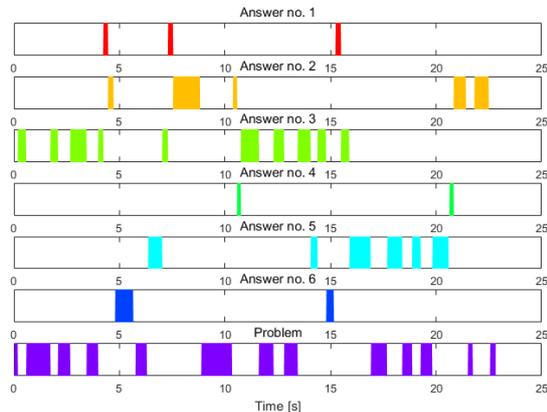
Graph 1: Record of eye movements in an unsuccessful solver: time spent in individual zones

Graph 2 shows the eye fixation of a successful solver. The ratio of fixation on the right answer to other fixation here is considerably higher (a total of 83 % of the time spent looking at the task itself and only 17 % of time devoted to the possible answers).
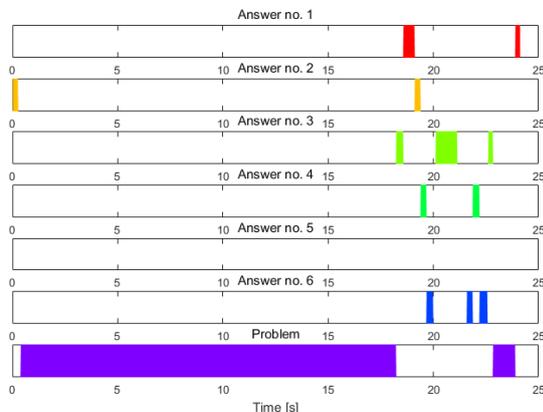
Graph 2: Record of eye movements in a successful solver: time spent in individual zones

The actual record of eye movements and time spent looking at the task itself and at the alternative answers on offer therefore allows us to predict success, the selection of the right answer, without the solver actually having to mark that answer. A strategy in which people spend more time looking for the correct answer in the task itself and not in the possible answers is a strategy which is considerably more successful.

4. Discussion and Conclusion

Our findings and conclusions are confirmed by other researchers[3;4;5] according to which a successful problem-solving strategy in choosing one correct answer depends on the time that the problem-solver spends on the task itself.

Identifying strategies using eye movements has many advantages in comparison with other methods. The tested person need not know the real purpose and objective of testing and is therefore unable to intentionally influence the results. In classic psychodiagnostics, answers can often be purposefully distorted - the purpose of measurement is discovered and answers or responses to the stimuli are adapted with the aim of achieving the desired or the best result. Our testing tries to avoid precisely this possible distortion. It is very complicated, almost impossible, for the tested person to find out the purpose of testing and thus wilfully influence the nature of eye movements. After all, eye movements are automated responses[6]. The development of computer technology means that almost every portable computer is fitted with a camera that can be used to capture the user. It is from this that the potential for this form of measurement stems. Indeed, the tested persons could solve the test problems without the use of special hardware– it is enough for them to have their own computer with camera and Internet connection. Testing could therefore be conducted at any time and from any place. The potential of this type of testing also stems from the fact that it is not demanding on time.

The limitations or disadvantages of our method of testing lie in the need to use a camera and special software. Moreover, the surrounding lighting must be good when measurements are taken and the person measured must remain within the focus of the eye camera during testing.

Success in solving problems depends on the strategy that we choose when looking for the right solution. Our research showed that a strategy in which the person tested spends more time on the task itself (rather than on the possible solutions) is a more successful strategy.

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LEADING ISSUES OF THE ECONOMIC RESEARCH CONDUCTED AT THE ECB: THE INFLATION INSTANCE

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Abstract: The European Central Bank relays new insights received from the research groups which operate on its ground. These innovative findings represent output of the research activities conducted by particular teams. The areas of the investigation cover various complicated and sensitive tasks. The paper deals with economic research of the European Central Bank, especially with key issues. Inflation as one of the current research priorities is analyzed in more detail. Inflation rate movements are discussed for selected period as well as present situation in this field. Moreover, expectations considering next few years are stated. The examination involves the European Union as well as the euro area.

Keywords: Inflation, Economic Research, European Central Bank, European Union, Euro Area.

1 Introduction

The primary aim of economic research (Goodfriend et al., 2004) realized at the European Central Bank (ECB) is to offer a base consisting of empirical as well as conceptual grounding on the one hand for policy making and on the other hand for improvement in the policy communication field.

The crucial function (Freedman et al., 2011) in the context of research at the ECB is carried out by the Research Coordination Committee. Its tasks are, inter alia, determination of preferential research matters, management of cooperation among directorates with regards on accomplishment the set goals and prevention from undesirable repetition in issues solving. The own justification lies within the Research Coordination Committee on Directorate General Research, especially in the form of the Research Priorities Report that annually submits.

In the following section, the economic research activities at the ECB are discussed in further detail supplemented with research organization.

2 The economic research activities of the European Central Bank

Economic research realized by the ECB includes a wide scope of financial and economic themes. Resulting findings represent the core for fulfillment the ECB's main objectives and the basis for dealing with constantly changing priorities. Moreover, they give assistance to set the stable fundamentals for the ECB's policy analysis. Activities in the economic research field are becoming increasingly intense what is related to a large number of emerging major challenges.

The organization of the ECB's economic research is depicted in Figure 1. Selected period responds to the last five years. The most recent available data correspond to 2016.

Figure 1 Organization of the ECB's economic research
Source: own adaptation, ECB (2013 - 2017a)

Scientific research concerning economic tasks covered by the ECB is executed by established research groups. Their number is changing and adapting to current needs over the years (see Figure 1). One from the capital purposes of these research teams is to support the coordination of the bank's research activities allocated to individual specialized business areas. Mentioned matter is advantageous from the structural point of view as well as vocational one. The teams collaborate to each other, solve the topics of similar orientation and thus increase the ECB´s research potential.

Discussing the current needs, they are reflected in yearly defined research priorities which are shown in Figure 1, as well. Presented data signify the quantity of research teams or research priorities appertaining to particular year.

Most of the research activities conducted at the ECB lead to publishing scientific papers. Publications elaborated by the ECB scientists themselves or in partnership with colleagues outside the ECB are summarized in Figure 2.

Figure 2 The ECB's research activities indicated over publications
Source: own adaptation, ECB (2013 - 2017a)

In Figure 2 above, the first number represents papers issued in the ECB's Working Paper Series (WPS) within respective year. It should be noted that there are counted also papers generated by external cooperating participants from the workshops and the

conferences. The ECB staff is thus not necessarily authors or members of the authors' team. Second figure states the quantity of papers published in refereed journals where ECB personnel are certainly authors or co-authors, at least.

3 Leading tasks of the economic research at the ECB

According to the European Central Bank (2017a), following list yields the principal fields of economic research interest:

a)   non-standard monetary policy
- asset purchases and refinancing operations,
- effective lower bound on interest rates,
- sustained adjustment of inflation,

b)   inflation in a changing environment
- risk of unanchoring inflation expectations,
- domestic and global drivers of low inflation,

c)   new macroprudential framework
- effectiveness of alternative policies,
- capital and liquidity regulation,

d)   deepening Economic and Monetary Union and convergence
- Economic and Monetary Union governance and fiscal policy,
- competitiveness and convergence.

Naturally, stated four economic research objectives are not the only ones in the spotlight. They are, however, currently top priority.

The research at the ECB (Directorate General Research, 2017) is presently carried out through seven research groups which are:

- Fiscal policy and Economic and Monetary Union governance,

- Monetary policy, strategy and implementation,
- International macro and finance,
- Macro-finance, systemic risk and macroprudential policy,
- Real sector and microeconomic analysis,
- Forecasting and business cycle analysis,
- Financial institutions, microprudential policy, financial markets and payments.

4 Inflation as the ECB's current research priority

Looking at the stated leading questions constituting subjects of the economic research at the ECB, it is undisputed that inflation is emerging as one from the actual priorities. Nowadays (European Central Bank, 2017b), there is noticed the global headline inflation increase. The development of this macroeconomic indicator in the European Union as well as in the euro area in recent months is listed in Figure 3.
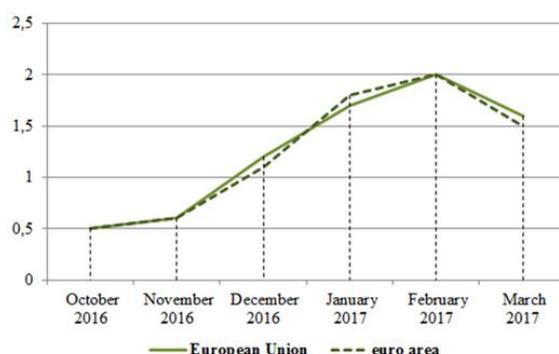
Figure 3 Annual inflation rates in the European Union
and the euro area given in %
Source: own adaptation, OECD (2017a)

Inflation specified in Figure 3 is measured by the Harmonised Index of Consumer Prices. The differences in values achieved within the European Union and the euro area have not been remarked or were only minimal. Identical figures fit for October 2016 (0.5%), November 2016 (0.6%) and February 2017 (2.0%). The other surveyed months are characterized by difference of 0.1% each. Moreover, mentioned small difference is reflected in higher annual inflation once for the European Union data and another time for the euro area data. Specifically, for the European Union apply 1.2% level of inflation in December 2016, 1.7% in January 2017 and 1.6% in March 2017. For the euro area are valid 1.1% in December 2016, 1.8% in January 2017 and 1.5% in March 2017. These findings thus do not point out remarkable variation of inflation development in the states that have adopted the euro and in the member states of the European Union but outside the euro area.

The other fact can be further observed from the Figure 3. It is already said the general inflation increase. This certainty is obvious over figures at the beginning of the period under review and at the end of it. The gap in annual inflation reached entire 1% in the euro area case and even 1.1% in the European Union case, both upwards.

The comparison of the rates in the last examined month with the same month of the previous year has a confirmatory character considering inflation rising. In March 2017 the annual inflation was 1.6% respectively 1.5% and in March 2016, a year earlier, the value level 0.0% was recorded in the European Union as well as in the euro area. The inflation rate increase is therefore evident.

It should be noted that the growth rate of inflation is currently slowed. This is possible to see through collation taking into account last two months of the studied interval. Growth slowdown was 0.4% in the European Union and 0.5% in the euro area. Nevertheless, the annual rate increase is notable.

Growing trend of the global headline inflation rate (National Bank of Slovakia, 2017) is primary consequence of the renewed increase in oil prices. Development of the annual inflation measured by the Harmonised Index of Consumer Prices is conditional upon a rapid enhancement in annual energy and unprocessed food price inflation at the first place (in detail see Table 1).

Table 1 Annual inflation of the chosen units for the euro area given in %

	October 2016	November 2016	December 2016	January 2017	February 2017	March 2017
Energy	-0.9	-1.1	2.6	8.1	9.3	7.4
Non-energy industrial goods	0.3	0.3	0.3	0.5	0.2	0.3
Services	1.1	1.1	1.3	1.2	1.3	1.0
All-items except: ▪ energy	0.7	0.8	1.0	1.1	1.2	0.9
▪ energy and	0.7	0.8	0.9	0.9	0.9	0.8

unprocessed food					
▪ energy, food, alcohol and tobacco	0.8	0.8	0.9	0.9	0.9	0.7
▪ energy and seasonal food	0.7	0.8	0.9	0.9	0.9	0.7
▪ tobacco	0.5	0.5	1.1	1.7	2.0	1.5
Food, alcohol and tobacco	0.4	0.7	1.2	1.8	2.5	1.8
▪ unprocessed food	0.2	0.7	2.1	3.5	5.3	3.1
▪ processed food, alcohol and tobacco	0.5	0.7	0.7	0.7	0.8	1.0

Source: own adaptation, Eurostat (2017) and OECD (2017b)

The prospects indicate that headline inflation is supposedly to persist close to 2% in the next months. Such a prediction predominantly reflects development of the annual growth rate of energy prices.

Despite of headline inflation upturn the essential inflation pressures preserve attenuated. The Governing Council thus decided that for the purposes of intensifying essential inflation pressures and facilitating headline inflation in the medium term it is necessary to continue with a very significant degree of monetary accommodation at present. There exists the effort leading to ensure permanent inflation rate return on level that is lower, but near to, 2% immediately.

Looking at the up to date non-standard monetary policy actions they will be in force until, at least, a lasting change in inflation development with respect to its inflation target will occur. For more about inflation targeting, see Drabiková (2012).

The annual inflation rate for the euro area calculated under the Harmonised Index of Consumer Prices should reach 1.7% in year 2017 taking into account macroeconomic prognosis of the specialists operate at the European Central Bank. The forecast indicating development in the next two years suggests inflation level equal to 1.6% in 2018 and 1.7% in 2019, the same figure as applies for current year.

However, prospect of the headline inflation measured by the Harmonised Index of Consumer Prices remarked editing when regarding on predictions realized by Eurosystem experts at the end of last year. The numbers were considerably modified upwards for year 2017. Selfsame direction of the revision was notified for 2018 but more moderate. The estimate for the last mentioned year stayed without a change. Admittedly, the forecasts are based on the assumption of complete execution of all measures resulting from the ECB's monetary policy.

For more information about some other indicators concerning the European Union check e.g. Štofa (2015). In this context the own justification has mathematical modeling (e.g. Schreyer - Fecková Škrabuľáková, 2015).

5 Discussion and conclusions

Scientific research conducted at the European Central Bank in the economic area is representative by topics variety. Manifold economic and financial tasks are resolved each year. Naturally, there exist subjects which are more urgent than some others in the given period. Research priorities are thus stated and they form the main work fulfillment for research teams operate on the bank's ground. The number of teams was standardly floating but

it has stabilized in the past few years. Currently the seven of them function.

Discussing the economic research key issues solved by European Central Bank staff the inflation question arises. It belongs to the group of leading themes nowadays. From the overall point of view, inflation has an increasing character. However, the increase noticed slowdown.

Looking at the annual inflation rates measured by the Harmonised Index of Consumer Prices the statements mentioned

above are confirmed. They are valid for the European Union Member States same as for the euro area countries. Moreover, analyzed period indicates a very small divergence or even none in the European Union data and the euro area data. It can be generally concluded that the inflation development is similar.

Considering the global headline inflation the growing trend is a consequence particularly of the renewed upturn in oil prices. Situation of the annual inflation measured by the Harmonised Index of Consumer Prices is mostly conditional upon a rapid rise in annual energy and unprocessed food price inflation. The predictions suggest that headline inflation is supposedly to persist close to 2% in the following months. This estimation mainly reflects development of the annual rate of energy prices.

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Primary Paper Section: A

Secondary Paper Section: AH

CREDITORS PROTECTION DURING CORPORATE CRISIS UNDER SLOVAK LAW

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Abstract: This article focuses on protection of creditors during corporate crisis under Slovak legislation with regard to responsibilities of company´s governing bodies, especially towards company´s creditors. The article marks new institutes of creditor´s protection in the light of new Slovak regulation of corporate crisis.

Keywords: creditor´s protection/ creditor´s rights, corporate crisis, guarantee for performing the duty/ liability of company´s governing bodies

1 Conflicts of interests

Separation of centralized corporate governance from shareholders is one of the fundamental features of stock corporations. In the interest of efficiency, strategies of business and corporate governance must be withdrawn from a large group of shareholders, often varying in composition and structure, and transferred to a small group of persons. The small governance group must be granted a substantial leeway in discretionary authority in performing their tasks. The core of the problem is how to make these persons bear responsibility for such authority without impeding the performance of their tasks.[1] Opportunism may be quite a natural part of human conduct, but the persons managing the company are not free to make decisions in order to maximize their own assets[2]. The key solution of the issue, therefore, is to inspire/motivate/encourage the managers (*agents*)[3] to act in the interests of the shareholders (the *principal*) rather than in the interests of their own. The Principal-agent problem may be expediently dealt with through fiduciary duties[4] specified in general legal definitions. Under Slovakian law, the general definition is constructed as the „duty of reasonable professional skill and due care". The managers of the company must use such degree of skill, effort and care as a reasonable person would use in similar circumstances.[5] One of motivating factors for the managers/officers of the company in performing their duties in relation to the management of company assets is responsibility/accountability as an inherent component of good corporate governance.

The main aim of corporate governance in general is to create a balance between all those related in some way to the corporation/company, such as shareholders, members of governing and supervisory bodies, managers in broader sense, stakeholders and employees.[6] The aim should not be limited just to shareholder and stakeholder values, but generally, to overall social welfare. The creditors, employees and customers may enter into contractual relations with a company only upon the prospects of financially favorable results[7]; the corporate transactions must be beneficial for all participating entities.

At certain stage of the company development, however, the creditors' interests become more prominent than the shareholder's interests, especially during the company's economic imbalance, when the company is in crisis. Due to the principle of limited liability, however, the shareholders are undoubtedly in a more advantageous position than the external creditors. When economic health of the company is shaking and the future of the company is uncertain, some legal measures are taken to counterbalance the advantages of shareholders over those of external creditors. The incoming mechanisms cause changes in the nature or quality of the obligations. Here a question arises: what care and/or skills must be provided by the governing bodies to the company suffering from ill health, together with the question of responsibility for such unsound conditions of the company under their management towards the company and the creditors.

Slovak law-givers tried to cope with the negative impact of bankruptcy and restructuring on creditors and to strengthen responsibility in business/entrepreneurial activities by introducing the term of corporate crisis[8]. It is a new legal term in Slovakia introduced by Act 87/ 2015 Z. z., amending Act 513/1991 Zb., the Commercial Code, amending also other laws (hereinafter the „Amendment"). The significance of the term of corporate crisis as an instrument mitigating the impact of bankruptcy or restructuring on creditors rests in transforming external finance provided by the shareholders or related creditors at the time of corporate crisis to substitute equity finance.

From the language used in the provisions of the Amendment defining the term substitute equity financing (literal translation from Slovak: "payments substituting own resources") and the term corporate crisis it may be presumed that the Slovak legislator was inspired by Austrian Act No. 92/2003 on equity substitution[9] (*Eigenkapitalersatz–Gesetz - EKEG*). The importance of the Austrian EKEG consists in the elimination of differences between the interests of shareholders granting loans to the company and the external creditors.[10] As stated in the Austrian professional publications, substitute equity financing (*Eigenkapitalersatzrecht*) developed from the decisions of German courts, later it was adopted also by the Austrian legal theory and after 1991 also by OGH (*Oberster Gerichtshof*).the Supreme Court[11] In the decisions of German courts, re-qualification of external to equity financing was originally connected with the ban on *venire contra factum propirium*: where a shareholder grants a loan to the company, otherwise the company will become insolvent, it would be conflicting to require repayment of the loan before the crisis is over. In its later decisions, BGH (*Bundesgerichtshof*), the Federal Court of Justice, pointed out to shareholders' responsibility for proper company financing (*ordnungsgemäße Unternehmens-finanzierung*). When the company is in crisis, the shareholder is not obligated to make additional payment to complement the missing capital. However, if the shareholder chooses to provide financial assistance, such shareholder will not be relieved of his/her responsibility where the shareholder has decided, by debiting the creditors, on a less risky looking form of funding instead of a capital contribution/investment that has been objectively offered. In case of functional requalification of external sources provided by a shareholder to equity/own sources, the shareholder must be responsible for the financial consequences. (*Finanzierungsfolgenverantwortung*). Consequently, the idea of responsibility for financial consequences is in literature more precisely specified as a

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[1] DAVIES P.: Corporate Governance s. 59, Konferenz zu Binnenmarkt und Gesellschaftsrecht, 15. - 16.12.1997, davailable at http://ec.europa.eu/internal_market/company/docs/otherdocs/actes_de.pdf
[2] HAVEL B.: Obchodní korporace ve světle promén: Variace na neuzavřené téma správy obchodních korporací, 1. Vydanie. Praha: Auditorium, 2010, p. 107
[3] Under Slovak law the term "statutory body", a body acting on behalf of the company as provided by law, the articles of associations, bylaws or rules of the company - whether one person/an executive/a director or a group of persons – the board of directors/management board . In this paper, the term manager(s) will be used in general, and in the part commenting on the statutory regulation in Slovakia, the term "statutory body" is used, or, when discussing the duties of its members the term "members of the statutory body" is used
[4] In specialized literature fiduciary duties are used in two different senses, in the Anglo/American narrow sense, fiduciary duties include primarily the duty of loyalty, without the duty of care (both are then included in „the general duties"),. In the other sense fiduciary duties include the duty of care, and the duty of loyalty, too. (see e.g.. BLACK, B.S. The Principal Fiduciary Duties of Boards of Directors, available at www.oecd.org/dataoecd/50/53/1872746.pdf, HAVEL B. Judikatura, Obchodněprávní revue. vol. 4, no.. 4 (2012). ISSN 1213-5313, p. 124, LASÁK J. Ve jménu korporace: derivativní žaloby vůči členům statutárního orgánu, Obchodněprávní revue. vol. 2, no. 3/2010. ISSN 1213-5313, p. 74. In this paper, the broader sense of fiduciary duties is implied .
[5] CLARK, R.,C.: Firemní právo. Victoria Publishing a. s., 1992, p. 173
[6] ČERNÁ S. in HURYCHOVÁ, K. BORSÍK, D. (eds) Corporate Governance, 1. Vydanie. Praha: Wolters Kluwers, 2015. p. 11

[7] KRAAKMAN, R. et al.: The Anatomy of Corporate Law. Oxford: OUP, 2004 (2009), ISBN 978-0-19-9565 84 – 9, p. 28.
[8] http://www.epi.sk/dovodova-sprava/dovodova-sprava-k-zakonu-c-87-2015-Z-z.htm
[9] Bundesgesetz über Eigenkapital ersetzende Gesellschafterleistungen
[10] KALSS in Kalss/Nowotny/Schauer, Österreichisches Gesellschaftsrecht (2008), Wien: MANZ´sche Verlags- und Universitätsbuchhandlung GmbH, 2008, p. 862
[11] Nowotny in Kalss/Nowotny/Schauer, Österreichisches Gesellschaftsrecht (2008), Wien: MANZ´sche Verlags- und Universitätsbuchhandlung GmbH, 2008, p. 1137

protection of creditors which is linked with substitute equity financing.[12]

2 Company in crisis and substitute equity financing

Pursuant to current law, corporate crisis does not apply to all forms of business entities. Under the Commercial Code, a company in crisis applies to limited liability companies, joint-stock companies and limited partnership if the general partner is not an individual, and, following January 1, 2017, also private limited company (literal translation of the Slovak term jednoduchá spoločnosť na akcie: simple stock company). As laid down in § 67i (2) of the Commercial Code, the concept of company in crisis will not be relevant for any bank, electronic money institution, insurance company, reinsurance company, health insurance company, (asset) management company, securities dealer, stock exchange, or central securities depository, because these institutions are subject to special rules governing company equity and surveillance procedures, as described in the explanatory report.

The state of crisis denotes bankruptcy or threat of bankruptcy; in case of threat of bankruptcy, crisis is determined with mathematical precision of equity: external financing ratio. Pursuant to Act 7/2005 Z. z. governing bankruptcy and a restructuring (Bankruptcy and Restructuring Act), bankruptcy occurs through over-indebtedness or insolvency. The state of crisis is defined through the following three alternative criteria:

- Insolvency occurring under § 3 (2) of Act 7/2005 Z. z. on bankruptcy and restructuring
- over-indebtedness occurring under § 3 (3) of Act 7/2005 Z. z. on bankruptcy and restructuring
- qualified equity-external financing ratio under § 67a (2) of the Commercial Code (equity/liabilities ratio being less than eight to one hundred, such ratio will first be used in 2018; the ratio in 2016 was four to one hundred, and the ratio is six to one hundred in 2017).

A loan or similar financing granted to the company at the time when the company is in crisis (§ 67c (1) of the Commercial Code) or before its crisis, the maturity date of which has been deferred or extended, may be considered substitute equity financing. Similar financing should be considered in line with its economic purpose. The notion of similar financing should include all agreements, according to which the company's settlement/performance will not be made concurrently with funding provided by a person specified in § 67c (2) of the Commercial Code, but later. It is not important whether this relates to performance of monetary obligations or provision of any comparable financing (e.g. borrowings).

According to Slovak statutory regulation financing to be qualifies as substitute equity financing must meet the following cumulative criteria:

1. *the nature of financing* (loan, borrowings and similar funding),
2. *timing* (financing was provided at the time when the company was in crisis; this applies equally to financing granted to the company before the crisis, the maturity date of which has been deferred or extended),
3. *personal scope* (financing was provided by a person specified in § 67c (2) and (4) of the Commercial Code (in the text referred to also as "related creditors"),
4. *the conditions of accounting, knowledge or presumed knowledge of the state of accounting* (the crisis resulting from the last regular or extraordinary balance sheet report, or it would be resulting so should the balance sheet report be made on time, or if the person providing financing knew, or could know, with regard to all circumstances, that the crisis might occur as shown in the current balance sheet).

De facto this means that transforming external financing to equity financing will (temporarily) limit the range of potential creditors whose claims would otherwise, outside the corporate crisis, have been settled. Such segregation of a certain group of creditors is connected with the creditors' relations to the company, primarily their ability to influence the company, to control or to decide on the fate of the company. Pursuant to § 67c of the Commercial Code these persons are not only shareholders. According to § 67c (2) of the Commercial Code such related person may be a member of the statutory body, an employee with a direct managing/executive authority within a statutory body, an authorized agent, the head of a branch, a member of the supervisory board, anyone holding a direct or indirect ownership interest representing at least 5% of the registered capital or having voting rights in the company or anyone able to influence the management of the company comparable to control corresponding with such ownership interest, a silent partner, or any person closely related with any person mentioned earlier, and anyone acting on behalf of all these persons. The law has introduced a rebuttable presumption, according to which it is presumed that the lender is considered a related person/party specified in § 67c (2) of the Commercial Code where it is not possible to identify the final beneficial owner. In terms with the explanatory report, at the time of crisis, in case of financing by a shell company, the burden of proof reverses. The importance of introducing the concept of company in crisis/corporate crisis and that of substitute equity financing into Slovak legislation lies primarily in the protection of the so called *unrelated creditors*.

For the purposes of assessing the relatedness, special rules governing collective investments, non-investment funds, old age pension saving schemes, and debentures are not taken into account.

The essence of the new law on substitute equity financing resources is set in § 67f of the Commercial Code laying down the ban to repay the funds plus interest and other charges, and the contractual penalty in case the company is in crisis, or in case the company would be in crisis in consequence thereof. In addition, according to these provisions during crisis, the time limits set for repayment do not run, and thus the company will not be in default

One of the sanctions for the breach of the said duty in relation to related creditors is the secondary duty to repay the respective value. Rightly, the legislator has not omitted any situations in which repayment occurred by setting-off, encashment of the security, execution, or in similar way.

The law does not exclude repayment claims in case of restructuring or bankruptcy; here the claim is to be made by an application. This represents a rule of insolvency law which is also included in the Commercial Code.

In case of bankruptcy, equity substitution claims will be granted by related persons/parties (§ 9 of the Bankruptcy and Restructuring Act), and, pursuant to § 95 (3) of the Bankruptcy and Restructuring Act, but the will be settled only after the other claims have been satisfied. The creditors of these debts have no voting rights in bankruptcy and restructuring, and they cannot be elected to the committee of creditors (§ 35 (4) and § 126 (3) of the Bankruptcy and Restructuring Act).[13]

3 Special responsibilities/ duties of the statutory body during corporate crisis towards the company and unrelated creditors

3.1 Duty of care

Together with the concept of corporate crisis the Commercial Code Amendment has also provided for special duties/responsibilities of the statutory body (§ 67b of the

[12] RAISER T., Veil R.: Recht der Kapitalgesellschaften, 4. Vydanie, München: Verlag Franz Vahlen, 2006, p. 588

[13] ĎURICA, M. Zákon o konkurze a reštrukturalizácii. Komentár. 2. vydanie. Bratislava: C. H. Beck, 2015, p. 15

Commercial Code). These responsibilities apply only to the companies that may be in crisis (limited liability companies, joint-stock companies, limited partnership, provided that its general partner is not an individual, and following January 1, 2017 also private limited company/simple stock company). Under § 67b of the Commercial Code, the statutory body, that has found, or, having regard to all circumstances, could have found that the company was in crisis, must do everything possible, as may be required in line with the principle of reasonable professional skill and due care, from a reasonable and prudent person to avert similar situation. As stated in the explanatory report to the Amendment[14], these special duties/responsibilities arising from the crisis situation are expected to avert the crisis and to see that the measures taken be effective.

It is a fact that defining crisis as a concrete form of threat of bankruptcy is a new idea, but the duty to monitor the situation concerning assets and liabilities was laid down already by the Bankruptcy and Restructuring Act so that a possible threat of bankruptcy could be recognized early and measures could be taken to avert it. This duty applied to all entities required to keep accounting according to a special law, i.e. not only the companies that may be in crisis. Such duty to prevent bankruptcy in line with the Bankruptcy and Restructuring Act would thus cover also the qualified external – equity financing ratio set forth in § 67a of the Commercial Code. The special duty/responsibility would also arise from the general clause of "reasonable professional skill and due care"(§ 135a and § 194 of the Commercial Code), the implicit part of which is also the duty of loyalty of a member of a statutory body in relation to the shareholders and the company. When considering the goal and purpose of the company - *overall social welfare, an* unsound company drifting towards dissolution is not consistent with this aim.

In case of a breach of the special duty under § 67b of the Commercial Code as a result of which damage is caused to the company, the claims against statutory bodies of limited liability company will be considered in line with § 135a of the Commercial Code, or in line with § 194 of the Commercial Code in case of a joint company or a simple stock company (following January 1, 2017). The grounds for relief from responsibility may arise from the *business judgment rule* [15] or from the resolution of the general meeting, provided it is not contrary to statute or the articles of association and bylaws of the company. In case of a breach of special duty occurring in a limited partnership, the claims against general partner(s) will be considered under § 373 et conseq. of the Commercial Code providing for compensation for damage, with the grounds for relief from responsibility being the "circumstances excluding liability" under § 374 of the Commercial Code.

3.2 Ban on repayment of substitute equity financing to related creditors

The above grounds for relief from responsibility do not apply in case of liability arising under § 67f the Commercial Code. Liability of statutory bodies arises in case of a breach of the ban on repayment of substitute equity financing to related creditors. The members of statutory bodies acting contrary to this ban are jointly and severally liable to repay the funds to the company. Liability arises also in case of the members of statutory bodies who have not acted in breach of the ban, but failed to claim the repayment, although, with regard to all circumstances, they knew or may have known of the duty of the related creditors' duty to repay the financing. The grounds for relief from responsibility that may exclude liability of members of the statutory body may

arise in case they claimed the repayment or that, with regard to all circumstances, they could not have known of the related creditor's duty to repay. To satisfy the grounds for such relief a mere notice requiring repayment will not be sufficient, instead, taking actual steps for its enforcement, such as filing a court action requiring the repayment will be necessary.

Liability (§ 67 of Commercial Code) arises towards the company and also towards the company (unrelated) creditors.

Where, contrary to the ban under § 67f (1) of the Commercial Code, substitute equity funding has been repaid to a person who fails return the funds within a reasonable time limit upon a notice of the company (§ 306 of the Commercial Code), the Company has the right to claim compensation from a member of the company governing body that has such liability. A member of the statutory body who has fulfilled the obligation of repayment for the obligated person, may claim recourse payment against such person.

Liability of a member of the statutory body towards creditors is not an instance of liability for the company's obligations, but liability for repayment of substitute equity financing. Therefore, the creditors have no right to claim compensation of their receivables against the company but they may claim repayment of financing in favor of the company. Thus, this is a special form of extinction of liability against creditors which becomes extinct upon repayment of financing to the company. As this has not been explicitly included either in the legal construction or in the explanatory report of the amended law, it may be implied that the purpose of such regulation of liability against creditors is to secure enforceability of repayment of such financing also in case of a passive company or inactive members of its statutory bodies.

3.3 Duty to file a petition seeking declaration of bankruptcy

The crisis may be provisional, but it may not be overcome either as a result of adopting insufficient and/or inadequate measures, or as a result of unfavorable market development. The statutory regulation of the concept of crisis in the Commercial Code is connected with the regulation contained in the Bankruptcy and Restructuring Act. Not considering the effects of the Commercial Code, where the company is over-indebted, the debtor company (or the persons mandatorily obligated to act so on behalf of the debtor) must file the petition to declare bankruptcy (§ 11 (2) of the Bankruptcy and Restructuring Act) not later than thirty days after learning of such over-indebtedness, or not later than thirty days within which the debtor taking due professional care could have learnt of such over-indebtedness.

Despite the fact that the amount of the company debt is decisive when considering both the threat of bankruptcy under the Commercial Code or over-indebtedness under the Bankruptcy and Restructuring Act, the relevant amounts of the debt will not be the same when considering threat of bankruptcy under the Commercial Code as in the case of over-indebtedness under the Bankruptcy and Restructuring Act. For the purpose of considering over-indebtedness, certain forms of debts are not counted in, including the company debts meeting the criteria of substitute equity financing (§ 3 (3) of the Bankruptcy and Restructuring Act).

In case of breach of the duty to file the petition seeking declaration of bankruptcy on time, the statutory bodies of limited liability companies and of the joint-stock companies will be liable to repay to the company one half of the least amount of registered capital of joint-stock company (EUR 12,500.00). The legal title to this sanction arises from the legal fiction of the contractual penalty agreed between a member of the governing body and the company (§ 11 (2) of the Bankruptcy and Restructuring Act). The oxymoron formulation of contractual penalty as a lawful penalty relates to the presumed legislative intent to enable application of such „legal contractual penalty" also outside bankruptcy proceedings. In such case, also the

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[14] http://www.epi.sk/dovodova-sprava/dovodova-sprava-k-zakonu-c-87-2015-Z-z.htm
[15] Under the business judgment rule, responsibility of the statutory body is excluded subject to the condition that in making a business decision based upon the relevant information, the statutory body may reasonably believe to have acted for the benefit of the company. In contrast with the troubling doctrine (of the duty of care), just mentioning the business judgment rule evokes smiles of relief in faces of the company managers/directors. (CLARK, R.,C.: Firemní právo. Victoria Publishing a. s., 1992, p. 173).

shareholders may seek such contractual penalty on behalf of the company (§ 122, § 182 of the Commercial Code).

Liability for damage of members of statutory bodies of companies other than a limited liability company and a joint-stock company, i.e. in case of a partnership, a limited partnership and a cooperative towards the company/cooperative, is governed, in case of late filing bankruptcy petition seeking declaration of bankruptcy, pursuant to § 374 of the Commercial Code. Liability for damage of members of statutory bodies towards creditors in case of late petition seeking declaration of bankruptcy, arises in agreement with § 420 of the Civil Code, with the form of the company/cooperative being relevant.

4 Special creditor´s rights arising from the company´s obligations secured by related persons

The concept of crisis has affected also the position of company creditors whose claims are secured (by guaranty/liability, pledge or another security) of related persons defined in § 67c (2) of the Commercial Code (in the Slovak text of § 67g of the Commercial Code such related persons are termed the persons „obligated due to the pledge/security"). Such secured obligations take effect as substitution of equity financing, allowing the company, shaken by crisis, to obtain a loan or similar funding from third persons, even though such secured loan or funding is not subject to the regime of substitute equity financing. The economic result of secured obligations of the company by the obligated persons correspond with the assignment of substitute equity financing[16], when, as a result of a recourse for payment, the person obligated and liable as a result of the security gets into position of a creditor of the company.

In case of the company obligations secured by related persons, the creditor has the right, when the company is in crisis, to be satisfied from the security of the obligated person without making a claim first against the company (§ 67g (1) of the Commercial Code); such creditor's right cannot be excluded by an agreement (a cogent provision of law representing represents an exception from the subsidiarity principle of the concept/institute of security). In case of a creditor who, at the time of the existence of the obligation (a loan or similar funding), learnt or could have learnt about the crisis of the company from the last published accounting statement, such creditor is limited in his option to have his claim satisfied/settled between the company and the obligated person by satisfying the claim only to the extent of the difference between the amount of debt and the value of security. This limitation concerns the situation when the company is in crisis or the situation leading to declaration of bankruptcy or re-structuring (§ 67h of the Commercial Code).

In the event that the creditor decides to seek payment at the time when company is in crisis, the company has the right to require the obligated to perform/pay directly to such creditor (§ 67g (2) of the Commercial Code). The amount of payment will be constrained to the amount of security. In the event that the company pays to the creditor, the company must require the obligated person to compensate the company up to the amount of security (§ 67g (3) of the Commercial code). The obligated person may be released of his obligation to compensate by transferring to the company free of any charge the property/assets serving as security.

5 Conclusion

Members of governing bodies of unsound companies tend to make risky decisions, choosing more risky investments and expecting superior recovery of investment, which may, however, be economically unsuccessful and may lead to bankruptcy. In indebted companies, the conflict of interests between the shareholders and the creditors becomes more prominent because any possible risk of dangerous investments is on creditor's account. On the other hand, shareholders and members of

governing bodies of indebted companies tend to act in accord reducing the conflict of interest between them, because both sides may opt for excessive risks, from which, in case of success, higher profits may result.[17] By this amendment, the Slovak law-givers extended the obligations of members of governing bodies/statutory bodies, in an attempt to bring harmony between the position of unrelated creditors towards shareholders and members of governing bodies as related creditors. With respect to statutory limitation of the extent of satisfying the claims of unrelated creditors from the company assets in case of the creditor's potential knowledge of the state of accounting, the new law imposes stricter requirements as for the more prudent conduct of unrelated creditors providing loans or similar funding.

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THE CLASSIFICATION OF FACTORS AFFECTING DEMAND FOR CULTURAL PRODUCTS IN THE DOMESTIC MARKET

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Abstract: Today the effect of cultural activities in GDP, economic growth, social welfare and development of international exchanges is very noticeable as it has changed cultural activities to one of the basic foundations of economic system of the world. In this regard, this study is conducted with the aim of classification of factors affecting demand for Iranian cultural products in the domestic market. This study was conducted by qualitative method and based on the Grounded theory, using interview from 30 artists, scholars and cultural activists of country and results of data analysis led to identify the main factors affecting demand for Iranian cultural products in four dimensions of "stimulate demand," "create demand", "supply demand" and "repeat demand".

Keywords: Iranian cultural product, factors affecting demand, cultural demand, consumption

1. Introduction

Nature of most of cultural products is in such a way that usually there isn't a large potential demand from the market and customers for it. The reason is that cultural products often have role in supply needs of high levels of Maslow pyramid, and are rarely placed in Iranian goods basket. Although, today due to the amazing impact of technology on life style of individuals, there isn't adherence to Maslow's Hierarchy of Needs and sometimes by providing minimum essential goods, the person thinks about forming his artistic and social character and goes towards the artistic and cultural products inevitably. Therefore, if the Iranian original products are not available, products replacing West and East countries are selected that certainly will be effective in changing people's lifestyle. On the other hand, attention to consumer boom and increasing cultural and artistic demand leads to the creation of new job opportunities and promote the Iranian cultural and artistic production and consequently country's cultural economic growth and provides conditions for cultural self-sufficiency. Now what factors influence the level of demand for culture and art consumption in Iranian family is the subject that in this paper, using the experience of producers, suppliers and cultural activists has been investigated.

2. Statement of problem

Economic of culture of country needs a development to be able to wake sleeping Phoenix of Iranian originality and focusing on the development of cultural products market to be created a prodigious leap in the total country's economy. Iran due to the strong historical and civilizational background has a diversity of cultural products therefore; it can provide high value products in the cultural field that due to civilization and monotheism of Iranian, it has a great overlap with Islamic aspects of the present Iran as well. On the other hand, cultural industry in average has allocated 5.2% share of gross domestic product (GDP) at the global level and on this basis, attention to the factors affecting the growth of products and cultural services while protecting Iranian original culture will be effective in the country's economic boom. Among the factors influencing in the boom of country's culture is planning of demand and consumption that now for reasons such as weakness in marketing, the existence of

products substitute industrial and activity of Western media in promoting the western products is faced with challenge. For example handicraft is obvious example of ancient Iranian culture that due to the entry of industrial goods has lost its consumption and demand among Iranians and needs to planning and organizing in order to survive and develop its market.

With regard to the subjects mentioned, in this study, it is tried to be investigated and classified the factors affecting the demand and consumption of cultural products according to the opinions and experiences of experts and manufacturers and suppliers of domestic market to be able to be considered as a guide for marketing and producers. Moreover, the question to be answered whether the factors affecting the demand for cultural products are different with factors affecting demand for other products?

3. Research literature

3.1 The definition of cultural production: Productions of cultural industries are divided to two groups of cultural goods and services. Cultural goods are called consumable goods that are the carriers of ideas and symbols or ways of life. The goods has entertainment and educational applications and help to create collective identity and are product of creativity individually or collectively, and are subject to intellectual property and by industrial processes and worldwide distribution, continuously will be produced, improved and developed. Book, film, periodical, multimedia products, software, music, video, fashion and handicrafts are an example of it. Cultural services is service that are offered to meet the needs and cultural interests and are not the reagent of material goods and in total, includes a series of cultural supportive measures and facilities that government and semi-government and private institutions or companies give to society. Cultural events and artistic programs as well as cultural information services and services such as news, publications, libraries and documentation centers and museums are in these kinds. These services are offered free or on commercial basis. (Najaf Beigi and Hossein Zadegan, 2011) cultural goods can be defined consumer goods that transfer ideas, symbols and lifestyles. They provide information on the identity and culture and have role in making identity and affect cultural activity. (Poul and Sadeghi, 2010).

The general concept of artistic products includes entertainments of events, learning experiences, social experiences, annual event or an adventurous event (Kolb, 2000; Momenzadeh et al., 2017; Shey et al., 2017).

"In comparison with cultural product with other products can be said:

- Cultural-artistic product reflects thought, conscience and specific cultural conditions and purpose of its supply is the transfer of a specified message that is the source of message of special culture.
- Commercial artifact pursues the other goal; merchandise is a function of the customer's taste and need. If the commercial commodity not has applicant, it is not produced and in any case, its characteristics is determined by the applicant.
- At the same time, these products "cultural" and "commercial" has in a similar aspect. Both must be supplied in a way to stimulate interest and desire of the applicant (receiver of message or consumer of goods) to buyer to be ready to pay its cost. Cultural goods that cannot attract the audience desire, it will not be purchased and commercial artifact that does not respond to consumer need, will be removed from the market.
- Some cultural products are almost disposable. For example, a consumer who likes a specific type of soda again wants the same that previously has drunk, but one who is interested in action, romantic or historic stories not wants to re-read the same story that has already read. He wants a different book but at the same time similar. A few people watch a movie, repeatedly and go to the movies for watching it. (Memarnejad and Hosseinzadegan, 2010) Most of cultural

products are disposable (with the exception of crafts) and cannot focus on repurchase of customers but it should be used advertising policies for creating new customers (Nouriyan, 2015).

Wasko et al, (2011) writes: the value of cultural products and services is largely immaterial, they not to be worn by using. Therefore, there is no shortage, no motivation to repeat purchase, in the information and culture, regeneration and economic growth depends on constant production of new products. So, what is referred in common industry as the production, in the cultural sector is closer to research and develop. Therefore, it should be understood from the perspective of political, economy and innovation rather than the perspective of model of classical industrial development. This means that cultural industries are reproduction systems, not production systems. Once, that the prototype is produced, the marginal cost of additional copy is close to zero. When the nature of cultural work was recognized, this means that productivity in the economy could be found only in the distribution. Thus, centralization of distribution networks and technologies that are deployed is based on the political economy of culture. (Zednik, 2015)

3.2 Motivations of purchase in the market of cultural products

In a classification, market of cultural products based on motivation of people has been divided into 4 sections:

1) The desire to achieve the awareness of first motivation of some consumers is artistic products that they are called "Searchers of cultural needs". These people are looking for the benefits of culture and direct practical benefits of that product. For example, the results of studies have shown that learning science is one of the primary reasons for visiting a museum.

2) The other part of the market are looking for its symbolic benefits, that this issue is related to psychological concept of that specific product for people and provides this possibility for consumer to make a relationship between personality and his values by choosing the product. (Social need)

3) But the use of artistic products for many audiences is a type of consumption ritual that is focused on social communications. As well as opportunities to get together in a theater (Functional requirement)

4) Feeling revenue (emotional needs) has relationship strongly with the need to experience that is stimulating, motivating and pleasant. The need means away from issues and daily habits. (Alaei, 2012)

Gazley in a research writes "generally, hedonistic consumption refers to aspects of consumer behavior that is related to the emotional aspects of a consumer's experience. Hedonistic goods includes art, film, music and fashion (Gazley et al. 2011).

4. Research background

4.1. The results of overall research of demand for cultural products

In identifying factors affecting demand for cultural products, research has been done as follows:

"The nature of most of the artistic and cultural goods is in such a way that usually there is no great demand from the market and its customers. These types of products are not generally placed in the basket of essential goods and in octet division of demand for goods are positioned in the category of products with zero demand (not demand). (Nouriyan, 2015)

Since art exhibitions, opera, theater or music concerts were observed; there were two approaches among consumers: First, some of the people become fans of certain cultural goods, while for others it was even boring. Second, the best sellers are the ones who paid attention to fun aspect more that the inspirational

aspect. However, both qualities were defined and preferences are common for cultural goods between the search for achieving an aesthetic experience or achieving entertainment. (Zednik, 2015)

Zednik (2015) considered the primary and secondary variables that is evaluated from the perspective of cultural economists included parent education, general education, special arts education, the number of cultural goods consumption in the past, active participation in the art (self or a family member), consumption and social reasons or discrimination sense with consumption of cultural goods. (Zednik, 2015)

Diniz and Machado (2011) in a study have analyzed the consumption of cultural- artistic products and cultural services in Brazil. This study sought to evaluate the characteristics of cultural artistic products and services in Brazil and considers this purpose as activity with positive effects on consumer of the society in general. Using the evaluation method based on human capital, researchers have estimated a model where "cost for cultural – artistic products" and "services" depends on the characteristics of the educational, social and demographic of variables and families that shows geographical location (poor or affluent area). In the meantime, education is an important part of human capital, because it has role in the individual's ability to process and retain information. The level of parental education, whether formal or cultural- artistic is a related factor, because it is the passage for the supply of a product in childhood and adulthood. In addition to formal education, education in the field of cultural-artistic activities also affects the consumption. The other individual characteristics that influence consumption include age, gender, race and religion. In addition to the characteristics of individual capital, factors related to social capital should be considered. Such factors can be considered as characteristic of quality of product. In this case, both individual taste and media impact are involved. An important factor in this understanding is the idea of the origin or source of products and services that reduces the tendency of consumer to buy undesirable product. To minimize this risk, individual makes decision based on critics of specialized media and his relatives and beside it considers information of people involved in the production, distribution and advertising products and services, and past studies. On the economic aspects of a product, demand for cultural-artistic products and services depends on the cost of product or services and also cost of its accessories, consumer income and product quality. Cost beside the value of the product represents useful cost of product. This issue on the other hand, included the satisfaction about the use of byproducts and costs associated with access to product and services of transport, social unrests and other items. Income is another important factor in the consumption. This factor is related to restriction in consumption. As well as the cost of product not has this effect. In total, the economic writings consider cultural –artistic products as luxury, such as products that are dominated by the income of individual. However, there is empirical evidence on the effect of income on the cultural aim. Finally, quality is considered as another important factor. Quality of products or services beside the idea mentioned in the past on understanding contains technical questions relating to the production, promotion and supply of products and services. Totally, the results of this study show that the cultural artistic costs are strongly influenced by income in addition, they change from place to place that may occur due to changes in the supply and cultural and historical differences (Diniz and Machado, 2011).

Cultural economists always stressed that the demand for the arts at the current time ..., particularly is under the influence of past arts. flavor and taste of the arts should be explored to be increased the rate of its consumption. The empirical findings show that people who were the consumer of cultural goods in childhood, in adulthood will be more the applicant of cultural goods. (Amestoy, 2004)

"In a study, to evaluate the effect of education on consumption of cultural goods and services, it was concluded that in planning for leisure of citizens and their cultural consumption, urban management of Tehran should pay attention to the interests and different tastes of citizens according to their education level. In

addition, the more the amount of cultural capital increases the cultural participation in artistic and cultural areas in the city increases. Therefore, it must be acted in order to increase citizens' cultural capital. The Tehran urban management also could act to encourage more the people-friendly types and with quality, music especially traditional and Iranian music, production and play good movies and with Islamic-Iranian features and with different messages of ethical, social, cultural, etc., and provide the facilities and spaces of cinema and theater in the different areas of city. (Kalantari, 2013)

In a study that was conducted on the differences in cultural consumption and cultural consumption patterns according to different levels of education among citizens in Tehran, found that there is a significant difference between different education levels and the use of cultural products. In other words, cultural consumption has a significant difference in different education levels. The findings also show that by increasing the education, the use of cultural products increases as by increasing education, the use of visual possibilities, listening to music and going to the cinema and the theater has increased. Finally, cultural consumption in levels and consumption rates and in patterns or consumer preference among people with varied education has been varied. So it can be said, education with accumulation of sources and cultural capitals in individual has shaped certain ways of consumption (Kalantari, 2013).

Alaei writes, at the moment attention to greater use of the Internet and e-commerce for the purpose of establishing the various communication styles in addition to the innovative development strategies arises from this thinking. More than ever people are going to be familiar with media and art organizations should pay attention that probably a relatively large part of the market demands to be able to purchase its ticket at any time of day and any day of the week. In addition, the Internet can be an effective means to achieve small markets around the world. (Alaei, 2012).

It is obvious that no product on the market is sold to anyone. The fact based on statistics is about the cultural products as well as other products. But because of the feature of several parts of culture market, there are several distinction aspects between them. For example, by an overview on the cultural sector can be said that almost 100% of people use one type of cultural product. The result of 40 years of research on cultural consumers suggests that customers of leading art are typically educated women with income more than the general people and with job in kind of clerk. This feature is true across all industrialized countries. As the statistic of audiences in these countries is similar to each other and no country can claim that its people more than people in neighboring countries supports leading art (Alaei, 2012).

4.2 The research results of the field of crafts

Zeeshan and Waqar (2013), with a study that have done on the crafts of India concluded that: "crafts are including products when a purchaser likes it; he is ready to pay beyond the standard of product. At first glance, his interest is in that product. Handmade products may be classified, based on price, export to the domestic markets, ease of maintenance, ease of storage, decorative value or value of modernity and traditional style. (Waqar and Zeeshan, 2013).

Abutalebi in investigating problems of artists in the field of handicrafts concluded that the major problems of artists include (1) improper marketing, (2) Preparation of raw materials, (3) the import of similar products, (4) lack of monitoring production, (5) lack of culture and consumer awareness from manufactured goods and the absence of a base or forum for dialogue (Aboutalebi, 2014).

4.3 The research results of the field of visual arts

Shirin Kalam in a study concluded that: "Dimensions of the product, market, create and develop value and provide value, human performance, cultural dimension of work, diversity of audience, critics effect, the discovery of new art, education and development of artists and audiences, access to a work of art and

pricing in the audience's attention to works of art and in other words, communication between the artist and the customer that is established through the work of art has effect a lot. (Shirin Kalam, 2013)

4.4 The research results of the field of music

Park (2010) by reviewing the marketing strategies of Korean music festivals will conclude "that in order to work more effectively in the market, it should be paid attention to the following points:

- Improve communication with the audiences through technology: providing information of music festivals through websites and social networks and make assured the audiences on the information needs;
- Develop various programs for the audiences: officials of Oregon Bach Festival (OBF) discovered that the presence of audiences depends on how Festivals to set their programs. Traditionally, proposals could be a variety of programs including choral, orchestral music, chamber music, small groups and individual performances. However, OBF discovered that by better organizing programs could be acted more success and divided its audiences into four groups: children, community, beginners and pragmatic.
- Due to the ease of transport in different parts of Korea, the audiences to fill the leisure time and enjoy it can travel to different places. Oregon Bach Festival (OBF) can achieve to attract new audiences and market expansion with the development and equipping venues. (Park, 2010)

Assassi (2010) introduces four main lever of marketing of music festivals such this:

- The first lever: customized recommendations, it means that it should be designed according to the taste of fans of classical music or modern, its duration to be 45 minutes, the tension should be avoided, and the diversity of music to be considered and its quality not to be degraded.
- The second lever: general support services, which means there should be plenty of room for relaxing, drinking and food to be established outside the concert space, transportation and parking to be available at cheaper rate and special.
- The third lever: improving productivity, which means that the number of concerts, tickets, the number of CDs and books and… to be recovering.
- Fourth leverage: the moderation of the price of the ticket with attracting government support to be attracted the maximum audience.

Brand is one of the principles of strategic marketing as a way to create the image of the organizations and the art products. Brand is a way to improve the value of the art products. If music festivals cannot identify new audiences, so they should be focused on strengthening the brand. (Assassi, 2010)

Azadfar (2011) on demand elements in the music, writes:

Product: Artist should be noted that the product must be fresh, innovative, creative and at the same time in terms of musical to have a high technique (Azadfar, 2011). Pricing music can be based on performed costs or on the basis of prices of other competitors or the consumer welcome. Especially in the case of music could be pricing based on qualitative and spiritual value that has near the customer (Azadfar, 2011). There are the following ways to distribute music albums. 1) play album at the supermarket, 2) large store (Azadfar, 2011).

Persuasion in the music: today, the most reliable way to promote music is that people should hear it, if it might be frequently and for free, after a while if you're lucky, people know your music and are fascinated by it. Sooner or later they want to have that music (Brown, 2011).

Album release time to market: Iranian publishers believe the late summer and early autumn, as well as mid-September to the end of October and early March is the best time for unveiling works.

Accordingly, summer despite the holiday is not a proper season for the unveiling work unless earlier for this purpose, a kind of mainstreaming to be made in the media (Azadfar, 2011).

Ahmadi (2014) in a study on the behavior of preparing music of consumers has concluded: features related to music have a significant effect on behavior of preparing music of consumer. So that I propose to the artists, active marketing in field of music to take more serious a group that have been trained in the field of music or are more familiar with music when audiences segmentation and determining target group and when the preparation of their works, to pay attention to tastes and comments of activists and experts and those who are more familiar with the music because they will be faced more welcome from them (Ahmadi, 2014).

Since the space has a significant effect on the behavior of papering music of the consumer, so some points such as modern and up to date of store, design and proper layout of store, appropriate color, pleasant fragrance of store, adequate lighting of store, play background music in store to be considered. And on the website, it should be considered the images and poster of artists on the site, site design, rich content of site, the updating site (Ahmadi, 2014). On the other hand, due to the comfort ie quick and easy access to the album has a significant effect on behavior of preparing music of consumer. So the classification process should be considered in the store and website (Ahmadi, 2014).

4.5 The research results of the field of theater and cinema

Artistic organizations including theatres require to be aware of two different consumer groups: Aficionado consumers select a theater that is available and is funny and not to follow the high aesthetic experience. And specialist consumers tend to drama with high-quality aesthetics. (Zednik, 2015)

Research has shown that the attitude towards theater has a positive effect on current consumption and Maryson and West (1986) found that participation in the arts in childhood affects the demand for the arts in adulthood. (Zednik, 2015)

In a study that was conducted in New Zealand on cinema market, they evaluated factors such as the characteristics of film (genre, symbols, Country of Origin), information resources, strategies of promotion, distribution and pricing and variables of movie star and director on purchasing movie ticket by effective consumer. (Gazley & Clark & Sinha, 2011)

The process of performing in theaters can be considered as a service, because the audiences would sit in the theater for paying and this payment not leads to the property of something. On the other hand watching a movie in theater is intangible and spectator cannot evaluate it before sees it. The process of watch and display is carried out at the same time, ie first the theater must be sold and then display and watch the service is performed simultaneously. Also the variability feature of services is true here. That is the type of service provider (different theaters) and technical abilities, the quality of services provided will be different (Taheri, 2014).

Mirzamani (2012) concluded factors influencing market demand on cinema such this: priority 1) web site design, 2) speed of access to a website, 3) status of website in the Google, 4) product quality in comparison with similar products, 5) authentic and brand familiarity, 6) additional and accessories facilities, 7) product discounts, 8) price of product, 9) the possibility of online payment, 10) brand related, 11) distinguishing, 12) comprehensiveness of Web Site (Mirzamani, 2012).

Ahmadi (2011) in a study that has conducted on factors affecting the increase of attracting audiences to theaters writes; According to the audiences, film impact (product) from the dimension of content, subject, those involved in the preparation and quality of watch in increase to attract the audiences has been very high and this means that the product has a significant role to improve all aspects in cinema industry and if advertising to be done on a large scale and halls to be allocated a high grade in terms of quality and price be planned based on the conditions of average

level payment of the audiences, but the film in terms of quality of content, subject or appearance to be placed in a lower level from the expected level, that film, the theater and finally the cinema industry is not successful and gaining profit will be difficult for filmmakers (Ahmadi, 2011).

It is natural that to attract the audience to the cinema, a commodity that is supplied to them must have certain characteristics that have the ability to absorb them. Now, according to the estimate of survey made from the sample investigated in this study, it can be rarely found a film in Iranian cinema that audiences have enthusiasm to watch it sooner and on the other hand, most of these films not have the features that effectiveness and appeal them is subject to being seen on the big screen in movie theaters therefore, many without having enthusiasm to see these films on the big screen, they stay to have the video version (Ahmadi, 2011).

On the other hand, in terms of audience, this problem that watching a movie should be in a suitable and hearty environment or spend waiting time for film in a fun and peaceful atmosphere as much as the film that to watch it come to cinema has importance and plays an important role in making decision. In other words, not only films can represent the more distance between the audience and the movie but also quality of sound and picture of cinema is considered an important condition in this field (Ahmadi, 2011).

Factors affecting the sale of a film can be a set, including video playback (Movie theaters) type of propaganda, the role of IRIB and the season of performing. So in general, a good film, strong structure film, actors, advertising right time to release a movie and required conditions to watch a film , all should be prepared to a film have a good sales. Ie, all factors must be met with each other to a good film will be released at the right time (Ahmadi, 2011).

In a study that is investigated factors affecting the absorption of audiences of Iranian cinema films to theater: "Prioritization of seven variables (derived from marketing mix 7s) of research from the perspective of their impact on attracting spectators showed that the variables" place "and" process "had the highest priority. The most important indices of product variable have been genre and director of the film. The most influential indices of variable "promotion" are as advice of friends and acquaintances, broadcasted news about movies and movie reviews. Among the indices, variable "physical evidence" of measures relating to technical characteristics of cinema (such as sound quality, size and quality of the screen) has a higher priority than other indices, such as "parking" and "quality of the food of buffet and restaurant". Results showed that "recreation" and "follow-up work of a director" has been the most important reasons for people to go to the cinema. The most important factors that prevent people from going to the cinema are "repeated subjects" and "low quality of Iranian films (Sezavar Habibi, 2011).

Geraiynejad et al (2010) in a study that have conducted on the effect of two factors of income and the number of family members on demand for theater concluded that there is a direct relationship between income of individuals and the number of times that go to movies (The maximum times of cinema going is related to those who earn more) also there is an inverse relationship between the number of family members and the times of cinemas going (such that by increasing the number of family members, the times of cinema going will be decease) (Geraiynejad et al., 2010)

If we consider the film as a product, it should be considered cases as factors of film production (director, movie star, producer), budget of film making, genre, music of film and prizes achieved in festivals as key factors in selecting film by audiences (Sezavar Habibi, 2005).

4.6 The research results of the field of book

Maktabifard (2008) writes in a research that is done for child's book; the reasonable time for book release to publishing market,

depending on the type of customers is different and managers of publishing should do publication and distribution of books with regard to these points. On the other hand, the book is not comparable with some consumed commodities and daily needs that consumer with any quality is forced to buy it. In the book market, if customer not found the book fits their demand and taste, they will refuse the purchase. He also emphasizes the packaging as in a market-oriented system, packaging a commodity is not only to protect it, but also the factor of facilitating sale is informing and motivating consumption. If we consider book volume as a part of its packaging, it can be accept that this volume is not only for that book's name to be carved on it, and may have a more attractive role and helps in transferring some concepts to the audience (Maktabifard, 2008).

All five elements of mix marketing are effective in buying fiction books and in terms of influence have the greatest effect in, respectively, vendors, access to books, price, product and promotion of sale in buying book. The important point in this regard is that the samples investigated, the book sellers in the purchase of books have paramount importance and among sub-components of "people", how to deal with is considered more important than knowledge and ability of seller in providing the offer of buying. Why booksellers way of treatment is considered so important, can be the subject of another study. However, it is obvious that the more contact and relation of booksellers with buyers to be improved, loyalty and frequency of purchase and increase their purchasing volume can be increased. Second point, price in terms of the importance is placed after seller and access to book that in addition to this subject, indicates less cost sensitivity of book purchaser in comparison to the importance of booksellers and availability of their desirable book. So that in that research, element of promoting is considered the most

effective component and in this research, promotion element is considered the least important component that the reason for this difference may be sought in the subject of research of the researchers (investigating the effect of book mix and not only fiction book mix) on buying book (Rahimniya et al., 2013)

Ebrahimi and his colleagues conducted a similar study on religious books and state that "product element (including different properties of religious book) has the most influence on buying religious books and distribution agent had no effect on it. Demographic characteristics of customers (in terms of job, income and their marital status) are also able to make difference in customers view in connection with the effects of elements mix on buying religious books (Ebrahimi et al., 2014).

4.7 The theoretical framework

As Nouriyan (2015) stated as common there is no large demand for cultural goods. Accordingly, in the first step, it should be created need for example, by increasing the level of information of society from cultural activities and persuasion to consumption, after that, factors affecting the choice and consumption of cultural goods to be provided and after the slection, the consumer must be satisfied of his consumption or other factor such as the desire to follow up the work of an artist or a sense of being distinct and…to be provided to be faithful to goods and continued consumption. On this basis, the factors affecting demand that is presented in the research background after extracting concepts and searching them classified in three sections of "stimulate need", "create demand" and "continue demand".

Table 1: theoretical framework

1. Stimulating need	2. Create demand	3. Continue demand
-Advertising and media activities: Aboutalebi 2014, Kalantari et al. 2013, Mirzamanai 2012, Deniz and Machado 2011 **-**Education: Deniz and Machado 2011, Kalantari et al. 2013, Ahmad 2014, Zednik 2015 **-**Education: Kalantari et al (2013)	-Distribution network: Deniz and Machado 2011, Park 2010, Assassi 2010, Gazali and colleagues 2011, Ahmadi 2014, Alaei 2012, Azadfar 2011, Ahmadi 2011, Sezavar Habibi 2011 -Revenue: Assassi 2010, Azadfar 2011, Geraiynajad and colleagues 2010 -Price: Deniz and Machado 2011, Assassi 2010, Gazly et al. 2011, Abutalebi 2014, Azadfar 2011, Ahmadi 2011, Sezavar Habibi 2011, Maktabifard 2008, Rahimniya et al. 2013, Geraiynejad 2010 et al. -Record, popularity, origin or source of product and quality of the product: Deniz and Mapchadv 2011, Gazly et al. 2011, Zednik 2015, Sezavar Habibi 2011 -Advertising and information and media critics effect: Deniz and Machado 2011, Park 2010, Shirin Kalam 2013, Abutalebi 2014, Sezavar Habibi 2011 -Individual tastes: Zeeshan and Vaghar, 2013, Deniz and Machado 2011	**-**Satisfaction of product consumption:, Zednik 2015, Park 2010, Taheri 2014, Rahimniya et al. 2013, **-**Active participation in the arts: Zednik 2015

5. Research method

Although cultural products for several years in the field of economic development has been proposed by the government however, a comprehensive study that includes a variety of cultural products has not been done in terms of demand and this

paper is conducted to provide theoretical arguments in this regard by using a qualitative approach based on grounded theory and using interview. To analyze the data obtained from the interview, the developed model of the process of implementing grounded theory consisting four stages as follows is used.
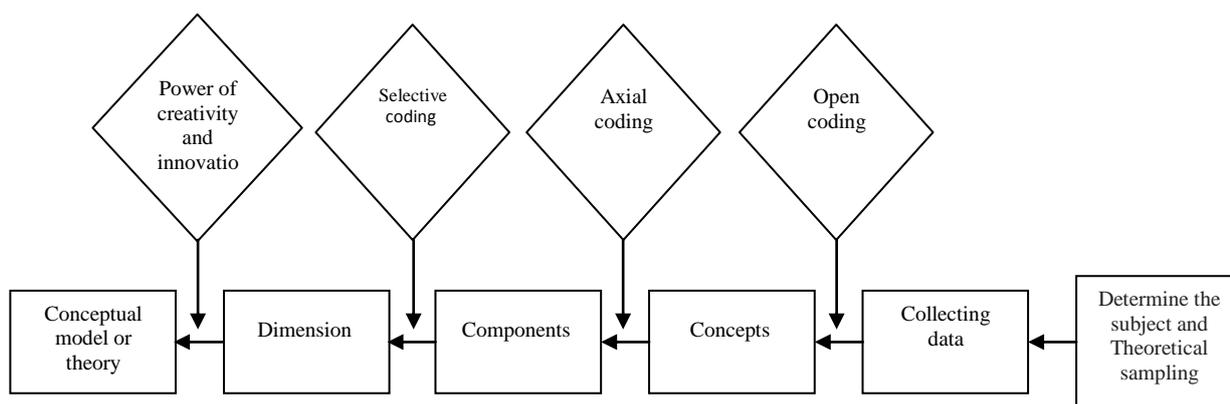
Figure 1: the developed model of the process of implementing grounded theory (Mehrabizadeh et al., 2011, p. 14)

Open coding stage: the process of crushing, compare, conceptualization and data processing are called open coding. In this stage, 182 initial code were identified that after monitoring and elimination of duplicated codes or incomplete and unrelated was reduced to 52 original concepts.

Axial coding stage: a collection of concepts, categories, features, sub-categories and output of open coding stage. The relationship between each category with its sub- categories (not the relationship between categories) is done in axial coding stage). In this stage of the study, 52 concepts, based on commonalities in 11 components were clustered.

Selective coding stage: open and axial coding process lead to the development of a set of categories that the model of specific connection between each category and its sub-categories is marked. Now it is time to relate the categories to each other and to provide a certain theoretical system. Linking categories to each other are called selective coding. In this stage of the study, components identified in 4 dimensions (described in the following) were clustered.

Stage of applying creativity and innovation of researchers: in this stage, concepts and components and dimensions identified on the basis of conclusion of researchers were modeling.

5.1 Population and sample

Population includes active artists and cultural producers, including cinema, theater, music, book, visual arts and crafts. Theoretical sampling was conducted this means that the selection of samples continued until the data saturation and adequacy was performed and researchers found the next samples not give them distinct information. The number of samples has been 30 people, of which 11 artists and cultural producers, five scholars and

policy makers from the Ministry of Culture and Islamic Guidance and affiliated organizations and 14 marketing and supplying cultural products in Tehran that using snowball method, it was asked the interviewees to introduce people informed on the subject of research for doing next interviews.

5.2 Investigating reliability and validity of data collected

In order to ensure the construct validity, the method of control by participation was used that is raised by Dimon and Holloway (2002). Therefore, it was tried to be selected from people with different experiences and desires. To achieve internal validity, the method of comparing Marshall and Rossman (1998) models was used in such a way that after coding, clustering and analyzing qualitative data, a model based on the experience was obtained that with the model predicted obtain of theoretical subjects was compared. To ensure the reliability of the results of interviews, after the initial coding, it was reviewed. Also a specialist in economics and marketing in collaboration team of research was used.

6. Findings

After doing the stages of extracting concepts, components and dimensions, according to researchers attitude, conceptual model of factors affecting demand for cultural products were explained as shown in Figure 2.

Identified and clustered factors in terms of dimensions were divided to four dimensions of "factors affecting in stimulating demand", "factors affecting in creating demand," "factors affecting in supplying demand" and "factors affecting in repeating demand".
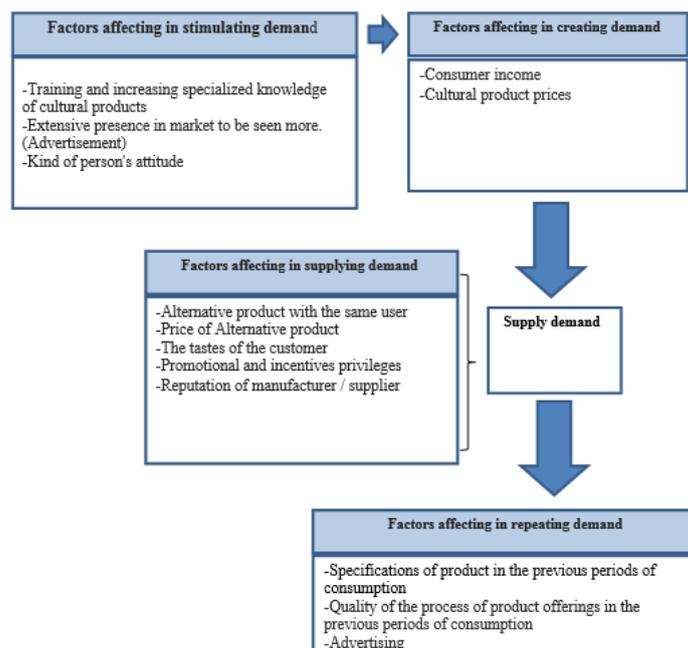
Figure 2: Conceptual model of factors affecting demand for cultural products (Conclusion of researchers from interviews done)

In the following, main components identified will be described.

6.1 Factors affecting in stimulating demand

As Alaei (2012) has stated the incentive of people to consume cultural goods as "willingness to learn", "social need", "functional need" and "emotional needs" so creating need to consume through attention and focus on four motivations mentioned is available. By increasing public awareness of cultural products and showing it in different parts of target market as well as providing general and specialized training specially children education with the participation and consumption of cultural goods in childhood (Amestoy) and institutionalization of the role of culture and art in the mind of prospective consumers could be considered as an implemented component. On the other hand, interests and tastes of people that are affected by age, sex, religion, place of residence, social class, level of education, interaction of the individual with cultural and artistic society (zednik, 2015) and their friends and advises has a key role in individual's motives and desire to consume cultural products.

Table 2: Describing components of the dimension of "factors affecting in stimulating demand"

Dimension	Component	Explanations
factors affecting in stimulating demand	training and increasing specialized knowledge of cultural products	Dare, it be claimed that in most cultural products, knowledge of people from the product and the relative dominance on the space of criticism and its expertise leads to increase demand. In addition, some products such as traditional arts & craft has lost their application status in Iranian family and modern industrial products are rather than copper pots, samovar that can be retrieved by providing specialized training.
	Extensive presence in market to be seen more. (Advertisement)	There are products that because not shown to people, the demand for it is low. Among them it can be mentioned the book, a good book and with quality and affordable if people are not aware it, there is no demand for it or how it is expected that in a city that not held theater, applicant is emerged for it, about other products with varying degrees, the affecting is the same.
	-Kind of person's attitude	Another interesting point is the person's attitude to life that this attitude arose from religion and religious beliefs, economic status, education level, occupation, age, etc. and affects the demand for cultural products, for example, the dominant professional theater audiences are idealistic, or for a sense of social pride go to the concert of music or purchase paintings of famous artists. Religious class of society is less Pop music applicant and perhaps is indifferent to the luxury aspect of art.

 (Conclusion of researchers from interviews conducted)

6.2 Factors affecting in creating demand

After stimulating cultural needs, the individual with respect to two factors of personal income and price of cultural factors makes decision, on whether it has the required ability for applicant of cultural product. Due to the economic conditions, many people in this stage will be stopped.

Table 3: Describing components of the "factors affecting in creating demand"

Dimension	Component	Explanations
factors affecting in creating demand	Consumer income	What is certain is that most of cultural products are not as necessary and public needs and the rate of demand for it on the public economic level of society is increasing and decreasing.
	Price of cultural product	Price is a factor that does not follow a fixed rule regarding cultural products. Clarifying that the original visual arts that are mainly sold in auctions and galleries while attention to the aesthetic aspect of product and brand of producing work are supplied at high prices, because the high price of works of art has a psychology dramatic effect on the buyer proud and makes him happy from his buying. But on the other art products because they must have the mission of culture in society therefore, it is necessary to set with price commensurate with the economic level of the public. Note that kind and supply provides pricing policy tailored to different level of income. So that, for example, in the field of music, high-income class use concerts of music and low-income people buy CD or purchase the download of the product.

 (Conclusion of researchers from interview conducted)

6.3 Factors affecting in supplying demand

Individual after ensuring the affordability of consumption of cultural products, according to the components acts to supply the demand created in him. When a person acts to supply his demand, he faced with alternative products and may be use the alternative product based on tastes or because the price of the product. On the other hand, in the process of supply demand, he decides due to advertising conducted and reputation of vendors of cultural effect as well as discounts and privileges offered about how to supply demand.

Table 4: Describing the components of the "factors affecting in supplying demand"

Dimension	Component	Explanations
factors affecting in supplying demand	Alternative product with similar users	Alternative product can be examined from two perspectives. First, the technology led to the emergence of a product with the same user that its obvious example is in Iran's traditional arts and crafts, replacing carpet with weaving carpet ... or replacement of electronic book with the printed book and ... Of course, there a neutralized solution for each. Second, imports of similar products with a cheap price that can be said it is changed to the problem of Iran's cultural products.
	Price of alternative product	
	The tastes of the customer	Aesthetic taste of person is an important factor in the supply of cultural and artistic demand that there is in demand subject. $Qdx = f (Px, Y, P1, P2, PoP, T, E)$
	The reputation of the manufacturer or supplier	As in the industry works, factory brand or company producing is effective on purchase, in cultural goods also, reputation of production and supply factors are effective in product selection. Especially in the visual arts, theater and cinema.
	Promotional and incentives privileges	The effective role of marketing activities on creating and supply demand is an issue that should be considered in the country's cultural demand planning as that failing to implement in this area has been meeting most artists interviewed.

(Conclusion of researchers from interview conducted)

6.4 Factors affecting in repeating demand

After each time of consumption of cultural products, pleasant or unpleasant feelings in person will be affected the repeating consumption of him in future (park, 2010). Although it cannot make a decision in this regard absolutely because it is possible that the demand of person from the manufacturer or brand to manufacturer and other brand to be moved and repeating demand because of interest of person to supply emotional, social, business function needs or his knowledge to be still ongoing. In the meantime, the role of the media and critics done on the products and information from the cultural market is very effective in repeating demand.

Table 5: Describing the components of the "factors affecting in repeating demand"

Dimension	Component	Explanations
factors affecting in repeating demand	specifications of product in the previous periods of consumption	Including content quality (originality, new and novelty of the message and the subject), visual and artistic quality (appearance, dimensions and aesthetics, technology used), is the type of product packaging. What message or theme that artists and producers choose for offering and after proper selecting of the topic and product content in what form presented it to the customer is raised as an important factor of demand by owners. The demand for good product (from two perspectives of the content and appearance) is always present unless the other factors affecting demand not to be provided.
	The quality of process of product presentation in the previous periods of consumption	Employees and vendors behavior with consumer, quality of infrastructure of product presentation such as in cinema, theater and music concerts, offering amenities such as parking, restaurant and ... near the place of performing and mailing and online orders and easy supply of cultural product is important and is effective in creating demand for a specific product.
	advertisements	Anyone with one time consumption of cultural product has the required capacity for becoming the usual applicant, provided that to be placed more in the cultural space of product consumed. Inform of new products, access to specialized

		information, access to expert critics of product and.. is effective in maintaining the level of demand that is a reaffirming the importance of policy and marketing activities.

(Conclusion of researchers from interview conducted)

Ranking the identified components based on frequency of repeating components in interviews conducted and according to Shannon entropy calculations is as the following table:

Table 6: Ranking the identified components based on frequency of repeating

Line	Criteria	Weight of criteria (Wi)
1	Price of alternative product	0.144
2	The tastes of the customer	0.103
3	The person's attitude	0.1
4	Alternative product with similar users	0.095
5	Consumer income	0.083
6	Product Price	0.082
7	Promotional and incentives privileges	0.082
8	The reputation of the manufacturer / supplier	0.082
9	Training and increasing specialized knowledge of the product	0.076
10	The quality of process of product presentation	0.061
11	Product Specifications	0.052
12	Advertising and strong presence in the market	0.042

As seen, the most important factor in supplying demand for cultural product is known " price of alternative product " and given that the alternative product is in fourth rank, so that there can be concluded that alternative product (including imported products or products with similar functions) that be able to meet customer tastes is regarded as the most significant challenge of cultural products.

On the other hand, the person's attitude that emanates from factors such as religion and religious beliefs, economic status, education level, occupation, age, etc. is placed in the third rank of importance and consumer income and product price are placed in fifth and sixth ranks that are introduced as components affecting in creating demand. Rank of promotion and encouragement and reputation and credit of the manufacturer /

supplier is placed in the same rank with product price and specialized training and increasing awareness of the product that affect person's attitude will be in the ninth rank in the list and the quality of process of providing product and product specifications are placed in the next ranks. Interestingly, placing advertising component and strong presence in the market is at the end of the ranking table.

7. Conclusions

The results show that the research background supports all the factors identified. "Although the quality of the process of providing product " is not mentioned directly in the literature. However, the concepts of "quality of supply", "physical evidence" and "behavior of employees and dealers" as direct factors are considered in the process of providing product.

Table 7: Comparison of the results with the research background

Dimension	Component	Researchers who confirmed the effect of the component in his writings.		
factors affecting in stimulating demand	specialized knowledge of Iranian cultural product (culture)	(Aboutalebi, 2014), (Shirin Kalam, 2013: 2), (Sezavar Habibi, 2011: 2).		
	Extensive presence in market to be seen more. (Advertisement)	(Brown, 2011: 28), (Bacon, 2007: 297), (Aboutalebi, 2014).		
	-Kind of person's attitude	(Waqar, Zeeshan, 2013: 26) (Diniz, Machado, 2011) (Kalantari et al., 2013), (Ebrahimi et al., 2014: 109).		
factors affecting in creating demand	Consumer income	(Diniz, Machado, 2011), (Baseghy, 2011, 56)., Nouriyan (2015)		
	Product price	(Assassi, 2010: 62-50), (Gazley & Clark & Sinha, 2011)		
factors affecting in supplying demand	Alternative product	(Aboutalebi, 2014)		
	Product Price	(Assassi, 2010: 62-50) (Gazley & Clark & Sinha, 2011)	pricing according to product type and customer type	(Azadfar, 2011: 167). (Shirin Kalam, 2013: 2)
			The direct impact of price on demand (inversely)	(Diniz, Machado, 2011)
	Attention to the tastes of the customer	Baseghy, 2011, 56), (Park, 2010: 50-47), (Assassi, 2010: 62-50)		

	Promotional and incentive activities	(Diniz, Machado, 2011), (Bernstein, 2007), (Park, 2010: 19), (Gazley & Clark & Sinha, 2011), (Shirin Kalam, 2013: 2), (Sezavar Habibi, 2011: 2), Mohamadian and Pourghaffari (2008)	
	The reputation of the manufacturer / supplier	(Diniz, Machado, 2011), (Assassi, 2010: 62-50), Schroeder, (2005), (Sesavar Habibi, 2011: 2)	
factors affecting in repeating demand	Cultural Product Specifications	(Diniz, Machado, 2011), (Park, 2010: 17), (Gazley & Clark & Sinha, 2011), (Shirin Kalam, 2013: 2), (Azadfar, 2011: 167), (Ahmadi, 1393: 175) (Taheri, 2014: 41-42), (Ahmadi, 2011: 206), (Sesavar Habibi, 2011: 2), Mohamadian and Pourghaffari (2008), (Ebrahami et al., 2014: 109), (Maktabifard, 2008: 140-139).	
	The quality of process of product presentation	The quality of supply	(Chivalrous and Soltanmejadh, 2009), (Alaei, 2011), (Shirin Kalam, 2013), (Park, 2010), (Azadfar, 2011), (Mirzamani, 2012), (Ahmadi, 2014), (Ahmadi, 2011), (Maktabifard, 2008).
		Physical evidence (a combination of spaces, parking, etc.)	(Park, 2010: 50-47), (Assassi, 2010: 62-50), (Ahmadi, 2014: 175-176).
		The behavior of employees and vendors	(Diniz, Machado, 2011), (Shirin Kalam, 2013: 2), (Taheri, 2014: 41-42), (Rahimniya et al., 2013)

 (Conclusion of researchers from the literature)

Also in response to the question of whether the factors affecting demand in cultural goods is different with other goods? Results of conducted interviews and background of study suggest that: Difference in origin of need and formation of demand for cultural products in different socio-economic classes that vary depending on the kind of product.

In the study of customers of cultural activates, it was obtained that different classes in terms of income with needs of according to following figure use the cultural products. As that the kind of need from five titles mentioned by Alaei (2012) increases to five titles. If the "desire to achieve knowledge" as a part of the motivation of "expertise follow-up" and the titles of "functional need" and "emotional needs" to be considered in the subset of motivation of entertainment, motives of "purchase as assets" and "application, decoration and gift "in the field of handicrafts and visual arts is added to the list of needs.

Figure 3: Motivation of consumption of cultural products by separating income classes (conclusion of researcher from interview conducted)

The need to consume theater and different music concerts is from need to consume cinema. Cinema is more public and low-middle class also uses it. While applicants of professional theater are idealistic class and young generation music concerts with the middle to high classes. About the visual arts chiefly in a part of it, public organizations and in a part, high income class is applicant and since these products are used to decorate the homes, its non-original version is used by the middle class. The book, due to favorable conditions for the consumer included applicants from each social and economic class. Handicrafts from the decorative and functional aspect depending on the level of price cover all classes of society.

Difference in the nature of cultural product with other products which leads to achieve a minimum share of cost of the Iranian household basket. (According to the report of SCCR: In an urban family in 2011, equal to 2.3 percent and in rural families 9.1%) that on the basis of cultural activists included three main reasons:

1. In some types of cultural products, placing in high levels of Maslow's pyramid and out of households' spending priority. And in others (even if the removal of Maslow's pyramid) high price of products that are placed in the category of luxury goods (music concerts, visual arts and some crafts) will lead to reduce demand. Explain that due to the reasons mentioned and as it is shown in the conceptual model of Figure 2, the evaluation of income and price of cultural products not enters to the stage of demand supply.

2. The lack of public awareness from the option of cultural products to meet the needs that is affected by the weakness in advertising and marketing activities. So that, due to weakness of advertising in the stage of demand supply (Figure 2), person may use alternative products.

3. The lack of industrial look to cultural products. As mentioned cultural products mainly have latent demand and zero or have reducing demand. An obvious example of reduced demand is cinema industry that due to the poor content quality has lost its customers. An artist must analyze audiences' preferences and values and reflected in his works. On the other hand, the solution of latent demand or zero and reduced demand is educational, persuasion and revival marketing that has also been referred by marketing scientists. The most important issue in the success of an industry is to create economic market for it. Product tailored to customer need to be produced and after advertise and attract customer, interaction to be formed. The type and volume of the advertising of cultural products is such that cannot be competed. By the lowest methods, cultural products to be supplied and sometimes even an important part of the market is unaware of such product. To attract maximum audience, there is no plan and often without attention to the target market, the product will be produced. All of these things show the fact, that there is no competitive market in Iranian cultural products.

At the end, it is noteworthy that in this article we were following the classification of factors affecting demand for Iranian cultural products by recording the experiences and oral reserve of cultural activists in Tehran and proving the impact and demand elasticity to each of the identified factors was not considered and referred to other researchers.

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CRIMINAL LIABILITY OF VIOLATING MEDICAL MYSTERIES IN IRAN'S LAW

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Abstract: The concept of privacy is an essential and important need for human and has various physical, psychological, social and informative dimensions. With a long history, medical confidentiality is one of the most important tasks in field of medical ethics and laws that has a broader range than "confidentiality of information". About the relationship between doctors and medical staff, on one hand and the relationship between patient and his relatives, on the other hand, one of the arisen issues is patient's medical mysteries. The patient has the right to determine how and when to give information to others or hospital organizations. He is entitled to identify nature of his personal thoughts that gives to others, who can receive the information and how to use it.

Keywords: doctor, medical staff, secrets, sick, criminal liability

1. Introduction

The doctor-patient relationship, patient and physician tone and bring their lives into their professional services offerings, and patients of medical professionals, but his body is what he puts as a matter of treatments. In Islam, mystery and confidentiality are in a special position so that Iranian legal system emphasizes on the need to consider all material and moral aspects of secrets' rights. Undoubtedly, some affairs are considered as secrets and privacy, so people have the right to hide that aspect of their lives. Keeping medical secretes of patients is one of the fundamental ethical principles of medical profession; therefore, physician is obliged to act as an honest depositary and refrain from disclosing it. Consequently, if some people access and disclose others' secrets due to his job, his action will be immoral and legislator should criminalize such acts. Disclosure of medical secrets is considered among issues of ethics and medical law that its subject is to study desirable and undesirable customs and behaviors that it should be considered and observed by medical business owners (Fazeli and Mozafar, 2012). During diagnosis and treatment of various diseases, many information and secrets of private life of patient are provided for physicians and medical staff, due to professional conditions that should be maintained as secrets. Accordingly, confidentiality is a fundamental principle in the relationship between doctor and patient that provides personal interests and social welfare (Lrijani et al., 2004). Undoubtedly, disclosing medical secrets causes different damages such as job loss, damage to reputation and physical injuries for patient. Consequently, there will be suggested the discussion of responsibility of disclosure of medical secrets. Article 648 of the Islamic Penal Code, Sanctions Section reveals that "if doctors, midwives and pharmacists, who are confidant because of their occupation or profession, disclose people secrets illegally, they will be condemned in prison from three months and one day to one year or pay cash punishment from 1,500,000 to 6,000,000 Rials". Criminalization philosophy of disclosing medical secrets is to defense and protect secrets and privacy of individuals who in some cases, they have to tell those secrets. Ethical norms of physicians and medical staff as well as their commitment to protect patients' privacy caused that confidentiality of medical information of patients is considered as the primary and inalienable right; consequently violator of this basic right should be accountable for violating the expected norms in the society. Disclosure of medical secrets is an intentional crime and the legislator has predicted legal sanctions for disclosure of medical secrets. Therefore, in case of violating the law of medical secrets there will be damaged to privacy and material and spiritual reputation of people. However, main issue of this research is that what penal sanctions have been imposed for disclosure of medical secrets by Iranian legislator? Therefore, this matter will be investigated by organizing the future four main topics.

2. Privacy and Confidentiality of Medical Secrets and Why to Support it

Medical is a science that human beings always require it. In most societies, doctors are individuals with a privileged status and position because they are associated with human life and health. So there is an especial sensitiveness to choose graduates of medical courses so that there is considered continuous and precise monitoring. Doctor is the only person that we let him voluntarily to relate with our most important element of being, namely our physical and spiritual health. Therefore, it is not surprising that medical profession is strongly correlated with religion and, of course, is consistent with the science of theology. In the distant past, doctor was called "priest" and patients looked for their health in the synagogue so that charmer priest tried to quench anger of gods, which was considered as cause of disease, by mumbo jumbo. By considering this mysterious and sanctity background of medical profession, the relationship between patient and doctor has not been an equal relationship and doctor has had an authoritative and imperative position. In today's world and globalization era, in practice, there has not been left the incantation and the relationship with physician, and there have been obtained great achievements and significant progress for this profession (Shojapoorian, 1994). In Islam, medicine science is valuable as like as religion so that knowledge is divided into two categories: religious knowledge and knowledge of body and its health. Imam Ali (AS) said: "The first attempts to adjust and health of human spirit and the second tries for human health and physical integrity". In an eloquent hadith, Imam Sadiq (AS) believes that people require three groups. He says that people of the Earth do not become free of needs for three groups in the world that they seek shelter them for their affairs in the world and afterworld, and if they don't have them, they will be unfortunate: the virtuous jurisprudent scientist, righteous and obeyed ruler and the skilled and trusted physician. Since medicine deals with treating disease and protecting health of human being, doctor should study characteristics and intricacies of the creation system in body. Therefore, medical profession associates people with God more than other professions (Soori, 2011). The Holy Quran says: "anyone who alive a man, he has given life to all mankind" (Computer Research Center of Islamic Medicine). Nevertheless, it is evident that medical profession is a sacred profession in Islam.

About the importance of privacy, it is sufficient to say that it is in the field of law that a person can exert his individuality. Failure to identify privacy for human means destructing his individuality because in this case, conscience loses its effectiveness. By removing the privacy, there is nothing remained, except puppets with human faces. The need to protect right of privacy has been emphasized in international documents. Article 3 of the Universal Declaration of Human Rights (1948) states: "everyone has the right to personal life, liberty and security". About respecting the privacy, Article 18, Paragraph B of the Islamic Declaration of Human Rights, adopted on 14 Muharram 1411 AH in Cairo, states: "every person has the right to be independent in his private life, and it is not permissible spy or monitoring on him and tarnish his reputation and he should be protected against any coercive intervention" (Soori, 2012). The domestic laws have emphasized the need to respect right of privacy, including Articles 4 and 7 of Code of Criminal Procedure, adopted in 2013. In Article 4, Iranian legislator has prescribed that intervening in privacy of persons is not allowed, unless by legal order and in compliance with regulations under supervision of judicial authority. In the following, Article 7 of the law obligate judicial authorities, the judiciary liaisons and other persons involved in judicial process to respect the stipulated citizenship rights in the Act of Respecting Legitimate Freedoms and Protecting Citizens' Rights, adopted on May, 5, 2005.

Confidentiality is a moral and religious duty of every Muslim. Religious doctrines have emphasized on the need for confidentiality (Soori, 2012). According to the nature of

physician job, the ethical obligation is more important for him because patient states his disease and reliefs treatment, due to the confidence. In this regard, Imam Ali (AS) says "if a person conceals hidden aspects of his illness, his doctors cannot treat him". The Hippocratic Medical Oath states: "during my career and even out of it, I will not say whatever I see or hear about lives of people that shall not be revealed because such material should be dismissed in the treasure of secrets". On medical confidentiality, Pandnameh Ahwazi states: "clinician should maintain his patients' secrets and avoid deciphering them for foreigners, relatives and others because many patients keep hidden and concealed their patients from parents and their relatives, but retell it for physician. Therefore, physician must be more careful to conceal the condition of disease than patient (Zeraatkar and Mahmoodian, 2009).

Medical secrets are data that patient does not wish to disclose them. They include all information that the patient may not tell to the doctor personally, but the doctor has understood them whether directly to the bedside, or indirectly, due to exchange of information in room, hallway or elevator in hospital and randomly during diagnosis and treatment. The information is considered as patients' secrets too. In addition to physician access with patient's personal history, confidentiality and privacy have a wider range of "confidentiality of information". There can be identified three different types of personal issues: psychological, social and physical secrets. Psychological secrets include a patient's ability to control emotions, perceptions, exudations, thinking, attitudes, beliefs, values and right of determining the conditions and individual who is entitled that patient reveals his thoughts and feelings with him as the confidential and private information. However, if doctor wants to do effective diagnosis and treatment, it will be inevitable asking personal questions and disclosing confidential data. The patient may consider expanding the relationship between him with physician, more aggressively and strongly controlled, as violation of psychological secrets. Social secrets are beyond psychological secrets and information and include the ability and effort of patients to control social relationships and improve interpersonal relationships. Observance of customs, their official forms, type of personal issues and the spoken language are defined as social secrets. Doctors' behaviors during patient's treatment are affected by social norms. For example, a patient may consider the eye contact as much intimacy in relationships and therefore, it may be considered as violation of norms in the context of medicine. In fact, physical secrets are defined as access to patient (Meghdadi and Delavari, 2014). Obviously, during medical examinations, perfect understanding of patients' physical or privacy secrets is inevitable and necessary. Patients believe that some medical behaviors are violation of physical and privacy secrets such as watching patient while he is ready for the examination, the unexpected touch patient, listening to private conversations or private practice of patients.

3. Principles to Protect Medical Secrets

The secret among three persons is a public secret. This interpretation has been quoted by Marzine, French lawyer, on the need to protect confidential information. Secrets' value depends on their confidential description and this feature allows owner to exploit the secret; it also justifies deterring others to the unauthorized access, use or disclosure the secrets. Legal laws and procedures have always insisted on protecting valuable information, however, some believe that protecting secrets should be very limited because it is a great obstacle to achieve the free flow of information. In addition, it imposes unreasonable restrictions on the possibility of moving employees, has adversely effects on promotion of innovation and finally, stifles the principle of free competition in its seed. This opinion is not acceptable and as we will see, the proposed arguments in the form of concerns about legitimacy to protect medical secrets remove these doubts largely (Rahbari, 2009). Lawyers have always considered observation of ethical issues in patient-physician relationship. Honorable and honest behavior requires to refrain all forms of immoral behaviors such as misrepresentation, fraud, espionage, theft, misuse, undue

acquisition of confidential information, breach of obligations and whatever else that is contrary to consent of holder of secrets. Removing protection rules will lead to allow immoral acts and purification of illegal equipment's that opportunists take their advantages for illegal acquisition of secrets; it is a matter moral has never submitted and does not give permission to use others' secrets. It may be argued that the ground is not relied on legal considerations, but it is simply considered as a moral advantage that cannot justify support of secrets in legal frameworks. While it must be remembered that many legal rules are rooted in moral foundations and in their evolution, many ethical implications have put on more obligatory clothes, in terms of social necessities; therefore, courts consider the supportive principle (Sharppin, 2004.). In medical jobs, observing ethical and professional principles has been seriously recommended and considered as the most important feature for physicians and doctors. Accordingly, on Islamic and Iranian literature and documents, there have been suggested various features as ethical culture in medicine such as the relationship and remember of God, trust in God, confidentiality, good humor, promising, appropriate communication and behavior with patients and good beliefs. What caused that angels worship human being was not his earth body, but his gifted nobleness by the Spirit of God. Preserving and promoting the dignity is the main task of every human being and the key reason for success to carry out the divine duty is to adorn the beauty that the Holy Prophet (PBUH) introduced it as the reason of completing his mission and indeed, this beauty is respects of ethics. Among different branches of professional ethics, medical ethics have a unique importance because its subject matter is the noblest creator of existence, namely human being. Medical ethics has always been associated with medicine and great physicians have emphasized and considered it during different periods. Meanwhile, the golden pages of Persian literature contain recommendations that can strength belief, trust and confidence in medical community and enhance a way to communicate with patients and their family (Eslami, 2009). It can be accepted that disclosing professional secrets is against with ethics and legality of its criminalization can be inferred from the Penal Code. Finally, every man is obligated to keep secrets of himself and others, especially about doctors because in addition their belonging to this class and their swear that they have concluded a contract with patients or organization; they are obligated to the matter. Privacy is a valuable moral act, but more important issue is that observing confidentiality by doctors means respect to the principle of human freedom and independence. On the other hand, people have fundamental right on their information that allows them to monitor or use and prevent the unauthorized disclosure the information. Thus, if others can access their information in the name of freedom of information, which medical secret is one of its kinds, it means ignoring this fundamental right. Of course, secret protection is not an obstacle to develop valuable information.

4. Criminal Liability

Generally, it should be said that individual's obligation to respond any aggression to others is brought up under the title of "criminal liability" or "penal liability", whether it is carried out to protect individual rights or defense of community (Ardebili, 2014). However, none of Criminal Codes, both past and present, has expressed a clear definition for the legal nature and criminal liability. Criminal liability is a personal obligation to respond the adverse effects of criminal phenomena or crime.

From criminal perspective, commit a crime or any violation of the Criminal Codes and Procedures does not lead alone and itself to criminal liability, but if we want to consider a person as responsible and punishable to commit a crime morally and socially, there should be available conditions including occurring criminal behavior that is originated from desire and will of its perpetrator and determine his manner of thoughts, deeds and decision; the realized criminal act in the outside world by thought, intention and desire of the perpetrator should be caused by bad intention of the perpetrator or his mistake and error; if we want to account a person in commit crimes, there should be a

relationship between the committed crime and its subject, in addition to the will and bad intention or criminal fault. In general, anyone who commits in a crime with knowledge and information is not necessarily accountable, but he must be qualified with common individual characteristics, in addition to realize the will and bad intention or criminal fault; in this case, occurring the crime can be attributed to him. As a result, a person is liable when he can be criminally responsible for an accident; namely the accident can be attributed to him. Therefore, criminal liability is the consequence of assignment and attribution capability. The purpose of attribution capability is that it is determined for the judicial authorities that in terms of physical, mental and will power as well as authority, perpetrator of the offense has the capacity so that it can be defined a causal relationship between the carried out crime and its perpetrator. In fact, the crime liability is obtained from direct results of attributing the crime to its perpetrator. In this case, it can be briefly said that criminal liability is attributable and documentable to criminal acts. Basically, the penal codes cannot create rights for all people, but force people to respect the rights and values. For this reason, the penal codes are called "law of values" too. The obvious feature of penal (criminal) code is its severe sanction. This is punishment and penalty that has changed penal code to a repressive discipline, compare to other trends. As this tool is available only to ruler, criminal law is considered as a branch of public law. Dr. Hassan Emami has sometimes used the term of punishment instead of sanction. To define of this term, he said: "punish consists of the prescribed conclusion in the rule about violating from legal law. In other words, punish is the reaction of non-compliance with law by individuals and it is against violators of law that is imposed on offender by the public forces in cases of violation" (Emami, 1986). Criminal regulations and laws impose obligations and duties on individuals that are related to maintain important values of society. The person is called to account for violating one of these duties and punishment in criminal liability is a defensive reaction that society indicates against criminals and therefore, the purpose of penalty cannot be limited to maintain private rights (Ibid).

After victory of the Islamic Revolution and in direction to implement Article 4 of the Islamic Republic of Iran's Constitution Law (yazdanian, 2007), there was changed criminal liability resulting from medical procedures. According to regulations of the Islamic Penal Act, approved on Oct. 13, 1982, the doctor actions were considered allowable, if medical necessity would approve its carrying out and it would be done for treatment. However, after approving the Islamic Penal Act on 1991, there were predicted more coherent and complete rules about medical procedures and responsibilities of medical professionals; for example, it ignored being essential condition for surgery operations in all cases. About getting letter of satisfaction, Paragraph C of Article 158 of the Islamic Penal Code, approved 2013, states that any legitimate surgery or medical operation should be done by consent of person, parents or legal guardians and in conformity with technical and scientific and governmental systems; however, in urgent cases, taking consent is not necessary. In Articles 495-497, legislator has identified toggle and acquittal dimensions for doctors.

In the Islamic Penal Act 2013, the first season of the fourth part for conditions of criminal liability, paragraph C of Article 158, provides: in addition to the mentioned cases in previous Articles, conducting behaviors that are legally crime, are not punished in the following cases: .... (c) any legitimate surgery or medical operation should be done by consent of person, parents or legal guardians and in conformity with technical and scientific and governmental systems; however, in urgent cases, taking consent is not necessary. Another important approved law on medical affairs in this period was the Governmental Suspended Health and Treatment Affairs, approved by the Expediency Council at Feb. 13, 1989. The law consists of 44 articles that include regulations about the following cases: 1) establishing the unauthorized medical institutions by ineligible persons; 2) establishing medical institutions by qualified persons without obtaining a license; 3) refraining hospitals to accept and provide basic services for emergency patients; 4) employing medical and

paramedical professionals and owners without legal authorization; 5) appointing medical and paramedical professionals in the unauthorized places; 6) creating and providing redundant services to profit; 7) leaving medical institution by technical authorization in the defined hours; 8) procuring and providing medicines from illegal sources and providing medicines without a prescription; 9) employing the unqualified professionals in medical institutions; 10) absence of pharmacist authorization in the defined hours; 11) managing drugstore without presence of technical authorization; 12) establishing pharmacy without obtaining a license; 13) supplying medicine without authorization from the Ministry of Health; 14) the unjustified closing medical office or medical institutions without notification to the medical system; 15) increasing the official rate of medicine and overcharging; 16) refusing to supply medicine; 17) refusing pharmacy to supply medicine and services in the defined hours. The State Punishment Organization is responsible to investigating all the mentioned crimes.

4.1 Basis for Doctor Criminal Liability in Violating Medical Secrets

If in the field of criminal laws, it is asked that what criminal liability and why criminal liability is related with doctors, the overwhelming answer will be that because he has committed in a crime. If we ask what crime is, its answer will be that crime includes any action that law prohibits and punishes it. Therefore, if the law does not prohibit act or omission in a special meaning, and there is not identified punishment for it, meaning that legal prohibition is not sufficient, its committing cannot be the basis for criminal liability, in any way. In criminal laws, legislators are difficultly committed to the principle and prohibit any extended interpretation of the criminal provisions that extends the concept of crime and punishment (Sanei, 1997). Perhaps this principle in the field of criminal liability has caused that persons who has considered criminal liability among triple legal liabilities, and it is just condemned to the above principle, consider morality range beyond the law. While, neither law is equal with statute or civil liability is confined to criminal liability. It is only in criminal liability that we can rely on the above-mentioned principle and it should be considered that implementing this principle in criminal laws is an aspect of implementing the moral and intellectual principle of the unexplained punishment ugliness (Baheri, 2001). It is certain that although violating moral standards, especially in professional morals, cannot be considered as doctor liability, but its punishment will be determined according its degree of unfavorability in the community. However, it is condemned to moral judgments, but it is not restricted by the judgments (Farahbakhsh, 2013). There is the same basis for criminal liability and why one is considered as a guilty person. The person has or has not committed an act that has been prohibited and punished by law.

The clear and decisive basis for criminal liability of a doctor and why he is faced with criminal liability is that has committed in a medicine crime. The offense should be determined and punished by the law. Therefore, thousands of legal texts (in general) that prohibit the physician from doing something or obligate him to do something does not mean determining the crime and violation of these rules will not lead to criminal liability. As seems to be more accurate, any act or omission that leads to physical injury of patient cannot be considered as a crime, unless the act or omission is considered as a crime under other criminal title. It seems that it can be said that atonement means are not considered as crimes automatically. Atonement is essentially a financial liability and effect of civil liability and should follow a civil liability system. To explain liability of doctor and its lapsing, the jurists have indicated that are loyal to the literature of civil liability. Articles 59, 60 and 319 of the former Islamic penal code had shown that despite raising the issues as crime following the crimes against life and limb, it follows the principles of liability. However, obligation to shape and plan, which it was originated from the detailed jurisprudence books and bring up atonement issues with retaliation subjects, cause to keep distance fundamentals of doctor guarantee from its

components. Accordingly, the formalism dominated on realism. By considering the matter that atonement is one of effects of civil liability, not criminal liability, we believe that only physical damage to the patient, an act or omission cannot be considered as the physician's criminal act, but the act or omission should contain triple pillars of a comprehensive crime to be the basis for criminal liability (Sadat akhavi, 2015).

4.2 Constituent Elements of Violating Medical Secrets

Disclosing medical secrets was one of the stipulated offenses in the former Penal Code that was approved by adapting Article 378 of the France Penal Code (The French Punishment Law) on January, 13, 1926 by Iran legislation, and was amended on May 28, 1973. Article 220 of the Act provided that "doctors, surgeons, midwives, pharmacists and all those who are confidant due to their job or career, whenever disclose secrets of people, except in cases that they are obligated by law, they will be sentenced from one month to one year in punitive imprisonment, and pay 25-200 Tomans as compensation". With a few changes on 1982, this Article became to Article 106 of law of sanctions that there was predicted 74 lashes as punishment of the offender. In May 17, 1976, the legislator amended the Article by changing the mentioned penalties in the above article, and now disclosing secrets is legal element of the crime. The Article text is as follows: "doctors, surgeons, midwives, pharmacists and all those who are confidant due to their job or career, whenever disclose secrets of people, except in cases that they are obligated by law, they will be sentenced from three months and one day to one year in prison or a fine of one million and five hundred thousand to six million Rials".

4.2.1 Character of the Perpetrator

In Article 648 of the Islamic Penal Code, legislator has stated that disclosing secrets of patients is a crime, with respect to include character and personality of the perpetrator. In other words, according to the Article, a person who has committed a crime should be an individual who is considered as the confidant based on his professional career, namely in fact, his job and career in such a way that the people tell their secrets to him, according to the special feature to assure him. The legislator has mentioned some people who are the subject of confidant of people, due to their special resolution and features of their professional such as doctors, surgeons, midwives and pharmacists, and then has assigned diagnosis of the issue judgment to the judge, by stating the general expression that "all people who are confidant because of their job or career". Therefore, the legislator has identified some people subject of the legal law in allegory and the judge is responsible to determine other people. Here, the raised question is that by considering the stipulated legal issues in Articles 648 that only include doctors, surgeons and other medical professionals, does the sentence that "all people who are confident because of their job and career" include other medical professionals such as dentists, nurses, physiotherapists, nutritionists, radiologists, specialists of laboratory sciences and even students of the course as well as other people who work in the field traditionally including bonesetters? Or does the allegorical nature of the included people in the case mean inclusion of other professions and occupations? The legislator or judicial procedure has not demonstrated specific criteria for identifying individuals subject to the law or those who are confidant of people because of their job. On the other hand, the matter can be considered as basis for action that "all people who are confident because of their job and career" include people who are obligated to maintain the professional secrets in other regulations, due to their job and career and the legislator has only predicted punishment of perpetrators of that crime (Pad, 1973).

4.2.2 Secret

Another condition and element of the crime of disclosing secret is that there is a secret between doctors with patients and other owners of professions who they are considered as confidante of

people due to their profession; in other words, there is a subject between them with secret aspect that other people should not be aware of it. In a better definition, the disclosed issue should be known as secret. For example, when a person with the minor talusemia who describes his disease for the doctor, in fact, has brought up his pain with him and has no interest that others are aware from his disease. Here, act of perpetrator is committing a crime, if other legal requirements are available. The legislator has not provided a clear definition of the secret and there is no a case in the judicial procedure that can provide a legal definition on secret. Necessarily, we should consider opinions and statements of lawyers. In the law terminology, there has been stated: "secret includes a matter that typically have a motive to conceal it. Therefore, if people do not desire to conceal a matter and state it in different ways, it will not damage its secrecy nature, namely it does not deny its secrecy nature (Jafari langroodi, 1997). The obligation of owners of some professions to refrain disclosing secrets that have achieved due to their professional activities can be called secret such as lawyers, doctors, pharmacists, secretaries. Violating this obligation, other than those stipulated in the law, is liable to punishment. According to the above definitions, there are gathered two essential points.

Firstly, secret is a matter that typically has a motive to conceal it. Secondly, secret has been obtained as a result of a specific occupation or job. Meanwhile, secrets that the doctor gains from his patient are divided into two categorizations: a kind of secrets relates to the disease itself such as drug addiction, consumption of alcohol or diseases that physician will diagnose during his examination, testing and surgical operations including sexually transmitted diseases; and the second type includes secrets that doctor discovers by discussion and questions from the patient such as the secrets of parasitic diseases or a disease that he will diagnose during his investigation including some congenital defects of the patient. Therefore, secret is a matter that its disclosure will firstly harm the secret owner and secondly, the secret owner does not consent to its disclosure. Although this harm on the secret owner has no impact on crime commitment and criminal liability of perpetrator, namely the court is not obligated to examine harm on the patient for obtaining crime prejudicing, but it should be remembered that prosecute the perpetrator depends on complaint victim of the crime. In addition, to obtain committing in a crime, it is not necessary that patient emphasizes that doctor does not disclose his secrets because the legislator has obligated the doctor for the task and using the penal guarantee, he obligates the doctor to prevent disclosing secrets of patients. On the other hand, it should also be noted that expression of nature of some common diseases, which the society does not consider them as secret disclosure, cannot be realized as disclosing secrets such as notification of the coroner that a patient had died because of the heart attack (Abbasi, 2009). Here, there is raised the question that whether mean of the legislator on disclosing secrets of people or patients is only secrets that the doctor will be informed about the type of disease or it includes all reflected information for the doctor, even information related to the patient's disease that he has no knowledge about them. As mentioned, Article 648 of the Islamic Penal Code, Sanctions Section reveals that "if doctors, midwives and pharmacists, who are confidant because of their occupation or profession, disclose people secrets illegally, they will be condemned in prison from three months and one day to one year or pay cash punishment from 1,500,000 to 6,000,000 Rials". According to this Article, it appears that there should be distinguished between two categories of information that are provided for the doctor or he will notify them:

▪ Information that the doctor will be made aware because of his job, which they are not related with the patient's disease;
▪ Information that the doctor will be made aware because of his job, but they are in line with the patient's disease

About the considered information on the first paragraph, it seems that the legislator has not considered any specification for the

doctor and in this case, there is no difference between the doctor and other people of the society. Therefore, if he discloses information that has no relevance with the patient's disease, the doctor will not be included in the Article 648 of the Islamic Penal Code. However, in the second paragraph that act of perpetrator is a crime and criminal prosecution, according to the legislator stipulation that "whenever they disclose people's secrets in illegal cases", it should be identified that whether the provided report for police by doctor and disclosing secrets of patients can be considered as the stipulated subjects in law that exempt the doctor from punishment, or in other words, it can be considered as excusable reasons of crime. Naturally, in the first case, there is no liability for the physician and if the subject is not a legal stipulation, disclosing patient's secrets will be certainly applicable in Article 648 of the Islamic Penal Code (Ibid). As the mentioned issue is included the legal stipulated cases and it is out of the considered exceptions for disclosing patient's secrets and as his remained information is a part of his secret about disease, therefore, the conducted action by doctor will be committing in crime, if there is obtained other legal conditions; so it is considered as one of evidences of disclosing patient's secrets.

4.2.3 Disclosing Secrets

The secret disclosure is material basis of crime that means revealing and informing others about the secret; it is not important that the secret is disclosed as written or verbal, public or non-public and partial or general. The means and how to disclose a secret are not considered as conditions. Disclosing secret in any way shows achieving material element of crime and it will be the subject of Article 648 of the Islamic Penal Code, if there are achieved other requirements. According to the written sentence in the Article, the legislator has expressed secret disclosure absolutely; therefore, in addition to the above-mentioned matters, if the doctor discloses a professional secrets for his wife, put it for another doctor other than in legal and justifiable cases, raises it in interview with magazines, radio, TV or in medical and non-medical seminars or even the patient is one of his relatives, it cannot be considered as cause of removing his liability. Therefore, disclosure of patient secrets in any form represents the realization of material element of crime and by fulfilling other elements of the offense, the perpetrator is responsible and prosecuted.

4.2.4 Criminal Intention

Criminal intention or malice is another element of the crime of secret disclosure. This is an intentional crime. Therefore, for its fulfillment, it is necessary that the perpetrator has the malice intention when committing the crime. The secret disclosure will not be punishable, if the secret is disclosed because of negligence or carelessness of the perpetrator to maintain the secret. However, lack of criminal liability of the practitioner in this case cannot prevent him from civil liability or warrant for damage compensation, if the secret disclosure is led to a loss for the secret owner. Of course, damaging the patient is not necessary condition to commit a crime by doctor that leads to his criminal liability. As we know, malice includes general and individual types. In this crime, general malice means that the doctor take an action by knowledge and intentionally that leads to disclose secret of patients; while in individual malice, the perpetrator wants to realize the crime. In crime of secret disclosure, commissioning to commit a material act is sufficient to achieve it. In fact, its realization is not bound by the result. So if a doctor discloses secrets of a patient with knowledge of confidentiality and the spiritual element of crime is achieved, the crime will be realized.

Another point that should be noted is that, firstly, in the name of scientific progress, secrets of patients cannot be disclosed without his permission; secondly, the incentive has no effect to commit this crime; thirdly, serve to others is not a cause to disclose secrets of patients (Saket, 2005). As a result, we can say that character of the offender, secret, secret disclosure and

criminal intention are considered as constituent elements of the crime of secret disclosure; if these elements are achieved, the doctor's criminal liability is realized and he will be sentenced to the defined legal punishment.

4.3 Punishment of Disclosing Medical Secret

As mentioned disclosing medical secrets was one of the stipulated offenses in the former Penal Code that was approved by adapting Article 378 of the France Penal Code (The French Punishment Law, 1810), on January, 13, 1926 by Iran legislation, and was amended on May 28, 1973. Article 220 of the Act provided that "doctors, surgeons, midwives, pharmacists and all those who are confidant due to their job or career, whenever disclose secrets of people, except in cases that they are obligated by law, they will be sentenced from one month to one year in punitive imprisonment, and pay 25-200 Tomans as compensation". With a few changes on 1982, this Article became to Article 106 of law of sanctions that there was predicted 74 lashes as punishment of the offender. In May 17, 1976, the legislator amended the Article by changing the mentioned penalties in the above article, and now disclosing secrets is legal element of the crime. The Article text is as follows: "doctors, surgeons, midwives, pharmacists and all those who are confidant due to their job or career, whenever disclose secrets of people, except in cases that they are obligated by law, they will be sentenced from three months and one day to one year in prison or a fine of one million and five hundred thousand to six million Rials". If crime of secret disclosure leads to material and spiritual losses for the patient, the perpetrator will be sentenced to compensate the losses, according to regulations of civil liability.

Punishment of disclosing medical secrets will not be subject to supplementary and complementary effects, but according to Articles 79-82 of Criminal Procedure Law, there can be suspended prosecuting the perpetrator. In the semi-liberty system, if the court agrees with the orders of judge of carrying out of decree, the judge will issue the court order and inform prison about it, after getting proper securities from the losing party. Article 66 of the Islamic Penal Code suggests that perpetrators of intentional crimes with maximum punishment of 91 days to six months' imprisonment can be sentenced alternative punishment imprisonment.

5. Conclusion

One of manifestations of right is to protect privacy, especially when human beings are inability. Individuals have fundamental right on their information that allows them to monitor or use and prevent the unauthorized disclosure the information. Thus, if others can access their information in the name of freedom of information, which medical secret is one of its kinds, it means ignoring this fundamental right. The concept of privacy is an essential and important need for human and has various physical, psychological, social and informative dimensions. The patient has the right to determine how and when to give information to others or hospital organizations. He is entitled to identify nature of his personal thoughts that gives to others, who can receive the information and how to use it.

One of the raised reasons to justify confidentiality is to respect for patient autonomy. The principle of autonomy emphasizes on the patient's right at all stages of his life. In terms of autonomy, an individual's personal information belongs for him and others should be aware without his consent. In breaching confidentiality, patient autonomy will be eroded too. It must be carefully determined the patient is willing to confident which his personal information and he is consent to reveal which information. Of course, a consent can be considered as the permission of disclosing patient's secrets that is issued by owner of the secrets (patient or his legal guardian), explicitly or implicitly, without any ambiguity, and continues until disclosing the secret. Thus, the patient has the right that his medical records are maintained in a secure environment that accessible only by

employees who are authorized to use it; even when the patient is out of the relevant sections for care purposes. However, disclosure of personal data can lead to its own legal problems. Limit of medical confidentiality begins since accepting patient for examination without ending, namely it is continued during treatment, after treatment and even after his death.

Confidentiality has a long history on customs, habits, religion and ethics of different societies. It is considered as one of components for patients' rights that there has been considered legal guarantees to prevent its violation. Confidentiality and secrecy of medical records by doctors and health-treatment staff is necessary based on jurisprudence and legal resources, and its disclosure is a committing in crime, unless to continue the patient's treatment or medical research and in cases are allowed by the law. The patient has the right to confidentiality of his identical information about health situation, medical conditions, disease, treatment and other private information, even after his death; the secret information will be disclosed by consent of patient or in cases that have been determined by the law clearly. On the other hand, medical records can be erased and destructed, and determining the duration of storage of medical records depends on the country's policies directly.

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SOCIAL POSITIONS OF STUDENTS AND CYBERBULLYING

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Abstract: The present study studies the evaluation of the social position of students towards cyberbullying. The dedicated survey was targeted on the self-evaluation of students among their classmates and the students' social positions were consequently put into the relation with cyberbullying. The research was aiming at identifying the relations between students' social positions and the level of cyberbullying. The results of the research confirm the assumption that there is a relation between the perceived social position of student and cyberbullying. The research was carried out as the part of VEGA project no. 1/0244/15 Detection and resolving cyberbullying

Keywords: social position, sociometric status, cyber-aggressor, cyber-victim

1 Introduction

The phenomenon of cyberbullying has been recently given more and more attention. The seriousness of this phenomenon is confirmed by theoretical studies and researches worldwide. In Slovak Republic, several experts including Valihorová (2015), Žiaková (2014), Hudecová (2014), Emmerová (2013), Dulovics (2013), Gregussová & Kováčiková (2009), Hollá (2010, 2013) et al. are studying the phenomenon of bullying in cyberspace. Empirical studies of cyberbullying are carried out on various levels and scopes (the social phenomenon, the form of aggression, psychical violence, the cyberbullying at schools, the consequences of cyberbullying, etc.).

The study is focused on identifying the relations and links between student's social position and cyberbullying. The fact how students evaluate themselves and their behavior represents the factor contributing to the start of cyberbullying.

Students' self-knowledge, self-understanding, and self-awareness, awareness of their role, the role in the classroom, their sociometric status require mastering of self-perception (self-image). Students can create their self-image via two forms: through introspection (self-examination) and through the evaluation of the results and consequences of the own behavior. As Oravcová (2004) points out, the creation of self-image comprises the important parts including *social comparison* (comparison of an individual to famous people), *self-reflection* of the own experiences over a period of time, basically the self-evaluation, focusing on the own positive and negative aspects, potential for changes, *feedback*, the information about an individual receiving from other people.

Self-awareness is closely related to the social position and sociometric status in the class environment. Students acquire their position and status on the basis of several factors: from their parents, through the ontogenesis, by the statements of the people in their surroundings, however, the latter may not necessarily be true. The position that student acquires in the class environment proceeds naturally from the outside world and from personal attributes. This includes particularly personal attractiveness, popularity – the bigger it is, the stronger student's position becomes. The position of the student is affected by the character of social relations in the class.

If a student acquires high number of social relations and selections from the classmates, it proves their acceptation or rejection in formal or informal group. The important factor that also contributes to the forming student's position includes meeting the expectations of being useful within a group, pushing through the own opinions, accomplishing the own ambitions, the ambition to be respected, admired, satisfying the need of self-realization, etc.

The student with high position and status in the classroom has significantly higher influence on the other students and is thus recognized as the natural leader of the group or team.

Student's activity within the classroom goes beyond the role of the student receiving the information. The current education practice requires the student to meet cognitive, social, emotional, moral and ethical skills, to master critical thinking and constructive evaluation of positive or negative situations in the class.

The current educational professional discourses underline the need of secure classroom environment particularly from the emotional, social aspect on various levels.

Proceeding from the latter, we would consider very important to think about the students' positions in relation to the occurrence of cyberbullying.

2 Relation between students' social positions in the class and cyber-victim and cyber-aggressor

2.1 Research goal and methodological base

Many scientific theoretical studies and empirical surveys register the presence of aggression and bullying in cyberspace in the global scope. The empirical aspect of the study aimed at identifying the existence of the relation between students' social positions in the classroom and the level of cyber-aggressor/cyber-victim. We studied the existence of statistical significance between student's social position and students' level of cyber-aggressor/cyber-victim. The focus was laid on the evaluation of student's position (self-perception) in the scope of cyberbullying.

Cyberbullying and Online Aggression questionnaire (Hinduja, S., Patchin, J. W. 2009) was used to collect the data. The modification of the questionnaire for the conditions of Slovak school environment proved highly effective values.

The reliability of the translated and modified research tool was established using Cronbach's alpha in SPSS program. The coefficient in the scale of cyber-victim was 0.864 and in the scale of cyber-aggressor 0.905 (Hollá, Fenyvesiová, Hanuliaková, 2016). The values of both scales point out highly effective internal reliability of the research tool. In addition to the above-mentioned questionnaire, we also used the non-standardized questionnaire focused on students' social positions within the class.

2.2 Research participants

The research sample included 1,118 primary school (PS) and secondary school (SS) students (boys – 45.5%, girls – 55.5%) from all regions of Slovakia.

The greatest number of students came from Nitra region – 45.2% and Žilina region – 20.8%; on the other hand, the least came from Bratislava region – 2.8% and Košice region – 3.5%. Most students (57.1%) attended primary school. The research included students aged 11 – 18 (the average age was 15.25). The structure of the research sample is demonstrated in Table 1.

Table 1: The structure of the research sample

| Region | N | Sex | | Type of school | | Age |
		Boys	Girls	PS	SS	Average (SD)
Bratislava	31	15	16	23	8	14.90 (SD = 2.23)
Trnava	90	45	45	20	70	16.34 (SD = 2.28)
Trenčín	90	42	48	71	19	13.11 (SD = 2.18)
Nitra	505	221	284	227	278	14.95 (SD = 2.39)
Žilina	232	100	132	20	212	17.34 (SD = 1.69)
Banská Bystrica	71	34	37	46	25	13.59 (SD = 1.97)
Prešov	60	34	26	44	16	14.15 (SD = 2.31)
Košice	39	18	21	29	10	14.00 (SD = 2.38)
Total	1118	509	609	480	638	15.25 (SD = 2.55)

(N – number of students, SD – standard deviation)

2.3 Research results

In recent years, cyberbullying has been studied by a vast number of experts. Following the research goal, we collected the data via questionnaire method, i.e. we performed the quantitative research. Using this questionnaire, the participants evaluated their social position in the class. We were highly interested in the participants' evaluation of their own behavior towards the other classmates and also the opinion, attitude and judgment of the latter group.

The collected data were evaluated by IRT statistic method, MANOVA method, Pearson's test and Tukey's test. We also used descriptive and inductive statistics to evaluate these data. IRT method helped us to identify the students' levels of cyber-aggressor and cyber-victim. Students' social positions in the class were identified by their answers to the questionnaire items:

- In the classroom, I...
- My classmates think, I...

Since the highly positive correlation measured by Pearson's correlation coefficient r (boys: r = 0,61 (p < 0,001), girls: r = 0,59 (p < 0,001)) was proved between the level of cyber-aggressor and that of cyber-victim, we used multivariate analysis of variance (MANOVA) for each question individually, in order to study the significance of the cyber-aggressors' and cyber-victims' levels regarding students' social positions in the class.

In the classroom, I… vs. Cyber-Aggressor (C-A) and Cyber-Victim (C-V)

In the questionnaire item *'In the classroom, I...'*, the respondents were offered to select one of the possible social positions: I behave friendly, I act like a leader, I often spread gossips, I make fun of the others, I hurt the others, I am ambitious, I act rudely and disturb, I act indifferently, I am emphatic and devoted.

The values in the Table 2 demonstrate both boys and girls mostly claim that they behave friendly in the classroom.

Table 2: Score of cyber-aggressor and cyber-victim according to the behavior and sex

| In the classroom, I... | CYBER-AGGRESSOR | | | | | | CYBER-VICTIM | | | | | |
| | boys | | | girls | | | boys | | | girls | | |
	N	Avg.	SD	N	Avg.	SD	N	Avg.	SD	N	Avg.	SD
behave friendly	344	-0.08	0.71	461	-0.21	0.62	344	-0.11	0.82	461	-0.11	0.77
make fun of the others	11	1.35	1.06	2	1.00	0.41	11	0.88	1.00	2	-0.44	0.52
act rudely and disturb	24	1.00	0.95	6	-0.17	0.61	24	0.62	0.78	6	-0.39	0.46
act like a leader	46	0.46	0.75	14	0.42	1.27	46	0.17	0.74	14	0.48	1.36
act indifferently	34	0.52	0.91	24	0.11	0.86	34	0.42	0.95	24	0.25	0.92
often spread gossips	4	0.77	0.68	17	0.96	0.48	4	0.74	0.44	17	0.69	0.71
am ambitious	25	0.16	0.78	31	0.22	0.72	25	0.04	0.87	31	0.23	0.80
am emphatic and devoted	18	0.01	0.84	49	0.06	0.68	18	0.05	0.97	49	0.13	0.81

(N – number of students, Avg. – Average, SD – standard deviation)

The least frequent answer is *'I often spread gossips'* (boys) and *'I make fun of the others'* and *'I act rudely and disturb'* (girls). The students who claimed they behave friendly have the lowest average level of cyber-aggressor and cyber-victim.

To demonstrate this phenomenon in more convenient view, we introduce the profile graphs of the average level of cyber-aggressor and cyber-victim for both boys (Picture 1a) and girls (Picture 1b) according to their behavior in the class.
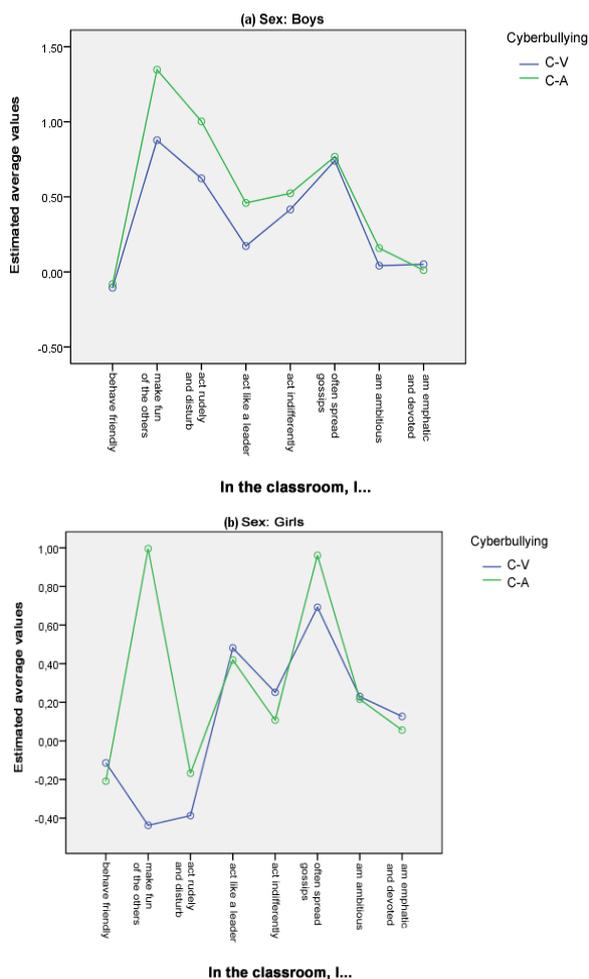
Picture 1: Profile graphs of cyber-aggressor and cyber-victim according to the behavior in the class

The graphs clearly demonstrate that both groups of respondents (boys and girls) have the same statistically significant category: *'I make fun of the others'*. For boys, making fun and rude, disturbing behavior prove they might probably become cyber-aggressors or cyber-victims. Girls, as per their self-evaluation, show high probability to become cyber-aggressors and cyber-victims due to spreading rumors and gossips of their classmates.

Using MANOVA method, we studied (separately for boys and girls) if the way how the students behave in the class statistically significantly affects the level of cyberbullying participants (C-A and C-V). We excluded all the categories with the frequency lower than 10 (*'I often spread gossips'* for boys and *'I make fun of the others'* plus *'I act rudely and disturb'* for girls) from the analyses.

MANOVA method results for *boys* demonstrate the fact that the boys' behavior in the class significantly affects the level of cyberbullying (or vice versa) ($\lambda = 0,811$, F (10; 894) = 9,86, p < 0,001). This relation was proved both in the case of C-V (F(5,448) = 7,63, p < 0,001) and in the case of C-A (F (5,448) = 20,43, p < 0,001). Tukey's test demonstrated that for C-V, the following category pairs show statistically significant differences:

- I behave friendly – I make fun of the others (p = 0,001)
- I behave friendly – I act rudely and disturb (p < 0,001)

The evaluation of students' social positions statistically demonstrated the probability that students making fun of the others in the class and showing rude and disturbing behavior may become the victims of cyberbullying. For C-A, the

following category pairs show statistically significant differences:

- I behave friendly – I make fun of the others (p < 0,001)
- I behave friendly – I act rudely and disturb (p < 0,001)
- I behave friendly – I act like a leader (p < 0,001)
- I make fun of the others – I am ambitious (p < 0,001)
- I act rudely and disturb – I am ambitious (p < 0,001)
- I act like a leader – I act rudely and disturb (p = 0,042)

Conclusions made from the identified results within the correlation of the selected items point out the high assumption that student who makes fun of the others can become cyber-aggressor. Taking age structure of the respondents into account, cyberbullying may arise because of making fun of the physical appearance, success or failure at school, failure to integrate to a group, nerds, preferred students, etc. Statistically significant relation was proved among students considering themselves rude and disturbing and cyber-aggressor. Students' disturbing is the result of passivity during the lesson, tedious lecture or disinteresting learning material. Boredom during the lecture creates the space for students to play on their mobile phones, record their classmates, teachers, whole atmosphere at the classroom and share such content on social networks, or send emails or text messages of various content. Mutual correlation of the student in the position of leader and the cyber-aggressor was statistically proved. A student – leader lusts for power, demonstrates their strengths to evoke fear among the others. If there is no reaction of the surrounding, the aggression intensifies. Rottová (2009) describes this type of cyber-aggressor as "lusting for power". The author generally considers the mentioned type of cyber-aggressor as the most dangerous. Student's self-evaluation as *making fun of the others* forms real assumption for the position of aggressor. Diminishing the classmates, mockery, humiliation, ridiculing of students represent one of the ways how to be successful, popular and respected within a group. Technologies, especially mobile phones and computers with internet connection recently represent significant means of diminishing other people.

The results of MANOVA method for *girls* demonstrate the way how girls behave within the class significantly affects the level of cyberbullying (or vice versa) ($\lambda = 0,876$, F (8; 1082) = 9,26, p <0,001). This relation was proved both in the case of C-V (F(4,542) = 8,09, p < 0,001) and C-A (F(4,542) = 4,93, p < 0,001). Since the equality-of-variance assumption was violated, Games-Howell test was used to evaluate the statistical significance of differences of average values between the category pairs for C-V and C-A. For C-V, statistically significant difference was identified only in the case of category pair *behave friendly – often spread gossips* (p = 0,002). In the case of C-A, statistically significant difference was identified in the following category pairs:

- I behave friendly – I often spread gossips (p < 0,001)
- I act indifferently – I often spread gossips (p = 0,002)
- I often spread gossips – I am ambitious (p = 0,001)

The mentioned results document that frequently gossiping girls become cyber-victims. Claims that girls show disinterest to everything are considered most serious. Respondents' indifference, thoughtlessness, disinterest, demonstrated lack of interest can be shown in the lack of interest in learning, social relationships, emotions within the class and in whole atmosphere in the group. Disinterest and indifference might be reflected intensively in gossiping the classmates. Defamation and gossiping of the classmates as a part of cyberbullying are closely related to respondents' ambitiousness. The compelling fact is that the female students use their self-assertion in the collective exactly for gossiping. Since the aim of spreading gossips is to hurt and harm the other people, female students, who considered themselves ambitious and at the same time spreading gossips, had high tendency to become cyber-aggressors.

My classmates think, I... vs. C-A and C-V
In the questionnaire item: *'My classmates think, I...'*, students were supposed to choose one of these answers: I behave friendly, I act like a leader, I often spread gossips, I make fun of the others, I hurt the others, I am ambitious, I act rudely and disturb, I act indifferently, I am emphatic. Table 2 shows that both girls and boys mostly think their classmates find them friendly.

We may claim that students' opinion of themselves and presumed opinion of their classmates match. Interesting thing is that second most frequent answer is *'I act indifferently'*. Least frequent answer is *'I hurt the others'* and *'I often spread gossips'* (boys) and *'I make fun of the others'* and *'I hurt the others'* (girls). Students who claimed their classmates found them friendly have the lowest levels of cyber-aggressor and cyber-victim.

Table 3: Score of the cyber-aggressor and cyber-victim according to sex and what, in their opinion, the others think about them

My classmates think, I:	CYBER-AGGRESSOR						CYBER-VICTIM					
	boys		girls				boys		girls			
	N	Avg.	N	Avg.	N	Avg.	N	Avg.	N	Avg.	N	Avg.
behave friendly	295	-0.13	295	-0.13	295	-0.13	295	-0.13	295	-0.13	295	-0.13
make fun of the others	26	0.68	26	0.68	26	0.68	26	0.68	26	0.68	26	0.68
act rudely and disturb	37	0.64	37	0.64	37	0.64	37	0.64	37	0.64	37	0.64
act like a leader	38	0.49	38	0.49	38	0.49	38	0.49	38	0.49	38	0.49
hurt the others	8	0.68	8	0.68	8	0.68	8	0.68	8	0.68	8	0.68
act indifferently	43	0.22	43	0.22	43	0.22	43	0.22	43	0.22	43	0.22
often spread gossips	9	0.81	9	0.81	9	0.81	9	0.81	9	0.81	9	0.81
am ambitious	32	0.30	32	0.30	32	0.30	32	0.30	32	0.30	32	0.30
am emphatic	18	0.23	18	0.23	18	0.23	18	0.23	18	0.23	18	0.23

To demonstrate this phenomenon in more convenient view, we introduce the profile graphs (Picture 2) of the average level of C-A and C-V for both boys (Picture 2a) and girls (Picture 2b) according to what, in their opinion, the others think about them.
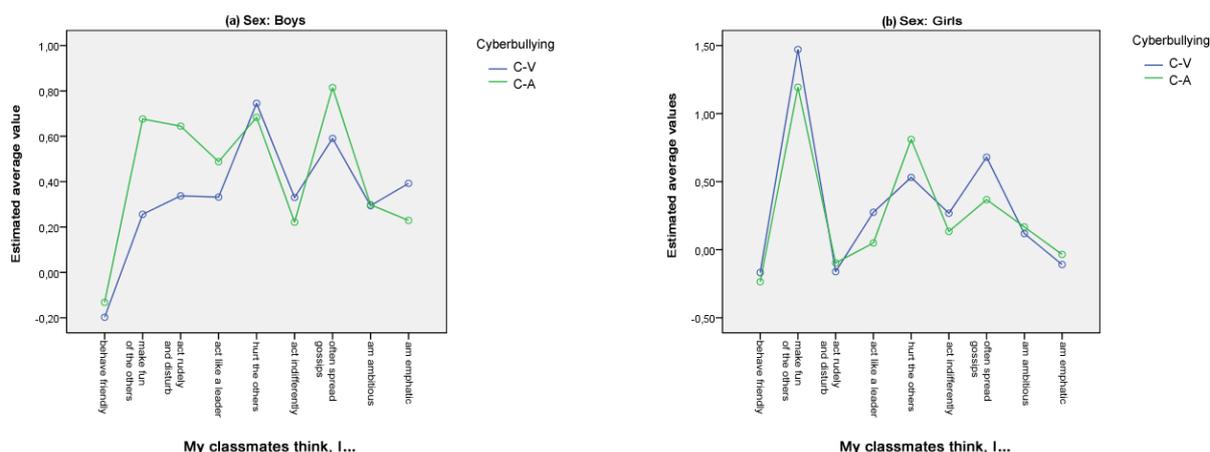
Picture 2: The profile graphs of the average level of C-A and C-V according to what, in their opinion, the others think about them

Above-mentioned graphs illustrate that students are well-aware of the fact their classmates consider them the ones who make fun of the others. Proceeding from this, they may become C-A in the future. Students who show high statistical probability to become cyber-victims think their classmates consider them the ones who make fun of the others or hurt the others.

MANOVA method was used separately for boys and girls to find out if students' opinions of their classmates affected the level of cyberbullying (C-A and C-V) in a statistically significant way. All the categories with less than 10 answers – i.e. *'I often spread gossips'* and *'I hurt the others'* (for both boys and girls) – were excluded from the analyses.

As per MANOVA method results for boys, students' opinions about them significantly affect the level of cyberbullying (or vice versa) ($\lambda = 0,845$, F (16; 886) = 4,86, p <0,001). This relationship was proved for both the cases of C-V (F (8;444) = 5,38, p < 0,001) and C-A (F (8; 444) = 8,11, p < 0,001). Since the equality-of-variance assumption was violated for both C-V and C-A, the statistical significance of the differences of average values between the category pairs for C-V and C-A was evaluated using Games-Howell test. In the case of C-V, the statistically significant difference was proved for the following category pairs:

- I behave friendly – I make fun of the others (p = 0,015)
- I behave friendly – I act rudely (p = 0,030)
- I behave friendly – I act like a leader (p = 0,016)

For C-A, these category pairs showed statistically significant difference:

- I behave friendly – I act rudely (p = 0,015)
- I behave friendly – I act indifferently (p = 0,010)
- I behave friendly – I am ambitious (p = 0,030)

The statistical data processing showed that students who thought their classmates considered them making fun of the others, being rude and acting like leaders were highly supposed to become cyber-victims in the future. The fact that students consider the respondents rude, indifferent when it comes to the class matters, leaders in the team work and dominant makes them supposed to become cyber-aggressors in the future.

As per MANOVA method results for girls, students' opinions about them significantly affect the level of cyberbullying (or vice versa) ($\lambda = 0,820$, F (16; 1072) = 6,97, p < 0,001). This relationship was proved for both the cases of C-V (F (8; 537) = 10,63, p < 0,001) and C-A (F (8; 537) = 11,50, p < 0,001). Since the equality-of-variance assumption was violated, the statistical significance of the differences of average values between the category pairs for C-V and C-A was evaluated using Games-Howell test. In the case of C-V, the statistically significant difference was proved for the following category pairs:

- I behave friendly – I make fun of the others (p = 0,031)
- I behave friendly – I act indifferently (p = 0,033)
- I behave friendly – I often spread gossips (p = 0,015)
- I make fun of the others – I am emphatic (p = 0,045)
- I act rudely – I make fun of the others (p = 0,036)

For C-A, these category pairs showed statistically significant difference:

- I behave friendly – I make fun of the others (p = 0,024)
- I behave friendly – I act indifferently (p = 0,049)
- I behave friendly – I am ambitious (p = 0,045)
- I make fun of the others – I act rudely (p = 0,019).

Girls who are empathic are highly supposed to become cyber-victims. The ability of these girls to understand their classmates and empathize with them may be counterproductive, i.e. they can become cyber-victims themselves. High probability of becoming cyber-victims also affects those girls who spread rumors and gossips. It can be the revenge of those they once gossiped. Girls' lack of interest in their classmates and class matters might proceed from the absence of interpersonal skills. The situation of these girls or their status in the class may deteriorate as soon as the aggressors draw their attention to them. The lack of interest can be also caused by the ignorance of class matters and classmates, the dominance over the others, the absence of interactions within the class, etc. It is important to work on girls' indifference at least within the class, as well as to identify what reasons they have for such a behavior.

In the context of cyberbullying, the student who is not interested in the class matters can hold the position of 'bystander'. This term is used in specialized literature to refer to an inactive participant, i.e. someone who neither stops nor supports the aggressor. Such students represent the third group of cyber-actors. They support bullying and cyberbullying by their apparent lack of interest. From a psychological point of view, we talk about the effect of diffusion of responsibility, i.e. the higher is the number of bystanders, the lower is responsibility to intervene or to do something that would change the whole situation. The supportive behavior of bystanders and the determiners of such behavior were studied by Macháčková et. al (2013).

Girls who make fun of the others are supposed to become cyber-aggressors. Their mockery may arise from different characteristics of their classmates; the effort to have the wanted status in the class; the desire to take revenge, to hurt, to humiliate someone, to attract the attention, to force acquiring the leader status, etc. The statistical significance is also proved in the case of girls who make fun of the others and are rude, as well. The above-mentioned types of behavior represent serious and proved tendency to become cyber-aggressors.

3 Discussion and conclusions

The study examines mutual relations between students' social positions within the class where cyberbullying occurs. Proved by the statistical evaluation, it is highly probable that the student once being in the position of cyber-victim could become the cyber-aggressor. Cyber-victim may become cyber-aggressor who is often referred to the 'vengeful angel' – former victim of cyberbullying who wants to get the revenge in the same way (see Rottová et al. 2009).

The mutual relations are significantly influenced by the way students evaluate their intrapersonal and interpersonal skills. The results from this study present students' most effective responses that can lead to the aggression in cyberspace. This phenomenon as such is essential to be treated both within classroom and at school. Cyberbullying has serious consequences for students. According to the results from this study, we consider very important to pay concentrate on students and their intrapersonal skills. Self-evaluation, self-perception and self-awareness are important elements of personal skills. The analysis of students' responses to the first and second item provides us with the responses where students see themselves as leaders. Following Herenyiová (2013), we can identify two kinds of leaders: emotional and work leader. We believe that it is necessary to focus on and work with the leader from the emotional aspect. Emotional leaders significantly contribute to the friendly atmosphere in the classroom. They handle and settle all the conflicts and other students are more likely to share their secrets with them. If the leader is a mature student with no signs of individualistic and egocentric behavior in front of the class, the class environment is usually positive without any unnecessary conflicts. The leader of the class is also adequately self-confident. Brack & Caltabiano (2014) carried out the research aimed at studying the relation between cyberbullying and self-confidence of the adults in Australia. Cyberbullying can lead to the conflict between the leader and the class. Conflicts between the leader and the core of the class may cause splitting the whole class into isolated or hostile groups. In most cases, the leadership may be held by both socially and emotionally negatively-oriented group. The latter is represented by a problematic student with leadership presumptions whose acts towards the others are autocratic or even despotic. This kind of student tends to use severe methods to persuade other, particularly weaker members of the group.

Social status of a friend is closely linked to student's sociometric status – popularity within the class. Student's popularity within the class can be of two kinds: sociometric and perceived. Sociometric popularity refers to the acceptance among the peers, i.e. to what extent the group accepts or rejects the particular student (Rubin edc., 2006). Sociometric popularity can be also identified simply as popularity. Perceived popularity refers to the way students perceive the individual's position in the group (Rubin et al., 2006), i.e. who they consider popular. The phenomenon of cyberbullying requires us to concentrate on another important element: the creation of subgroups. The creation of subgroups is closely related to the structure of the class and students' positions within the class. These subgroups often consist of students with common characteristics: common school performance (high/poor), the same status within the class, similar interests, the same opinion or 'the same enemy'. The important phenomenon in the creation of isolated subgroups represents the danger of forming elitist or 'outcast' subgroups which may easily become the target of cyberbullying. Rejection and failure are typical for the position of 'outcast' who often makes the atmosphere in the class morally negative. This can affect school, educational and social attitudes of the other members of the subgroup or the class. Jiang & Cillessen (2005) claim that expressing sympathy to peers is recently less stable; having the aversion to the peers, however, has become more stable. In recent years students have become more anxious,

overprotective and they rather focus on aversion than on sympathy. Since students' sociometric status changes in the long-term period, it is necessary to proactively influence students' personalities and their social and emotional skills. We believe that cyberbullying can be effectively prevented by supporting the development of interpersonal skills (students' social skills and competences to be able to handle the conflicts in an appropriate and assertive way; to be tolerant; to accept different opinions, attitudes, religious beliefs, races and social groups; to understand other people's feelings and situations; to be concerned about their classmates' behavior), as well as intrapersonal skills (such as self-knowledge, self-evaluation, self-motivation, auto-regulation of the own behavior, the application of ethical principles in the own life).

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THE FINANCIAL STRUCTURE OPTIMIZATION - A STRATEGIC TOOL FOR COMPETITIVE FIGHT OF COMPANIES

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Abstract: The financial structure optimization is one of the strategic tools for competitive fight of companies. Decision making on the financial structure is an extremely important and key task of financial management of each company. Financial theory and practice do not give a generally respected recommendation for the composition of the company's financial resources. All companies are unique systems with distinctive features. They vary, for example, by asset structure, development phase, investment, and various market positions. There is also a different need for capital with which the company operates. Therefore, it is important for managers to make right decisions, to consider all the risks and uncertainties, and to respect the individual conditions of each company.

Keywords: financial structure, capital structure, financial analysis, optimization.

1 Introduction

All business decisions will be ultimately reflected in some of the company's financial results. That is the reason why financial managers are trying to make decisions that increase the performance and efficiency of the company.

The most discussed and most often addressed issues of company management are questions relating to the financial structure and decision-making about its optimization. The financial structure and capital that company uses to finance its activities are topics that are currently highly up-to-date, and this topic is becoming increasingly important and even more crucial in the company's financial management. This is mainly because the financial structure and its optimal state are largely involved in achieving the financial stability and prosperity of the company and thus the overall efficiency of the company.

Decision-making on funding sources represents an important part in the financial management process, which, on the other hand, is very demanding. The necessity of making the right decision requires the respect of a quantitatively large number of factors that determine the financial structure of the company. In addition, this is a controversial area where there is a contradiction in a number of expert opinions. The subject of an argument is whether the optimal financial structure of the company exists at all and, if so, on what criteria it can be defined. That is why it is hard for the company and especially the financial manager to decide on the optimal ratio of own and foreign capital, in which capital costs will be minimal and at the same time the market value of the company will be at the maximum.

2 Financial and capital structure of a company

Financial management of the company, when deciding on a long-term financial plan, decides on the structure of sources of capital needs. "We understand the financial structure of a company as a share of individual components of own and foreign capital in the total capital that financially covers the assets of a company. The liabilities side of company's balance sheet characterizes the static state of the financial structure. The dynamics of the process expresses the share of own and foreign capital in the financial coverage of the increase of the company assets for a certain period.

Both capital and financial structures can be viewed from a static or dynamic perspective. Both aspects are related. The structure of resources that finance the growth of company assets in individual period changes their overall structure at given individual moments (the date of the balance sheet). Due to dynamic changes, the static situation changes" (Vlachynský et al, 2006, p. 83).

The financial structure can be understood in the broad sense as the structure of the total capital that finances the assets of a company. It follows the part of the capital structure is a part within the company's financial structure. The capital structure expresses the way in which a company finances its overall operations and growth through a variety of funding sources. Debt comes in the form of different types of loans that have to be paid in the future, usually with some kind of interest. Equity includes, in addition to retained earnings, the sale of the company's share to investors in the form of equity and preferred shares. Investors thus become business owners and partners, thereby gaining a certain degree of control over the company and return on their investments.

There is a number of factors affecting the financial structure of the company. It may be the cost of acquiring and linking the various components of capital, the risks associated with the disproportionately increasing credit load, the composition of the company's assets. In addition, it can be sudden changes and prospects of cash flow development, the way and the strength of the company's income taxation, the necessity of adhering to the selected level of liquidity and other. The company's financial structure is also affected by the ability to sell its products and services. In the broader context, it is also all employees who affect the composition of costs and revenues by adding their work and their abilities to the value of corporate performance. Consequently, the overall trading income, which affects largely the financial structure of a company.

3 Composition of company financial structure

The financial structure is a composition that according to the accounting consists of the liabilities side of company's balance sheet. It consists of equity, liabilities and a time distinction.

3.1 Equity

Equity represents the accounting unit's own sources of cover and is an indicator of the financial stability of the company. Equity is identical to the net trading value provided by the Commercial Code. At the same time, it defines its individual elements, to which belongs:

- basic capital,
- emission premium,
- other capital funds,
- statutory reserves,
- other funds from profits,
- valuation differences from revaluation,
- trading income of previous years,
- trading income for the period after tax.

Basic capital represents the resources that the founders and investors put into business in the monetary as well as in the non-monetary form and the company formed it or reduced itself. The obligation to create capital also applies to companies with a legal form of Joint Stock Company, a Limited liability company and a simple company for shares, which also derives a fixed minimum capital. In the joint stock company it is 25 000, - €, in the limited company it is 5 000, - € and in the simple company for shares it is 1, - €.

The emission premium represents the difference between the nominal value of the shares issued and the amount paid for shares (Emission rate) under a special regulation or deposits in the increase of the basic capital by subscription of new shares or deposits.

Other capital funds are monetary and non-monetary deposits that are intended to increase equity (but not to the basic capital, nor are they incurred as an emission premium). They can be received gifts, i.e. tangible and non-tangible assets acquired free of

charge, money gifts and member shares for cooperative housing construction and state contribution in cooperatives.

Statutory reserve funds are compulsorily generated from the earnings of company unit. "Since the creation of a fund is mandatory, the law specifies exactly how it is created, as well as its minimum amount. From the point of view of the law, this refers to the statutory reserve fund or the indivisible fund of the cooperative" (Šiman, Petera, 2010, p. 60).

The company creates other funds from profit based on an optional decision. The statutory body decides to create a statutory fund, as the possible alternative to the other funds from profit. Financial sources from this fund will be used up, for example, in the form of rewards attributable to members of the statutory body.

Valuation differences from revaluation are valuation differences from property and liability revaluation, valuation differences from equity investments and revaluation differences when merging, fusing and disposing of a company.

The trading income of previous years is the profit or loss that a company has obtained for the immediately preceding accounting period. In addition, an accounting unit has the obligation to use the trading income, therefore to keep it books until it is decided on what specific purpose it will applied (payment of the loss, reduction / increase of the basic capital, allocation to the basic reserve fund and others).

The trading income for the post-tax period can also be defined as the official residual shown on line no. 61 of the Profit and Loss Statement. It follows that the trading income represents the difference between the accounting revenue and the accounting cost, which may be positive (profit) or negative (loss). It should be noted that the trading income in the profit and loss statement must be consistent with the trading income shown on line no. 100 in the balance sheet.

3.2 Liabilities

Liabilities represent the financial liabilities and debts of the accounting unit that arise from past transactions in the course of business operations. The accounting unit pays these financial liabilities to external stakeholders through the transfer of economic benefits that involve cash, goods or services. Interested parties include banks or other financial institutions, creditors or state institutions. Liabilities include reserves, liabilities, bank loans and short-term financial assistance.

Reserves belong to a group of liabilities that are uncertain in terms of time and amount, but on the other hand, their intended purpose is known in advance. The obligation to make reserves in the company is a matter of law and of the agreements and contracts concluded. The company creates reserves for future expenses that may arise against suppliers, employees, members of the Supervisory Board, other business bodies, and so on. The company's liabilities can also be classified as a debt that company is required to pay. From a time perspective, the liabilities consist of long-term liabilities that the company pays for a period of one year and short-term liabilities with a maturity up to one year or a normal business cycle, whichever is longer.

Bank loans are a temporary loan provided by a commercial bank to a client who is obliged to return to the bank not only the provided financial support but also to repay it by paying a certain amount of interest. This subsidy relationship may be of a long-term, medium-term or short-term nature, for securing it, eligible loans, advances or personal or material guarantees are acceptable. Short-term financial assistance consists of funds borrowed and managed by the company, but unlike bank loans, the provider of the assistance is a business unit other than a commercial bank, or the short-term financial assistance was created by issuing mortgage bonds or issuing short-term bonds.

3.3 The time distinction

In accordance with the applicable provisions of The Accounting law, the cost and revenue time distinction is intended to overcome time discrepancies that arise in relation to costs and expenses or revenues and returns. Therefore, in terms of liabilities, it is said about:

- long-term deferred expenses,
- short-term deferred expenses,
- long-term, future returns,
- short-term future returns.

"Within deferred expenses, which include both short-term and long-term expenses, it is a time distinction of the current accounting period costs related to expenses in certain future periods, such as lease payments payed behind. Settlement of deferred expenses is charged when the expense is incurred, e.g. rent paid behind, interest on loans paid behind" (Štangová, Hajduchová, 2010, p. 126).

"Both short-term and long-term future returns can be characterized as income in the current accounting period that is intrinsically included in returns in future periods, such as rentals received in advance, amounts paid in advance to provide service and received subscriptions. Settlement of future returns is made in the period with which accrued return is materially related, for example, Rents received in advance, pre-paid subscriptions, royalties received in advance" (Štangová, Hajduchová, 2010, p. 133).

4 Factors affecting the financial structure of a company

The formation of a company's financial structure takes into account factors, which at first glance create the impression of opposites. The factors required and taken into account in this case include:

- the cost of capital,
- formation of insolvency,
- composition of company assets,
- level and fluctuations of cash flow,
- effect of inflation,
- the rate and intensity of corporate income taxation,
- financial freedom of a company.

4.1 The cost of capital

The cost of capital represent the cost of financial resources used to finance business activities. The cost of capital is associated with the different types of capital that a company uses. Each type of capital, that is, each component of total capital has its own price, which is based on the rate of return required by the investors who provided the financial resources to the company. The costs of own and foreign capital and average costs of total capital are distinguished. "In the case of foreign capital it is interest. In the case of equity, it is the net profit expected by the owners of the company for their capital deposit" (Ďurišová, Jacková, 2015, p. 44).

4.2 Formation of insolvency

"Insolvency is in bankruptcy proceedings identified as one of the material conditions for declaring bankruptcy. Insolvency is defined as a form of bankruptcy, which is the reason and condition for declaring bankruptcy" (Ďurica, 2010, p. 131). If a company continuously increases the ratio of foreign capital to total capital, the risk of insolvency is only a matter of time. This is because the debt service, regardless of the positive or negative trading income achieved, must be constantly secured. In this case, even a slight fluctuation in the company's revenues and costs may cause insolvency to pay interest or repayments. Ultimately, this situation may culminate in bankruptcy as one of the possible solutions to the crisis the company has fallen into.

4.3 Composition of company assets

"Company assets represent the sum of all items, money, receivables and other property values that belong to entrepreneurs and serve to carry out business activities. It consists of two basic groups of resources, which differ in the time it takes to operate the business before returning to the cash form. We talk about long-term assets, current assets and temporary assets captured by the left-hand side of the balance sheet. They are also referred to as assets" (Synek et al, 2011, p. 48). From the point of view of the financial structure, the structure of corporate assets plays an important role, especially from the point of view of asset quality and liquidity. The basis for this argument is the fact that the liquidity of assets determines to a significant extent the composition of the company's financial resources.

4.4 Level and fluctuation of cash flow

The company's prospects to meet its debt obligations in the future are heavily influenced by both the level and the fluctuations in the cash flow. It is true that if a company expects an overall increase in its sales without limiting greater fluctuations, the share of foreign capital in this case does not play an important role. The cash flow that a company expects to achieve represents a sufficient guarantee accepted by creditors. To increase the share of foreign capital, a company should not enter into a period when it expects that the development of its boom in revenue and profit would be interrupted. In this situation, it should be just a matter of reducing the share of foreign capital, which should be sought primarily by company for the sake of its protection and stability.

4.5 The rate and intensity of corporate income taxation

The rate and the intensity by which the positive trading income of a company is taxed represents the substantial part in forming the financial structure. The justification for this is that interest paid out of foreign capital is part of the cost, which reduces corporate profits and therefore the tax base on income tax. The rate and intensity of taxation is more pronounced on the financial structure when the tax rate rises up and is substantially higher.

4.6 Financial freedom of a company

"Financial freedom means choosing a capital structure so that the company can secure the fast availability of money to take advantage of a good investment opportunity or other market chances. A higher share of own capital enables greater flexibility in decision-making" (Sedlák et al, 2007, p. 221). Financial freedom is an advantage especially for companies that have a great potential for developing their activities. A more conservative financial structure in the form of an increased share of own capital enables such companies to prevent any intervention by creditors into the business.

5 The role of financial analysis

The answer to the question of whether to self-finance the business or to fund the use of foreign resources gives a financial analysis.

Financial analysis is an inseparable part of a company's financial management that provides sufficient feedback on the areas in which the company stands out and vice versa, where the company has certain absences. Financial analysis eliminates ignorance and contributes to a perfect knowledge of the financial situation of the company.

There is multiple of financial analysis methods. Among the basic belong analysis of absolute indicators, which consists of the horizontal and vertical analysis. Horizontal analysis, also known as trend analysis, compares financial information over a series of accounting periods, while vertical analysis is directly proportional to the analysis of the financial statements, where each line indicates a percentage from another item. In practice,

this means that individual items in the profit and loss statement are quantified as a percentage of total costs or revenues. In the case of a balance sheet, the individual items are quantified either as a proportion of the total assets or the sources of their coverage, i.e. at this point it means the asset and capital structure of the company. Using the absolute indicators, some other difference indicators can also be calculated, for example, the golden balance rule and net working capital.

The next method of financial analysis, which can also be described as the basic tool for determining performance and stability, is financial ratios, including profitability, liquidity, activity, productivity, indebtedness and capital market. In contrast to the analysis of the set of indicators, as one of the methods of financial analysis, it includes pyramid decompositions, credit and bankruptcy models. Banknote indicators are primarily intended for creditors who focus their attention on the ability of a company to meet its obligations to them. Creditworthy indicators reflect the positive side of a company, which is based on its performance quality, which is particularly beneficial to investors and publishers.

The optimization of the financial structure assessed on the basis of the financial analysis will ultimately be reflected not only in the financial management of the company but also in its relations with employees (work/wage), suppliers, buyers (goods/payment), banks (loan/interest) Business owner (deposit/return).

6 Optimization of financial structure

The financial structure of a company influences a number of factors that need to be taken into consideration when optimizing it. From the point of view of the source from which the individual factors flow, it is possible to categorize them as internal and external. Internal factors represent a category of specific factors that are exclusively related to the business being optimized and its financial structure. In contrast, on the one hand, external factors group factors of a universal nature that affect any company without exception, and on the other hand factors that determine the specific aspects of the Slovak economy.

Factors affecting the financial structure of a company:

1. Internal factors:
- the asset structure of a company with a significant proportion of current assets,
- the size and stability of profit of long-term company in the market,
- choice of financial structure in the future,
- company liquidity and lack of cash flow,
- company strategy in the area of goals,
- managers' approach to managing and financing of the company.

2. External factors:
- interest rate development when drawing foreign sources,
- developments in the financial market situation,
- legal form of business,
- tax determinants and overall tax burden on the company,
- favorable macroeconomic situation of the SR,
- attractiveness of the national economy sector.

By identifying internal and external factors, it is possible to proceed with the proposal to optimize the financial structure. However, in addition to the factors, the proposal must take into account a number of additional knowledge that is specified in the various phases of the proposal.

The proposal for optimizing the financial structure of a company consists of three stages:

- testing of the financial structure in terms of compliance with the basic funding rules,
- testing of determinants affecting the financial situation,
- applying suggested recommendations.

The goal of first phase is the basic orientation in consideration of the rationality of the company's financial structure; the criterion is the golden rule of financing and used the vertical and horizontal analysis of the company balance sheet.

The second phase aims at long-term financial stability, solvency and stabilization of the company's trading income. The criterion is a set of selected financial analysis indicators and planned profit. The ex-post and ex ante financial analyses are performed.

The third phase goals is the optimal financial structure, the criterion is profitability of own capital and method of optimization.

The proposed optimization of the company's financial structure monitors the company's prosperity and progress, meeting its main goals, increasing its profitability and its market share.

7 Conclusion

The financial structure, as well as its optimization, has been the subject of a number of considerations. While theoretical financial discipline excludes the presence of an optimal financial structure, the practice creates situations in which the attention paid to the financial structure is greatly underestimated. Companies often try to get financial resources because of financial difficulties, not even considering optimizing them. On the other hand, relatively profitable companies also omit this area of their financial management. The optimal financial structure should have its irreplaceable representation in the significant features that describes the company.

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Primary Paper Section: A

Secondary Paper Section: H

THE ROLE OF AHLUL BAYT IN THE ETERNAL LIFE OF QURAN

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Abstract: Ahlul Bayt in the Quran, traditions and customs of the Islamic community applies to whom? What is their role in the eternal life of the Quran? Research on this issue needs more chance, but this article tries to review it briefly and, according to reliable sources.In this article, it becomes clear that Ahlul Bayt only refers to a certain group of Prophet Peace be upon his family and his progeny that according to the explicitly stated of the Prophet, there is a permanent link between them and Qur'an. This eternal bond is determined a special place for the Ahl al-Bayt (as) beside the Qur'an that if carefully examined, it leads to a worthy result of information to an eternal life of the Quran. The author tries to study the Quran and Ahl al-Bayt link with this approach.

Keywords: Ahl al-Bayt, Quran, the eternal life, the Quran and Ahl al-Bayt link.

1. Introduction

In some verses of the Quran and in the Holy Prophet of Islam, peace be upon him and his progeny expression, a group called "Ahl al-Bayt" that are clean from any evil and has virtue and a special status in Islam. Among the virtues that the Prophet, peace is upon him and his progeny has insisted and considered for this group, is their eternal bond with the Holy Quran.

Islam is the subject of an inmate to clarify the role of the Qur'an in the eternal life.

This link, which, according to the explicit words of the Prophet, peace is upon him and his progeny, if considered by Muslims, will be the savior of the Islamic Ummah, will consider a special place for the Ahlul Bayt with the Quran. This article attempts to study only one of dozens problem about Ahlul Bayt pay and Islam and that is explaining the role of Ahlul Bayt in the Quran eternal life.

The author will try to explain the issue by referring to the original sources of Islamic teachings and religious and other documents and expose different aspects of it to fair criticism of judgments and religious scholars. Before entering the subject, some preliminary discussion will briefly outline.

2. Etymology of Ahl al-Bayt and progeny concept

Ibn Manzur knew "Ahl al-Bayt" as residents of the house, as the "Ahl al-rajol" means the closest people to him, and elsewhere described it as the "tribe" and his relatives. (Ibn Manzur, 1996, madde Ahl)

Raghib Isfahani in Article "Ahl" says:

"Ahl al-rajol" originally refers to those who lived with him in a house. Then to be allowed, it has been applied to those who shared his genealogy. (Raghib Isfahani, 1995: madde Ahl)

Firouz Abadi below the same article says: Ahl al-rajol are the family and close friends of him that its plural form is "Ahlon", "Ahal", "Aaahal" and "Ahlat" ... and the Ahl al-Bayt are residents of the house ... " (Firouz Abadi, Beata: Chapter Alhamzeh and Alba', Bab al-Lami, madde Ahl)

Thus, the term "Ahl" means a group that an attribution has happened between them because of sharing in the specific cause, whether material or spiritual among them. This certain sharing is determined with the genitive "Ahl".

Accordingly, "Ahl al-Bayt" refers to a group that an assignment has been emerged due to Sharing on attribution to a certain person or a certain residential home among them.

In addition, "A & L" testament in the genitive of Ahl [al-Bayt], is the reminiscent of a certain house, meaning the home of the Prophet of Islam, peace is upon him and his progeny. (Tabresi, Beata)

Therefore, "Ahl al-Bayt" is known as the synonymous with "inmate of Prophet Peace is upon him and his progeny". For this reason, the use of "Ahl al-Bayt" in an absolute way of traditions of Muslims, of Islam so far, was especially for the family of the Prophet peace is upon him and his progeny. (Raghib Isfahani, 1995: madde Ahl) This word in Persian is used by deleting "Alef and Lam" in the form of "Ahl al-Bayt".

Philologies have known the term "progeny" as the term "inmate". Ibn Manzur said "the family of a man is his relatives from son and daughters" (Ibn Manzur, 6991 AD: The following words Atr) He, then, after quoting the hadith of the Prophet, peace be upon him and his progeny, said: According to some sayings, the Prophet peace be upon him and his progeny on a hadith says: I leave among you two precious and exquisite borrow one book of the Quran and the other my Etrat and Ahl al-Bayt, so the Prophet peace be upon him and his progeny knows the progeny is equated with the Ahl al-Bayt. (Ibid.)

Ibn Manzur in the continuation of the same speech quoted by Ibn Arabi says:

Hence, the prophet (pbuh) Etrat is his child Batool Fatima (RA). (Ibid.)

Farahidi also expressed similar words of Ibn Manzur about the meaning of Etrat word. He says:

The man Etrat is his relatives from his son and his grandson. (Farahidi, 5241 AH: The following words Atr)

3. The use of "Ahl al-Bayt" in the Qur'an

In the Quran, the word "Ahl al-Bayt" is only used in two verses:

A: Do you wonder the God's command? Mercy and blessings of God be upon you the family of this house, he is commendable and noble. (Hud (11): 37)

[The angels said to Abraham's wife]: Do you wonder the working of God, mercy and blessings of God are upon you, the family of Abraham because God is very commendable and honorable.
Undoubtably, God just wants to take away the evil and sin from your family of the Prophet and his progeny and fully purify you. (Ahzab (33): 33)

The first verse is about Abraham peace is upon him and his family that, in the verses before and after it, the story of the angels descends upon him and the good news and the subsequent birth of Isaac and following the amazement of Abraham's old wife were raised. The second verse that is known to Tathir verse, according to all Muslims, is dedicated to the family of the Prophet; peace is upon him and his progeny. (Tabresi, Ibid)

According to this verse, God has taken all the wicked from the Prophet, peace are upon him and his progeny away.

Who is the Prophet's Ahl-al-Bayt, peace is upon him and his progeny?

To identify the family of the Prophet, peace is upon him and his progeny, the only way is referred to Islamic narrations. According to these teachings, the Ahl al-Bayt of the Prophet, peace is upon him is Ali, Fatima, Hasan and Hussein PBUH.

Jalal al-din Suyuti in his narrative interpretation has brought many of these stories with different documents from Prophet's relative. (Suyuti, 2000)

Tabarsi also quoted many stories from Abu Said Khedri; Anas bin Malik, Vaseleh bin Asqa, Aisha, Umm Salamah, Jabir and Hasan bin Ali that all states have the same expression. (Tabresi, Beata) in one of the hadith that says:

The Prophet said purification verse was revealed for five people, I, Ali, Hassan, Hussain and Fatima, peace are upon them. (Ibid, P. 955)

Tabarsi After quoting several stories with the same theme, saying:

There are many narratives in this field that have brought both by the Sunni and by Shiite and if we want to bring them all, the book lasts. (Ibid, P. 065)

Allameh Tabatabai also in below purification verse brings lot narratives with various documents and says:

Many hadiths are in this regard by Sunnis and Shiites as well, everyone wants to be informed about them must refer to Ghayatol Maram Bahrani and Bqat Abrar. (Tabatabai, 1993: V. 21, p 913)

Allameh Majlesi has written numerous stories in this regard. (Majlesi, 1982)

The frequency of stories in this field is that will not leave any doubt for fair researcher in the revelation of the verse about noble and virtuous unique dignity of the Prophet, Ali, Fatemeh, Hassan, Hossein. (Majlesi, 1982, about the virtues of Ahl al-Bayt)

Of course, in the books of Hadith and commentary, other stories can be seen to clarify the facts of the Prophet peace is upon him and his progeny. (Ibid)

According to this narrative, in addition to the Companions of the Cape [Prophet Peace be upon him and his progeny, Ali, Fatima, Hasan and Hussein PBUH], nine innocent Imams from Hussein children are also among the family of the Prophet. The Prophet, peace be upon him and his progeny sometimes called this group with the word "Ahli" (Suyuti, 2000), * sometimes with the word "Ahle Bayti" (Ibid, pp. 235-435), sometimes the term "Etrati" (Saduq, 1993) and, in some cases by combining "Etrati, Ahle Bayti". (Majlesi, 1982)

Ayashi in the following verse: O those who believe obey Allah and the prophet and former prophets. (An-Nisa' 4: 95) A long narration narrated from Abu Basir from Imam Baqir that according to it, the instances of "former Prophets" in this verse are the same with examples of "Ahl al-Bayt" in the purification verse.

This narration, recalling what has reached from the Prophet and his progeny in determining instances of two verses and some other verses, it has counted "the twelve Imams" in certain instances of "the former Prophets" and "Ahl al-Bayt". According to this narration, Holy Prophet Muhammad (pbuh) has recalled from this group, with the words "Ahle Bayti", "Quli", "Ahli". (Ayashi, Beata: Vol. 1, pp. 672-772) according to some quoted narrations below the verse, "The first Governors" Prophet has named from the first to the last of the group for some of his companions. (Ibid., P. 280)

4. Link between Quran and Ahl al-Bayt from the view of the Prophet, peace be upon him and his progeny

The Holy Prophet, peace is upon him and his progeny has counted many virtues for his Ahl Albayt that according to them, the Ahl al-Bayt is placed in a unique position among the Islamic Ummah. Including, most important virtue is the equivalent of putting Ahl al-Bayt with Quran and its unbreakable bond (*), Ibn Jarir, the governor and Ibn Marduyah from Saad, have quoted this narration.

There are two Resurrection. According to a narrative that Shiites and Sunnis have agreed on the validity and is known the 'Hadith Thaqalayn ", the Prophet of Islam, peace is upon him and his progeny has said:

I left among you two precious objects that if you hold to them, you will never go astray after me; one of them is bigger than the other: the Book of Allah (the Qur'an) which is a hanging rope from heaven to earth and my family, Ahl al-Bayt. Be aware that they will never separate from each other until they meet me at the pool.

This tradition has been quoted from the most prominent companions of the Holy Prophet and his progeny and has been transferred repeatedly from generation to generation. (Balaghi, 1999) Most positions, hadith communities and virtue books that Sunni has written, from the beginning of a writing tradition, so far, Thaqalayn hadith has been quoted from a companion of the Prophet or more. Some of these works have narrated the mentioned hadith from more than twenty companions, either in the form of breife, as Ibn Hajar has brought in Alsvaq Almhrqh, or in detailed, so that Skhavy, Sayuti and al-Samhoudi, and others have brought (Ibid, p. 101)

Attention to the text of the hadith and its documents given it a sign that the Prophet of Islam, peace is upon him and his progeny has said that on several occasions to the Companions and his followers and has informed them of the importance of the unbreakable bond between the Quran and Ahl al-Bayt. Ibn Hajar Heytami, a prominent Sunni scholar in this field, says:

Hadith mentioned has many ways. Twenty-some of the Sahabah have narrated it; some of them have heard this tradition on the farewell tour and the day of Arafah. Some have quoted it during the Prophet's sickness and in a group of the Companions. Others have heard it in a great and unforgettable story of Ghadir from the Prophet and eventually others said, Prophet after returning from Taif, has said in a speech which he expressed Thaqalain tradition. (Haytham, Beata, p. 051)

Thaqalain tradition importance more than anything else is for expressing the Ahl al-Bayt (AS) and the Qur'an in the language of the Prophet Muhammad peace be upon him and his progeny. The interpretation of the Prophet from the Quran and Ahl al-Bayt (as) to "Thaqalayn" is a sign of these two positions in the life of Islam. (Ibn Manzur, 1996) According to this narrative, the Islamic Ummah remaining safe from any deviation in the age of the seal, depends on gaining the Quran and progeny, and these two shall meet the needs of human knowledge until the judgment day.

5. The philosophy of Quran and Ahl al-Bayt bond

The bond of Quran and Ahl al-Bayt has the accurate revelation support, which thought in some verses of the Quran revealed it as goodness. According to some verses of the Koran that explicitly talked about revelation and prophecy, divine revelation in all historical periods, has been accompanied by two features. The first feature that is always the revelation has been revealed with language and understandable words of the prophets and the audience; second, in the revelation, always the presence of a reliable and knowledgeable human was necessary for the word of God so that in addition to receiving and conveying revelation, has the responsibility to explain and teach various aspects of revelation in human life or the hereafter. The clearest verse of the Qur'an in this regard:
We have not sent any messenger except in the language of his people [revelation] to make clear to them. (Ibrahim (41): 4)

The Quran has also made clear this responsibility about the Prophet, peace is upon him and his progeny:

In addition, we have revealed the Quran to you to explain to people what was revealed to them and you should think. (An-Nahl (61): 44)

Elsewhere the Quran knows the responsibility for teaching the revelation alongside other responsibilities to the Prophet and his progeny:

He is who provoked a messenger of their own among the illiterate to recite His Signs to them, purify them, and teach them the Book and wisdom. (Jomeh 26: 2)

According to these verses, divine revelation has never been released without a chosen human element, and the prophets were the chosen people that were aware of the revelation minutes that in addition to receiving and conveying revelation, they had the responsibility of explaining it.

Now with the finality of prophethood, revelation is terminated, but the validity of the Qur'anic revelation, according to popular belief will remain until the judgment day. This immortality of Quran in the context of time from one hand, and the emergence of new needs in the field of individual and collective life of believers on the other hand give the necessity for the presence of commentators aware of and familiar with the secrets and depths of revelation in the Qur'an to all periods. The presence of these human elements, in the Qur'an, causes the clear verses of the revelation will always be sent down for the humans and the ages and generations do not be unbenefitted from the Holy Quran redirections.

Prophet Muhammad, peace be upon him and his progeny, which was a divine revelation guide, beautifully knew the "transplant of Quran and Ahl al-Bayt" to meet basic needs in the era of the seal. It seems that the secret to emphasize Prophet and his progeny on this blessed union and confirm its recurrence is the key point lies. Therefore, you should consider the consequences.

6. The Ahlul-Bayt role in the immortality of the Quran

What results come through the Link between the Quran and Ahl al-Bayt (as) in the immortality of the Qur'an in the context of dynamic time?

A clear answer to this question, in addition, that awaring us from Ahl al-Bayt role in the Quran immortality, it reveals the importance of this inextricably linked and stressed by the Prophet peace be upon him and his progeny. According to Islamic teachings, the Ahl al-Bayt with the Quran had a unique role and had an effective role in the immortality of the Qur'an in the context of time. We examine the objective symbols of this unique role in the following.

7. Explaining the true revelation, according to the needs of the times

The first conclusion from the Quran and Ahl al-Bayt was obtained was explaining the verses of the Quran after the death of the Prophet peace be upon him and his progeny. According to the Holy Quran states have already passed that, the responsibility stipulated by the Quran during the time of the Prophet was the Prophet's charge. With the death of the Prophet, peace is upon him and his progeny, although the revelation was terminated, but the explanation of the revelation never ends. This is because, the Quran, as addresses the people in the Prophetic age, it is also addressing the people the same manner and this same address, logically, requires continuous explicating.

The Ahlul-Bayt continuous link with the Quran, in fact, is an accurate mechanism prediction that gives an appropriate response to this need. If this mechanism will be neglected, the Qur'an, in the era after the Prophet, it will become consonant propositions that can never communicate with the needs of modern believers and in practice, will be removed of individual and collective life of man.

This fundamental truth has been stated in the pure Word of Imam Ali (PBUH) clearly:

The Quran is the book of silence from God and I have explained it, so hold fast to the Book of God speaking. (Mohammadi Reyshahri, 2000: V. 8, p. 702)

Imam Baqir (as) citing the Quran argues the necessity of the presence of the Imams peace be upon them after the Prophet, peace be upon him and his progeny to guide the believers to the truth of revelation and says:

Imam Baqir (as) about this verse, which is you, O Prophet are a warner and for every group a leader. I asked Imam said: The Messenger of Allah is a warner and at any time, we will be the member of God inmate who, guids faithfully to what the Prophet peace be upon him and his progeny has brought from God. Leaders after the Prophet, peace be upon him and his progeny, the first of them is Ali, and after him, the successors one after another. (Chiellini, Beata: vol. 1, p. 272)

Imam Reza (PBUH), in expressing the philosophy of the infallible Imams (as) among believers, in the era of the Prophet, peace be upon him and his progeny, asserts the same fundamental point and knew Ahl al-Bayt as a guarantor of the right flow of religious teachings among the believers and faithful custodians among the people. (Sadoughi, Beata: vol. 2, p. 101)

Imam Sadiq (as) also insists on this point and says:

God always among us, Ahl al-Bayt, chooses who knows the book from beginning to end. (Saffar Qomi, 1995)

Elsewhere he says:

I swear to God, all the knowledge of the Qur'an is ours; (Chiellini, Beata: vol. 1, p. 333)

Some Sunni scholars have sought to deny the vital role of Ahl al-Bayt (as), (Abu Venus, Beata, p. 022), but because of the clear emphasis of the Prophet and his progeny on this most important, many Sunni thinkers such as Shia scholars have confirmed the role and unequivocally expressed it. Meanwhile, Abdul Karim Shahrestani view of the famous cities of the Sunni scholars is very enlightening. He believes the Lord has placed the Quran knowledge only with the carriers from the house of the Prophet and his progeny. They are his heirs and one of two "Thaqal" and the assembly of book and tradition. They are the guiding of the nation, and rightful scholars, which always protect in the official interpretation of Qur'anic verses. Shahristani on the part of his speech specifies the consensus of all companions of the Prophet, peace be upon him and his progeny in the allocation of the Quran to Ahl al-Bayt (as) and says:

Companions agreed on the fact that the science of the Quran is for Ahl al-Bayt because they have asked Ali Ibn Abi Talib (PBUH): Do you have other superiority except the Quran. The matter that Companions ask something other than the Qur'an from the Prophet is an evidence of their opinion on the allocation of the Quran (discounting and its interpretation) to Ahl al-Bayt. (Shahrestani, 1989).

Besides the fact that Ahl al-Bayt (as) has always been emphasized this important role, their school students who were known to be intelligence, in their debates with deniers of the Ahl al-Bayt position, have stressed the unique role. Meanwhile, the debate of Mansour bin Hazim with a group of opponents (Saduq, 2001), the debate of Hisham Ibn Hakam with the damascene man (Chiellini, Beata: v. 1, pp. 042-442), as well as his debate with Amr Ibn Ubaid (Saduq, p 826-436) is interesting and sobering. What is obtained from these debates is the importance of Ahl al-Bayt next to Quran in order to explain the teachings of the divine verses according to human needs in the eras after the messenger of Allah peace are upon him and his progeny.

It should be noted that, scientific authority of Ahl al-Bayt (as), in explaining the teachings of revelation does not belong to certain verses and the specific time, but this authority is timeless. This fact can be clearly understood from Thaqalayn hadith because in that hadith, first the link of the Quran and Ahl al-Bayt (in absolute terms) has been emphasized as well as the continuation of that link until the resurrection.

Ibn Hajar Hytmy, the Sunni scholars, says about the continuing links between Ahl al-Bayt with the Qur'an:

In the tradition of adhering to the Ahl al-Bayt (as), it has been pointed out that, as the Koran is the eternal until the resurrection and the need to adhere to it is eternal, the merits of the Prophet (PBUH) Ahl al-Bayt to hold them until the Day of Judgment remains powerful (Ibn al-Haytham, Ibid, p. 051).

In the same context, he cites another tradition from the Prophet; peace is upon him and his progeny:

In each generation of my people, there are righteous people of my Ahl al-Bayt. A person among Ahl that is former should be adhered, and Ahl al-Bayt Imam is Imam Ali bin Abi Talib - (Ibid, 150)

Allameh Seyed Mohsen Amin (Amin Ameli, 1979: vol. 3, p. 136), Sheikh Tusi (Tusi, 1988), Mohammad Hossein Boroujerdi (Boroujerdi, 1978) and many religious researchers have said that.

From the above, in addition to clarifying the unique position of Ahl al-Bayt, in explaining the verses of Revelation, this delicate point will also be obtained that the backing of Ahl al-Bayt, in this explanation is their connecting to the knowledge of God. This fact can be achieved by placing the purification verse "God as will remove dirt and evil from you Ahl al-Bayt and make you pure and holy." (Ahzab (33): 33) and the holy verse this is indeed a noble Quran that nobody can have it except the clean ones (Alvaqh (65): 77-97). If a verse of "nobody can have it except the clean ones "as some commentators (Tabatabai, 1993: V. 91, p 731) commented, will be placed as a description of "Maknoon Book", so the meaning of the word of God is such that only "clean ones" can be informed from Maknoon book that is the main source of the Koran. According to the clear wording of purification verse, the Prophet Ahl al-Bayt is including "these clean one" and as a result, they know the Maknoon book of God. This connection to the knowledge of God saving is the mystery of the Holy Quran and Ahl al-Bayt links and unique authority of them to explain the true revelation of the Qur'an in the era of Khatam.

Imam Ali says in the fact that:

God has taken away the dirt and ugliness from our family and has protected us from falling in the trap of sin. We are witnessing people and guiding them in the land. We are next to Quran, Quran is our companion, and we will never be parted. (Majlesi, 1982)

The entry into force of the words of the Ahl al-Bayt, in explaining the verses of Revelation, will explain many of the concepts of Quran in detail; as the same way, a number of general principles or absolute Quran will be assigned and this is a secret of the mysterious link between the Quran and Ahla al-Bayt in the context of the time.

8. Learning the correct method of ijtihad in the Quran

Attention to two following introductions reveals the educational role of Ahl al-Bayt in methodological ijtihad in the Quran:

A) Many verses of the Quran have called everyone, both believers and unbelievers, to contemplation in the Quran. (Verse 92; Nisa (4): 28; Mohammad (74): 42; Nahl (65): 44)

No doubt, thinking of everyone in the Qur'an asks initial articles, tools and appropriate mechanisms.

B) continuous and immediate success of the visit to the Ahl al-Bayt (as), with the aim of achieving long-inspired teachings, for all believers in every time and place is not possible; as for all believers of the Prophet era peace be upon him and his progeny, also has not been achieved.

According to the above introduction, training and comprehensive logical mechanism of ijtihad in the Quran from the Ahl al-Bayt (as) who are Qranand sciences is necessary. With this method, knowledgeable believers can always reflect on the Quran and in the proportion of time and its various needs, benefit from redirects revelation. Thinking in the Quran verses, in the light of pedagogical way of Ahl al-Bayt (as), creates a certain type of ijtihad creates that in the thinking, it has always been based on the necessity of linking Quran and Ahl al-Bayt, its door is always open. The first point in the pedagogical way of Ahl al-Bayt (as) on the interpretation of the divine verses can be seen, encouraging believers to contemplation and ijtihad in the Qur'an. Imam Ali says:

Learn the Quran is the best speech and think in its profound that is the spring of hearts. (Nahj al-Balagha, Sermon 110)

He has also described Jabir Ibn Abdullah Ansari for his knowledge. A person who asked with surprise: I ransomed you; you describe Jaber like this, while you are a superior in knowledge? Imam Ali replied:

He knows this interpretation of God's statement as saying: whom that assumed the Quran to you will return you to your place. (Al-Qesas 82: 58). "(Arthur Chfry, 1954)

Another point that can be seen in a pedagogical way of Ahl al-Bayt (as) in methodically reference to the Qur'an verses is "premonitory" of claimers from the unconscious and unmethodical interpretation of the Quran. Imam Sadiq expressions addressed to Abu Hanifa is the clear example of these premonitories. In the dialogue between Imam Sadeq with Abu Hanifa, after he claimed the knowledge of the Qur'an, Imam said to him:

Abu Hanifa! You claim a great deal of knowledge! Woe to you, such knowledge is not anywhere except for People of the Book, those whom the Quran has been sent to them. Woe to you! Quran knowledge is not just for the children of the Prophet; peace is upon him and his progeny. Your God has not given you a bit. (Hurr Ameli, 1988)

Such as the severe warning can be seen in Imam Baqir (as) debate with Qatada Ibn Dameh, a jurist of the people of Basra. (Majlesi, 1982; Hurr Ameli, the same: V. 81, p 631)

In the Ahlul-Bayt educational practices, referring to Quran verses and their interpretation is not only prescribed but also verified. Of course, this prescription has circumstances that their achievment before embarking on these risky areas is required. In addition to general conditions such as recognition of an Arabic speech method, revelation tool, Qur'anic sciences, logic, rhetoric, predecessors' speech, special conditions in education practices of Ahl al-Bayt (as) to refer and ijtihad in the Quran verses become the necessity are as follows:

A) Gaining a comprehensive understanding of the whole Quran and attention to the meaning of some verses with others;

B) Attention to the Ahl al-Bayt (as) presence next to the Quran and awareness of what they have presented in verses;

C) Recognizing many elegance and inner and outer of verses, as inmate PBUH have considered the believers in it;

Referring to the teachings of Ahlul Bayt (as) in the interpretation of some verses of the Qur'an, the importance of these conditions in the view of Ahl al-Bayt (as) in context and ijtihad can be clear in the Quran.

Explaining the rule of Traveler's Prayer to be broken by verses of the Quran by Imam Baqir (as) (Saduq, 1993), the expression of burglar hand amputation verdict citing verses from the Quran in Imam Jawad (PBUH) hadith (hor Ameli, 1988), explaining the long concepts of the Quran by Imam Baqir (as) in an interview with Qatada ibn Damh (Majlesi, 1982) are examples of interpretation and methodological ijtihad in the Qur'an that place a special pedagogical before the Quran researchers thinkers.

Ignoring the progeny of the Prophet, peace be upon him and his progeny and the way they place for believers to interpret the Quran has caused the birth and growth of deductions without rules and scattered and the emergence of different religions and sects in the history of Islam. Khawarij, Batnyh, Marjayeh, Sufiyeh and tens of other religions formed among Islamic nation is the result of this ignorance. When Imam Ali sent Ibn Abbas toward Khawarij to negotiate with them, On the one hand, according to Quran ijtihad and non-systematic ijtihad of Khawarij on the other hand, addressed to Ibn Abbas, saying:

Do not argue with them with the Koran because the Koran is interpretable in different aspects. (Nahj al-Balagha, Letter 77)

The Prophet, peace is upon him and his progeny at the time of life has expressed his serious concern at the rise of ijtihad without rules in referring to the Quran, stated:

Most of my concerns for my nation after myslef are those who take the Koran and interpret it wrongly. (Majlesi, 1982)

9. Believers' attention on the existence of elegance in the Qur'an

Another role that Ahl al-Bayt (as) have played next to the Qur'an is giving attention to elegances and many features that distinguish the Quran verses from other texts. Ahlul Bayt (as), on recalling these features, even when they have to interpret and when they are reminiscent of the grandeur of divine revelation-have never hesitated to express any point. The following expression from Imam Ali in this regard is:

Book of your Lord is among you, stating lawful and unlawful, obligatory and recommended, abrogating and abrogated, permitted and prohibited, special and general, maxims and proverbs, and the same is absolute and tightly bound. It interprets its brief commentary and clear its complex points. The obligatories that knowing them took a covenant from slavery and ignorance is what they permitted. Part of the religion in the Quran is considered obligatory, that its abrogating is in the tradition of the Prophet peace is upon him and his progeny, and some of them are obligatory in the tradition of the Prophet, peace is upon him and his progeny, its prevention in God's book is permitted. Some obligations were temporary and in the future, their obligation was removed. Prohibitions of Allah were separated. Some are major; that a fire is promised to them and some are minor that forgiveness is promised for them. Some of the actions that are acceptable for limited number and some are free to do more of it. (Nahj Alblaghh', sermon 1)

In addition, the Ahl al-Bayt (as), always gave attention to faithful visionary believers in various layers of meanings of the verses, the verses above. Although, the Prophet, peace be upon him and his progeny, has given attention to Muslims in the Quran for the first time, but what Ahl al-Bayt have done in the interpretation of this fact is very dramatic and revealing. (Majlesi, 1982: V. 98)

Notifying the believers of the Quran makes first, the interpretation of the Qur'an: do not catch in the trap of stagnation on the verses and superficiality; second, pay attention to sustained and systematic efforts to achieve an appropriate response of revelation to the diverse needs and knowledge of human livelihood over time.

Due to this important, the path in a continuous way to meditate on the verses of the Qur'an, and to the process of divine revelation in the people's individual and collective life in the era after the Prophet peace be upon him and his progeny, is smooth and no age and generation will not be deprived of the gift of revelation.

Ahlul Bayt (as) with playing this role, in addition to close the way of chaos and adopting procedures without foundation in interpretation of the Quran, and intoruce understanding the Quran, something very subtle and methodical, and consider achieving long-Quran teachings of all ages and generations, with the help of methodological approach and the appearance of verses allowable and encourage scholars to it.

10. Trying to protect the Quran from alteration

The first person after the death of the Prophet, peace is upon him and his progeny and with his will collected the Quran is his successor, Ali ibn Abi Talib (PBUH. (Suyuti, Beata: v. 1, p. 77; Majlesi, 1982)

However, this valuable initiative, at the beginning, was not concerned with the Muslim community, but it made the collection of the Quran and its preservation plan from the events of the day, spread as a noble and necessary idea quickly among the Muslims (Marefat, 1996). In that way, the Muslim Ummah in the first years after the death of the Prophet and his progeny, have witnessed the widespread effort, for codifying the Qur'an in a single book. In the era of the third caliph that the different readings has provided the field of scattering and differences between the opinions of the Muslim Ummah in the Qur'an, the unity of scripture, as a necessity, has emerged as an undeniable necessity among Muslims. In this historical moment, Imam Ali confirmed the need and stressed for doing it, thereby, he closed

the way for any difference and division in the Qur'an (Sayuti: v. 1, p. 95). Ali, in his caliphate has encouraged the Muslims to the obligation to read conventionally, based on what was promoted at the time of the third caliph, and has avoided them from any modification, even the mistakes of writing, thereby, to close the path from any distortion (Marefat, the same: v. 1, p. 982). According to some accounts, when a person read the verse to Imam Ali More than anything else, it is stacked "(Vagheah (65): 92), Quitely Imam said:" What is Talah? Tala is right, such as the word of God "Fields and olive trees and vineyards and every kind of fruit grows "(Shoara (62): 841) who had heard Imam, asked the Imam whether he changes" Talah "to" Tala "? Imam strongly refuted this question and said:

The Koran never in this era will change. (Tabresi, the same: v. 9, p. 033)

Infallible Imams (as) after the Prophet, has always had the same sort of approach, and never allowed, the Quran will be changed from the Prophet and his progeny era and the early years after the death of the Prophet in the Muslim community. According to some accounts, when a person read with Imam Sadiq (as) some of the letters of the Quran in an unconventional way, Imam Intensity prevents him and said:

Never read the Quran like this, read the Quran the way that people read. (Hurr Ameli, the same: v. 4, p. 128)

Imam Sadiq elsewhere, with an emphasis on famous readings, said:

Read as people read. (Ibid) Imam Baqir (as) also rejects the legitimacy of any differences in the recitation of the Quran, said: Quran is unified, is issued, and came from a unit and the difference is from the narrators. (Askari, 2003) The Ahlul-Bayt emphasis on teaching and learning, writing, memorization, recitation and reading the Quran and listening to the Quran, looked at the book, interpretation of Quran and ponder its revelations, and maintenance of Quran at home and keeping the dignity of carriers and keepers of Quran, and avoiding dispute in its verses, (Hurr Ameli, as: f 4, chapters of the Quran recitation) in the continuation of the Quran presence among Muslims and its immunity from any distorted, have been very effective.

Special attention of Ahl al-Bayt to the Quran, and their persuation efforts to maintain the deposit of the sky, from any distorted and changes, has led the followers of Ahl al-Bayt students, along the way, do not hesitate any effort. Through the generous efforts that, in the second half of the first century AD, marking the letters and words of the Quran were carried out (Hojati, 2005) and, thereby, any inadvertently or deliberately change the Word of God was omitted.

In reading, the students of the Ahlul Bayt (as), have always excelled. They have developed, released the principles, rules and techniques of reading. Many of reciters of the Quran that reading the Quran is known by their names, were the relatives and companions of Ahl al-Bayt and educated in their school. (Marefat, the same: v. 1, p. 942) Reading that was popular among Muslims in the second century and is known as the only recital of the Quran in the world in the modern era is "reading Asim narrated by Hafs". Hafs was the companions of Imam Sadiq (as) that has learnt the Quran from his master Asim that was a Shiite scholar in Kufa. He also has learned from Abu Abd al-Rahman al-Selmi, who was Ashab companions and Imam Ali (PBUH) student. (Ibid, p.250) Thus, reliable and frequent recitation of the Holy Quran in the document goes to the Imam Ali that he has also learned to read from the prophet peace be upon him and his progeny.

Continue reading the Quran, based on reading the Prophet and his progeny and recognizing that, within the Ummah and then, in the entire world, causes to close ways to any alter and deliberate and inadvertent disort, in the words of the Lord. The role of this important matter in the immortality of the Koran cannot be ignored.

11. Conclusion

The above matters are the clearest conclusions about the link between Quran and Ahl-e Bayt peace is upon them, and its role in stability and life of the Koran, in the era after the Prophet and his progeny is not covered on any thinker with fairness.

Ahlul Bayt unbreakable bond with the Qur'an causes maintaining the appearance of the heavenly deposit from any distorted and opens the door of human knowledge, to the purest teaching of revelation, in all historical periods. Despite the best efforts of the enemies to distort the Koran, as well as the emergence of the different concepts and the emergence of various religions and sects among Muslims, in the light of this Mubarak link of the world, still we have witnessed maintaining any distortion of the Qur'an.

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THE INFLUENCE OF ECONOMIC GEOGRAPHY ON SUPERMARKET CONCENTRATION

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Abstract: The number of supermarkets in Bratislava has rapidly risen in the past years. It can be considered as a successful business result, when the Slovak groceries market sees the entry of non-traditional sales forms such as communal gardens, farmer markets, and other alternative forms of grocery sales aimed to increase the access to groceries. In this context, the article focuses supermarket concentration and also evaluates supermarket locations in Bratislava from 2011 to 2016. To calculate the concertation of supermarkets in Bratislava relative entropy was employed, using data from supermarket network from 2011 and 2016 located in the of Bratislava. The special distribution of supermarkets within the city was evaluated using a geographic information system. Although, there were changes in the distribution of supermarkets in each part of Bratislava during the observed period, the results show that supermarkets sufficiently cover the city. The changes concern mainly moves away from the city's center further out to the city edges. These changes will continue and reflect changes in grocery demand, current healthy grocery trends, settlement changes and creation of new counties.

Keywords: Special concentration, geographical concentration, supermarkets, economic geography

1 Introduction

Retail geography is attracting attention due to dynamic purchasing and consumption as well as the existence of retail units in growing competition. It evaluates the retail network's special structure during two periods. The creation of a great number of retail units characterizes the first period. The second period is marked by international retail chains entering the Slovak market. Construction was concentrated mainly in larger cities. New retail unit were constructed in the second half of the 90s, the first of which were hobbymarkets and groceries; hypermarkets followed and later shopping malls ensued. Development of large scale shopping complexes brings problems like declining city centers, outflow of commercial functions to the city's periphery, commuting and ecological problems, closure of small and traditional retailers.

2 Literature review

Several authors focus on retail unit concentration in Slovak cities. By defining the theoretical and real number of retail units, and by comparing these two numbers these authors obtained information about the surplus and deficiency of retail units in each town (Bilková a Križan, 2013). Ceapraz focuses on special specialization and concentration from the perspective of competitiveness of the European union. His article provides different perspectives of diverse economic theories on concentration and special specialization development. Ceapraz defines concentration and special specialization in connection to manufacturing structure and tries to explain regional employment structures (Ceapraz, 2008). Lang, Marcon, and Puech view special concentration through the distance-based methodology used to improve spacial economics of economic activities through accurate spacial layout evaluations (Lang, Marcon, Puech, 2016). Badia-Miro (2015); Furtună, Reveiu, Dârdală, Kanala (2013); Glaeser, (2012); Arbia; Copetti, Diggle (2009); Fingleton (2006); Desmet, Fachamps (2005) focus on analyzing the impact of a city's territorial structure based on an inner metropolitan approach. Garcia-Lopez and Muniz (2013)

further analyzes the city employment growth model based on a dynamic agglomeration economic tied to a city's spacial structure using distance of employment center to judge metropolitan effects and variable distances to measure neighborhood effects. Fujita and Mori (2005) provides and overview of the development of spacial economics while emphasizing spacial economic theories, i.e. general location economics.

3 Objective

The article focuses on supermarket concentration in Bratislava as rapidly developing city. The first part examines the supermarket as a dominant retail format in the retail store structure in retail chains. The second part provides an analysis of supermarket concentration in Bratislava. This article also evaluates the spacial supermarket distribution in each city district from 2011 to 2016.

4 Spacial concentration

Krugman (1991) indicates that production is concentrated in space, he considers this as one of the important features of the current economic activity geography. Thus, the article's focus is on the supermarket spacial concentration in Bratislava and if there exists a spacial concentration among industries within its economic.

According to p. Kotler, on this level of analysis of the grocery market the individual retail unit don't pose as competition to one another but it is on the retail chain level where there is competition to offer the most utility to the consumer in the exchange process (Kotler, Keller, 2006, p 30-38). Acquisition of merging of various businesses within the distribution channel can explain the concentration. This market structure resembles an oligopoly where only a small number of businesses represent the offer. Based on this, the market becomes less competitive as the competition grows. The grocery market shows a clear propensity towards concentration which leads to the creation of global enterprises (retail chains) and strategic business alliances. Concentration happens also on the organizational and spacial accessibility levels (the retail units concentrate in shopping center, commercial venues, etc.). The concentration process has a negative influence, e.g. closure of numerous small commercial businesses, which can't compete with retail chains. On the other hand, it improves the effectiveness of businesses and thus improves consumer satisfaction. The highest level of concentration is observable on a retail chain level where fast moving merchandise is sold mainly in supermarket and hypermarkets. The existence of retail units on a inter-regional and regional level is due mainly to a correct strategy based on an accurate analysis of the market landscape (Cimler, 1994; Kunc et al. 2012).

5 Economic geography

This field of research focuses on the uneven distribution of economic activities in space. Two colliding theories are influential in the field: institutional economic geography and "new" economic geography. Institutional geography is lead by experts with a background in cartography and carries many similarities with institutional economics (Hodgson, 2001). Plainly said, institutional geography states that the uneven distribution of wealth in an area is due to institutional differences (Whitley, 2000). New economic geography results from neoclassical economics (Krugman, 1991; Brakman et al., 2001) and considers the uneven distribution of economic activities as a result of universal processes of the agglomeration fueled by production factor mobility. The lack of intersections between the two fields can be explained as two immesurables such as institutional and neoclassical economics (Boschman & Frenekn, 2006). In many cities or regions, retail is considered as stabilizing industry for socio-economic development. From a food policy perspective, it provides nourishment for the citizens, i.e. citizens living in cities or on the countryside and make it accessible to low-

income consumers to limit malnutrition or overconsumption. While analyzing food policy, various authors focus on understanding the relations in geographical accessibility of healthy groceries to ensure nutritional security (Bateersby et al., 2014) and supermarket concentration in Bratislava along with their placement among districts. On a macro scale, analyzing relations within economic chains focuses on globalization processes manifested in the presence of multinational retail chains on the grocery market. These are strongly concentrated and supported by an established supplier and logistics network along with their offensive marketing strategy and widespread distribution. Globalization in Slovakia is observable not only on the number of domestic and international retail chains but also on their supply policy and price stability. On a micro scale, retail chains focus on providing food access to consumers based on a relation between consumer income; and food prices and consumer behavior. The increasing consumer interest in healthy and fresh produce in the past decade results from impacts of grocery scandals in developed countries which contributed to the increased interest in food safety (BSE, food-and-mouth disease in cows). At the same time, changes in consumer behavior towards distrusting food processing procedures or unfavorable stances to the anonymous environment of supermarket and shopping center. The consumers are also aware of the increasing number of red flagged groceries in retail chains. From this perspective, the new food security program places the small farmer into the spotlight of its efforts to resolve a growing worldwide problem of food insufficiency. In this respect, Slovakia is on the tail end in Europe and on a global scale, according to the Global Food Security Index, established by the Economist in 2012 (table 1).

Table 1: Food security index 2012 - 2016

Year	2012	2013	2014	2015	2016
Rank	27.	37.	31.	32.	40.

Source: The Economist http://foodsecurityindex.eiu.com/

6 Geographical localization

Even though it seems that this problem is more severe on the countryside, the opposite is the truth. This problem increasingly concerns population in cities, where it takes form of accessibility. Accessibility to groceries in cities depends on the ability of the family to realise the purchase, this ability is influence by their level of income, grocery prices, and reatail unit location (Karamychev, van Reeven, 2009). Groceries can be economically accessible but not present within a certain space (the store is located too far or it is difficult to get to). On the contrary, groceries can be available in the given space (supermarket) but economically non-accessible (the merchandise is sold out). Grocery supply in Slovakia leans on a developed distribution system of each retail chain.

7 Supermarkets

The result of developing large surface store was the boom in supermarkets, originally supposed to cover the needs of higher and middle class citizens. Currently, supermarket is the most widely constructed retail store format due to rapid district urbanization such as in Bratislava. In contrast to traditional food distribution systems, farmer market, communal gardens, and niche oriented stores (Starý otec. Bio market) serve as key selling point for small and medium farmers not able to compete with large surface stores (Pinard et al., 2016). Customers in these stores search for a greater shopping experience and foster a personal relationship with the farmer or vendor.

These store format don't play such a significant role in the city's fresh food supply as do supermarkets, although increasingly important for job-creation. Slovaks have taken their shopping behavior from Western countries but the main purpose of traditional and non-traditional distribution systems is still providing the citizen with fresh and processed food. The rapid development of supermarkets has a significant influence on non-traditional food distributors. Supermarket intensify competition with non-traditional distributer by becoming increasingly universal in their offerings to cover lower-income consumers.

Although, groceries are becoming more accessible to the low-income families (Fan, Brzeska, 2016), this effort leads to lack of quality in the groceries and leads to price wars among competition (Pickles et al., 2016). A neoliberally managed market, at first glance brings unclear positive consequences for low-income consumers, who don't realize it. On the contrary, the business sphere is significantly affected in market entry, competition and control.

8 Methodology

The field research took place in the metropolitan area during two periods, first from February to May 2011 and second from October to November 2016.The research took place in Bratislava, Slovakia's capital, since it is the largest metropolitan area in Slovakia's market. Using a geographical information system, the geographical distribution of supermarket and their concentration in Bratislava was indetified.

Two research questions were formulated based on the defined objective:
1. Is each of Bratislava's districts sufficiently covered by supermarkets?
2. Have there been changes to the territorial coverage of supermarkets in Bratislava betweem 2011 and 2016?

The utilizing formula for calculating entropy enables measuring spacial dispersion of the population. The more the population is disperse in space, the higher the entropy. Geographers measure use entropy to gauge outflow of residents from the countryside. When the entropy is low, the population dispersion is decreasing, thus population concentration is higher (Cliquet G., Fady, A., Basset G., Groizean J-P., 2006). In the article, the entropy formula applied on retail chains supposes that their development will increase their areal coverage.

The authors of the article utilized the following formula to calculate the territorial supermarket coverage in Bratislava.

$$^kE = -\sum f_i \log f_i \qquad (1)$$

$i = 1$

where: E - entropy;

k – number of divided geographical areas;
f_i – number of retail unit within area i.

Application of relative entropy:

$$RE = E / \log k \qquad (2)$$

(Cliquet G., Fady A., Basset G., Croizean J-P., 2006)

k is calcuted within the interval [0, 1] to ensure the simplest comparison with competitors (Cliauet G., Fady A., Basset G., Croizean J-P., 2006). For calculating the relative entropy in Bratislava k=5, due to the administrative division into 5 districts (Bratislava 1, Bratislava 2, Bratislava 3, Bratislava 4, Bratislava 5).

9 Results

Although, most common literature focuses on sufficient provision of food for residents to ensure their sufficiency, from this perspective the focus should be on the groceries on offer in the whole city, i.e. if retail store formats offer a wide range of healthy and fresh groceries at competitive prices. For this reason, the study focuses on supermarket chains supposing they provide a complete assortment of fresh groceries at low costs and profit margins. This is in accord with the work of Apparicio et al. (2007) or Leat et al. (2011). In 2011, the field research resulted in locating 99 supermarkets belonging to 13 retail chains, displayed in scheme 1. In 2016, field research localized 119 supermarket under 14 chains.

Scheme 1: Supermarket network in Bratislava in 2011 and 2016
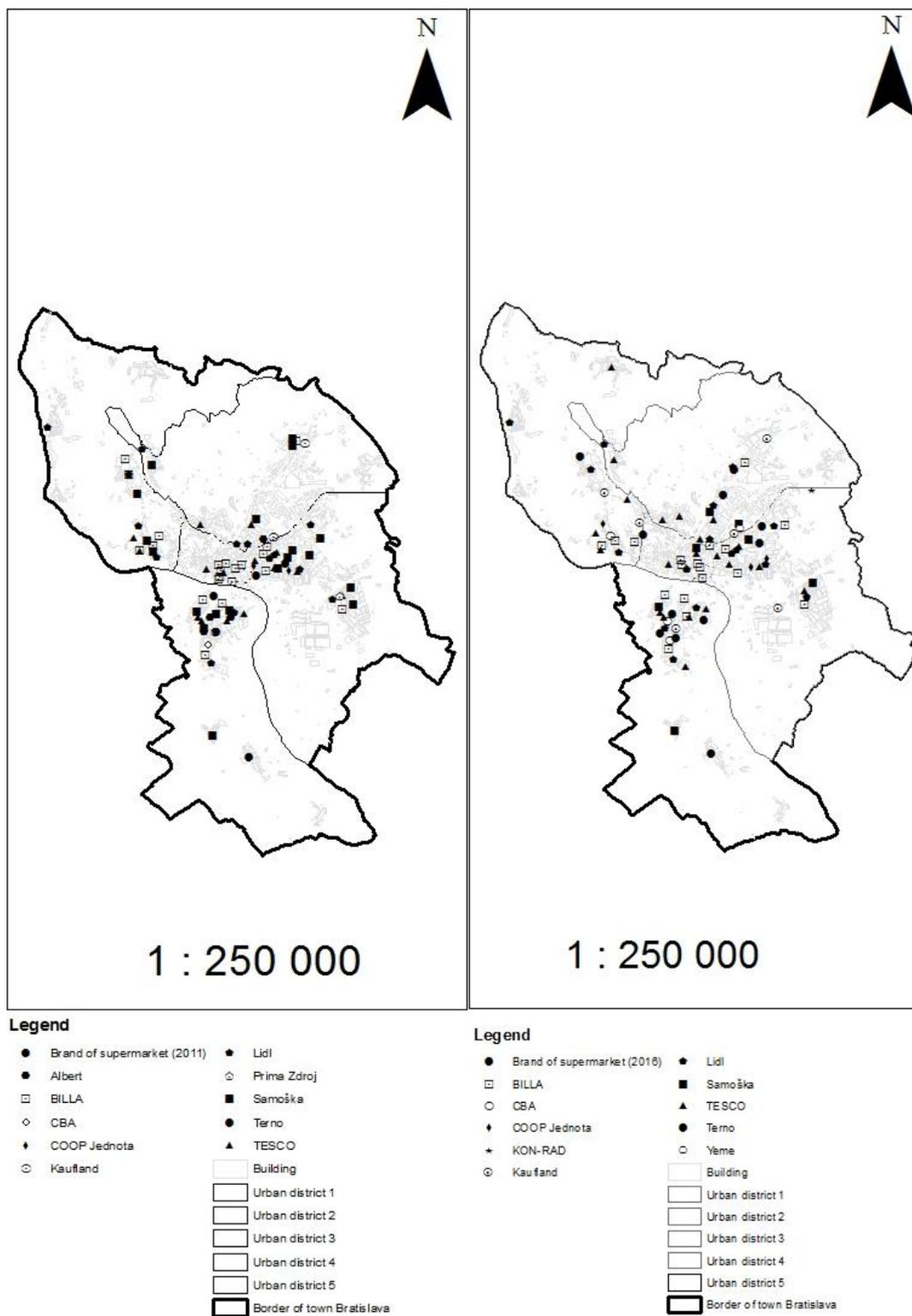
Source: Own research

Supermarkets are located in every district of Bratislava. Table 2 displays the format and number of retail unit per chain in 2011 and 2016. Based on the available data, the most numerous are Billa and Tesco. Changes happened among retail chains as well. Chains as Albert, Bala, Hypernova, Prima Zdroj were present only in 2011; whereas Delia, Malina, Môj obchod, Yeme were present only in 2016. Other retail chains were localised in both years.

Table 2: Overview of supermarkets in Bratislava

Retail chain	Type of store	Number of stores in 2011	Number of stores in 2016
Albert	Supermarket	4	x
Bala	Small sized store	4	x
Billa	Supermarket	22	20
Carrefour	Hypermarket	2	2
CBA	Supermarket	5	3
DELIA	Small sized store	x	9
Hypernova	Hypermarket	1	x
Jednota	Supermarket	2	4
Kaufland	Supermarket	3	6
KON-RAD	Supermarket	x	1
Lidl	Supermarket	15	16
Malina	Small sized store	x	5
Môj obchod	Small sized store	x	8
Prima Zdroj	Convenience store	1	x
Samoška	Supermarket	18	7
Terno	Supermarket	1	11
Tesco	Hypermarket/supermarket	21	26
Yeme	Supermarket	x	1

Source: Own research

Tables 3 and 4 show the relative entropy of all competing supermarket chains in Bratislava, in 2011 and 2016. The calculation are done for all five districts.

Table 3: Relative entropy calculation for the complete set of competing supermarket chains in Bratislava in 2011

Mestská časť	fi	log fi	fi log fi	E	k	log k	RE
Bratislava 1	0,121212121	-0,916453949	-0,111085327				
Bratislava 2	0,292929293	-0,533237197	-0,156200795				
Bratislava 3	0,151515152	-0,819543936	-0,124173324	**0,67823647**	5	0,69897	**0,970337**
Bratislava 4	0,191919192	-0,716881594	-0,137583336				
Bratislava 5	0,242424242	-0,615423953	-0,149193686				

Source: own research

Value fi and $fi \log fi$ were calculated of every retail chain to obtain the relative entropy of every retail chain in Bratislava. In 2011, Terno, Prima Zdroj, Jednota, Hypernova attained the lowest entropy values. These retail chains attained an entropy value of 0 due to their incomplete territorial coverage of Bratislava. In 2016, KON-RAD was the only chain to attain an entropy value of 0. On the contrary, Tesco in 2016, and Billa in 2011 attained the highest entropy values.

Table 4: Relative entropy calculation for the complete set of competing supermarket chains in Bratislava, in 2016

Mestská časť	fi	log fi	fi log fi	E	k	log k	RE
Bratislava 1	0,168067227	-0,774516966	-0,130170919				
Bratislava 2	0,268907563	-0,570396983	-0,153384063				
Bratislava 3	0,168067227	-0,774516966	-0,130170919	**0,687224**	5	0,69897	**0,983195102**
Bratislava 4	0,151260504	-0,820274456	-0,124075128				
Bratislava 5	0,243697479	-0,613148963	-0,149422857				

Source: own research

Tesco supermarkets are present in each district. It had 7 units in district Bratislava 2, attained a frequency of fi 0,269230769 and value of $fi \log fi$ -0,153427968. In Bratislava 1, Tesco has 3 units with a frequency of fi 0,115384615 and value of $fi \log fi$ -0,108213703. Tesco's entropy value is E = 0,680623155 and relative is RE = 0,973752. Relative entropy ranges between 0 and 1. Therefore, Tesco covers almost all of Bratislava, i.e. it has an excellent territorial supermarket coverage.

10 Discussion

The answer to the first research question is: Yes, supermarkets sufficiently cover every district of Bratislava. The answer is supported by the displayed calculations where the relative entropy attains a value of 0,983195102 in 2016 and 0,970337 in 2011. Although, there are district with a lower number of supermarkets per capita; such as: Bratislava 4, Bratislava 5 in 2011 as well as 2016.

The answer to the second research question is: Yes, there have been changes in the territorial supermarket distribution. Scheme 1 shows the supermarket distribution in 2011 and 2016, there has been a certain movement from the center towards the peripheries. In 2011, supermarkets were more concentrated around the center which left peripheries with low coverage. In 2016, noticeable changes are visible from the center towards the peripheries. This may be connected with the development of new peripheral areas, rising rent prices in the city center as well as changing settlement tendencies.

11 Conclussions

The Slovak retail market, as are other central European countries' markets, is typical for an enormous growth in concentration of distribution and radical changes in distribution channels. Modern grocery supply chains are increasingly tied by contracts (among distribution channel members) in their purchasing decisions. Supermarkets represent a large portion in sales of processed or fresh groceries among a limited number of preferred suppliers. Most supermarkets in retail chains dispose of a centralized purchase and distribution center. The supermarket revolution won't radically transform city systems of food supply in the future. Territorial changes in supermarket distribution will continue to reflect changes in demand for groceries, current healthy food trends, settlement changes, or new district creation.

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SEASONALITY OF UNEMPLOYMENT ON THE LABOUR MARKETS OF THE WEST POMERANIAN VOIVODESHIP

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Abstract: This paper aims at the comparison of diversity of the seasonality of unemployment on the labour markets of the West Pomeranian Voivodeship. Analyses concerned the monthly and yearly fluctuations in seasonal unemployment. This paper has also attempted to verify whether on the studied markets there occur dependencies between the number of the unemployed and the number of the seasonally unemployed. The analysis concerned all communes in the West Pomeranian Voivodeship based on the adopted classification of administrative division into rural communes, urban and rural communes, and urban communes. Data applied in the research concerned the monthly number of the unemployed in general from the period of January 2001-December 2015 obtained from the Voivodeship Labour Office in Szczecin. Seasonal components of unemployment were distinguished with the Census X-12 ARIMA algorithm.

Keywords: unemployment, seasonality, labour market

1 Introduction

One of the commonly applied classification of labour markets in the spatial arrangement is a distribution into the urban, suburban and rural markets[1]. Each of these markets shows different specificity, while social and economic changes in the recent years have resulted in the evolution of their functioning. Currently, in many countries one observes the process of deindustrialisation of towns, especially the big ones. Urban labour markets are more and more frequently the providers of new technologies and public services[2], thus significantly affecting the functioning of local labour markets[3]. The second phenomenon observed in the recent years includes the process of multifunctional development of rural areas, which may affect a change in the functioning of rural labour markets, less and less connected with the agricultural production. The above-mentioned processes may result in the decline of some differences and the occurrence of new differences between the urban and rural labour markets.

Here it should be emphasised that the majority of conducted empirical analyses connected with the labour market concerns the issue of unemployment. They confirm the occurring spatial diversity of this phenomenon[4], simultaneously emphasising the fact that diversity among regional markets within one country is often larger than among countries[5]. They indicate the usually occurring permanent character of this[6]. Often the labour market analyses omit the aspect of seasonality, although full characteristics should consider also short-term changes. It should be agreed that seasonal fluctuations may constitute a significant part of short-term variability of economic phenomena[7].
The division of labour markets into the rural, urban, and urban and rural markets[8] seems to be justified, allowing for better

description of seasonal fluctuations in unemployment. Thus, it has been decided that seasonal fluctuations may constitute the subject of analysis with consideration of the mentioned market classification. This paper aims at the comparison of diversity of the seasonality of unemployment in the West Pomeranian Voivodeship, Poland. In detailed analyses one applied data concerning the rural, urban, and urban and rural labour markets. The attempt was made to define differences in the size of seasonal fluctuations, trends of those changes and distribution of seasonal fluctuations in the course of the year. The subject of analyses was constituted also by the connection between changes in the number of the seasonally unemployed and changes in the total number of the unemployed.

2 Scope and method

The most common definition describes seasonality as regular and recurring changes in natural phenomena in a given place, usually connected with climate and seasons[9]. Due to seasonal fluctuations, business activity and employment differ regularly in the course of the year as a result of impact of various factors, mainly natural[10] and institutional[11]. From the point of view of the labour market functioning, seasonality should be regarded as a negative phenomenon, as reference to its positive consequences is rare in the literature[12].

In this paper, the research of the seasonality of unemployment covered all communes in the West Pomeranian Voivodeship classified based on an administrative criterion into urban (11 facilities), rural (49 facilities), and urban and rural (53 facilities) communes. The research included jointly 113 facilities. To analyse the seasonality of unemployment, one applied the data concerning the monthly number of the unemployed from the Voivodeship Labour Office in Szczecin. The research time scope included the years 2001-2015, that is 180 monthly observations in total.

An initial step in that research was the separation of seasonal components of unemployment from the original time series. Time series decomposition consists in the separation of the trend-cycle component (Tt), random component (It), effect of a various number of working days (Dt), effect of holidays (Et) and a seasonal component (St) from the initial series[13]:

$$Xt = Tt \ \blacksquare \ St \ \blacksquare \ It \ \blacksquare Et \ \blacksquare Dt$$

where ■ depending on the considered multiplicative or additive model means respectively the multiplication or plus sign. TRAMO/ SEATS and X-12 ARIMA constitute the most often applied methods of seasonal data equalisation[14]. In this research, the Census X-12 ARIMA procedure was applied to select a seasonal component, thus receiving time series for particular markets describing the number of the seasonally unemployed and relative deviations of the number of the seasonally unemployed from the total number of the unemployed.

At the second stage, average annual deviations of the number of the seasonally unemployed for particular years were calculated,

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[14] Others method are: X- 11, X- 11 ARIMA, SABL, STAMP, BV4, DAINTIES. more in: B. Fischer, *Decomposition of Time Series Comparing Different Methods in Theory and Practice*, Luxembourg, 1995.

as well as for the whole analysed period – the average annual deviations of the number of the seasonally unemployed in particular months. Average annual seasonal fluctuations in the number of the unemployed MSV were calculated with use of the following formula:

$$MSV = \sum_{n=1}^{12} \left(\frac{\left| \dfrac{U_{u,n} - U_{a,n}}{U_{a,n}} \right|}{12} \right) \times 100$$

where $U_{u,n}$ is the not seasonal adjustment number of the unemployed in n month of a given year; $U_{u,n}$ – seasonal adjustment number of the unemployed in n month of a given year. With use of the same values, also average deviation of the seasonal number of the unemployed in particular months MMV was calculated as follows:

$$MMV = \sum_{i=1}^{j} \left(\frac{U_{u,i} - U_{a,i}}{U_{a,i}} - 1 \right) \cdot 100$$

where $U_{u,i}$ and $U_{a,i}$ are, respectively, not seasonal adjustment and seasonal adjustment number of the unemployed in a given month of an i year. The results obtained in such a manner allowed for the description of the size of seasonal unemployment on particular markets, tendencies of its changes and yearly distribution.

Another analysis conducted in the paper concerned the elasticity of seasonal unemployment towards the total unemployment. It was conducted with use of the regression function in the following form:

$$\Delta lnUs, i = a + b\Delta lnUt, i$$

where $\Delta lnU_{s\,i}$ means an increase in the number of the seasonally unemployed between extreme years in an i group of communes and $\Delta lnU_{t,i}$ is an increase in the total number of the unemployed between extreme years in an i group of communes. In the context of changes in the seasonality of unemployment, interpretation of the b coefficient is important. The coefficient below the unity means that the seasonality of unemployment decreases together with an increase in unemployment and increases together with a decrease in unemployment. It would imply the pro-cyclical character of the seasonality of unemployment.

3 Analysis of the labour market of the West Pomeranian voivodeship

Selection of the West Pomeranian Voivodeship for the unemployment seasonality research is justified, as according to the latest research results it is a region with one of the highest sensitivities to seasonal changes and is strongly internally diversified, mainly with regard to the unemployment intensity[15]. In part, it results from the labour market specificity, which is the occurrence of tourist and agricultural areas and the relatively low impact of cities on the Voivodeship economy[16].

In general, economic and social condition of the region is assessed as significantly poorer than of the most of other regions in Poland[17]. In the recent years, business activity of the Voivodeship has been subject to further weakening. Very unfavourable downward trend of the professional activity

indicator has been observed – from 54.1 in 2005 to 52.2 in 2015[18]. Relatively low level of professional activity characterises mainly rural areas of the Voivodeship (50.1 as compared with 54.2 for towns). The West Pomeranian Voivodeship belongs to the group of voivodeships of lower human capital level than the average one in other regions in Poland (and it is still falling)[19]. Research in the area of labour market activity indicates that in this Voivodeship the entrepreneurship indicator (a number of enterprises per one thousand inhabitants) is higher than the average in the country and shows an increasing trend, i.e. from 122 in 2005 to 126.1 in 2012, which should be assessed positively. It could have affected the observed increase in employment in that region (employment rate increased from 41.8 in 2005 to 46.5 in 2012 and to 50 in the first quarter of 2016)[20]. Similarly, share of persons with higher education does not depart from the average level in the country. Within the region the following labour markets can be distinguished[21]:

- the City of Szczecin, capital city of the region and the largest local labour market, constitutes a growth pole covering a group of adjacent communes.
- labour markets established by the communes situated around towns, i.e. Koszalin, Kołobrzeg, with relatively favourable level of development (employment intensity is the lowest, a number of households supporting themselves on the non-agricultural activity and migration attractiveness is relatively high).
- labour markets of coastal communes with relatively strong, although seasonal, tourist economy, heterogeneous with regard to the level of social and economic development and to the structure of its components. Among them one can distinguish strongly urbanised communes[22], those with prevailing large-scale agriculture, and communes on the path of multifunctional growth[23];
- labour market of communes far from the coastal belt and the capital city of the region, with relatively very low, low or medium level of social and economic development, mainly monofunctional former State-Owned Funds based on wage-labour large-scale agriculture. They are characterised with low (against the country and the Voivodeship) use of labour resources, high registered and hidden unemployment (mainly rural communes of the Central Pomerania).

The West Pomeranian Voivodeship is characterised with high spatial internal diversity with regard to the average annual intensity of unemployment, which may indicate an unequal development of these areas (see Tab. 1).

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[22] Międzyzdroje, Dziwnów, Rewal, Ustronie Morskie, Mielno
[23] Kamień Pomorski, Trzebiatów, Kołobrzeg

Table 1 Diversity of the unemployment intensity on the labour markets of the West Pomeranian Voivodeship from 2001 to 2015 (in %)

Years	Rural Markets			Urban Markets			Rural-urban Markets		
	Max	Min	Average	Max	Min	Average	Max	Min	Average
2001	33,4	7	20,4	22,4	7,2	15,2	33,0	9,4	20,0
2002	32,5	10,2	22,8	22,9	9,5	16,4	32,5	11,7	21,8
2003	32,0	10,6	22,8	22,1	10,7	16,5	31,9	12,5	22,2
2004	31,3	9,3	22,3	23,2	10,7	16,5	34,0	11,7	22,0
2005	29,4	8,4	20,5	21,6	9,8	15,2	29,9	10,4	20,3
2006	26,2	6,8	17,6	19,1	8,4	13,4	26,2	9,0	17,4
2007	23,2	5,6	14,0	17,5	6,2	10,3	22,9	6,9	13,7
2008	21,8	4,5	10,9	14,4	3,2	7,6	20,2	5,5	11,2
2009	19,9	4,7	11,1	13,5	4,3	8,0	19,5	5,7	11,7
2010	18,2	5,5	12,0	12,9	5,1	8,9	17,7	6,5	12,3
2011	20,0	5,6	12,4	13,4	5,3	9,2	20,2	6,8	12,7
2012	18,5	6,0	12,0	13,3	5,0	9,3	19,8	6,5	12,2
2013	18,8	6,1	12,1	13,7	5,1	9,1	19,3	6,5	12,2
2014	17,4	5,1	10,9	12,6	4,0	8,6	18,3	5,4	11,2
2015	15,7	4,1	9,5	11,4	3,7	7,5	16,9	4,2	9,9

Source: own elaboration and calculations based on data WUP in Szczecin (www.wup.pl)

An analysis of the number of the unemployed on the researched markets allowed to distinguish three subperiods within the whole period: a short period including only 24 observations from 2001 and 2002, probably the final stage of the phase of an increase in the number of the unemployed begun before year 2001. The second phase includes the years 2003-2008, characterised with a significant decrease in the number of the unemployed. The third phase occurred from 2009 to 2012, when an increase in the number of the unemployed on all market types was observed. The last months of observation from 2013 to 2015 indicated the change in an economic trend, as the number of the unemployed started to slowly decrease, while its decline was clearly visible since 2014. It should also be emphasised that despite the increased number of the unemployed in the third observed phase the number of the unemployed did not reach such a dramatically high level as in the preceding years (see Fig. 1). While assessing responses of changes in the number of the unemployed on the researched markets: rural, urban and rural, and urban, it was stated that they were similar in all phases of the analysed period. The average annual intensity was declining till 2007, after which the downturn in the markets happened, which was noticeable also on the regional markets in the increased unemployment, while its extreme values were on a significantly lower level than before 2007 (see Tab. 1).

Figure 1. Number of the unemployed in the West Pomeranian Voivodeship in the years 2001- 2015 (in thousands of people)
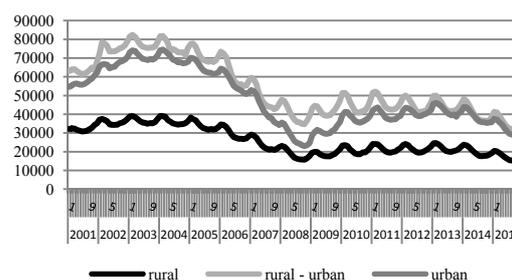
Source: own elaboration based on WUP in Szczecin (www.wup.pl)

4 Analysis of the seasonality of unemployment from 2001 to 2015

An analysis of the seasonality of unemployment in the system of rural, urban, and urban and rural labour markets indicated that on the level of averages differences in seasonal fluctuations in unemployment were small and showed one-way changes in time (Tab. 2). The size of fluctuations showed an increasing trend from 2001 to 2010. In the subsequent years the size of fluctuations was reduced. On the rural markets, a decrease in seasonality was observed with a one-year delay. The researched markets were characterised with significant diversity of seasonality, i.e. the lowest seasonality characterised the urban markets, while high extreme differences of seasonality occurred on the rural and mixed markets (Fig. 2).

Figure 2. Average annual seasonal fluctuations in unemployment according to the commune types in the years 2001 -2015
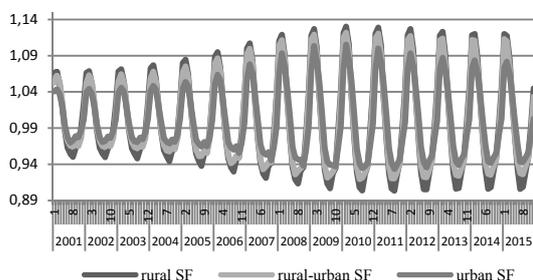
Source: own elaboration and calculations based on data WUP in Szczecin (www.wup.pl)

Specificity of the average annual components of the seasonality of unemployment inclines to the adoption of a thesis of relatively poor diversity of the researched markets, although noticeably stronger fluctuations occurred on typically rural and mixed markets that did not show any significant differences against each other. A response of the urban markets was different, as the fluctuations in seasonality were relatively the weakest there (see Tab. 2).

Table 2 Average annual seasonal components (in %)

Years \ Market	Rural			Rural-urban			Urban		
	Average	min	max	Average	min	max	Average	min	max
2001	3,78	1,3	6,8	3,34	0,5	6,2	2,38	0,2	4,3
2002	3,83	1,4	6,9	3,39	1,0	6,3	2,40	0,2	4,4
2003	3,96	1,5	7,1	3,52	1,4	6,4	2,47	0,3	4,6

2004	4,25	1,7	7,7	3,84	1,6	6,8	2,64	0,3	4,8
2005	4,73	1,8	8,5	4,32	1,8	7,5	2,95	0,1	5,4
2006	5,36	1,8	9,5	4,98	2,0	8,6	3,48	0,1	6,3
2007	6,04	1,8	10,7	5,63	2,2	10,0	4,21	0,2	7,8
2008	6,65	1,8	11,9	6,19	2,3	11,1	4,92	0,6	9,3
2009	7,03	1,6	12,7	6,55	2,1	11,9	5,35	0,8	10,3
2010	7,18	1,3	13,0	6,65	1,8	12,2	5,41	0,4	10,5
2011	7,12	0,9	12,9	6,56	1,6	12,0	5,18	0,2	10,0
2012	6,96	0,8	12,7	6,35	1,6	11,7	4,85	0,0	9,3
2013	6,81	0,7	12,3	6,16	1,8	11,3	4,58	0,2	8,7
2014	6,70	0,7	12,0	6,03	1,9	11,2	4,41	0,2	8,4
2015	6,65	0,7	12,0	5,98	1,9	11,3	4,33	0,0	8,2

Source: own elaboration and calculations based on data WUP in Szczecin (www.wup.pl)

Figure 3. The relation between the unemployment intensity (Rate) and the level of seasonal fluctuations in unemployment (average annual data 2001-2015)
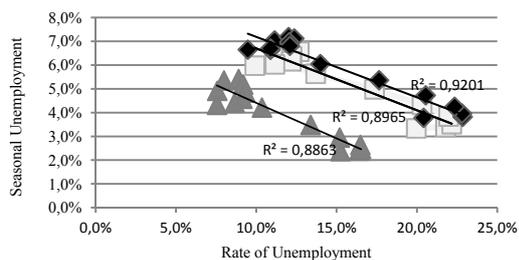
Legend: triangles – urban markets; rhombi – rural markets, squares – urban and rural markets.
Source: own elaboration and calculations based on data WUP in Szczecin (www.wup.pl)

The obtained results indicate the relatively strong relation between the seasonality of unemployment and the level of unemployment. On all the researched markets in the periods of an increase in unemployment (i.e. 2001-2007), the size of seasonal unemployment was smaller ($R^2 > 0.88$) than in the periods when unemployment was decreasing (after 2007). Then an increase in the size of seasonal unemployment was observed (Fig. 4).

5 Distribution of monthly fluctuations of unemployment

Differences in seasonality, apart from the size of fluctuations, may concern their different distribution in the course of the year. An analysis of the distribution of average monthly fluctuations in seasonal unemployment in the course of the year allows to distinguish two types of responses observed on all researched market types (r, u, u - r): an increase in seasonal unemployment observed from December to April and a decrease in seasonal unemployment from May to November. Although the researched markets (r, u, u - r) were characterised with a similar tendency of the distribution of fluctuations in the course of the year, the strength of their response was diversified. From December to March significantly higher fluctuations occurred on the rural and

urban and rural markets. The lowest fluctuations were observed on the urban labour markets.

Figure 4. Average monthly fluctuations in the seasonality of unemployment from 2001 to 2015 (in %)
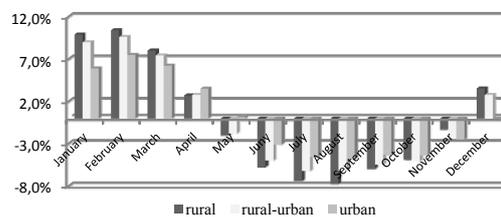
Source: own elaboration and calculations based on data WUP in Szczecin (www.wup.pl)

In April a change in behaviour of particular market types was observed, as, contrary to the previous months, the greater response of an increase in seasonal unemployment was observed on the urban markets, while from January to April the strongest fluctuations occurred on the rural markets. In the period of a decrease in seasonal unemployment, i.e. from May to November, diversified responses on particular market types were observed. It means that the strongest decrease in seasonal unemployment occurred on the rural markets, while the weakest – on the urban markets (such a response was observed from May to September). However, in October the largest decrease in seasonal unemployment occurred on the urban and rural markets, while typical rural and typical urban markets responded in a slightly weaker manner. In November the markets responded even more differently, as the weakest response was observed on the rural markets, while the urban markets indicated the strongest decrease in seasonal unemployment. While assessing the strength of fluctuations in seasonal unemployment (in %), it should be stated that both the strength of decrease in and of increase in seasonal unemployment characterised mostly the rural markets. In addition, the strength of an increase in seasonal unemployment was greater than the strength of its decrease, and this concerns all analysed market types (r, u, u- r).

6 Analysis of the elasticity of seasonal unemployment towards the total unemployment

In order to define the influence of a direction of changes in the number of the unemployed on the behaviour of unemployment seasonality, it was necessary to conduct analyses for the same markets, but separately for the period of a decreasing number of the unemployed and for the period of an increasing number of the unemployed. The elasticity test was conducted jointly for the rural, urban, and urban and rural markets in two subperiods: the first subperiod from 2003 to 2008, characterised with a decreasing number of the unemployed, and the second subperiod from 2009 to 2013 of an increasing number of the unemployed.

Figure 5 Changes in the number of the seasonally unemployed and changes in the total number of the unemployed
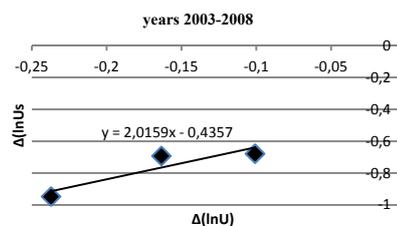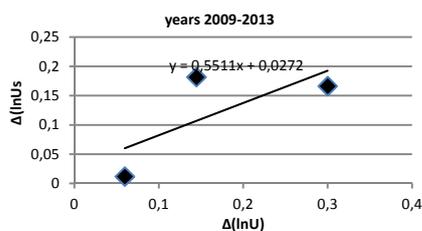
Source: own elaboration and calculations based on data WUP in Szczecin (www.wup.pl)

Results of elasticity estimated for a period of a decreasing number of the unemployed indicate that the elasticity of the number of the seasonally unemployed towards the total number of the unemployed was above the unity (b=2.01). As a consequence, a decrease in unemployment entailed a decrease in its seasonality, while the response of seasonal fluctuations was stronger than the response of the number of the unemployed. In turn, while assessing responses in the period of an increasing number of the unemployed, it was stated that elasticity was below the unity (b=0.55). It means that together with an increase in unemployment its seasonality grows, but its response is weaker than the response of the number of the unemployed (see Fig. 5).

7 Conclusions

In this paper, the phenomenon of unemployment seasonality was researched on the rural, urban, and urban- rural markets to define the size of seasonal fluctuations in particular years and their distribution in the course of the year. Based on those characteristics, it was stated that:

▪ The researched markets (rural, urban, urban- rural) did not show strong diversity concerning the size of fluctuations, however, in general stronger fluctuations in seasonal unemployment occurred on the rural markets. On all markets the strength of an increase in seasonal unemployment was greater than the strength of a decrease, while the strongest decrease in seasonal unemployment was observed on the rural markets.

▪ On all markets (rural, urban, urban-rural) one yearly cycle was observed. Seasonal increase in unemployment occurred in winter months. In spring and summer months its decrease was noticeable (which, in general, is a regularity confirmed in other research of the authors[24]).

▪ The research confirms strong internal diversity of the researched markets with regard to employment intensity. However, a joint analysis for three types of labour markets (rural, urban, urban- rural) indicates that differences in values of the average annual intensity of unemployment on the researched markets are surprisingly small. It is caused probably by strong internal diversity on those markets, especially the urban ones.

▪ Despite the significant diversity among the researched markets, it appeared that with regard to the average annual fluctuations in unemployment seasonality all of them responded similarly, i.e. in the period of economic growth characterised with a decrease in unemployment the size of seasonal unemployment increased on all markets. In the period of economic downturn a reduced size of seasonal unemployment was observed, with simultaneous increase in unemployment intensity.

A conclusion from the analysis of elasticity of the number of the seasonally unemployed against the total number of the unemployed is that the elasticity is diversified according to the economic trend on the labour market. Elasticity below the unity (b<1) for the period of an increasing number of the unemployed means that seasonality would behave as the pro-cyclical variable. In turn, elasticity above the unity (b>1) in the period of a decreasing number of the unemployed indicates its anticyclical character.

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[24] excluding Germany

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THE SITUATION OF THE REGIONAL LABOR MARKETS WITH THE HYPOTHETICAL ABSENCE OF FOREIGN DIRECT INVESTMENT

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Abstract: This article focuses on the quantification of the utility of the system of investment incentives in the case of six selected regions in the Czech Republic. Based on comparative analysis of information from the annual reports of multinational companies and statistics of the Czech Statistical Office and the data government agency CzechInvest is quantified impact of the direct effect of creating jobs in foreign direct investment, which received investment incentives. The contribution of these investments to solve the problem of high unemployment rates is illustrative of a hypothetical rate of unemployment. It means what would be the situation of the regional labor markets in the case of absence of these investments.

Keywords: Foreign direct investment, investment incentives, labour market, rate of unemployment

1 Introduction

Foreign direct investment (FDI) is a term that is mentioned worldwide. This is a phenomenon that can be seen as a key barometer of future prospects of the economy. It is not possible to say that international capital flows into the Czech Republic, including FDI, were low (Hlaváček and Bal-Domanska, 2016). There are rather difficulties associated with the absorption of economy, especially with the low flexibility of Czech domestic enterprises, banks, local authorities and government responsiveness. There is a slow reaction on the impulses from this kind of capital (Benáček, 2000).

The aim of this paper is the evaluation of the direct effect of creating new jobs in FDI, located in the six selected regions of the Czech Republic. The subject of the research is about (Multinational Companies) MNC's that have localized their examined branches in these regions and received investment incentives.

2 Selected impacts of FDI

The capital inflow of long-term character can be considered as the first direct positive effect of FDI as it simultaneously complements insufficiently generated financial capital in the host regions (lack of savings), which is expressed by the well-known equation:

$$I_f = (S - I) + (T + G) \qquad (1)$$

It means net foreign capital inflows I_f (including FDI) fills a gap in supply deficits domestic private (S) and public savings (T) relative to domestic investment demand (I) and the needs of government spending (G). At the same time there is a reducing the domestic price of home insufficiently generated financial capital.

An often overlooked effect of FDI that stands „in the shadow" of major economic effects is the impact on the institutional environment. Changes in the institutional environment can occur in many ways. It can be for example a change in governmental functions or in the area of protection of property rights. This effect is ultimately form the so-called signaling negotiations when thanks to FDI outward improve of host economy can be seen by the efficiency and credibility of local markets.

One of the main risks is associated with the creation of the so-called dual economy, which is in the Czech Republic relatively high. On the one hand, there are prosperous and growing businesses linked to foreign capital and holders. On the other hand, there are undercapitalized former state corporations with still unresolved property rights, which are struggling for the favor of the state and avoid the need for intensive restructuring. The conflict between these two sectors consists in the different production capabilities that make domestic manufacturers unable to produce in higher qualities.

This leads to adverse vertical product differentiation. Due to this fact, the mutual competition between domestic and foreign firms weakens temporarily. At the same time, each of them operates to other existing markets. This has an impact not only on price relations between them, export opportunities and on wages, but also on the possibility of taking over advanced technologies (Benáček, 2000).

The creation of a dual economy can be supported by investment incentives and incentive redistribution that is caused by them, from subjects that do not benefit from investment incentives and pays taxes to the entities benefiting from an investment advantage. The actual allocations of investment builds «taxpayer incentives» to a considerable disadvantage as compared «beneficiaries» are not able to offer their employees such high salaries, as would be gained by recipient incentives". Furthermore, the non-beneficiaries have to face "ordinary paying taxes" which results in higher customer prices. (Kotíková and Čuhlová, 2015)

Crowding out and liquidation of domestic competitors is considered as the key negative effect of FDI. This phenomenon is certainly severely frustrating for producers on the domestic side. On the other hand, it is a standard phenomenon of healthy market reallocation of resources where efficient producers extrude inefficient producers from the market.

3 Methodology of the survey - description of the researched sample

The direct effect of job creation will be studied in a sample of six regions of the Czech Republic. Respectively the impact of FDI will be identified within the business environment of Pilsen, Carlsbad, Ustí nad Labem, Liberec, Hradec Králové and the Pardubice region. A common characteristic of these regions is their border position, which calls for international cooperation and greater cross-border business activities. The following calculations reflect respectively in how far these regions can exploit comparative advantages of these excellent locations.

The primary source of data is the statistic that issued decisions about granting investment incentives published by CzechInvest (2017). Secondary source are financial statements and annual reports of foreign companies that have received the promise of investment incentives (Ministry of Justice, 2017). Lists published by CzechInvest show evidence of FDI including information about regional location, country of origin of the investor, sector, granted investment incentives, the promise of new jobs and additional information.

CzechInvest (2017) mentions that since January 1st, 2017 from a total of 1,053 projects, 536 projects were from foreign companies. Of which 230, respectively 43% were made in the sample regions. Specifically:

- in the Pilsen region were promised 38 FDI projects,
- in the Carlsbad region were promised 14 FDI projects,
- in the Ústí nad Labem region were promised 105 FDI projects,
- in the Liberec region were promised 25 FDI projects,
- in the Hradec Kralove region were promised 23 FDI projects,
- in the Pardubice region were promised 25 FDI projects.

Given that in the first half of the year 2017 was available annual reports of companies analyzed until 2015 (Ministry of Justice, 2017) in the context of the research are modified data of actual investment incentives granted in this way:

- in the Pilsen region 38 FDI projects were supported with investment incentives,
- in the Carlsbad region 11 FDI projects were supported with investment incentives,
- in the Usti nad Labem region 98 FDI projects were supported with investment incentives,
- in the Liberec region 25 FDI projects were supported with investment incentives,
- in the Hradec Králové region 20 FDI projects were supported with investment incentives,
- in the Pardubice region were 22 FDI projects supported with investment incentives (CzechInvest, 2017).

The most important method, that was used, is the so called comparative analysis. Representative data on the regional labor market announced by the Czech Statistical Office (2017) are afterwards compared with figures from annual reports examining FDI. The consequence of analyzed FDI cases on regional labor markets is expressed by variances between the actual rate of joblessness on the one side (u):

$$u = \frac{U}{L} * 100 \qquad (2)$$

and on the second side the hypothetical unemployment rate (u_h):

$$u_h = \frac{U + E_{FDI}}{L} * 100 \qquad (3)$$

where U expresses the contemporary number of unemployed persons published by the Czech Statistical Office (CSO), L labor and E_{FDI} the quantity of the number of employees in the examined FDI in every year - see formula (4) (Kotíková, 2014).

$$E_{FDI} = \sum_{i=1}^{n} E_{FDI_i} \qquad (4)$$

The selected methodology constitutes the real situation of the labor market in the examined Czech regions supposing the absence of FDI. In lack of FDI, or at their location in different region, the figure of unemployed people would raise by the number of newly created jobs E_{FDI}. It is the uttermost perspective of states on regional labor markets.

This methodology also represents the importance of investment incentives benefits, due to the defined expressions that were mentioned above, it is the FDI which gained investment incentives.

The problems associated with this methodology are that companies often employ people from different regions and also foreigners. Unfortunately, this state / situation is difficult to define. To define the real effect of FDI on regional unemployment rate, it is essential to reduce the hypothetical calculations unemployment rate (u) from the impact of foreigners ($u_h - F$).

For the calculation of the effect of new job positions connected with home supply of labor it is expected to find dependencies among the immigrant inflow and FDI. It is necessary to calculate whether there is an existing dependence among FDI inflow and foreigners. This dependence will be specified by mentioned correlation analysis. The test of variables will be presented at the 5% significance level.

From the percentage of foreigners in total employment in individual region, this share will be used to calculations based on the formula (4) for particular years. This will give the framework of employment rate in these places, or how many of these new

positions are occupied by foreigners, and how many of them are occupied by local inhabitants.

To represent the true impact of FDI on regional labor market it is necessary to reduce the effect of immigration in the individual region from the hypothetical unemployment rate (u). From mentioned computations can be expressed the real effect of FDI that is benefited from investment incentives on regional labor markets. Using the selected methodology made it possible to calculate the primary effect of the creation of new jobs due to FDI at various grades – e.g. the effect of placement of FDI from a concrete industrial zone on the labor market of the territories and counties, present a collation of the impact of different industrial zones at various regional grades or identify the contrast of the effect of FDI on reducing regional unemployment rates among regions (Kotíková, 2016).

4 Results

For more accurate quantification of the development of primary jobs in the FDI and the attainment of the objective of this merit, it is necessary to define if there is an examined relationship among the inflow of FDI and foreigners in these regions. Table 1 represents results of the measurement indicating the dependency through correlation analysis, where the regions are sorted in descending order according to power dependence between the variables.

Tab. 1: The results of the analysis of dependence between FDI and the number of employed foreigners

Analysed region	Value of correlation coefficient
Ustí nad Labem	0,7013
Carlsbad	0,7552
Liberec	0,8615
Pardubice	0,6228

Source: own processing based on calculations from data of the Czech National Bank (2016) and the CSO (2017)

In four of the analyzed six regions was proved by correlation analysis linear relationship between FDI inflows (illustrated recalculated FDI per 1000 population) and the numbers employed foreigners in regions - except Pilsen and Hradec Králové region where on the significance level of 5% was not proven a linear relationship between the two variables.

4.1 The primary impact of FDI on the labour market in the Pilsen region

From the annual reports of companies meeting the criteria for FDI and receiving investment incentives, data on the number of jobs created in individual years in the period 2002 – 2014 was identified. Due to the use of the chosen method of calculation in the Pilsen region, the impact of FDI reduced unemployment in the size of about 3.19 percentage points per year. This corresponds to the area between the blue and the red curve in Fig. 1. The graph also shows that the gap between FDI and the unemployment rates increases over the years with the growing influence of FDI. FDI in this region have created an average of 9,900 jobs.
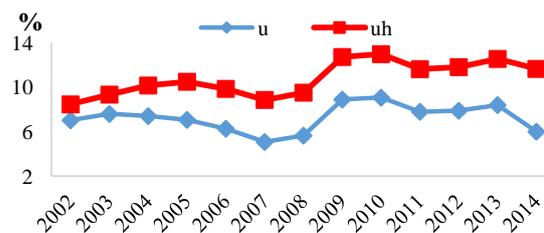
Fig. 1: Comparison of real and hypothetical unemployment rate in the case of the Pilsen region
Source: own processing, data CSO (2017) analyzed the annual reports of FDI (2017)

4.2 The primary impact of FDI on the labour market in the Carlsbad region

In terms of the economic structure of the Carlsbad region that belongs to regions with varied economic structures, this region is mainly influenced by tourism and traditional industrial sectors such as glass industry and the production of porcelain. The economy of the region has a great variety. On one side there is a development of the traditional fields of light industry, on the other hand, an important position belongs to the engineering.

The Carlsbad region being a region of low concentration of FDI has the potential for future investors due to its economic diversity. This is an area for future investors with the possibility of establishing appropriate trade links with the existing businesses. Simultaneously, this region has the comparative advantage of cheap labour in comparison to neighboring Germany.

This poorness of the region is enhanced by the low mobility of the staff and the reluctance to commute to work. Long-term unemployment that is higher than the national average is defined by a high portion of the unemployed with basic or incomplete basic education. This category represents almost half (42%) of all job applicants (Ministry of Labor and Social Affairs, 2014).

The leverage of FDI benefiting investment incentives in the Carlsbad region the unemployment rate in comparison with the Plzeňský region is quite low - 2.43 p.p. The development of the hypothetical unemployment rate ensues from the development of a real one, is illustrated in Figure 3, there has not performed the growing trend (Kotíková, 2016).
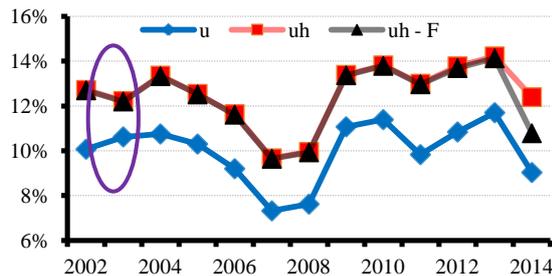
Fig. 2: Comparison of real and hypothetical unemployment rate adjusted for the impact of migration in the Carlsbad region
Source: own processing, data Czech Statistical Office (2017), CzechInvest (2017), annual reports of analyzed FDI (2017)

The number of newly created jobs is also relatively low, about 2,400 thousands which is due to a low inflow of FDI into the region. However, the newly created jobs as in the other of the six examined regions are almost all occupied by local inhabitants (97%). It is worth mentioning that the dropping lines of the hypothetical rates in year 2003 illustrate the outflow of investors from the region (Kotíková, 2016). Furthermore, the significant drop in the last year of the graph indicates the hypothetical adjusted unemployment rate on the impact of migration to the region in the last analyzed year, caused by a significant increase in the year-on-year inflow of foreign labor.

4.3 The primary impact of FDI on the labour market Ústí nad Labem region

The first of the examined regions is the Ústí nad Labem region that represents the highest unemployment rate in the Czech Republic. A typical attribute is an unsettled educational and social structure of the region's population. In addition, the orientation and professional secondary education do not optimally cover the needs of the labor market, and it is often the case that graduates from schools and colleges are still unusable to be employed on the job market.

As a consequence of this state, a lot of conducted investment incentives are targeted to the Usti region. In some cases, investors have to observe the structure of the population and built "assembly plants" that do not have to be oriented to the quality of human potential (Ministry of Labor and Social Affairs, 2017). The mentioned methodology above has been applied to the six selected regions of the Czech Republic.

The regular reports of companies fulfilling the standard of FDI benefiting investment incentives show the figure of jobs created every year in the period 2002 - 2014. The selected method of calculation in the Ústí nad Labem region served to calculate the effect of FDI in order to reduce the high unemployment rate in the magnitude of about 5.38 p. p. annually. This complies with the area among the blue and the black curve in figure 3.
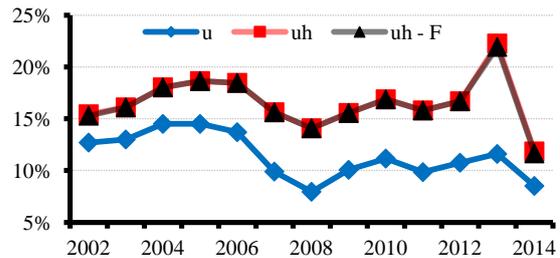
Fig. 3: Comparison of real and hypothetical unemployment rate adjusted for the impact of migration in the Ústí nad Labem region
Source: own processing, data Czech Statistical Office (2017), CzechInvest (2017), annual reports of analyzed FDI (2017)

FDI in this region havecreated on averageover 19,500 positions. From the result there can be reported that examined MNCs have a significant effect on the regional labor market.

It is worth noting that almost 10% of the hypothetical unemployment rate in the last year of exploitation dropped over the previous year. This decrease was not caused by the outflow of investors from the region. New trends of recruitment through specialized agencies mainly caused this drop. In this case, hired staff is not employees of the company for which they work, but employees of the agency. Therefore they are not recognized in the annual reports of FDI as permanent staff.

Based on the quantification of the total share of employed foreigners in the region, it can be reported 97% of all job positions within the examined companies are occupied by the native population (Kotíková and Čuhlová, 2015).

Additionally, it was discovered that employment developments in FDI ensue from the trend in unemployment in the region and their effect on reduction of the unemployment rate has remained relatively stable. The development of the unemployment rate (u) and the consequences of hypothetical unemployment rate (u_h), the hypothetical unemployment rate adapted for the effect of foreign nationals $(u_h - F)$ is illustrated in the Figure 3 (Kotíková, 2016).

But it cannot with certainty content that without investment incentives and without localization of the FDI in the Ústí nad Labem region the unemployment rate was raising to values quantified (u_h). It can be assumed that portion E_{FDI} be moved to domestic firms or they would start an own business. In spite of the fact that (u_h) illustrates the specific pessimistic situation on the regional labor market, which without the localization of FDI could occur.

4.4 The primary impact of FDI on the labour market Liberec region

Unlike in the Ústí nad Labem region, a significant problem in the labour market in the region is not high unemployment, but low productivity of labour. Labour productivity measured as the percentage of gross domestic product (GDP) per 1 employed

person in the Liberec region is around 500 thousand CZK, this fact ranks Liberec region on the lower positions within between-regions comparison (CEP, 2012). As in the Ústí nad Labem region, even in this case the labour market reflects the influence of exogenous discrepancy in supply of education and labour market requirements. Generally, the educational structure of the Liberec region is not too convenient. The share of university-educated population is the third lowest among the regions (CSO, 2017). Composition focus of FDI benefiting investment incentives that are localized in the Liberec region corresponds to the educational structure of the population - it is primarily a type of assembly plants (Ministry of Justice, 2017).

On the basis of calculations according to formulas (3) and (4) FDI which received investment incentives, have created on average of 4,500 new jobs, which was 97.3% occupied local population.The difference between the real and hypothetical unemployment rate adjusted for the impact of foreigners is on average 3 p.p. Figure 4 illustrates the development and the progress of these variables.
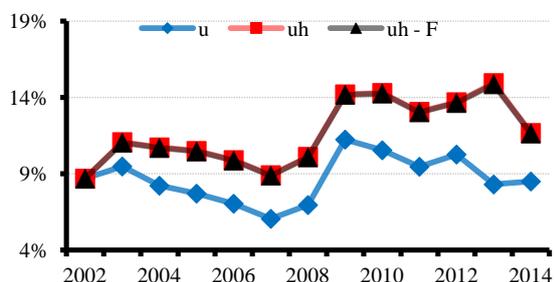
Fig. 4: Comparison of real and hypothetical unemployment rate adjusted for the impact of migration in the Liberec region
Source: own processing, data Czech Statistical Office (2017), CzechInvest (2017), annual reports of analyzed FDI (2017)

4.5 The primary impact of FDI on the labour market in the Hradec Králové region

Among factors that could negatively affect unemployment in Hradec Kralove region is the difficult access in peripheral parts of the region, the growing gap between supply and the demand on the labor market. For example, growing interest in technical fields, but the registered candidates are another focus. It is possible to identify different levels of educational establishments with little emphasis on practical skills in the Hradec Králové region (CSO, 2017).

In the Hradec Kralove region it was also found that employment trends in FDI follows the development of unemployment in the region was demonstrated significant growth trend, which is indicated in Fig. 5. If it was not incurred 10,200 jobs created in FDI, there would be an increase in regional unemployment rate at worst by about 2.6 percentage points.
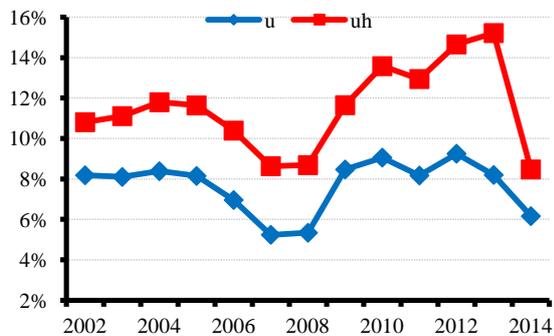

Fig. 5: Comparison of real and hypothetical unemployment rate in the case of the Hradec Králové region
Source: own processing, data CSO (2017) analyzed the annual reports of FDI (2017)

4.6 The primary impact of FDI on the labour market Pardubice region

In comparison with other regions of the Czech Republic is for Pardubice typical large number of small municipalities. Which is related to the difficult accessibility of peripheral parts of the region and the uneven distribution business background.

The relative openness of the region can be expressed for example by the indicator of the turnover of commuting in and to 1,000 residents employed economically active population. Values of the indicator are in the Pardubice region in the range from 258 (Pardubice) to 541 (Letohrad). Low values indicate a high degree of isolation movement for work in the region and viceversa low internal integration usually characterized by a relatively high commuting outside the borders of the region. This is a consequence of a developed infrastructure, especially the railway corridor Czech Třebová - Brno. The location on the main railway line and the stops of the majority of fast train connections greatly increased the possibility of commuting to other districts.

The proportion of people with a foreign citizenship to all inhabitants of the Czech Republic is generally low in the long term. In 2011, according to the results of the census and housing their proportion represented about 5%. The distribution of immigrant foreigners is related to a certain extent to the attractiveness of a region, particularly with regard to job offers. In the Pardubice region, the value of this indicator is annually around 3%. In the districts Chrudim and Svitavy at this level citizens of Ukraine are mostly represented, whereas in the district of Pardubice the citizens of Slovakia are mostly represented and in the district ÚstínadOrlicí dominated citizens are citizens of Poland.

The importance of human capital is growing, as well as the importance of its relationship to economic variables. The most commonly used measure of human capital is the highest level of educational attainment, or the number of years spent studying and eventually participation in further education. The extent of human capital can have a greater or lesser impact depending on the value range of other socio-economic indicators (Ministry of Education, Youth and Sports, 2015). CSO statistics show that the educational structure of the population of the Pardubice region is similar to an educational structure of the Czech Republic. The same applies to the unemployment rate of the Pardubice region, which is at the same level as the national unemployment rate of the Czech Republic (CSO, 2017).

In the Pardubice region, the situation on the labor market deteriorated significantly the situation of non-localization of FDI with government support as shows the similar situation in the Ústí nad Labem region. Specifically, an increase of the unemployment rate about 5.18% will result in the hypothetical loss of almost 14,000 jobs that are by 96.8% occupied by local population - see figure 6.
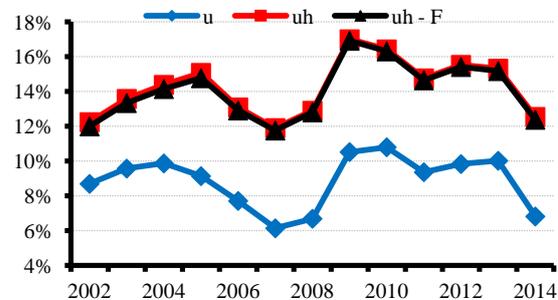

Fig. 6: Comparison of real and hypothetical unemployment rate adjusted for the impact of migration in the Pardubice region
Source: own processing, data Czech Statistical Office (2017), CzechInvest (2017), annual reports of analyzed FDI (2017)

5 Conclusion

The global trend of liberalization of international business is currently one of the two driving forces of the flow of goods and services as well as capital itself. Over the last quarter century, the volume of international trade increased greatly and the volume of direct and portfolio investment increased even more rapidly. The second drivers are innovations in information technology that facilitate communication and dramatically blur the barriers of time and space (Šimanová and Trešl, 2011).

The inflow of foreign investments currently supports most governments around the world. Foreign investments could create a higher GDP growth, new jobs and thus affect the unemployment rate in different regions affect the business environment and increase the prosperity of the country as well. Both parts benefit from FDI- the multinational companies (MNCs) and host countries. The goal of a provider of investment is to increase profits, either through cost reduction or through the increase of revenues. MNCs locate their capital and technology into places that are attractive because of cheap labor, energy, low taxes and interesting investment incentives. All this represents an important reduction of costs for the investor. At the same time, the entry into a large market offers the opportunity of realizing large sales.

However, there are two sides of everything. FDI also have not only purely positive benefits for the host region as there are several advantages and inconvenient. A consequence often coming along with FDI is a high competition, which is due to its capital strength and consequently drags experienced employees from the already well-established local companies. In certain cases, international investors are only active in the region during the time they are benefiting from governmental support. The problem is that after the departure of FDI, unemployed people remain and the initial greenfield investment becomes a more untapped brownfield area.

Economists often disagree about whether the investment incentives have a positive influence and even if there are necessary. Investment incentives can be considered beneficial if the country attracts unique investors who differ from domestic producers, by bringing them specific know-how and managerial practices that eventually spill-over on businesses environment on the level of regions or even respectively in the country. On the other hand, investment incentives cause unfair redistribution from entities that do not profit from investment incentives as they regularly pay taxes to entities benefiting from an investment advantage. The actual allocation of investment builds a considerable disadvantage for ,,taxpayer of incentives" compared to ,,beneficiaries" who are able to offer their employees such high salaries.

This paper tried to highlight the purpose and benefits of investment incentives in terms of job creation. Whether investment incentives represent a significant expense of the state budget, hypothetical modeling of regional unemployment rates, at least in part to illustrate their socio-economic benefits.As evidenced by the following table. Table 2 summarized the results above.

Tab. 2: Summarization of calculations of direct effect of job creation in selected regions for the period 2002 - 2014

Analyzed region	The average hypothetical increase in regional unemployment rates	The average number of new jobs created in FDI
Pilsen	3,19 p. p.	9,9 ths.
Carlsbad	2,43 p. p.	2,4 ths.
Ústí nad Labem	5,38 p. p.	19,5 ths.
Liberec	3,00 p. p.	4,5 ths.
Hradec Králové	2,60 p. p.	10,2 ths.
Pardubice	5,18 p. b.	14,0 ths.

Source: own processing based on own calculations on data from the CSO (2017) and annual reports analyzed FDI (2017)

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ANALYSIS OF THE RELATIONSHIP BETWEEN HUMAN RESOURCE MANAGEMENT PRACTICES AND ORGANIZATIONAL COMMITMENT FROM A STRATEGIC PERSPECTIVE (THE CASE OF IRAN OIL INDUSTRY PENSION FUND)

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Abstract: The present research is aimed at analysis of the relationship between practices of human resource management and organizational commitment from a strategic point of view in retirement pension and funds organization of Oil industry. The study is an applied research and its data are collected through descriptive-survey methods and also in terms of data analysis, it is considered as a correlation study. The population of research includes the entire full-time employees of retirement pension and funds organization of Oil industry in Tehran and approximately 50 other cities in Iran. The research sample includes 248 employees of the aforementioned organization who were selected according to a simple random sampling method. Independent variables included eight practices of human resource management including selection, training, performance evaluation, promotion, performance based rewards, information sharing, job security and human resource management system. The dependent variable is also organizational commitment. In addition, the research data are collected through application of a researcher made questionnaire and a standard questionnaire. The aforementioned data have been subjected to analyses through application of the tests of structural equations and confirmatory factor analysis within the Software of SPSS and LISREL. Research results manifested that the entire variables have a significant positive effect on organizational commitment i.e. a significant statistical relation holds among them and organizational commitment.

Keywords: employee training, performance evaluation, human resource management (HRM) system, HRM practices, organizational commitment

1 Introduction

Mankind has continuously tried to establish and expand organizations synchronous to his era in order to be able to realize his needs and goals. Despite the massive recent advances in technology human is still remaining as key element in every organization and firm. In this regard it can be claimed that success of every organization towards realization of its goals is in debt to its attitude towards humans and the manner of exploitation of these humans.

The basic objective of HRM is creation of strategic capabilities through making sure of possession of committed, expert and motivated employees. Therefore the strategy of resource oriented human resources is considered as a competitive advantage only when the organization possesses expert human resources. In this way the organization is able to learn and effectively implement its acquisitions faster than competitors. Pare and Trembli (2007) mentioned the practices of HRM as recognition of employees and development of their competence and capabilities. Through organizational commitment the aforementioned components leave a positive significant effect on maintenance of expert employees of information technology units. Alnaqubi (2011) showed that when employees feel that the organization is paying adequate attention to them, they become more committed to their job and towards realization of organizational goals.

Organizational commitment is a type of attitude consisted of reflection of feelings such as attachment and loyalty towards goals. In fact its shortage results in absence of employees, transfer, creation of job expenses, job stealing and lack of job satisfaction (Cohen, 2005).

Existence of a committed human resource signifies the overall importance of the organization and provides the necessary contexts for growth and development of the organization. Therefore expert employees are consistent with values and goals of their organization, possess stronger motivations, are committed to maintenance of their organizational membership and considering all these factors, they are a crucial need for every firm and organization since each firm requires only those employees who undertake practices beyond their regular duties.

In other words, HRM practices which improve organizational commitment among employees can guarantee the long-term realization of organizational goals which requires adoption of a strategic attitude by HRM i.e. an attitude with a long-term outcome that is the development of human resources. For this purpose, the present study has tried to analyze the relationship between HRM practices and organizational commitment in retirement pension and funds organization of Oil industry from a strategic point of view. The former organization includes a total number of 700 employees and provides healthcare, welfare and retirement services for retired employees of Oil industry.

In addition, with regard to the operational definition of 8th aspect of HRM practices i.e. the system of HRM and organizational commitment; while making a strategic evaluation of these practices, instead of analyzing each element individually, all of them should be analyzed in a combined fashion and as a system for investigation of the relations and interactions between managers and employees. Furthermore the resultant HRM system gives a sign of high internal consistency in the sense that it practices independent actions that further connect to each other. Plus, it also bares signs of high external consistency in the sense that it forms a relationship with organization's strategy (Bamberger and Missoula, 2000).

As the current era undergoes significant changes and evolutions, organizations are also taking a step into the domain of knowledge-based economy. In this middle, human resources who are committed to organizations' values and objectives not only are considered as an advantage over other organizations, but also are considered as sustainable competitive advantages for their organizations.

According to researchers, the main sources of competitive advantage for an organization are employees' sacrifices, qualities, commitment and capability. In this sense, human resources consistent with organization's goals and values are willing to practice beyond their regulated duties. This also results in increased overall organizational efficiency (Roepki, 2000).

There are many reasons for increasing the level of commitment among employees (Esier, 2000). On the first hand, organizational commitment is a notion different from job attachment and job satisfaction. Organizational commitment is a suitable anticipator for willingness for keeping the job. Commitment and satisfaction are close to each other in terms of attitude in the sense that both of them affect important behaviors including transferring and absence. In addition commitment can have several positive outcomes. Committed employees have more discipline in their work and are more precise while doing their jobs. They also spend more time in their organizations and work more. Considering these content, managers should be able to improve their employees' commitment through different methods and ways. For this purpose managers should incorporate employees in decision makings and provide them with a desirable level of job security.

Among the most important results of increased employees' commitment which are also effective on organization's overall performance it can be referred to the following points: increased innovation and creativity among employees, maintenance of employees, development of a feeling of attachment to organization among employees, increased job performance among employees, reduced desertion, occurrence of active social behaviors, reduced absence, empathy and helping co-workers, reduced job stress, organizational financial achievements and increased overall organizational effectiveness and efficiency. The entire aforementioned outcomes result in

realization of organizational objectives and results in benefaction of the community from efforts of the organization. Nowadays, it is clear that it's necessary to adopt a strategic point of view and to inspire employees in order to have a continuous movement towards realization of goals, creation of consistency between employees and organization's goals, implementation of new leadership styles and creation of maximum employee participation. Pioneer organizations provide motivations for employees and persuade them towards innovation and creativity and solvation of organizational issues in groups and teams in order to empower the employees and guide them effectively and efficiently. One of the responsibilities of every social organ is obtaining goals that form the existence reason of that organ. Realization of organizational goals is in debt to cooperation and synchronization of the entire elements that signify the existence of an organization in case of having a systematic interaction with each other. In this regard, through the entire levels of an organization, it has been observed that the role of human resources is the most significant compared to other elements. On this basis, these intelligent elements of organizations are worthy of more attention due to having personal, materialistic, ethic and group needs.

In this regard, the present paper has tried to elaborate on the type of HRM practices that result in best outcomes for the retirement pension and funds organization of the Oil industry.

The retirement pension and funds organization of the Oil industry includes approximately 700 full-time employees and almost 70000 retired employees receive services from this organization. On this basis, this organ is one of the most important retirement pension and funds organizations of Iran.

Most important services that are provided by this organ include: payment of wages, providing healthcare services, providing bureaucratic services, retirement services and welfare services for employees. Other services include allocation of different loans, life insurance services, disability compensation and etc. for the present employees of the Oil industry and 160 subsidiary firms. With respect to the significant role of this organization in terms of providing different services for retired employees, it is considered as an industry effective on total national gross production. Therefore it seems that adoption of a strategic point of view by the HRM unit of this organization may result in increased commitment among the employees and it also may even play a more effective role in terms of realization of organizational goals. The present study tries to adopt an operational attitude to provide an answer for the following question:

How can the relationship between HRM practices and organizational commitment in retirement pension and funds organizations of the Oil industry be strategically analyzed?

The following section of the study is dedicated to the review of the literature of the subject matter. The third section is dedicated to research model and research variables. The fourth section is related to results and the fifth section provides a total conclusion.

2 Review of literature

Sanchez et al. (2015) carried out a study and investigated the effects of HRM on performance of knowledge management. In their study they have stated that HRM and knowledge management can have a mutual interaction. Based on this idea, a research model was developed in their study and the results of their study show that HRM is effective on knowledge management and increases the motivations for expansion of knowledge in an organization.

Aston et al. (2015) carried out a study and investigated the challenges and opportunities in HRM. This research has named several factors that affect and anticipate HRM. It has also been stated that economic, organizational and technological changes are effective on HRM.

Aston et al. (2015) performed a study and elaborated on the effects of technology on future of HRM. In fact the authors tried to investigate the effects of development of information technology on human resource management. This study's population was consisted of American firms. In addition the research has made use of structural equations modeling method for analysis of collected data.

Alnaqubi (2011) carried out a study named as "relations between HRM practices and maintenance of employees in governmental organizations". In this research the author has tried to identify the effects of HRM practices and other factors including job satisfaction, job commitment and leadership on maintenance of employees. Results of this study have shown that these factors have a significant effect on maintenance of employees.

Freehan (2008) investigated the manner of perception of servicing leadership by both official and voluntary employees of the private basketball community of Hop fest in Washington D.C. and its relation with job commitment. The research concluded that reasons such as confidential relationship, creation of meaningful relations, spiritual participation readiness and commitment towards organizational success result in increased commitment towards organization among employees as well as increased staying intention among the former.

Miao (2008) investigated the structure of strategic operations of human resources among army nurses. It was concluded that nurses are provided with average training and they are recruited based on expert competences. However, they nurses themselves were not satisfied by their wages. It was also revealed that performance evaluations were performed irregularly and in general, the structure of strategic operations of human resources was in an average status.

Abeysekera (2007) carried out a study and investigated the effects of HRM practices on desertion among marketing managers of firms located in Sri Lanka. Results of this study manifested that analyses of employees, service compensation and variables of real job related information all have a negative significant effect on desertion tendency among marketing managers.

Aaron and Zock (2006) investigate the strategic operation of human resources in military bases from the perspective of military officials and pointed out the important role of recruitment of employees according to their knowledge and capability for development of organizational goals.

Bawa and Jantan (2005) carried out a study named as "HRM practices: determinants of desertion among employees". Their findings indicated that the processes of recruitment and monitoring are effective on reduction of voluntary desertion. In other words, other practices of HRM were not found to have a significant effect on desertion. In this sense the employees would continue deserting the organization irrespective of the practices of HRM.

Chew (2004) carried out a research named as "effects of HRM practices on maintenance of key employees in Australian firms. In this research it was revealed that there are eight key factors that affect the maintenance of aforementioned employees. In terms of the human resources aspect these factors included personal organizational consistency, rewards and recognition, training and development and challenging job opportunities. In addition in terms of organizational aspect they included leadership behavior, organizational culture and policies, relationships between working teams and a satisfactory working environment. Furthermore, the intervening variable in terms of the relation between the aforementioned eight factors and tendency for staying was organizational commitment.

Del Rey and Dati (1996) determined seven key factors in strategic operations of HR including career development route, training, performance evaluation, rewarding, and employees' job security and enrichment of jobs with content and exploiting them for development of innovation.

3 Designing hypotheses and analysis methods

Organizational commitment is a manifestation of individuals' mental attachment to their employing organization. According to Allen and Meyer (1997) it can adopt different shapes. Porter and colleagues (1974) believe that organizational commitment is manifested in three main recognitions:

- Having strong faith in organization and acceptance of its values and goals
- Tendency for putting excessive effort for organization
- Having an absolute willingness for staying as a participant of the organization

Emotional commitment is defined as employees' emotional feeling for attachment to an organization, synchronization with the organization and being engaged with the organization (Allen and Meyer, 1997).

Normative commitment is defined as the set of internalized norms used for committing to an act that is righteous in the view of the individual. In terms of this aspect of commitment, the individual considers continuing doing his/her job as his/her duty. Those who are more committed to their organizations in terms of norms, are more prone to manifest behaviors including sacrificing and putting more efforts in order to work for the organization. They also consume a huge amount of their energy for pursuing the goals of organization (Meyer and Allen 1997; Pinder, 1998).

The views of calculative commitment (Morrow, 1993) and continued commitment (Meyer and Allen, 1997) consider the advantages of attending to work and expenses of desertion of job. In other words, it can be stated that by this type of commitment, the employee remains as an employee of the organization due to high expenses of desertion.

Considering the aforementioned content and by investigating the results of previous studies, a research model is proposed for investigation of relations that hold amongst organizational commitment and each individual component of organizational selection, employee training, human resource performance evaluation and promotion opportunities, performance based rewards, information sharing, job security and the system of HRM.

HRM is defined as perception of importance of human resources for an organization. These human resources in fact result in organization's overall advantage, consideration of costumers, entrepreneurship, quality and alike. On the other hand, growth and development of capabilities and also organization of human labor of an organization is essential for making progress towards the overall goals and objectives of the organization. This level of management is therefore essentially impactful on failure and success of the organization. In general it can be stated that HRM consists:

- Recruitment and employment
- Training and improvement
- Exploitation and assignment
- Maintenance of human resources towards realization of organizational objectives

These four processes are considered as the basic processes of HRM and the entire patterns, systems and methods should be developed with regard to them. The basic objective of HRM is obtaining desirable results from group efforts of employees of an organization. It can move the organization towards realization of its purposes and goals.

In addition, according to the definition proposed by Meyer and Allen, HRM practices include recruitment of employees, training, performance evaluation, job promotion, performance based rewards, information sharing and job security (Meyer & Allen,1997).
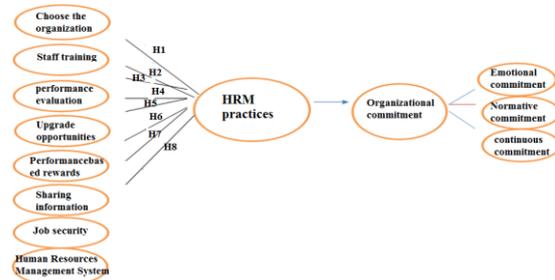
Figure 1: conceptual model of study

[Selection/ training/ performance evaluation/ promotion opportunity/ performance based rewards/information sharing/job security/ HRM system. HRM practices. Organizational-commitment. Emotional commitment/ continued commitment/ normative commitment.]

The hypotheses of this research are as follows:

1. There exists a positive relation between selection and organizational commitment.
2. There exists a positive relation between training and organizational commitment.
3. There exists a positive relation between performance evaluation and organizational commitment.
4. There exists a positive relation between promotion opportunity and organizational commitment.
5. There exists a positive relation between performance based rewards and organizational commitment.
6. There exists a positive relation between information sharing and organizational commitment.
7. There exists a positive relation between job security and organizational commitment.
8. There exists a positive relation between HRM system and organizational commitment.

In terms of type of data collection the present study is considered as a survey study and on this basis there in no way for manipulation of the independent variable for the researcher. On the other hand, in terms of data analysis methods the present study is considered as a correlative research. First we have tried to collect some research data through library studies and field methods. Data collection instruments in terms of our library studies included internet based searching for defining concepts, notions and indexes. On the other hand, in terms of field study, the applied instrument was questionnaire. Ultimately the collected data are subjected to statistical analysis and research hypotheses have been tested.

The method applied by this study for analysis of data is structural equations method. Structural equations modeling is a multivariate analysis technic that is extensively general and strong while belonging to the family of multivariate regressions. In more precise definitions, it is the expansion of the general linear modeling method. This method allows researchers to make a simultaneous investigation on several regression equations. Structural equations modeling is a general approach for testing hypotheses regarding relations between the observed variables and independent ones. It has also been occasionally termed as Covariance structural analysis, objective modeling and also sometimes LISREL. However, currently the dominant and the most frequently used phrase is structural equations modeling (SEM).

The population of the present study is consisted of the entire full-time employees of retirement pension and funds organizations of Oil industry of Iran who exceed 700

individuals. Since it is not feasible to study the entire population, a simple random sampling method was made use of and a number of 248 individuals were selected as the sample of study. It is worth mentioning that the Cochran's formula was applied for calculation of the size of sample through the following formula:

$$n = \frac{\frac{z^2 \delta^2}{d^2}}{1 + \frac{1}{N}\left(\frac{z^2 \delta^2}{d^2} - 1\right)} = \frac{\frac{1.96^2 \delta^2}{0.07^2}}{1 + \frac{1}{700}\left(\frac{1.96^2 \delta^2}{0.07^2} - 1\right)}$$

4 Results of data analyses

The index of reliability coefficient is used for determination and measurement of reliability. In other words, if the same test is administered to a same population in short time intervals; the results must be close to each other. Since the obtained value was plus 0.6 for the entire variables, it can be stated that the instrument under investigation is of a suitable reliability.

Table 1: Cronbach's alpha coefficients

Variables	Cronbach's alpha coefficient
Selection	0.82
Training	0.79
Performance evaluation	0.84
Promotion opportunity	0.73
Performance based rewards	0.87
Information sharing	0.80
Job security	0.81
HRM system	0.84

The perquisite for execution of every parametric test is normality of statistical distribution of variables. In general it can be stated that parametric tests are generally based on average and standard deviation. If the distribution of the population was not normal, no precise inference can be made from results. For this stage, the K-S test is administered. The results are as follows:

Table 2: normality test results

Variables	K-S value	Sig.	Error	Result
HRM practices	0.643	0.803	0.05	Normal
Organizational commitment	1.201	0.112	0.05	Normal

In the above table, with regard to the value of K-S test and the value of Significance, it can be inferred that no significant difference exists between the expected distribution and actual distribution of variables among the population. Therefore, parametric tests should be used for hypothesis testing.

In this stage it is determined whether theoretical concepts are correctly measured by the observed variables or not. For this purpose, construct validity is tested. In addition for this purpose, two validity criteria of convergent validity and discriminant validity are made use of. Whenever one or more features are measured through two or more approaches, the correlation between these measurements provides the aforementioned important indexes of validity. If the value of this correlation was high, then it can be stated that the questionnaire has a convergent validity. This validity signifies that the test measures what it is ought to measure. On the other hand if the value of the aforementioned correlation was low, then the test can be claimed to have discriminant validity.

Table 3: results of estimation of correlation coefficient

HRM practices	Organizational commitment		
	value	Sig.	Result
Selection	0.592	0.000	Relation with

			average intensity and forward direction
Training	0.650	0.000	Relation with average intensity and forward direction
Performance evaluation	0.645	0.000	Relation with average intensity and forward direction
Promotion opportunity	0.698	0.000	Relation with strong intensity and forward direction
Performance based rewards	0.686	0.000	Relation with strong intensity and forward direction
Information sharing	0.633	0.000	Relation with average intensity and forward direction
Job security	0.639	0.000	Relation with average intensity and forward direction
HRM system	0.645	0.000	Relation with average intensity and forward direction

With respect to the values, correlation is significant at Sig. <0.001. Therefore it can be concluded that at a two-fold relationship exists between HRM practices and organizational commitment. In terms of methodology of structural equations modeling method, first of all one may need to investigate the validity of the construct under study. In this regard it would be turned out whether the selected variables are of sufficient precision for measurement of their designated constructs or not. For this purpose, confirmatory factor analysis method is used. If value of t was higher than 1.96, it shows that the selected factor is confirmed for the designated construct. On the other hand the value of route coefficient is ranged between 0 and 1. If its value is smaller than 0.3 it is considered as weak, if it's between 0.3 and 0.06 then it is considered as acceptable and if its value was higher than 0.6, then it would be considered as highly desirable.

4.1 Selection index

This index is consisted of three items.
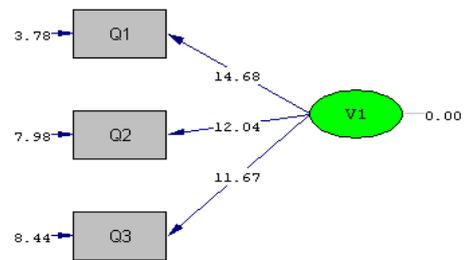
Chi-Square=0.00, df=0, P-value=1.00000, RMSEA=0.000

Diagram 1: T value for investigation of significance of parameters of selection model
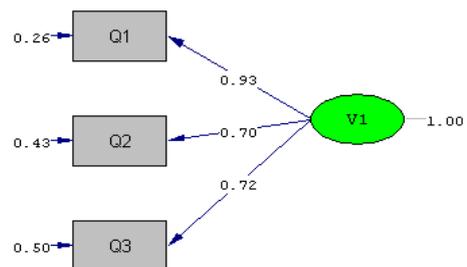
Chi-Square=0.00, df=0, P-value=1.00000, RMSEA=0.000
Diagram 2: selection measurement model

Table 4, results of organizational selection model

Research construct	Model factor	symbol	Route coefficient	t	p-value
selection	Item 1	Q1	0.93	14.68	1%
selection	Item 2	Q2	0.70	12.04	1%
selection	Item 3	Q3	0.72	11.67	1%

The calculated t values for each load factor of each components and its variable construct is higher than 1.96. Therefore it can be concluded that representatives are consistent for measurement of notions.

4.2 Training index

This index is consisted of five items.

Chi-Square=1.00, df=3, P-value=0.80057, RMSEA=0.(

Diagram 3: T value for investigation of significance of parameters of training model
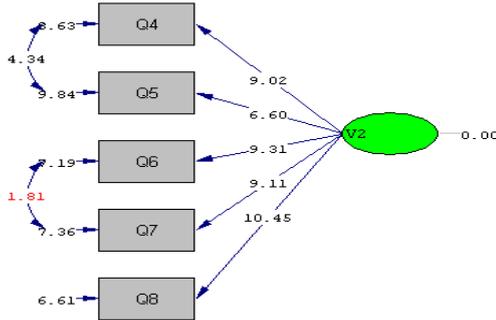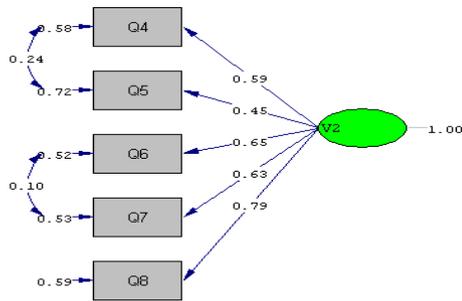
Chi-Square=1.00, df=3, P-value=0.80057, RMSEA=0.000

Diagram 4: training measurement model

Table 5, results of organizational training model

Research construct	Model factor	symbol	Route coefficient	t	p-value
training	Item 4	Q4	0.59	9.02	1%
training	Item 5	Q5	0.45	6.60	1%
	Item 6	Q6	0.65	9.31	1%
	Item 7	Q7	0.63	9.11	1%
	Item 8	Q8	0.79	10.45	1%

The calculated t values for each load factor of each components and its variable construct is higher than 1.96. Therefore it can be concluded that representatives are consistent for measurement of notions.

4.3 Performance evaluation index

This index is consisted of four items.
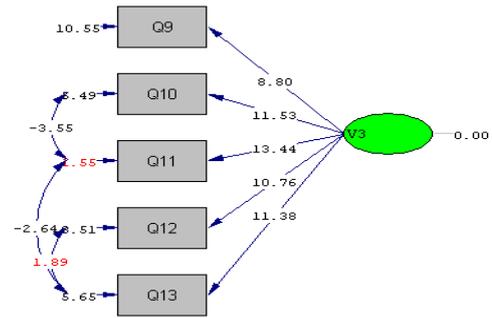
Chi-Square=0.95, df=2, P-value=0.62318, RMSEA=0.000

Diagram 5: T value for investigation of significance of parameters of performance evaluation model
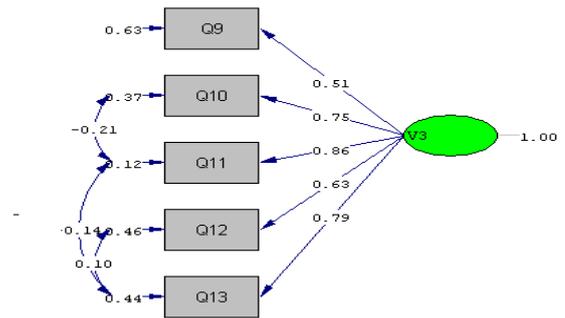
Chi-Square=0.95, df=2, P-value=0.62318, RMSEA=0.000

Diagram 6: Performance evaluation measurement model

Table 6: results of performance evaluation model

Research constructs	factor	symbol	Route coefficient	t	p-value
Performance evaluation	Item 9	Q9	0.51	8.80	1%
	Item 10	Q10	0.75	11.53	1%
	Item 11	Q11	0.86	13.44	1%
	Item 12	Q12	0.63	10.76	1%
	Item 13	Q13	0.79	11.38	1%

The calculated t values for each load factor of each components and its variable construct is higher than 1.96. Therefore it can be concluded that representatives are consistent for measurement of notions.

4.4 Promotion opportunity index

This index is consisted of three items.
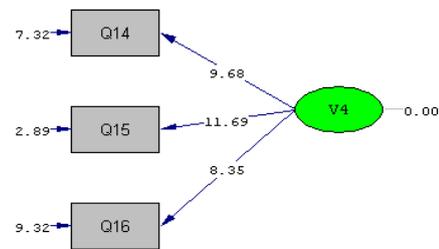
Chi-Square=0.00, df=0, P-value=1.00000, RMSEA=0.000

Diagram 7: T value for investigation of significance of parameters of promotion opportunity model
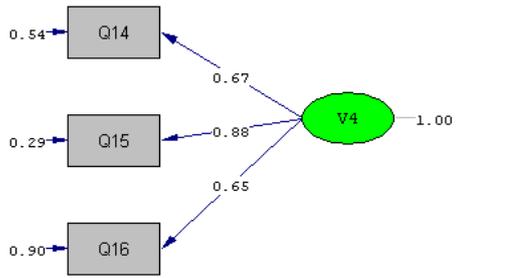
Chi-Square=0.00, df=0, P-value=1.00000, RMSEA=0.00

Diagram 8: Promotion opportunity evaluation measurement model

Table 7: results of performance evaluation model

Research constructs	factor	symbol	Route coefficient	t	p-value
Promotion opportunity	Item 14	Q14	0.67	9.68	1%
	Item 15	Q15	0.88	11.69	1%
	Item 16	Q16	0.65	8.35	1%

The calculated t values for each load factor of each components and its variable construct is higher than 1.96. Therefore it can be concluded that representatives are consistent for measurement of notions.

4.5 Performance based rewards index

This index is consisted of four items.
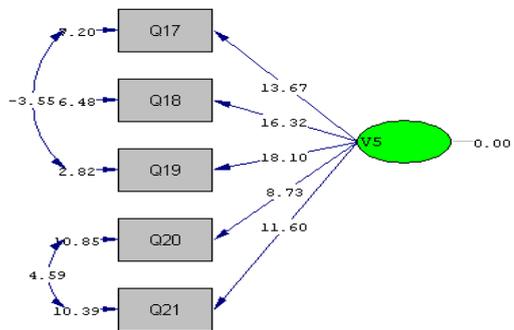
Chi-Square=2.92, df=3, P-value=0.40354, RMSEA=0.0

Diagram 9: T value for investigation of significance of parameters of performance based rewards model
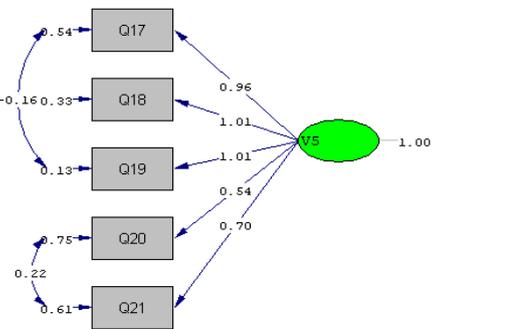
Chi-Square=2.92, df=3, P-value=0.40354, RMSEA=0.000

Diagram 10: Promotion opportunity evaluation measurement model

Table 8: results of performance based rewards model

Research constructs	factor	symbol	Route coefficient	t	p-value
Performance based rewards	Item 17	Q17	0.96	13.67	1%
	Item 18	Q18	1.01	16.32	1%
	Item 19	Q19	1.01	18.10	1%
	Item 20	Q20	0.54	8.73	1%
	Item 21	Q21	0.70	11.60	1%

The calculated t values for each load factor of each components and its variable construct is higher than 1.96. Therefore it can be concluded that representatives are consistent for measurement of notions

4.6 Information sharing index

This index is consisted of four items.
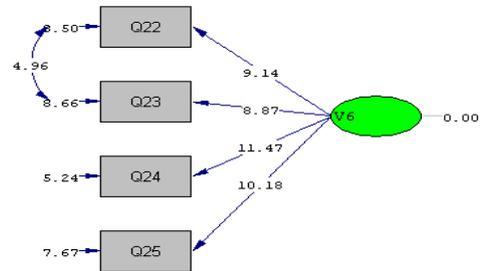
Chi-Square=0.00, df=1, P-value=0.97725, RMSEA=0.000

Diagram 11: T value for investigation of significance of parameters of information sharing model
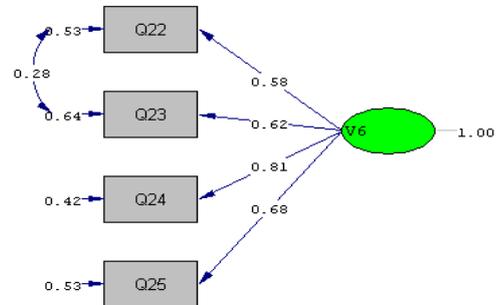
Chi-Square=0.00, df=1, P-value=0.97725, RMSEA=0.000

Diagram 12: information sharing measurement model

Table 9: results of information sharing model

Research constructs	factor	symbol	Route coefficient	t	p-value
Information sharing	Item 22	Q22	0.58	9.14	1%
	Item 23	Q23	0.62	8.87	1%
	Item 24	Q24	0.81	11.47	1%
	Item 25	Q25	0.68	10.18	1%

The calculated t values for each load factor of each components and its variable construct is higher than 1.96. Therefore it can be concluded that representatives are consistent for measurement of notions.

4.7 Job Security index

This index is consisted of four items.

Chi-Square=3.07, df=2, P-value=0.21594, RMSEA=0.
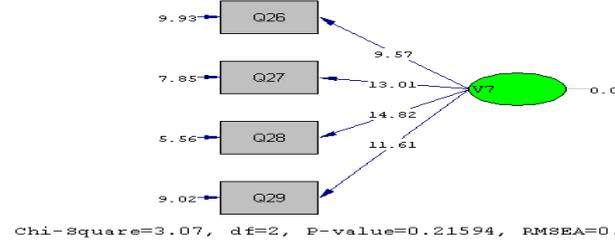
Diagram 13: T value for investigation of significance of parameters of job security model

Chi-Square=3.07, df=2, P-value=0.21594, RMSEA=0.04
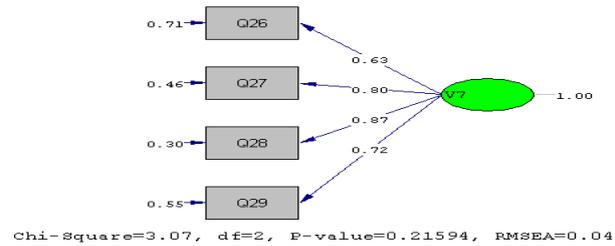
Diagram 14: job security measurement model

Table 10: results of job security model

Research constructs	factor	symbol	Route coefficient	t	p-value
Job security	Item 26	Q26	0.63	9.57	1%
	Item 27	Q27	0.80	13.01	1%
	Item 28	Q28	0.87	14.82	1%
	Item 29	Q29	0.72	11.61	1%

The calculated t values for each load factor of each components and its variable construct is higher than 1.96. Therefore it can be concluded that representatives are consistent for measurement of notions.

4.8 HRM system index

This index is consisted of five items.

Chi-Square=2.20, df=2, P-value=0.33221, RMSEA=0.020
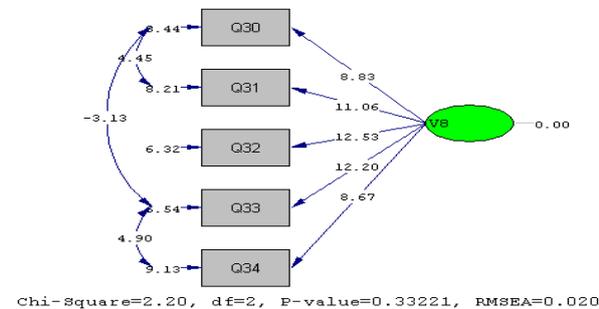
Diagram 15: T value for investigation of significance of parameters of HRM system model

Chi-Square=2.20, df=2, P-value=0.33221, RMSEA=0.020
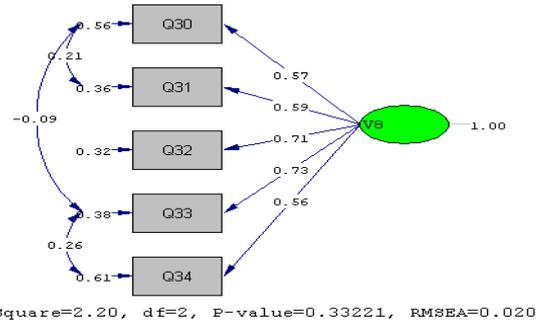
Diagram 16: HRM system measurement model

Table 11: results of HRM system model

Research constructs	factor	symbol	Route coefficient	t	p-value
HRM system	Item 30	Q30	*	*	1%
	Item 31	Q31	*	*	1%
	Item 32	Q32	*	*	1%
	Item 33	Q33	*	*	1%
	Item 34	Q34	*	*	1%

The calculated t values for each load factor of each components and its variable construct is higher than 1.96. Therefore it can be concluded that representatives are consistent for measurement of notions.

4.9 Organizational commitment index

This index is consisted of three items.

Chi-Square=0.00, df=0, P-value=1.00000, RMSEA=0.000
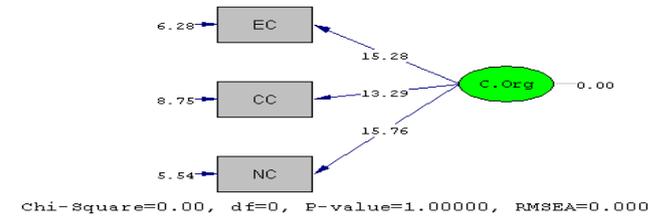
Diagram 17: T value for investigation of significance of parameters of organizational commitment model

Chi-Square=0.00, df=0, P-value=1.00000, RMSEA=0.000
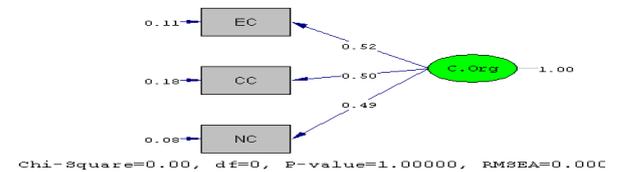
Diagram 18: organizational commitment model

Table 12: results of organizational commitment model

Research constructs	factor	symbol	Route coefficient	t	p-value
organizational commitment	Emotional commitment	ECC	0.50	15.28	1%
	Continued commitment	CC	0.52	13.29	1%
	Normative commitment	NC	0.49	15.76	1%

The calculated t values for each load factor of each components and its variable construct is higher than 1.96. Therefore it can be concluded that representatives are consistent for measurement of notions.

Table 13: fit indexes of the overall model

index	Desirable range	selection	training	Performance evaluation	Promotion opportunity	reward	Information sharing	Job security	HRM system	Organizational commitment
RMR	≤ 0.1	0.009	0.027	0.025	0.016	0.016	0.022	0.031	0.042	0.007
SRMR	≤ 0.1	0.011	0.029	0.027	0.018	0.022	0.014	0.053	0.064	0.010
GFI	≥ 0.9	1	0.98	0.98	1	0.99	1	0.98	0.97	1
NFI	≥ 0.9	1	0.98	0.99	0.99	0.99	1	0.98	0.97	1
NNFI	≥ 0.9	1	0.99	0.99	1	0.99	1	0.99	0.99	1
IFI	≥ 0.9	1	0.91	0.91	1	0.9	1	0.9	0.9	1
CFI	≥ 0.9	1	0.95	0.95	1	0.95	1	0.95	0.94	1
RMSEA	≤ 0.1	0.000	0.000	0.000	0.000	0.000	0.000	0.046	0.02	0.000

As it can be seen, the data of the present research are of a suitable fitness with factor structure and theoretical foundations of the study. In other words, the construct is of a high validity. After passing the previous sections, now the final model is determined and also the final structural model is produced. For this purpose the proposed model is implemented in LISREL software. Since the value of RMSEA is reported as smaller than 0.1, therefore there is no need for any reformations on research hypotheses for making a precise estimation of route coefficients. Therefore we have:
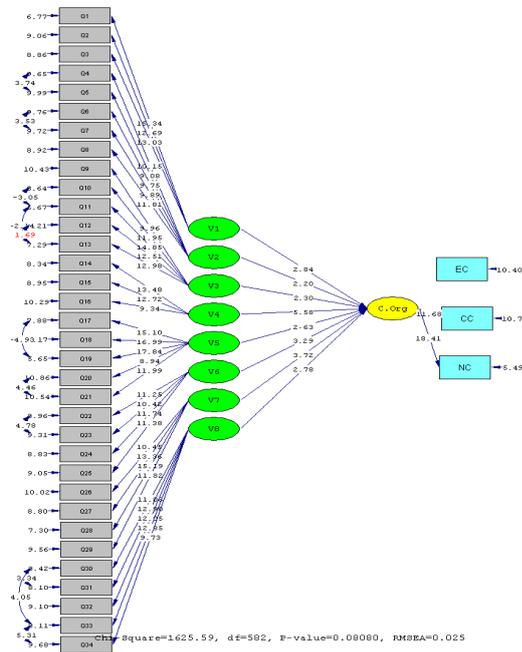
Diagram 19: T value for investigation of the structural model
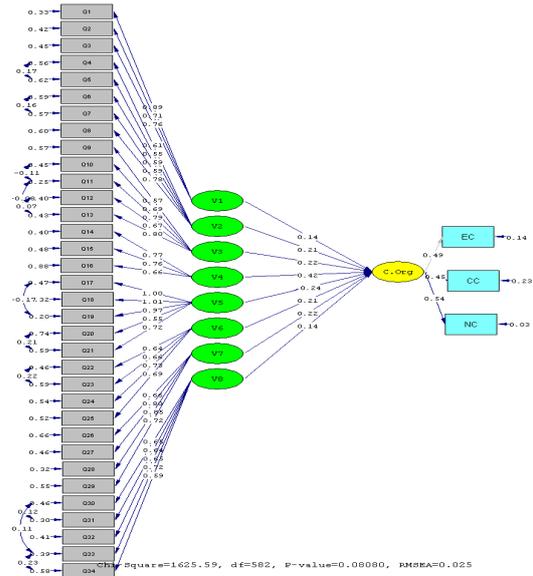
Diagram 20: coefficients of the structural model

Table 15: route coefficients for effects of constructs

Independent construct	Dependent construct	Route coefficient	R^2	T	P. value	result
Selection	Organizational commitment	0.14	0.019	2.84	0.000	Hypothesis accepted
Training	Organizational commitment	0.21	0.044	2.20	0.000	Hypothesis accepted
Performance evaluation	Organizational commitment	0.22	0.048	2.30	0.000	Hypothesis accepted
Promotion	Organizational commitment	0.42	0.176	5.58	0.000	Hypothesis accepted
Rewards	Organizational commitment	0.24	0.057	2.63	0.000	Hypothesis accepted
Information sharing	Organizational commitment	0.21	0.044	3.29	0.000	Hypothesis accepted
Job security	Organizational commitment	0.22	0.048	3.72	0.000	Hypothesis accepted
HRM system	Organizational commitment	0.14	0.019	2.78	0.000	Hypothesis accepted

Table 16: considering for priorities

promotion	Dependent construct	Route coefficient	R^2	T	P. value	result
rewards	Organizational commitment	0.42	0.176	5.58	0.000	Hypothesis accepted
Evaluation of performance	Organizational commitment	0.24	0.057	2.63	0.000	Hypothesis accepted
Job security	Organizational commitment	0.22	0.048	2.30	0.000	Hypothesis accepted
training	Organizational commitment	0.22	0.048	3.72	0.000	Hypothesis accepted
Information sharing	Organizational commitment	0.21	0.044	2.20	0.000	Hypothesis accepted
Information sharing	Organizational commitment	0.21	0.044	3.29	0.000	Hypothesis accepted
selection	Organizational commitment	0.14	0.019	2.84	0.000	Hypothesis accepted
HRM system	Organizational commitment	0.14	0.019	2.78	0.000	Hypothesis accepted

With respect to research questions and hypotheses it can be concluded that the entire variables of HRM practices in addition to having a direct and positive effect on organizational commitment, also have a significant relation with it.

5 Conclusions

Results of this research manifested that the HRM unit can take effective actions in order to improve organizational commitment among the employees. In this regard, long term realization of organizational goals is assured. Strategic management of human resources is a macro perspective which allows us to elaborate on employees' main issues in order to make the organization benefit from expert, committed and motivated employees who put efforts towards obtaining a sustainable competitive advantage. On the other hand, organizational commitment is also defined as engagement of an individual employee with his/her recruiting company. In fact this subject has recently attracted several attentions. Since none of the proposed 8

hypotheses were denied in this study, it can be concluded that the proposed structural model is of a high validity and fitness.

Findings indicated that there exists a two-fold relation between HRM practices and organizational commitment. In addition the entire relations have a forward and straight direction. In addition the highest of all correlations was attributed to opportunities for promotion and organizational commitment. In general, the entire variables of HRM practices have a significant effect on organizational commitment. On this basis it can be claimed that strategic HRM is able to provide employees with opportunities for promotion through application of the integrated system of this type of management and through selecting suitable labor force and providing them with adequate training. In addition rewards could be considered for sharing information or obtaining higher scores in performance evaluation tests. These rewards may result in increased job security.

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Primary Paper Section: A

Secondary Paper Section: AE, AF

SOCIAL WORK IN PAEDIATRIC PALLIATIVE CARE IN SLOVAKIA

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Abstract: Having a child with an incurable disease is a very difficult situation for the family and it interferes with their whole lives. Palliative care is provided by a specially educated multidisciplinary team that works closely with the members so that they can solve all kinds of problems together. In addition to healthcare professionals, social workers are often a part of the multidisciplinary team as well. The paper shows the specifics of paediatric palliative care, its current trends, development and further characteristics of work of social workers. Through ongoing research the authors are mapping the current state of providing palliative care in Slovakia. The paper presents partial results focused on roles of social workers in selected organizations providing specialized paediatric palliative care.

Keywords: paediatric palliative care, social work, social worker

1 Children with life-limiting or life-threatening diseases

According to the world statistics, the incidence of primarily incurable diseases that result in death, i.e. life-threatening or life-limiting diseases, is 1 child per 10,000 children (children aged 0-19 years). The prevalence of these diseases is 10 times higher (10 children out of 10,000) and it has been stated that a half of those children need palliative care. In Europe, according to these data, there are minimally 125,000 children who need some form of palliative care (Goldman, Hain, Liben, 2006; Paliatívní péče v Evropě, 2014; Jasenková, 2007). In Great Britain, according to the recognized British organization Together for Short Lives (former ACT – Association for Children's Palliative Care), there are up to 49,000 children with life-threatening diseases that could use services of paediatric palliative care (Who we are. Together for Short Lives, 2015). Therefore, an establishment of all forms of palliative care has become a main goal in these countries, which would increase quality of life not only in children but also in their families. In accordance with a designed model of paediatric palliative care, this care does not focus on death but its goal is to help children and their families live as high-quality lives as possible and also face serious diseases (Paediatric and Adolescent Palliative Model of Care, 2009).

Despite the fact that perceiving death as a natural part of life is one of the fundamental principles of palliative care (Sedlárová, 2013), dying and death of children are something unnatural for us. "It is in our subconsciousness that children should have enough time, a possibility to develop their talents, and live longer than their parents. If it is not so and a child's death enters the family, it shocks all its members from the roots – including parents, grandparents and children (sibling's survivors)" (Mojtová, Sedlárová, 2011, p. 31) (all citations are translated by the study authors); and thus, the death of a child is perceived as the worst event in one's life. Because of bad practice and lack of services and information, often there are situations that children with life-threatening diseases spend their last moments in life in isolation, as a result of their diseases or disabilities. And it happens also to their families whose parts they are (Démuthová, 2010). When curative care fails and prolonging life brings the child suffering and pain, palliative care is in the best interest of the child. A precondition, however, is accepting the fact that it is not possible to save the child any more. In this case there are only two options available – to attempt to prolong life, even for the price of certain deterioration of quality of life, or not to influence the length of life and focus on alleviation of symptoms only (Jasenková, Mikesková a kol., 2005). And the latter way of care is referred to as palliative care. Decision making about not continuing in curative care is a long process that involves both child's physicians and parents, and a result of such decision making includes these factors: a disease is incurable and necessarily results in death and the child and parents wish to finish life-prolonging treatment that would only significantly worsen quality of life in the child.

1.1 Specifics of paediatric palliative care

Palliative care does not perceive the death of a child as a complete end or failure of medical care and treatment. Although care for children in their last moments in life is particularly demanding and exhausting both for the family and professionals, it attempts to fill these days with life – it does not speed up or prolong the death unnecessarily. "Regardless of the causes, we must accept the fact that it is not granted to every child and not every threatened life can be saved" (Kasanová, 2009a, p. 78).

Every child with a life-threatening or incurable disease, regardless of race, age, religion, gender or place of residence, has a right for access to permanent, holistic and high-quality palliative care and support (A Guide to the Development of Children's Palliative Care Services, 2009). A strong and respected opinion in society that children should not die, creates one of the barriers how to deal with such a reality and implement paediatric palliative care in the national strategies and standards.

The need of paediatric palliative care appeared also as a result of the increased number of incurable diseases and possibilities of their diagnostics. Due to the medical development with the use of multiple technologies it is possible to reduce child mortality; furthermore, the experts attempt to increase the length of life in children with severe and mortal pathologies that require an entire complex of palliative care. For a long period of time palliative care was not offered to paediatric patients; and also today in Europe, apart from the development of palliative care in some countries, only part of these children can profit from palliative care. Thus, many children die in inadequate conditions – in pain, with multiple unpleasant side effects of treatment, and often in hospitals. Paediatric palliative care has become a serious issue in our society, so far with inadequate solutions (Palliative care for infants, children and young people, 2009); therefore, it is often a discussed issue at many conferences.

Despite certain variations of the terminological definitions of palliative care, most experts agree on its main philosophy. It is an approach or programme that strives to maximize the present quality of life through the implementation of the fundamental principles of palliative care and their adaptation to the target group of children from neonates to adolescents (Davies, Siden, 2010). The central features of palliative care are symptomatic treatment, psychological, social, spiritual and emotional support, assistance to the whole family, and providing assistance, accompanying the decedent's survivors in the period of grieving. Thus, in accordance with the recommendations of the Council of Europe, organization of palliative care is based on these values: human rights and patient rights, human dignity, social cohesion, democracy, equality, participation, and freedom of choice (Odporúčanie Rady ministrov Rady Európy ...., 2008).

1.2 Services and forms of assistance in paediatric palliative care in Slovakia

Paediatric palliative care as a complex, active and quality-of-life-centred care provided to children with incurable diseases and their families has, equally to palliative care for adult patients, according to the international standards, at least two levels: general and specialized (Mojtová, 2014). General palliative care is a good clinical practice that is provided by healthcare professionals within their expertise. Its basis includes particularly early detection of an incurable character of a disease and identification of the areas that are significant for the quality of life in the patient. It should be provided by every healthcare professional – general practitioners, hospital departments and clinics, long-term nursing care facilities. Specialized palliative care is active multiprofessional care for patients and their families provided by teams of specialists in palliative care. It is

provided to patients who exceed the possibilities of general palliative care by the complexity of their needs (physical, psychological, social) (Sláma, Špinková, Kabelka, 2013).

The study we conducted focuses on the area of specialized palliative care which specifically focuses on providing palliative care to dying children and their families in optimum forms and in any settings (homes, inpatient hospices, day care centres). The aim of such oriented paediatric palliative and hospice care is palliation – providing comfort and satisfaction and meeting the children's needs. However, it is necessary a child's personality is not deformed by the loss of privacy, social isolation, inadequate medicaments, and inability to express and ventilate their feelings (Gojdová, 2002). Thus, palliative care is not about death but about life that is finished by death. The principal philosophy suggests fulfilment of children's lives by everything that brings joy to them and their families. Services of specialized paediatric palliative care are to be offered and available in all forms of this care. Complex assistance appropriate to age, cognitive and educational ability of the child must be available for the child and family (Craig, 2007). Jasenková, Mikesková a kol. (2005) differentiate between two basic programmes of paediatric palliative care: paediatric inpatient hospices and home hospice programmes. In the world, home hospice care is preferred; it allows dying children to stay in the settings they know, allows the whole family be with such a child, while professional assistance and support are provided all the time. The second form includes paediatric inpatient hospices that are particularly abroad established as independent facilities entirely for paediatric patients and their families. When compared with hospices for adult patients, paediatric hospices are rather used for repeated respite and relaxation stays. The whole family can come to a hospice and is provided with so-called respite care that is provided by the team of professionals (physicians, nurses, psychologists, social workers). The aim of such stays is to allow parents to have a rest and spend time also with healthy siblings who often face the feelings of jealousy and insufficient attention and care from their parents. Entertainment and educational programmes are prepared for these children. "For the whole family, quality respite stays of the child and close family mean multiple stimuli and possibilities to make new friends. According to the experience from abroad, the stays significantly enrich and improve quality of life in affected families" (Jasenková, Mikesková a kol. 2005).

In the world, apart from these forms, they use also palliative day care centres; care for dying patients is provided in the settings of day care centres substituting their home settings during a day. Palliative care departments are another form of care for dying children. In Slovakia, the department is in the National Institute of Oncology in Bratislava where they provide complex oncological palliative medicine for the ill with incurable cancer diseases (multidisciplinary pain therapy and care for the terminally ill) and hospitalizations with administration of palliative chemotherapy and radiotherapy. Other facilities of specialized palliative care include outpatient departments in hospice facilities and hospitals.

In the present in the Slovak Republic, palliative care is provided only by children's mobile hospices; there are not any other forms of care for paediatric patients. Despite that, we can talk about significant steps in the scope of the development of specialized paediatric palliative care (we state some of them):

- Establishment of the Association for Hospice and Palliative Care in Slovakia (1999),
- Development and approval of the Charter of Patients' Rights in the Slovak Republic (2000), article 8 – Care for incurably ill and dying patients,
- Introduction of the term "hospice" into legislation in the Amendment No. 80/2000 which amends the Act of the National Council of the Slovak Republic No. 277/1994 on health care,
- Development and approval of the document the State Policy of Health in the SR (2000) in which one of the priorities is creating the conditions for the development and

improvement of the quality of palliative care, including hospice activity,
- Approval of the Palliative Care Conception in the field of palliative medicine including hospice care in 2006 (the first conception was approved in 2002),
- Defining palliative medicine by the Ministry of Health of the Slovak Republic as a specialized field of medicine in 2006 (Centeno et al., 2013; Kasanová 2009b).

1.3 Social workers as members of multidisciplinary palliative teams

Dying of a child in the family brings multiple unpleasant emotions the family has to cope with – fear that the child will suffer unbearably, feeling guilty that a parent has failed, sadness, and desperation.

Social workers are significant persons in the whole process of work with the dying child and his family because they can provide adequate assistance and often are an interface between a patient and his environment. In the present, according to Sedlárová (2013), it has been repeated through various national and international organizations and institutions, conferences and publications that palliative and hospice care should be one of the priority areas of the development of not only health care but also social care and every person has a right for its availability. In order to improve paediatric hospice and palliative care, the countries design and implement the standards and recommendations for this care, e.g. the Standards for Paediatric Palliative Care in Europe (IMPACT: standards for paediatric palliative care in Europe, 2007). In Slovakia, unfortunately, similar standards or recommendations are lacking.

Social work in palliative care is also in Slovakia labelled as a growing part of social care (Laca, 2011). The main objective of social workers is particularly cooperation with other team members to ensure the best possible quality of life in the dying patients and their families. The uniqueness of social work is a different view of a dying person – a child, because it deals with all current needs – psychological, developmental, social, or spiritual. Social work as a practical science promotes the social change, social functioning of clients-patients and pursues the respect for the fundamental human rights and freedoms. Social workers become supporters of changes in society or life of the individuals or families (Hetteš, 2014).

Social workers work not only with children but also with their families. As Mojtová (2010) states, not only patients but also family members go through different stages of adaptation to the situation. When they overcome a period of anger, they enter a phase of preparatory grief. The role of social workers is to assist not only patients but also their families to overcome individual phases of grief, help them reconcile with the disease and thus increase quality of their lives. Related to the issue of palliative care, social workers have several levels, roles, i.e. they work as clinicians, researchers, advocates, and leaders in communication. Relatives must be encouraged, led to try to understand the ill by trying to feel their situation and imagine how they think and how they experience their situation. Social workers provide the relatives with emotional support and emphasize how necessary help by the relatives in home care is. After death of the child, the role of social workers is to ensure the proper functioning of the family and care for other members. If the family needs it, they help with the funeral and other issues related to the death of the ill.

2 Research

In 2016, the qualitative study was conducted after the implementation of a short survey in which we had identified all providers of specialized palliative care in Slovakia with a target group of children (0-18 years of age). After contacting all the facilities, we specified only these facilities meeting the criteria: Plamienok, a non-profit organization; the Civic Association Svetielko nádeje; Svetielko pomoci, a non-profit organization; and Pod krídlami Dominiky, a non-profit organization (more information in the part Results). In this paper, we state only a

part of the selected results describing the forms of specialized palliative care (mobile hospices) and roles of social workers. The complex study focused on the analysis of the present situation of specialized paediatric palliative care will be published later in 2017.

One of the methods for data collection was document analysis by which we obtained the information about the character of the organizations providing paediatric palliative care (annual reports of the organizations, national strategies, organization registers, reports, and data available on the Internet). In the study, we were interested in these areas: an establishment of an organization and its status (legal form), offered services, a target group, and a professional focus.

Another method for data collection about the roles of social workers was a semi-structured interview. We used audio recording. The interviews were conducted with social workers and directors of the organizations; the total number of the respondents was 5 (n=5), which was sufficient to meet the partial objective (to maintain anonymity, we do not state the workers positions in the specific facilities because of a narrow sphere of professionals and their possible identification).

2.1 Results

Based on the document analysis we state the current character of the organizations providing specialized palliative care in Slovakia. In Slovakia, as we have stated above, apart from mobile hospices, there is a lack of other forms of specialized palliative care. The table below closely describes the current providers of this type of care.

Table 1: Facilities providing specialized palliative care for children in Slovakia

Name	Plamienok	Svetielko pomoci	Svetielko nádeje	Pod krídlami Dominiky
Place	Bratislava	Košice	Banská Bystrica	Nitra
Establishment	2003	2011	2013	2014
Legal form	Non-profit organization	Non-profit organization	Civic association	Non-profit organization
Type	Mobile hospice	Mobile hospice	Mobile hospice	Mobile hospice
Focus	Home hospice care	Home hospice care, clinical oncology	Home hospice care	Home hospice care

According to the study of the European Association for Palliative Care, Slovakia is one of the countries where palliative care is provided at the general level and the process of integration of palliative care in the health care system is only at its beginning (Centeno, 2013). Although the Constitution of the Slovak Republic guarantees a free access to a broad basic package of health care for all the citizens, still we can witness a lack of services and limited capacities of healthcare facilities. In spite of the fact that the attempts to develop palliative and hospice movement in Slovakia have been developing since 1989, there is not a complex of related services and forms of assistance for dying paediatric patients, which is suggested also by the study results. The facilities providing this type of care are either non-profit organizations or civic associations. Thus, support by the state is lacking, for example in the form of system funding of these facilities or paediatric departments of palliative medicine in hospitals.

In Slovakia, the first mobile hospice was established in 2003 (Plamienok), but it started to provide home hospice care services in Slovakia only in 2004. This year (2017), the fourth mobile hospice obtained the licence, which improves the availability of palliative care from the view of the geographic distance.

In the analysis of the facilities, we focused also on the services and forms of assistance provided to paediatric patients and their families by these organizations. We identified main three areas: health care, social assistance, and psychological assistance; the fourth area includes multiple additional services and types of assistance.

Table 2: Provided services

Provided services	Description	Number of facilities providing the service
Health care	Pain relief, symptom and pain management, drug administration, equipment loans	4
Social care	Basic social counselling (assistance in arranging various benefits), social assistance	4
Psychological care	Psychological counselling in coping with crisis situations, accompanying, assistance also after the loss of the child	4
Spiritual care	Mediating the contacts	1
Other	Patient transport (for examinations, home after discharge from hospital)	3
	Cultural and other events (weekend stays, other leisure time activities)	3
	Providing material assistance	2

Apart from home visiting services including health and nursing care, the facilities provide a broad range of services and assistance depending on the personnel structure, funds and focus of each of the organizations. All of the organizations provide care also after the death of the child. The offers of the services correspond with the personnel structures where apart from the clinicians (health, social workers, psychologists, etc.) there are also project managers, fundraisers, economists, and lawyers. Some of the personnel have only part-time contracts (or other types of employment contracts), which requires accumulation of work positions.

We closely focused on the roles of social workers who are significant members of multidisciplinary teams. The field of activities and competences of social workers corresponds with the identified services of social care. A surprising finding, however, was that there were no social workers in one of the organizations in spite of the fact that they declared providing social care in the form of counselling. A key status of physicians as guarantors of provision of palliative care was found in every facility.

Despite that, we were able to identify several categories – roles of social workers resulting from care for dying children and their families. In defining the basic roles, the authors use various divisions of these activities. Based on the analysis of the selected authors (Mojtová, Dobríková, Student, Vorlíček, Payne, etc.), Sedlárová (2013) suggests four groups of these roles to which we added the study results (specific descriptions of the activities specifically focused on work with children in the selected facilities):

1 Roles focused on patients – dying children: providing crisis/social interventions, social diagnosis, counselling activities, accompanying the dying, documentation, planning the services and work with dying children.

2 Roles focused on families (relatives, survivors): obtaining and recording the information about the family, mapping the family social situation, active search for family members, accompanying the family and survivors, social counselling – informing the family about possible solutions for difficult social situations, assistance in job seeking, help with the funeral, crisis interventions, work with survivors, organization of support groups (parents, siblings).

3 Roles focused on multidisciplinary teams and volunteers: seeking and mediating new information to other co-workers, e.g. legislative changes, coordination of volunteers, management of educational courses and programmes, supervision, possibility to participate in regular meetings.

4 Other roles and requirements: organization of conferences, lectures for educational purposes, introducing the philosophy of palliative care, diminishing the taboo theme of dying of children and significant advocacy and promotion of social work in palliative care; social workers can be initiators of legislative changes.

We would recommend the fifth group of activities: *Roles focused on cooperation with other sections of the system*; Mojtová (2014) states work with the local community or institutions which the families or dying children are in contact with (authorities, schools, employers, parishes) and action in clients' interest, their representation.

In the centre of specialized palliative care, patients and their families are always in the first place, which shows high quality of this conception of care (Mojtová, 2014). Thus, they are included among the team members and addressees of the information, supported by other professionals. The composition of the team must be complex and multidisciplinarily adapted to the needs of paediatric patients. Inseparable part of health care includes support for patients, dealing with social problems, planning the interventions, or assessment of psychosocial aspects of the situation. Therefore, in the present, also social section of this care is emphasized; but even despite the significant and long-term status of social work in palliative care, roles and competences of social workers are not clearly defined.

3 discussion and conclusion

Specialized palliative care is considered an optimum form of care focused on meeting the needs of families with a dying child that can provide adequate and directed services and forms of assistance. It respects wishes of paediatric patients and their families, maintains an individual approach, and achieves and maintains the quality of life to the highest degree. It is a complex care that includes the areas of physical, psychological, social and spiritual needs of dying children and their families through the specially trained and experienced team of professionals. The above mentioned facts as well as the results of various studies and practical experience of professionals have become the basis for selection of specialized paediatric palliative care as an optimum form of assistance to children with life-limiting or life-threatening diseases. In the ongoing study, we continue in mapping the model of assistance for this target group, and possibilities and limitations of further development of paediatric palliative care.

If there are suitable conditions in society (high prestige of social work, adequate moral and financial appraisal, possibility of specifically focused education, and offer of further education), social work in specialized palliative care has space for its implementation and further development. In the present, we have defined the following problems and limitations important for increasing the effectiveness of social work to improve care for dying children and their families:

▪ Lack of clearly defined roles of social work in palliative care for dying children and their families (a definition of care),
▪ Lack of a legislative definition of the scope of social work and standards for its performance,
▪ The need to improve professional education in social work with dying children (university education, post-gradual education, further education),
▪ Insufficient/no regulations for funding the performance of social workers.

Social workers play multiple roles related not only to children but also their families and other members of the multidisciplinary team. Often they are in the position of an interface in the multidisciplinary team of professionals, and help and support other professionals.

Children's complex needs are determined by age, course and status of a disease, family and religious environment, which requires cooperation of all sections of care (Liben, Goldman, 1998), including assistance by social workers but also implementation of paediatric palliative care in all countries and following its basic standards that are recommended by various international institutions and organizations (for example, the Standards for Paediatric Palliative Care in Europe developed by the European Association for Palliative Care; the Recommendation Rec (2003) 24 of the Committee of Ministers of the Council of Europe to member states on the organization of palliative care; the Recommendation of the Council of Europe No. 1418/1999: Protection of the human rights and dignity of the terminally ill and the dying; etc.).

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SELF-CARE FOR PROFESSIONAL HELPERS IN CONDITIONS OF THE SLOVAK REPUBLIC

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Abstract: This article focuses on the characteristics of the realized self-care for the specialists in the helping professions. The main goal of the research was to clarify the characteristics of the self-care with selected specialists and also to find out whether statistically important differences exist between the social workers and educators. The results, in summary, do not prove a significant difference in self-care depending on the profession. On the contrary, it is interesting to find out there are significant differences because of universal and work self-care..

Keywords: self-care, helping professions, social workers, educators.

1. Introduction

The self-care is an important part of the professional equipment not only of helping professionals. It brings them benefits in terms of improving personal, professional or social competencies. It is also an important part of working with the client. Brings also benefits to individuals in terms of increased resilience, mental wellbeing, or pleasure from their work. In the case of a self-care failure, however, it brings many risks in the form of negative phenomena in the workplace environment. Helping professionals pay attention to self-care of their clients. One of the goals of their work is to achieve improvement in self-care area. On the other hand, they often neglect their own self-care. Social workers, as well as teachers, are constantly struggling with a lot of problems that are both psychologically and physically challenging. Careful consideration of the self-care is therefore a basic work skill for these.

2. Self-care

The concept of a self-care is a scientific term that has recently been used in many areas of the knowledge. It is used in a medicine, nursing, public health, psychology, social work, pedagogy, as well as in the other areas, especially for the helping professions. Self-care at an individual level is a feature that each individual has (Lovaš et al., 2014). Self-care is most often defined as a multidimensional concept involving physical, mental and social dimensions. It helps to ensure a sufficient quality of life for individuals. It is an important part of a self-concept. (Cameron, Leventhal 2003) It comprises several components, including physical, emotional, spiritual, social and relaxation areas. (Tartakovsky 2015) The paradox of this phenomenon can be the fact, that while one person can classify the situation as self-care, other can view it as stressful. For example, team sport, which on one hand can be seen as a form of a relax on the other hand it can be seen as a form of competition, which can cause people who are involved in it to be stressed almost frustrated. (Williams-Nickelson 2006)

An inherent part of the work in tough, dynamically changing conditions of providing care is uncertainty, risk environment, time pressure and serious consequences of decisions. These circumstances emphasize the importance of the factors used in the decision-making process, which are connected to the emotional experiencing of persons in the problematic situation. (Gurňáková 2013) The important part is that, if an individual is capable of helping themselves, that individual has prerequisites to help the others, which is more than desirable in the scope of social work. Self-care is a necessary support of good social work practice. Self-care has importance for social workers in the performance of their work and in the personal life. Murphy and Dillon (2003) warn about the stressful environment, which social workers face daily. That is why it is important to focus on the behavior, experiencing and inner well-being of the social worker in the context of their work. On the contrary, Cunningham (2004) considers the further education of social workers in the field of self-care most important. By that, he means organizing different lectures, which content would be correct usage of self-care strategies, which can considerably improve the physical, mental, professional, spiritual and interpersonal field of social workers.

Expert, working in the field of helping profession isn't just a professional, but also a balanced personality. They focus on thorough fulfilment of their own responsibilities, have positive effects on the social environment in which they live or work, improve the situation of the client and even can contribute to the higher status of their work in a given society. In this sense, the self-growth and development are especially important because an expert is considered as a part of some higher unit. Expert is a real authority which in the end increases feelings of personal responsibility. It is expected that they will approach the profession and to the solution of problems from the point of view of collective good and ethics. (Naagarazan 2006) If the aforementioned elements are in harmony with lives of social workers, they are capable of focusing on themselves, manage their personal and professional growth. They can appropriately make decisions, work with the clients or other experts, focus on achieving goals set out in given time and to contribute to positive changes in social work as well as in profession. An essential instrument of every social worker are in most cases social workers themselves, that is why it is important that this tool is working effectively and efficiently, which increases their potential to work with a client.

The work of an educator is a practical activity, but besides the relationship of the teachers to the objects of their work activity (kids, youth), the relationship with themselves is also important. (Ďurič et al. 2000) To realize their personal values, several particulars are required. Bezáková (2003) says that it is important to base it on the theory of "six S", which consists of six areas, that expert should focus on. Those are self-reflection, self-evaluation, confidence, self-control, self-regulation, and self-creation. In this regard, it is useful to highlight important of self-care strategies with experts in helping professions. Using right strategies can not only increase happiness with own life but to a large extent, the society is influenced as well. (Liba 2000)

3. Research

The primary goal of the research was to analyse the characteristics of self-care with experts in helping professions. Data collection was conducted by quantitative research using questionnaire survey. The survey used close-ended questionnaires *Self-regulation in the fields of self-care and Carried out Self-care*. Lovaš (2014) is the author of the both questionnaires. They are focused on finding out the frequency of self-care done at the moment in the form of specific activities by 5-point scale. The research sample was formed by experts from helping professions, specifically social workers and educators. All in all, 240 respondents took part. 120 social workers and 120 educators. The research was focused on three parts of Slovak Republic, district of Bratislava II., district of Revúca and district of Košice. To be exact, in every district 40 social workers and 40 educators took part. The reason for this was expected different economic and the educational level of the experts and also differences in the possibilities and opportunities for carrying out self-care.

In terms of the research, the importance was on the connection between various fields of self-care with selected respondents and also a connection between universal self-care and one experts focus on at their workplace. Furthermore, the research was dealing with the differences in self-care with the selected experts in the helping professions. The main goal of the work was to clarify nature of self-care with the experts in helping professions. From this point of view, the research was focused on finding out

the differences between self-care between social workers and educators. The results are in table 1 below.

Table 1 - Mann – Whitney U-test – differences in Self-care from point of view of profession

Profession	n	X	z	p(α)
Social Workers	120	120,82	-0,071	0,944
Educators	120	120,18		

This shows that there were no significant differences found in the self-care. On the basis of the discovery, it can be stated that there are no differences between social workers or educators, specifically in physical and emotional self-care. Activating element, their self-regulation in physical or emotional care does not show differences. Also, no differences were found in their inhibitory elements, that means in the control of their physical or emotional state. In reality, this can mean that focus of selected experts on personal growth and development is not higher than sticking to the principles of a healthy lifestyle. It can be said, that all respondents consider self-care as a part of a complex entity and all the fields have almost the same level of importance for them. Even if there are no clear significant differences from point of view of the profession, an answer of social workers and educators differed slightly. It can be said that emotional and physical self-care with educators shows slight differences, their focus on their own subjective or physical balance doesn't need to always be in balance. On the basis of the findings, it can be said, that there can be differences in self-care with educators in terms of how they care for their physical health and how they control their emotions.

Because we were interested in differences between social workers and educators focused on personal growth and development, the goal of the research was to find out, which experts are trying more, more precisely care more for personal growth, more precisely development in personal growth. Table 2 shows the results.

Table 2 - Mann – Whitney U-test – differences in field of personal growth and development from the point of view of profession

Profession	n	x	z	p(α)
Social Workers	120	3,354	-0,782	0,434
Educators	120	3,289		

There were no statistically important differences. That means, in self-regulation, concerning the emotional field of self-care from the point of view of social workers and educators no differences were found. From this point of view, we find it necessary to highlight, that the results show the fact, that it is important to view the human being as an entity, no matter what their profession, age or education is. Personal growth and development is a basic instrument for realizing the value or carrying out of the goals. That is why we don't see findings in the field as negative since self-realisation in the field of mental self-care should be a cornerstone for self-care for every human being. Despite that the importance between experts was not found, their answers show slight differences. It can be said that social workers focus on the field of personal growth and development slightly more than educators. Working with personal plans and goals requires time and focus to themselves. A possible reason for differences is a lack of time for self-care from the point of view of educators, precisely their focus on fulfilling needs of children and parents.

If the individual is focusing on the development of personal potential, we see it as necessary to point out differences that were found out from the point of view of the place of the profession. Table 3 shows the results.

Table 3 Kruskal-Wallis test – development of potential from the point of view of place of profession

	Place of profession	n	X	z	p(α)
Potential	Bratislava II	80	4,12	-1,652	<0,001***
	Revúca	80	3,01		
	Košice	80	3,26		

Because the research was focused on finding out the differences between selected experts in three regions of Slovakia, in terms of developing potential big statistical differences were found depending on the place of the profession of respondents. This in big part can be connected with previous findings, which are presented in table 3 higher. Where an individual is and works has a big influence on their self-regulation in terms of personal growth and development. Findings prove, that experts working in the district of Bratislava II. focus on developing their potential more than experts from other to districts. Because the majority of respondents were social workers and educators, it is important to consider education in the field of personal growth and development, that means acquiring new knowledge and skills in various fields of working with people and also developing of creativity or mental hygiene.

The biggest difference was between district of Bratislava II. and district of Revúca. This can be attributed to different life standards of these towns. According to the statistic concerning development potential of the district of Revúca, the evaluation of population showed unfavorable results. On the contrary, in last few years, Bratislava was among the top cities concerning life standard in all categories. The district selected by us, Bratislava II., is in the eastern part of Bratislava and consists of neighborhoods of Podunajské Biskupice, Ružinov, and Vrakuňa. On the basis of the research, concerning the quality of life in Bratislava, the district Bratislava II. was identified as the worst from the point of view of the quality of life of people who live here. This was the main reason for selecting the district for comparison. In the contrast district of Košice showed in this context average results compared to the other districts.

4. Discussion

The following part will offer a view of some other researches which are to do with the topic. First research was conducted by experts from the Department of Educational psychology at the University of Malaya in Kuala Lumpur. Board of advisors came forward in 2012 with the information that the number of registered advisors is rising daily in Malaysia. With the speed of the growth in this field, there will be expected higher demands in their professionality in future. They consider self-care absolute necessity and state that human being itself is the most important tool in achieving subjective satisfaction. According to them, it is necessary that every advisor uses in their work process their personal characteristics, life experiences and also expert knowledge. That is why if they are not aware of their own personal needs and unsolved conflicts or if they suppress them in a way, this way they will be creating sort of barrier in personal growth and development and that can lead to failures in process of helping others. The research was qualitative; the main goal was to find out strategies of self-care with given advisors. On the contrary, our research was quantitative because our goal was to get exact and objective data about research issues. Research samples were comprised of four advisors with main criteria being at least 7-year practice. Other criteria were to be a part of a group of advisors, with the base in Klang valley, one of the busiest and most sophisticated areas of Malaysia. The duration of their practice was between 8 to 25 years. Research sample in author's research was 120 social workers and 120 educators and length of practice was between 6 months and 20 years. Research in Malaysia found that all four respondents use self-care in the personal and professional environment. Self-care in work environment could be meant by this. Also, research done by us was focused on finding out the relationship between ordinary, universal self-care and one which is the focus of respondents at

the workplace. The goal of our research was to find out differences, but in case that we would have to focus on connections the correlation coefficient would be 0,875 which shows very positive correlation. Also, it can be stated that respondents taking part in our research consider not only personal self-care but also professional one important. On the other hand, Malaysian experts could by the term self-care in the professional field mean professional growth and development of the advisors. At this point, the author's research field of personal growth and development could be parallelized. The goal was to find differences in this field between social workers and educators, where no statistically important differences were found. It is useful to say that personal growth and development is considered a basic tool for the realization of values or achieving goals of every human being. This thought was showed on the basis of the complex perception of human being, no matter their profession, age or education. Also, the research in Malaysia points to the fact that the experts say, that human is a complex being and because of that, it should approach self-care in the same way.

Another research was conducted by experts from World Health Organisation from Thailand, whose results show that self-care differs depending on many social determines and health conditions of people. They found out that 87% of respondents which took part in the research answered that ways they care about themselves are influenced by the environment in which they live. Also, the author's research was based on the assumption of differences of respondents, place of living, the number of kids and others. Experts from Thailand prove that self-care is focus and decision of an individual which in big part depends on the family, community and also local or socio-cultural aspects which influence the individual. In conformity with what was mentioned, results of our research warn about the influence of these aspects from several points of views. We found out major significance concerning the environment in which the individual lives. It can be said that environment in which the individual lives influences self-care majorly and it is up to the individual how they grasp possibilities and opportunities which the environment offers.

5. Conclusion

The article was focused on self-care in helping professions and to compare social workers and educators in three regions of Slovakia. Based on expected differences the three districts were selected: Bratislava II., Revúca, and Košice. Assumptions about differences between experts of helping professions were confirmed. Based on realizing the need of helping others the assumption was that they will take care of themselves in the same way. Here it is important to highlight self-care as a multidimensional concept which forms a necessary part of the life.

Self-care is one of the aspects which is a major contributor to the happiness in private or work sphere. It is an important element which influences the quality of life of every individual and that is why important to focus on conscious influencing of health on the basis of defined steps. Experts of helping professions are a distinctive group because their focus is on helping others. This means that focus on self-care can significantly help to balance personal and work sphere, also help physical, mental or emotional health.

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SPECIAL DUTIES OF DIRECTORS IN LIMITED LIABILITY COMPANIES UNDER THE LAW OF THE SLOVAK REPUBLIC

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Abstract: The author deals with and examines the conditions and consequences of a breach of duties by statutory bodies which have just recently been introduced into the Slovak law. At the same time, the author compares these with the statutory regulation of similar concepts in selected countries. This article focuses mainly on the specification of duties imposed on statutory bodies in cases when a company is in "crisis". Moreover, it also deals with duties related to the registration of companies with the Register of Public Sector Partners.

Keywords: director's duties in a limited liability company, Register of Public Sector Partners, company in crisis, director's liability for damage

1. Introduction

The Slovak legislator is currently focusing, to a very special extent, on directors in limited liability companies, their rights and duties and especially their liability for the performance of their tasks. This has consequently led to significant changes made in the relevant statutory regulation. The above-mentioned situation has undoubtedly been brought about by a number of factors, but the main reason is an enormous interest of the legislator to improve the business environment in the Slovak Republic which has long been struggling with the insolvency of business partners caused mainly by the conduct or negligence of companies' statutory bodies. The given issue is also closely related to efforts made by the legislator to clearly identify particular natural persons within companies' ownership structures who represent their ultimate beneficial owners,[1] i.e. persons found at the end of an ownership chain who constitute the actual recipients of benefits obtained from business activities of a particular company, due to the fact that these persons are actually able to affect the management and operation of a company through persons who act as its statutory bodies.

Given the fact that the above-mentioned issues, which the business environment in the Slovak Republic has been struggling with, have been a part of it ever since it started to exist, it has to be pointed out that the procedures which had led to their emergence developed to quite a sophisticated form and thus cannot be removed easily. The Slovak legislator is facing an important challenge which can either result in a significant improvement of conditions for conducting business activities in the Slovak Republic or can eventually end in a complete failure. In order to achieve the given objectives, the relevant statutory regulation will not suffice and it will definitely be desirable to ensure through other state bodies (namely through courts) that such statutory regulation is actually applied in a business life flexibly and actively. At the same time, it is important to set the conditions for performing the post of a statutory body in a limited liability company in a way which will actually not result in a situation in which the persons eligible for performing such post would be "discouraged" from it due to the fact that the risk of being held personally liable is too high.

2. Scope of activities undertaken by directors in limited liability companies

Given the fact that the duties of statutory bodies in limited liability companies are defined in a rather general way, it is firstly necessary to define the scope of activities undertaken by

directors. Their identification constitutes the basis for defining their roles.[2]

The activities undertaken by directors in limited liability companies may, in terms of a doctrinal interpretation[3] and currently effective laws, be generally specified in a number of ways. Firstly, the scope of activities undertaken by directors could be defined in a way that a director acts on behalf of a company in all matters.[4] However, if we accepted the above-mentioned fact without any reservations, then the role and namely the scope of activities undertaken by the remaining bodies in a company would be quite questionable. In specifying the scope of activities undertaken by directors, one has to accept also specific statutory limits which are visible in the restrictions on directors' powers. Despite the fact that the law of the Slovak Republic recognises the legal personality of a limited liability company, it is apparent from the nature or the character of legal entities, that these may not perform a certain kind of legal acts due to the fact that some legal acts can be performed solely by human beings (e.g. entering into a marriage, etc.). It is therefore possible to define the scope of activities undertaken by directors also in a negative way by stating that directors are not allowed to perform on behalf of a company those legal acts which the company itself is incapable of performing. Furthermore, the limitation of powers of a statutory body can also be seen in respect of the scope of activities undertaken by other bodies in a company. A statutory body may not, through its conduct, interfere with the scope of activities undertaken by other bodies in a company.[5] The general prohibition to interfere with the scope of activities undertaken by individual bodies in a limited liability company is, from my point of view, broken with respect to strengthening the position of a general meeting in a limited liability company at the expense of the remaining bodies of a company. The above-mentioned phenomenon is visible especially in a so called "rubber" provision contained in Section 125(3) of Act No. 513/1991 Coll. (Commercial Code) (hereinafter referred to as the "ComC") which expressly allows the change in powers conferred on bodies in limited liability companies in favour of a general meeting. I share the opinion presented by Eliáš who stated in this regard that this statutory provision has not been thought-out very well due to the fact that it undermines the necessary stability in the structural arrangement of competence relationships among company's bodies. Moreover, the provision contained in Section 125(3) is a mandatory one which means that neither the articles of incorporation may prohibit the general meeting to apply a legal rule contained therein. It would undoubtedly be desirable if our legislator respected the rationality in the arrangement of internal relations in a company much more in the future and prescribed that a general meeting is empowered to make decisions solely on those issues which only the relevant law and the articles of incorporation reserve for its decision-making.[6] I have to note that such opinion was presented in 1997 but, up to this day, no change has been made in the given area which would specifically resolve the given issue.

According to the currently effective statutory regulation, the scope of activities undertaken by directors in limited liability companies may be divided into two basic groups depending on whether an activity is undertaken on behalf of a company with

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[1] The term "ultimate beneficial owner" is defined in Section 6a of Act No. 298/2007 on Protection from Money Laundering and on Protection from Financing of Terrorism and on Amendments and Supplements to Certain Other Acts

[2] For further details, see: Smalik, M.: Liability, position and duties of limited liability company directors. Saarbrücken : LAP Lambert Academic Publishing, 2015, 95 p.
[3] As for the interpretation of director's scope of activities in relevant theoretical and application contexts with an emphasis on the review of relevant Slovak and Czech case law, see e.g. commentary on the provisions of Sections 133 to 136 of the Commercial Code by Mamojka Jr. (In: Mamojka, M. a kolektív: Obchodný zákonník. Veľký komentár, 1. zväzok. Žilina: Eurokódex, 2016, p. 523-544).
[4] Section 20 (1) of Act No. 40/1964 Coll. (Civil Code)
[5] Dvořák, T.: Akciová společnosť a Evropská akciová společnost. Prague: Aspi, 2005, p. 465
[6] For further details, see: Eliáš, K.: Společnost s ručením omezeným, 1. vydání. Prague: Prospektrum, 1997, p. 161-162

respect to third parties or whether an activity deals with internal matters of a company.[7]

The second area in which directors in limited liability companies undertake their activities is the *business management of a company*.[8] The term *business management* is an essential term when it comes to the specification of the scope of activities undertaken by directors but the currently effective laws fail to provide its definition. Its content may only be derived from a broader context related to the performance of director's tasks. I believe that one may use the definition provided or presented by scientific literature. Malovský – Weing defines this term as a regular operation of a trade.[9] The explanatory memorandum states with respect to Section 134 of the Commercial Code, which governs the decision-making in the business management of a company, that this term shall be understood as the operation of a basic economic activity and decision-making on the internal matters of a company…, i.e. on organisational, technical, production and economic matters, etc. Fekete perceives this concept as decision-making on all internal matters of a company unless a general meeting reserves decision-making on such matters.[10] It is apparent from the above-mentioned statements that these activities deal with internal matters of a company and are built upon the organisation and management of a company during its regular operation. It is important to note that directors may, in the business management of a company, make decisions solely pursuant to the mandatory provisions contained in Section 134 of the ComC which states that a decision in the given area has to be approved by a majority of directors. This naturally applies unless the articles of incorporation require a higher number (e.g. two-thirds majority, etc.). The provision in question represents a special regulation in respect of Section 66(4) of the ComC which does not apply to the decision-making on business management by directors to the extent of a quorum prescribed for adopting the given decision. In order to improve the flexibility in adopting decisions in the given area, I opine that directors should be allowed to make their decisions outside a general meeting (*per rollam* decisions) under Section 66(4) of the ComC. However, it is important to regulate the voting performed in such way in company's articles of incorporation or by-laws. Given the importance of decisions made in the course of business management, one of the advantages of *per rollam* voting also lies in the fact that its result is recorded in a definite way since it is performed either in writing or through electronic means which ensure that the given procedure is unequivocal. In the event that a decision in the given area is adopted at directors' session, it is advisable to adequately apply Section 195 of the ComC to the course of such session. According to this Section, the course of the sessions of the board of directors and its decisions are recorded in minutes.

However, the currently effective law also imposes duties on directors where such duties neither fall within the business management of a company, nor within the area of acting on behalf of a company.[11] Having said that, as for the scope of activities undertaken by directors, one may also recognize a specific scope of duties which is also related to their activities undertaken with respect to company's internal matters but which does not constitute activities falling within the business

management of a company.[12] This opinion was also shared by the Supreme Court of the Czech Republic which confirmed the fact that convening a general meeting falls neither within the business management, nor does it fall within the activities performed on behalf of a company with respect to the external environment.[13] Blaha expressed a very similar opinion by stating that it is necessary to point out the fact that not all internal matters of a company may fall within the term business management. It is necessary to distinguish between the decision-making of directors in the business management and decision-making on other internal matters concerning solely a company and its shareholders, such as organisation, convening and course of general meetings, etc. Making decisions on these other internal matters concerning solely a company and its shareholders is a specific obligation which the law imposes on directors.[14] The need to perceive these duties imposed on directors in a special way is also significantly visible in certain stages of company's existence (e.g. liquidation of a company) where a significant proportion of activities undertaken by directors is transferred to a different person (liquidator). However, these special rights enjoyed by a director (e.g. right to convene a general meeting) continue to exist even after such third person is appointed.

3. Special duties imposed on statutory bodies in limited liability companies

Defining the scope of activities undertaken by statutory bodies in limited liability companies is directly related to the specification of their duties,[15] which, given the significance of the role of directors and the business plan of a company, is so important that it is given particular attention in the scientific, professional as well as legislative field. However, despite this fact, there are still more and more cases which either point out the incorrect application of legal rules regulating this area or actually call upon the legislator to adopt legislative amendments which would prevent their emergence.

As we have already pointed out above, the duties of directors in limited liability companies (the same applies to statutory bodies in other companies) are formulated in a rather general way and it is actually rather unusual and rare to give an exact name to a particular duty. This fact arises from objective circumstances according to which one has to approach this area with a particular care and in a way so as not to actually resort to the restriction of the scope of their activities through a very detailed enumeration of duties imposed on statutory bodies.

In defining the duties imposed on directors within their scope of activities undertaken inside the company and with respect to the external environment, we could highlight two basic terms that actually define the stance which statutory bodies should take towards the performance of their tasks. The need to follow them can also be seen during the performance of particular duties imposed on them. In the light of the above-mentioned, the duties of statutory bodies are generally divided into duties of care and duties of loyalty[16]. These terms represent the cornerstone on which the principles determining the duties of directors in limited liability companies are built. We could agree with an opinion presented by Novotná Krtoušová[17] who stated that despite the fact that there is no clear distinction drawn between the duty of loyalty and duty of care, these two terms correspond to the two basic problems faced by shareholders. The first

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[7] Mamojka Jr. points out the fact that the activities dealing with internal matters of a company (e.g. an expression of will to dismiss an employee immediately) shall not be subject to the restrictions which apply to the action taken with respect to the external environment, i.e. according to the company law and relevant case law, an employee is not deemed to be a "third party" with respect to his/her employer (In: Mamojka, M. a kolektív: Obchodný zákonník. Veľký komentár, 1. zväzok. Žilina: Eurokódex, 2016, p. 526).
[8] Blaha understands the term "business management" as *"…making decisions on organisational and technical issues, issues concerning the internal operation of an undertaking, on company's business plan, etc."* In: Patakyová, M. a kol.: Obchodný zákonník. Komentár. 3. vydanie. Prague: C. H. Beck, 2010, p. 412
[9] Malovský – Weing, A.: Príručka obchodného práva. Prague: Československý kompas, 1947, p. 202.
[10] Fekete, I.: Obchodná spoločnosť s ručením obmedzeným. Komplexná príručka. Bratislava: Epos, 2004, p. 463.
[11] See: SMALIK,M.: *Zmluva o výkone funkcie konateľa spoločnosti s ručením obmedzeným alebo "Pracovná zmluva konateľa"*. Pracovné a sociálne zákonodarstvo z hľadiska aktuálnych legislatívnych zmien : zborník vedeckých článkov Bratislava : Merkury, 2014. p. 205-215, ISBN 978-80-89458-34-9

[12] For more information about the activities undertaken by directors with respect to company's internal matters, see: Faldyna, F. a kol.: Obchodní právo. Prague : Aspi, 2005, p. 367.
[13] Supreme Court of the Czech Republic dated 30.4.1997, file No. Odon 2/97.
[14] Blaha In: Patakyová, M. a kol.: Obchodný zákonník. Komentár. 3. vydanie. Prague: C. H. Beck, 2010, p. 413.
[15] See: Armour, J., Hansmann, H. and Kraakman, R.: Agency Problems, Legal Strategies, and Enforcement (July 20, 2009). Oxford Legal Studies Research Paper No. 21/2009; Yale Law, Economics & Public Policy Research Paper No. 388; Harvard Law and Economics Research Paper Series No. 644; ECGI - Law Working Paper No. 135/2009. Available at SSRN: https://ssrn.com/abstract=1436555
[16] Davies, P. L. Gover and Davies´ Principles of Modern Company Law. 8th edition, London : Sweet & Maxwell, 2008, p. 488.
[17] Novotná, Krtoušová, L.: Zákaz konfliktu zájmů jako jádro fiduciární povinnosti loajality. In. Obchodně právní revue. Vol. 8, 6/2016, p. 182

problem lies in the fact that a member of company's statutory body can actually be active but not in a way that would be in company's interest and the second problem lies in his/her incompetence. This perception of the scope of basic duties of statutory bodies also corresponds to the principles of British law which also distinguishes between the duty of loyalty based on fiduciary duties which were further shaped in case law, and the duty of care, skill and diligence.[18]

In spite of the fact that the Slovak law does not expressly regulate the duty of loyalty, its content might clearly be derived through the interpretation of individual provisions on the duties of directors in limited liability companies contained in the ComC.[19] The duty of loyalty can thus be perceived in a way that statutory bodies are required to fully act in the interest of a company, its shareholders and not to give preference to their own personal interest.[20] The duty of loyalty thus sets the right direction which statutory bodies should take, unlike the duty of care which prescribes the quality of such effort.[21] To put it simply, we can state that a statutory body (its member) must always take into foremost consideration the interest of a company and its shareholders when performing its tasks. At the same time, it should observe the law because the welfare of a company and its shareholders is not superior to law.[22]

Having referred to the fundamental duties of companies' statutory bodies, one may also identify certain special duties prescribed by the currently applicable law which have just recently been introduced. In particular, we refer to the duty imposed on a director which arises in a situation where a company is in "crisis" and directors' duties related to the Register of Public Sector Partners.

Act No. 87/2015 Coll. which amends and supplements Act No. 513/1991 Coll. (Commercial Code) as subsequently amended and which amends and supplements certain other Acts introduced (among other things) the concept of a company in crisis. According to the explanatory memorandum[23], the purpose of this amendment/supplement to the already existing statutory regulation of companies was to respond to the existing problems concerning the bankruptcy and restructuring in the Slovak Republic and related issues arising in commercial relations and their social implications. The primary objective of the Bill is to prevent the infringement of creditors' rights in the course of bankruptcy or restructuring proceedings and to strengthen the responsibility for carrying out business activities. In order to achieve the given objective, the foregoing Act also introduced the so called register of disqualifications and further measures aimed at the prevention of the so called tunnelling (ban on repayment of contributions or performances substituting own resources).[24] The legislator hereby expresses an effort to set clear rules for providing loans and credits to companies which face insolvency. Under the currently effective law[25], a company is in crisis if it is insolvent or at a risk of being insolvent. The term "insolvency" is defined in Section 3 of Act No. 7/2005 Coll. on Bankruptcy and Restructuring and on Amendments and Supplements to Certain Acts pursuant to which a debtor is insolvent when it is unable to repay its debts of when it is indebted.[26] Should a debtor file for bankruptcy, such debtor is deemed to be insolvent. A company is at a risk of being insolvent when the ratio of its equity and liabilities is lower than 8:100. Pursuant to Section 768n of the ComC, this ratio of equity and liabilities for ascertaining whether a company is or is not in crisis shall apply in 2018. Until then, the ratio of equity and liabilities corresponding to 6:100 shall apply in 2017. Besides other significant restrictions and duties which relate to the period in which a company is in crisis (e.g. ban on returning performances substituting own resources, securing liabilities replacing own resources, ban on the repayment of contribution, etc.), the legislator has also introduced a special duty to be imposed on a member of a statutory body in a company which, according to the given criteria, is in crisis. A company's statutory body which discovers or, in consideration of all circumstances, could have discovered that a company is in crisis is obliged, in accordance with the necessary due diligence requirements, to take all action that would be taken in such situation by another reasonably prudent person in a similar position to overcome such crisis.[27] This implies the fact that there has been a rather wide area established for holding company's statutory bodies liable since the legislator has created a relatively new group of special duties to be imposed on these bodies. In the event that these duties are not adhered to, i.e. the failure to take "all" such action that would be taken by another reasonably prudent person in a similar situation to overcome the crisis, statutory bodies are at a risk of being held liable for damage. The explanatory memorandum only states with respect to this provision that the law shall impose on companies' statutory bodies in crisis special duties which are derived from the nature of the crisis itself and which shall be aimed at overcoming such crisis as well as at monitoring whether the measures taken for overcoming the crisis are effective. I believe that, on the one hand, the legislator's effort to define certain duties to be imposed on company's statutory bodies is desirable due to the fact that precisely these bodies are generally responsible for the state a company is in. On the other hand though, there is a number of questions arising in connection with holding these bodies liable for beaching this duty. We could also point out that the duties to be imposed on statutory bodies of a company in crisis are defined in a very general way and the legislator provides no, not even a non-exhaustive illustration, of action which should be taken by statutory bodies at the time when a company is in crisis. I believe that determining at least the basic characteristic of action which should be taken by statutory bodies could eventually lead to a more effective application of the given provision. At the same time, I have to note that in consideration of the previous cases of holding statutory bodies liable for damage suffered as a result of a breach of their duties in the course of undertaking their activities[28], it is, to a certain extent possible, that this provision will be interpreted in more of a formal sense and any potential punishment of statutory bodies will be rather complicated. On the other hand, we have to note that any ambiguity as to the interpretation of the given provision could lead to the punishment of also those statutory bodies which, in terms of their abilities and personal competence, attempted to take an action that could have prevented the crisis of a company, but it turns out later on that they failed to take all such action as prescribed by the relevant law and this, in terms of any legal certainty, is not a desirable state. However, it should also be pointed out that too much effort to define particular duties of statutory bodies of a company in crisis in a much clearer way could eventually result in the limitation of cases to which the relevant law applies. This remark shall be perceived as justified but it shall be also pointed out that this is an entirely new concept which was not recognised by the previous statutory regulation. Having said that, we believe that even the case law

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[18] See: Hansmann, H. and Kraakman, R.: What is Corporate Law? (Feb 25, 2004). Yale Law & Economics Research Paper No. 300. Available at SSRN: https://ssrn.com/abstract=568623.
[19] See: Smalik, M.: Autonómia konateľa spoločnosti s ručením obmedzeným. Autonomie jednotlivce. Prague : Leges, 2014. p. 74-78.
[20] Vítek, J.: Odpovědnost statutárních orgánů obchodních společností. Prague: Wolters Kluwer ČR, 2012p. 204
[21] Fleischer, A., Hazard, C., G., Klipperová, M. Z.: Pokušení správních rad. Prague: Victoria Publishing, 1996, p. 83
[22] Strapáč, P.: Ustanovenie, postavenie a zodpovednosť člena predstavenstva akciovej spoločnosti..Bratislava: EUROUNION, 2012, p. 153
[23] Explanatory memorandum to the Government Bill on the Register of Public Sector Partners available on 20.6.2017 at:
https://www.nrsr.sk/web/Default.aspx?sid=zakony/zakon&MasterID=5432
[24] For the definition of the term "prohibition to return performances substituting own resources" see: Duračinská, J.: Riadenie spoločnosti v kríze. In. Zborník príspevkov z medzinárodnej vedeckej konferencie Bratislavské právnické fórum 2016 organizovanej Univerzitou Komenského v Bratislave, Právnickou fakultou v dňoch 21. – 22. októbra 2016 pod záštitou predsedu Národnej rady Slovenskej republiky Andreja Danka. Bratislava: Comenius University in Bratislava, Faculty of Law, 2016, p. 11
[25] Section 67a of Act No. 513/1991 Coll. (Commercial Code)

[26] For the definition of the terms "unable to pay one's debts" and "indebted" see Section 3(2) and (3) of Act No. 7/2005 Coll. on Bankruptcy and Restructuring and on Amendments and Supplements to Certain Other Acts
[27] Section 67b of Act No. 513/1991 Coll. (Commercial Code)
[28] For further information on lodging claims against statutory bodies for breaching their duties, see: Duračinská, J.: Uplatňovanie nárokov spoločnosťou a spoločníkmi voči členom štatutárnych orgánov vzniknutých z porušenia ich povinností z hľadiska právnej komparatistiky. In. Zborník príspevkov z medzinárodnej vedeckej konferencie Bratislavské právnické fórum 2013. Bratislava: Comenius University in Bratislava, Faculty of Law, 2013, p. 811 – 820.

established by judges will be built on a rather unknown base and the creation of a more unequivocal definition of clearer rules of statutory bodies' conduct will take a longer period of time. As a result, this may be contrary to legislator's primary objective in the given area.

In consideration of the above-mentioned facts and the rationality of both approaches, it will later be necessary to evaluate the given statutory regulation, namely in terms of its application practice and in terms of whether the expectations which had existed prior to the adoption of the relevant statutory regulation were met.

In addition to this, a similar stance could be taken towards other recently introduced requirements/duties related to the performance of tasks by directors in limited liability companies with respect to the Register of Public Sector Partners (hereinafter referred to as the "Register"). The obligation to register a certain group of companies with the given register is laid down in Act No. 315/2016 Coll. on the Register of Public Sector Partners and on Amendments and Supplements to Certain Other Acts (so called Letter-box Companies Act) pursuant to which (in addition to other entities)[29] companies which receive funds from public sources have to be registered with the given register. These entities are therefore subject to the statutory registration obligation or otherwise suffer harsh consequences and sanctions. It has to be noted in this regard that the legislator specifies a narrow group of entities, the so called authorised persons[30], who can carry out such registration. This means that the registration is not carried out by companies' statutory bodies but by other entities on the basis of a contract entered into between a company and the authorised person. However, in spite of the above-mentioned fact, the Letter-Box Companies Act imposes special duties, namely the personal liability of directors in cases in which the application for the registration of a company with the Register of Public Sector Partners contains untrue or incomplete information about the ultimate beneficial owner or about public officials or in cases in which the application for recording a change in the already registered information about the ultimate beneficial owner is not filed within the statutory period or in cases in which the prohibition set out in Section 19 of this Act is breached.[31] We could therefore identify special duties imposed on statutory bodies of companies which are subject to the statutory registration obligation. These special duties include an obligation to choose a certain authorised person and to provide such authorised person, for the purpose of identifying the ultimate beneficial owner and registering the given company with the register, with all information and documents which such person might need for the performance of its activities. The sanction (penalty) which directors are liable to for breaching this obligation ranges from EUR 10,000 to EUR 100,000 and such penalty will be imposed by the relevant registration authority. The legislator thus imposes on companies' statutory bodies an obligation to ensure that the authorised person carries out the registration with the Register of Public Sector Partners which, at the same time, reflects the actual state of required information, or otherwise these suffer rather severe penalties. This liability of directors is constituted as strict liability without any possibility of liberation. Another significant sanction imposed for the breach of directors' duties in connection with the registration of a company with the Register of Public Sector Partners lies in the fact that the final decision on removal and on imposing a sanction on a statutory body actually constitutes the decision on exclusion.[32] It has to be noted in this

regard that the legislator imposes a special category of duties on the bodies of those companies which are subject to the statutory obligation to be registered with the Register of Public Sector Partners and states that the failure to comply with such duties actually makes the registration authority impose a penalty but, at the same time, the legislator fails to provide for such cases in which, provided that these are successfully proved, these bodies would not be held liable or would not be liable to penalty. We also have to note in this regard that the Letter-box Companies Act also sets out a certain form of a joint liability of authorized persons for complying with the duties related to the registration with the register and constitutes a statutory guarantee of those persons who act as authorized persons at the time when the obligation is breached. The authorized persons thus provide a statutory guarantee for paying up the penalty which the registration authority imposes on a company's statutory body. The liability of a statutory body differs from that of an authorized person in a way that statutory body's liability is constituted on the principle of strict liability without any possibility of liberation. The liability of authorized persons is also a strict liability but carries the possibility of liberation if the authorized person proves that it exercised all due care in the performance of its duties.[33] This different approach taken by the legislator is probably derived from the presumption that statutory bodies (its member) are entities which, on an objective principle, should be familiar with all facts concerning the company in which these perform their tasks and which are relevant for its registration with the register. Given the sanctions constituted on an objective principle without any possibility of liberation and given also the fact that statutory body's conduct related to the registration of a company with the register could possibly amount to criminal liability[34], it is necessary to note that these duties imposed on a statutory body are so significant that the failure to comply with them is punishable with the most severe sanctions in the entire Slovak statutory regulation concerning the liability of statutory bodies. Therefore, directors should exercise the utmost responsibility and care during the performance of their duties arising out of the Act on the Register of Public Sector Partners so that they avoid any possible sanctions which could eventually have severe and devastating effects on them.

4. Conclusion

The definition of duties imposed on directors in limited liability companies is very frequently dealt with in scholarly papers focusing on company law. Particularly when it comes to business activities conducted in the Slovak Republic, it is an area which plays an important role in terms of its implications for complying with commercial duties. This is possibly also the reason why it is subjected to constant changes and introduction of new concepts as well as duties imposed on statutory bodies and related liability structures which aim to, under the threat of punishment, make these entities perform their tasks duly. Recent significant changes have also been introduced mainly due to this fact and these are undoubtedly aimed at exerting more pressure on statutory bodies to perform their tasks more responsibly. We should therefore praise legislator's effort made in this regard. On the other hand, the introduction of "draconian" sanctions may also result in an undesirable effect of discouraging capable and competent persons from acting as statutory bodies and may also entail attempts to find ways for avoiding such statutory duties. I therefore believe that the introduction of new duties and sanctions for the non-compliance with the given duties should simultaneously be accompanied by certain recognition or motivation of "dutiful" and competent statutory bodies (or their

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[29] Section 2(1)(a) of Act No. 315/2016 Coll. on the Register of Public Sector Partners and on Amendments and Supplements to Certain Other Acts specifies all entities which are under an obligation to register with the Register of Public Sector Partners
[30] Under Section 2(1)(b) of Act No. 315/2016 Coll. on the Register of Public Sector Partners and on Amendments and Supplements to Certain Other Acts, only an attorney, notary public, bank, branch of a foreign bank, auditor and tax advisor who have their place of business or registered office in the territory of the Slovak Republic may act an authorised person.
[31] Section 13 of Act No. 315/2016 Coll. on the Register of Public Sector Partners and on Amendments and Supplements to Certain Other Acts
[32] The decision on exclusion is regulated in Section 13a of Act No. 513/1991 Coll. (Commercial Code) under which: The decision issued by a court may state that a natural person is not allowed to act as a member of a statutory or supervisory body in a company or cooperative (hereinafter referred to as the "excluded representative")

within the period designated by the court or, according to the court's decision, during the period of three years from the moment the court's decision becomes final (hereinafter referred to as the "decision on exclusion"). This shall likewise apply to the activities undertaken by the head of branch of an undertaking, head of undertaking of a foreign person, head of branch of undertaking of a foreign person or to a procurator.
[33] For more information on due diligence, refer to: Lukáčka, P.: Zodpovednosť štatutárneho orgánu spoločnosti s ručením obmedzeným za škodu spôsobenú pri výkone svojej pôsobnosti In: Míľniky práva v stredoeurópskom priestore 2011. - Bratislava : Univerzita Komenského v Bratislave, Právnická fakulta, 2011. - p. 178-179.
[34] E.g. fraud under Section 221, subsidy fraud under Section 225, distortion of data in economic and commercial records under Section 259 and 260 of Act No. 300/2005 Coll. (Criminal Code)

members) so that there is a certain balance redressed between their strict duties and liability for performing their tasks (e.g. decreasing the administrative burden on companies, etc.).

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INVESTIGATION OF BRAIN DEATH FROM THE PERSPECTIVE OF MEDICINE, LAW, AND ISLAMIC JURISPRUDENCE

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Abstract: Life and death are some of wonderful phenomena have been always considered by human over the history. Human is interested in understanding life beginning and its reasons. Meanwhile, perception of human life end is one of issues considered by human to understand it and its reasons so that accurate diagnosis of death time is one of the most important ethical challenges (medically and legally) at the moment, because when human understands these odd secrets of creation then numerous of medical, legal and social problems will be solved. When judges face with victims with disabled brain and heart in legal cases, they will properly judge about the accused person of case and issue the judge if they have a correct recognition of death and its reasons.

Keywords: brain death, law, Islamic, jurisprudence

1. Death Diagnosis

Death diagnosis is one issues the human is always facing it. Since human is not able to determine the main element of life and since major reasons of death are not clear, human sometimes faces people who have had cardiac attacks while can feel and sometimes faces people with disabled brain while have heart and breath. Accordingly, the following questions can be considered in determination of death.

Is cardiac arrest a reason for human death? Are patient with disabled heart and breathe the real dead people? Is brain failure the reason for human death? Are the patients with disabled brain even if with working heart and breathe treated as real dead people? Whether all of vital signs such as heartbeat, breathing and brain activities should be stopped for death realization? Do physicians, lawyers, and jurists agree on definition of death and life? If there is any disagreement, what is the reason for such disagreement? Finally, which one of definitions should be accepted as comprehensive definition? Diagnosis of death due to old age or accidents, in which the heart and brain stop working, is not often so difficult. Sometimes, despite signs of death, diagnosis of death is not that easy. Brain death is an example of this type of dubious death which has been the subject of interest among jurists and physicians since the second half of the nineteenth century. This issue is of great importance in many cases such as allowing or not allowing euthanasia of the patient, organ transplant, burial, etc.

2. Definition of Death from Perspective of Jurists

In opinion of jurists such as Dr. Mohammad Tantavi (former Al-azhar Sheikh) that defined death as follows: in opinion of jurists, death is exclusion of soul from body and its diagnosis reference is reliable physicians. In other words, when soul, which is not a physical element, is disconnected from body the life of human is ended. In other words, this theory assumes the relation between soul and body as the main reason for life. If this relationship is disconnected for any reason, the human will die and the life of human will be finished.

Although this theory is clear, it should be accepted that immediate diagnosis of the moment of soul and body disconnection is not simple for human; hence, it is not simple to distinguish vegetable life from real life. Therefore, when we face an injured person or a victim with disabled brain with non-normal heart activity and breathe while his heart and lungs are working using artificial respiration device so that blood and oxygen are reaching to his organs, it is not possible to issue verdict in this case considering the mentioned definition. Such persons are not dead people and the verdicts for dead people cannot be issued for such patients.

3. Traditional Definition of Death from the Perspective of Physicians

In past, physicians believed, with adherence to jurisprudential viewpoint, that heart is life agent and consciousness and feeling as well as human life are subjected to heart. Since heart is active, human is alive but when heart and breathe are disabled at the same time, human life is also finished due to disconnection of blood flow and oxygen delivery to cells. Although this theory was accepted in majority of cases and disconnection of blood and oxygen flow in body would lead to end of life, physicians faced some exceptional cases practically. In such cases, although the patient was at deep coma and there was not any heartbeat or breathing sign, the patient could return to normal situation after several hours or even after a day and vital signs could be revived. The belief in mentioned definition of death was eliminated due to violation case; hence, there are a few believers of this viewpoint.

Historically before 1960, death was defined as the complete and irreversible cessation of spontaneous cardiac and respiratory functions. Refinement of cardiopulmonary resuscitation techniques and the advent of Intensive Care Units (ICUs) with mechanical ventilators enabled temporary support of cardiopulmonary function in the absence of brain function. Hence, the cardiopulmonary definition of death lost relevance in such cases. Conversely, the functional loss due to damage to the vital centers of the brain is irreversible and hence brain-stem death concept evolved. It is relatively a new concept, and it is hard for relatives to believe that the patient is dead (brain dead) when his/her heart is still beating.

4. New Definition of Death from the Medicine Perspective

Death is defined as irreversible disconnection of all cortical brain activities (cerebral cortex), subcortical (layer below cerebral cortex) and brainstem. Death is irreversible stop of brain activities.

According to this definition, when all brain activities of human are stopped although the lung is full of oxygen using ventilator, the heart is beating through oxygen delivery, and the skin is warm with normal color, such person is considered as dead person. This is because when brain, its cerebral cortex and brainstem stop working at the same time, blood and oxygen supply to brain is stopped, brain loses its function and cerebral cells would be damaged irreversibly within 3-5 minutes. In such conditions, if other human organs such as heart, liver, and lung are active, activity of such organs are not able to revive the person. Therefore, since brain activity is the main agent of human life, the life of human is finished and revival will be impossible if this agent stops working due to any reason.

Majority of Islamic scientists and lawyers approved brain death concept and its diagnosis indexes based on this viewpoint; the evidence for such claim is third conference of Muslim Lawyers in October 1986 in which, it was determined that almost half of required kidneys for transplant in Saudi Arabia are obtained from dead bodies using these brain death indexes.

For instance, Imam Khomeini and Great Leader Ayatollah Khamenei approved this opinion and stated, if brain death is proved and probability of recovery is not possible then organ donation is permissible, but if revival of person is possible, organ donation is not permissible and this case should be diagnosed by a specialist. Also, definition of brain death presented by the Single Article of Enforceable Act of Organ Transplant of Dead Patients is matched with mentioned definition.

Then Minister of Health of Egypt, Dr. Hamdi Al-Seyyed, which considers brain death as real death, has stated that medical equipment are able to diagnose human brain death before death of other organs. When the brain of human stops working then other organs stop working immediately. Brain is ruling over the human body. In case of brain death, there would not be any revival. Although some of organs of a person with brain death might be active using medical equipment in ICUs, such activity of organs is

not a sign of human life. Disconnection of this equipment from such person is not a murder, because such patient had been died before due to brain death despite having heartbeat. Some of proponents of this theory are Mohammad Naeem Yasin, and verdicts of Association of Islamic Jurisprudence issued in Jeddah and Islamic Medical Organization of Kuwait.

However, there are some physicians, Islamic Lawyers, and jurists that do not consider brain death as a real death.

One of these physicians is Sefvat Lotfi, Professor of Anesthesiology, which has stated, patients with brain death are not real dead people but they are patient alive people who are in the coma. It is observed in many of cases that patents with brain death have revived. Therefore, such persons cannot be treated as dead bodies so their organs cannot be harvested, because organ harvesting is subjected to murder punishment considering all of its components. Sefvat has explained that scientific studies have proven that conducted researches are not reliable for brain death diagnosis and studies conducted about experiment of electricity activities of brainstem cells have not valid results, because their results might be wrong since electricity activity does not exist in it always; therefore, brain cells will not always react against such signals (and or there is not always a natural reaction against electricity activity due to sensory functions' disorders) although brain life is continuing. In other words, lack of electricity activity in brain cells as well as sensory functions' disorders are not reasons for human death. Therefore, human death cannot be inferred even in absence of electricity activity and lack of feeling in brain. According to Sefvat, age is another factor for disagreements on brain death so that some of physicians state that brain death is not simply diagnosable in children below the age of 2 and some other physicians believe that brain death is not also diagnosable among children that are younger than 5 or 11. Therefore, this factor might be one of definite reasons for wrong concept of brain death, because constant natural realities, in particular the issue of death determination, are not different among human beings only due to age. Therefore, how can be a case definite when the issue that nor physicians are not unanimous on it neither age is ignorable case in it. Considering the success of organ transplants and the organ transplant being the only hope for end stage organ failures; in view of acute shortage of organs and availability of a large number of brain dead patients as potential organ donors; we must promote the timely diagnosis and declaration of brain dead patients. It will allow the organ transplantation to gift the life and will relieve the relatives of brain dead individual from undue anxiety and fruitless hope.

Nasir Farid Vaseli is one of proponents of this theory has claimed precisely in definition of death that if disconnection between soul and body is along with stopped functions of all human organs then the person can be a dead body. Accordingly, it is not possible to claim that person is dead just due to brain freeze, but also stopped function of other human organs besides brain freeze are required to call a person dead body.

Regarding this theory, when the human brain stops working while the heart is still beating, such person cannot be called dead body; if they are dead then what is this heartbeat? Therefore, when human brain has stopped working but the heart is naturally beating that person is alive and living considerations should be taken into account. Some of these considerations are ownership, marriage, and cleanliness. In this case, the patient is owner of his asset and is responsible for debts and obligations and his children are not allowed to own or use properties of the patient. The wife of such person is still his wife and deserves alimony and until his husband is in such conditions she is not allowed to marry another person. Such person is alive; hence, it is not permitted to harvest his organs such as heart that his life is dependent on it.

Following real and legal persons are proponents of this theory:

- Dar Al-Fata Al-Mesri
- Fatwa Committee of Kuwait's Ministry of Endowments
- Sheikh Jad Al-Hagh Ala Jad Al-Hagh, former head of Al-zahr
- Dr. Nasr Farid Vasel, former mufti of Egypt

- Dr. Bakr Abuzeid, Head of Islami Jurisprudence Association of Jaddeh
- Sheikh Badr Al-Motevali Abd Al-Baset
- Dr. Mohammad Ramezan Al-Booti, famous Islamic Jurist and Author
- Sheikh Mohammad Al-Mokhtar, Mufti of the Republic of Tunisia
- Ayatollah Makarem Shirazi
- Ayatollah Fazel
- Ayatollah Seyed Ali Sistani

5. Conclusion

According to the mentioned reasons, it can be stated that stopped activity of brain, cortex, and brainstem while the heart and lung of human is working would not lead to death of the patient so that in this case, the patient is not a dead body. Real death occurs when all brain, respiratory and cardiac activities are stopped and there is not any vital sign in human. As we know, Article 1 of Iran's Law for Diagnosis of Brain Death has considered brain activity failure as real death; however, findings obtained from this study indicate that this is a hasty opinion that ignores right to life of patient with brain diseases.

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A COMPARISON OF PHILOSOPHICAL BASES AND EDUCATIONAL OPINIONS OF AL-FARABI AND ROUSSEAU

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Abstract: Curriculum is one of the basics of education in any given educational system. The present study aims at comparatively reviewing opinions of Al-Farabi and Rousseau regarding curriculum components. This is a descriptive-analytic study. Data necessary for reaching research goals was gathered through available sources and texts related to the research topic using note taking forms and then was quantitatively analyzed. Results of the study indicated that in Farabi's curriculum system the purpose of education is reaching the ethics climax. In his curriculum, content is taken from different sciences. He suggests teaching-learning methods like: staircase, persuasion, ascending, descending, discussion, memorizing, repetition and observation for ideal learning. Farabi's evaluation system is mainly based on pre-evaluation, verbal and self-evaluation.

Key words: comparing opinions, curriculum, components, Al-Farabi, Rousseau.

1. Introduction

From the beginning of human life on earth a social phenomenon which is one of the basic and most challenging issues that Muslim scholars, ethics litterateur and philosophers pay attention to is education, purpose and goal of education, education methods and eventually what kind of a man results from education and training. Educational system and thought in any school is influenced by the view of that school to entity, life and human and it directs education in that school. Therefore studying the nature and truth of human is one of the most basic issues is education philosophy. And based on that its specifications are set and educational factors affecting human, ability and facilities for ideal change and briefly his educability is recognized (Kavandi, 2011).

In this regard, philosophers play the most important role in preparing schools. They provide a specific system which shows their way of thinking towards entity of the world and human and aim at explaining their educational opinions. In fact philosophers suggest their educational opinions along with the goals and purposes and at the same time challenge others educational opinions are continually the most effective factor on education trend. So that today we must accept some methods of philosophy basics for choosing educational methods (Naqhib Zadeh 2010).

Farabi is the first Islamic Intellectual who tried to recognize different kinds of science and classified different sciences in an integrated and systematic way. For this reason he is called the second teacher and founder of Islamic ethics after Aristotle. Unlike his contemporary philosophers this Muslim philosopher, did not suffice to quoting Greek sciences and transferring to world of Islam but he criticized, evaluated and examining them to created specific Islamic philosophy (Rahimi. 2011:68).

On the other hand, Jean-Jacques Rousseau was among philosophers and teachers who pay attention to nature's role in children's development and growth. He emphasized on nature's role in formation of human existence more than his *predecessors* and was a complete role model for teachers of next generations. Some experts think that after Plato who was one of the primary founders of education and training no one could take an important role in this field but Rousseau. In fact it can be interpreted that the modern education system in Europe is borrowed from Rousseau's educational thoughts (Olidge 2012, Maier, 1972, Farahani, 2005).

Based on the above information, in this study we attempt to comparatively review Farabi and Rousseau's opinions regarding curriculum components and the overlapping or non-overlapping of the components.

2. Research Method

The study method is based on qualitative research was done using the comparative method. For this purpose, the first elements of the curriculum two Thinker separately described and then matched with each other, and the most important similarities and differences between them have been identified.

Research Questions:

What is Farabi and Rousseau's opinions regarding four components of curriculum (goal, content, teaching-learning methods, evaluation)?

How much these components overlap or do not overlap in Farabi and Rousseau's opinions?

3. Results

First research question: What is Farabi and Rousseau's opinions regarding four components of curriculum (goal, content, teaching-learning methods, evaluation)?

3.1 Goal Curriculum

One of the basic aspects in curriculum is goal, purpose or wills of the curriculum. The value of each curriculum lies in the consequent goal. The goals of Farabi and Rousseau curriculum falls in the mediational and final education category which we will clarify in the following sections.

3.1.1 Farabi opinion

Mediational goals

Physical training

Farabi believes that human existence aspects include body and soul. So in the education matter he considers both of them. But what is important is the originality he relates to the soul and believes that soul serves the body. The physical aspect of education in his opinion is so high that thinks the most important feature of city head who is the most complete man in city in the sense off education ability in different aspects, being in physical healthy state (Mirza Mohammadi, 2003). According to Farabi, physical education must help soul education. Unreasonably high attention to physical training and ignoring soul education derails the community.

Ethical training

According to Farabi the most important goal of education is closing man to God. He believed that entity is purposeful and that is to coming close to Allah. Reaching this level would happen through education as he defines the ethical goal of education to be reaching blessedness and it is worshipping and setting free oneself from materials and reaching God (Mirza Mohammadi, 2003). Farabi believes that ethics is acquired and human's deliberate actions based on will and authority can be ethically valued. In the field of ethical school Farabi is a Utilitarianism so that he thinks blessedness is the ethical purpose and the highest instinctive benefit. He considers this benefit at

the true blessedness and anything other than that as untrue blessedness (Bolboli Ghadkalaei, Parsaniyan, and 2013).

Intellectual training

Farabi believes that human is equipped with speech ability and thinks that it is the master of all abilities. Thinking is possible through this ability. He explains different meanings of intellect in the book "The meaning of reason". Intellect means foreseeing (form), common sense, natural perception, self-consciousness, potential and actual intellect, sacred intellect and infinite intellect (Mirza Mohammadi, 2013). For intellectual development, Farabi designed a complete curriculum in Ihsa al-Uloom a valuable book. He is the first Muslim philosopher who Ihsa al-Uloom and therefore he deserves being called the second teacher. In Ihsa al-Uloom sciences are categorized as: 1. Language science 2. Logic science 3. Mathematics science 4. Natural science 5. Divinity 6. Social science 7. Fiqh science 8. Speech science (Farabi. Translation: Khadiujam, 2010).

Artistic training

Farabi pays specific attention to the soul and mental discipline and for this aspect considers art. The basis of this belief is the presence of "creative ability" in human and its role in acquiring knowledge. In his opinion music and poetry has a sublimation for creative ability to acquire knowledge (Mirza Mohammadi, 2003).

Social training

Farabi believes the necessity of socializing is blessedness because in social policy book He relates perfection human and community finding true blessedness. He believes that without cooperation and coordination blessedness is not possible. According to him human is social by nature and naturally needs things that cannot be fulfilled but by taking part in community and receiving help (Nafisi, 1989). Human creation strives for preparations to reach perfection which is not a lonely task. To fulfill this need human societies are formed. In society, everyone gets help from others and other than meeting natural needs and necessities catches things that help striving towards perfection (Seminary and university research center, 2010:120). Farabi suggests: individual life is possible but to life blessedness and reach perfection a social life is needed. Based on cooperation life gets social (Farabi, 1979).

3.1.2   Final goal

The final goal of education as Farabi suggests is reaching a degree of intellectual moderation for life and after death life blessedness which is nearness to Allah. So his view and many other Muslim thinkers, the purpose of education is moderation in anger and sexual forces and their dominance on intellect. Therefore, building a moderate character with stronger intellect and speech rather than other abilities is the aim of education. Regarding goal, Farabi says "Utopia is where citizens help each other in reaching perfection attributes." (Seminary and university research center, 2007).

3.2 Rousseau's opinion

3.2.1 Mediational goals

Physical training

In Rousseau's opinion physical training is one of the most important parts of every human's life and is one of the necessities of education. One cannot have a strength in soul and intellectual thought unless he is physically strong. So acquiring high levels of knowledge and consequently blessedness requires healthy mind and subtilized soul which are possible when one is physically healthy and strong. Rousseau believes that a strong body can obey the soul. Weakness avoids trading the soul. The more weakness in body, the more it orders to soul and the more strength in body, the more the soul obeys. A weak body weakens the soul (Rousseau, 2014).

Ethical training

Rousseau believes training is mostly related to protecting human nature against filth in society. The best human aspect that distinguishes man from other animals is ethical conscious which is distinguishing good and bad. Human is pure and good. His conscious has a sign from God and judges good and bad (Rousseau, 2014). Rousseau focuses on the necessity to nourish true and natural needs and turn greed and abusing tendencies into creative and beneficial ones. He says Young nature destroyed if not, then great moral sentiments, such as love, justice and will task. Rousseau's beliefs about ethical nourishment of people roots in his belief that human can choose instincts (Hosseini & Safdarian, 2013). Regarding ethical training Rousseau points to negative training. He suggests that avoiding children from filthy situations is negative training.

Intellectual training

According to Rousseau, the biggest share of intellectual training should be carried by oneself and parents and family are responsible for preparing the development path as he states: the best training is to help a person grow logic. But today teachers try to reach the kid in this level only by logical reasons. It's like wanting to start a task from end to start it's like setting a result of an action as the tool to act. If children could perceive logical reasons they didn't need training at all! If from early stage we start talking with a kid in a language that he doesn't understand, we teach them to use useless, nonsense words. He evaluates what he hear with his understanding. They consider themselves as logical as their teacher and learn to argue and be rebellious. All you think the child is doing based on logic is not that way, but he acted that way because of fear and egotism that you triggered in him (Rousseau, 2013).

Artistic training

Rousseau thinks that nature is a good model for improving artistic abilities in children. Nature is the best artistic sign for children. So Rousseau states that: watching parties and gatherings prompts Emil to study art and enthusiasm in his surroundings. Art includes an ability to judge likes and dislikes. It changes based on climate, habit and traditions. The best ideal examples of beauty is found in nature. So most of the time art is destroyed by luxury. It results in ill-nature and ill-natured societies delicate and accurate thought must be learnt. So it's good to spend some time in such counties and correct his judgment by going to countries with good taste (Rousseau, 2013:306). Emil must learn drawing. But doesn't want a teacher other than nature. (Rousseau, 2013).

Social Training

Rousseau thinks a corrupted society affects man in the same way so in order to avoid it early stages of a child's life should be spent society. But after spending early life with nature he should return to society and continue adulthood in this frame. Therefore Rousseau believes all that God can do is flawless. But when it comes to human, corruption occurs (Rousseau, 2013). Rousseau was pessimist to society but a society that is corrupted and trains a child for a horrible adulthood. He believes that nature made us good but society can train adversely. Nature created a free human but society imprisoned him. Nature made human happy but society made him poor and disparate (Shawarde, 1972). One who wants to live apart from human and independent from human and meet his own needs, is unfortunate and he even can't survive (Rousseau, 1963).

3.2.2 Final goal

A child with complete coordination with nature in Rousseau's view is instinct good. So, Rousseau suggests we observe nature and follow the path it shows (Rousseau, 2013). So we see that based on Rousseau turning to nature does not mean returning to the animal state but means providing a condition to human in which he completes himself thoroughly and coordinately. Therefore blessedness only results from preserving tendencies in settled limits of nature (Alavi & Shariatmadari, 2006).

Table 1. Comparative review of Al-Farabi and Rousseau's opinion regarding training goals

Goals	Al- Farabi	Rousseau
Physical	Playing game and military techniques	Just game
Ethical	Nearness to God by acquiring ethical virtues	Avoiding corrupted environments in society
Intellectual	Having proper intellectual training with a specific curriculum	Intellectual training is possible in its natural flow
Social	Presence in society from early stages of life	Avoiding society from early stages for protection against corruption
Divine	Religious training in the form of Islamic training	No specific religious training
Artistic	Art is a tool of affecting on people's emotions	Nature is the best thing for artistic training

3.3 Content Curriculum

Content includes a set of skills. Concepts and attitude is chosen and organized by planners and create teaching-learning interaction between teacher and student (Molki, 2012:127). In other words, content is a wide concept including knowledge, skills, and attitudes related to lessons and students and teachers' intellectual experiments in a lesson (Canon, Newbell, 2009:91).

3.3.1 Farabi's opinion

At the beginning of his valuable book, Ihsa al-Uloom says: We attempt to point to well-known knowledge books one by one and get a summary of each one's context , point to each section of the multi section ones and show a sample of each context. This book is divided to 5 parts. First part: language science and its parts. Second section: logic science and its parts. Third section: teaching sciences including: arithmetic, geometry, optics, astrology and music, Ilm-Hayil and Ilm-Asghal. Fourth section: natural science and its parts and divinity and its parts. Fifth section: social science and its parts and Fiqh and speech science (Farabi, 2010:39).

What we understand from this topic is that Farabi believes in categorizing different sciences and discusses about the value of each one and focuses on it. It can be concluded that Farabi considers different science is valuable and of different use. Learning it is essential for everyone. For example think of his language science which is two types generally: One is learning words that are meaningful for a community and the variety of things that it refers to. And second is learning rules of their combination. Language science has 7 parts in every country: 1. Knowing Singular words 2. Knowing plural words 3. Knowing grammar for singular 4. Knowing grammar for plural 5. Knowing proper writing 6.knowing proper pronunciation 7. Knowing poetry rule (Farabi, 2010).

Regarding training Farabi considers the ability of trainer important and based on individual differences different tasks should be assigned for different trainers because people are in different understanding levels. Therefore a different methods must be applied for each one considering their ability (Hashemi, Nourozi, 2010). Farabi also believes that the content of the lesson should guide students to God as the creator, believing him and obeying him as a creature and effect (Eslamian, Keshti Aray 2013).

3.3.2 Rousseau's opinion

Rousseau believes that the best content for children is what nature offers. We shouldn't have any teacher but the world and any teacher but events. The child that reads doesn't think. He just reads. He doesn't learn He just learns words. Do something that

your students and you observe the nature's work and gets curious. But to fulfill this sense of curiosity never hurry. Put him in contact with issues but let him solve it. He shouldn't take what you say. He must grab it himself. He shouldn't learn science but he should explore it (Rousseau, 2013). According to Rousseau lessons like history, geography, geology and music are beneficial for students in case they are kind of played with the student. Emil is mentally and intellectually ready for education from 10 to 15. He feels the need himself and getting to know history, geography, arithmetic and music is a kind of game and hobby for him. Emil won't study any book because Rousseau believes a book worth reading does not exist. The only book he suggests is Robinson Crusoe (Shavarde, 1972). Rousseau also does not believe in official content. He says: I set students free of doing homework I put this very misfortune maker away. Reading is almost the most common hobby given to children, but it's the biggest trouble. The 12 year old Emil doesn't know what is book. You tell me that she must eventually learn reading. I do agree but he must learn it when it leads her to result and before that this work is tiresome and depressing (Rousseau, 2013). Also Rousseau believes that theoretical science is good for youth and not for children at all because they still can't use concepts. This science is only for after youth hood (Shato, 1990). Emil's information is natural and only materialistic. She has not even heard of history and doesn't' know what philosophy or ethics mean. He knows basic relationships between human and things and therefore doesn't know anything about ethical relationships between human. He can't properly generalize concepts and meanings and can't properly make abstracts. He sees common features between objects but can't see them as abstract. He has learnt abstract by geometry patterns and has learnt the quality of abstract and absolute by expressions. These expressions and patterns is a support for the time he gets tired of abstraction to rely on and rest. He is never into knowing the nature of objects but he wants to know about the relations in his own favor. For things other than himself he considers those with relation valuable (Rousseau, 2013). I don't want to give lessons planned by strangers and priest to children (Rousseau, translation: Kia, 1987). If you always want to lead to the best way always listen to nature commands (Rousseau, translation: Kia, 1987). Rousseau believes that the best training seals in a child's life is freedom of action and providing natural growth tools (Shavarde, 1972).

He also thinks the first lesson to a child is the way of living and living like a human. In natural life everyone is the same and their dignity is not only to be human. Anyone who is trained to be human might not necessarily do what a human must do. For me it's not important what my student is supposed to do in future, army, priest or judge. Nature says before doing any job you must take the responsibility of being human so I first teach them this occupation. After my instructions he would not be a priest, judge or soldier but prior to anything he will be a human it means as necessity determines, he will perfectly handle his human responsibility like others (Rousseau, 2013).

Table 2. Content of curriculum from Al- Farabi and Rousseau

Al- Farabi	Language, logic, arithmetic and geometry, geology, music, fiqh, speech, social science.
Rousseau	Natural science, history, geography, arithmetic, music.

3.4 Teaching-learning method Curriculum

The regular disciplined measures a teacher takes for accomplishing goals that is taken based on situation and equipment is called teaching method (Shabani, 2007).

3.4.1 Farabi's opinion

To achieve perfection and final blessedness, Farabi considers measures starting from speech ability (theoretical intellect) and continues to actual intellect. He believes that human spirit's development does not provide a simple short path for reaching final result. But teaching is a continuous process and current

dependent on preparation and eliminate obstacles. By setting stages for training and giving opportunities to trainer not only provides incentives, but also help him achieve goal. Training and education is a gradual process needing different theoretical and practical preparations (Kavandi, 2011). We can suggest a categorization according to Farabi's recommended method. In this study we discuss some of them.

Staircase

In this method the teacher considers intellectual abilities and skills of the students in scientific matters and starts his work from simple and matters close to their minds and gradually reaches harder or higher levels discussion. In other words, at the early stage of education, students' abilities are limited, so the teacher must use tangible examples to prepare them for scientific discussion (Beheshti, Faqihi, Abojafari, 2006).

Persuasive

Farabi believes that theoretical science must be taught through a persuasion approach. People commonly perceive these sciences through thinking. Because they first perceive many scientific and nonmaterialistic basics and get to perceive these scientific topics. But people get an image of them by persuasion. Teacher must be familiar with what relates to a specific group of people, the way of teaching it to all, necessities of teaching to those people and things related to a specific group of people in a city. These differences help someone learn theoretical science with help of creativeness (Sharif, 1986).

Ascending

When teacher is inspired by interests, preparations and experiments of the students and generalize it to lessons, he is in fact using ascending or induction method. Farabi says this method starts from effect (sense) and reaches cause (intellect). It is used in many topics and lessons related to human and society. Teacher starts the activity and creates an intimate relation with students. This method helps increasing self-awareness, self-controlling abilities in students, improving thinking capacity, gathering information, organizing and data controlling and setting names for concepts (Jaberi Moghaddam, 2003).

Descending

When teachers offer lessons to students based on the type of organizing the topic and logical framework or in other words descend from a whole to its parts they are using descending or deductive method. Farabi thinks this method starts from cause (grace principle) and reaches to effect (the earth) and results in better learning. Knowledge gained this way is not easily forgotten. He applied this method in metaphysics and propheey theory (Mirzamohammadi, 2005).

4. Discussion

Farabi defines this method as "encouraging and triggering student against what satisfies his mind and intellect without needing his full faith. He believes that no tool has served human as much as speech logical reasoning discussions help students get the things they already did not know. Teacher can provide a topic in class so that students learn the content in discussion together and with cooperation go to the depth of the context. This way the silent state of teaching turn to activity (Daq, Rashi Oyman, translation Koshafar, 1995).

4.1 Memorizing and repetition

Another method that Farabi talks about is memorizing and repetition which helps perceiving the content. He thinks that ethical virtues, writing skill, art and figures of speech is gained through repetition and habit and are engraved in brain. Farabi recognized two levels of memorization: first memorizing words and phrases that the listener repeats for memorizing like learning language, Quran and singing. Second: memorizing the meaning of the words and phrases so that students get to know them. He thinks perceiving the content is of a high value because memorizing is mainly concerned with words, phrases and details which is of no real use. While perceiving deals with meaning,

whole and rules and is very useful. It flourishes skills and makes use of abilities (Mirzamohammadi, 1995).

4.2 Observation

Farabi thinks the first step in education is using a proper name for objects. Then the object and its details must be completely defined and drawn as patterns and geometrical patterns on paper. This way students' creativity is triggered and understanding is easier and straightforward (Farabi, 1998).

4.2.1 Rousseau's opinion

Cooperation

Now is the time to adapt him to pay more attention to a specific topic little by little. But don't forget you always have to create enthusiasm and don't proceed the work with force and inflexible order. We must consider not to make them tired and feel fed up. Always listen to him and whatever lesson you are teaching stop before he is tired because learning with incentive is more important than the content to learn. If he asked you answer in a way to trigger his curiosity even more (Rousseau, 2013).

Negative training

As Rousseau points out negative training is introducing ideal models and try not introduce corruptions and teach them to follow the natural flow of life. He says: I strongly agree that good education is one with negative training. If you stop any further corruption you have already helped virtue to grow (Rousseau, 1989).

Experiment

Experiment method is one of the practical teaching methods most of the teaching experts focus on. So Rousseau says: Emil did not memorize anything till she got 10 but have explored and learnt many things by exploration. Teacher emphasizes on the abilities a child must gain according to his physical and mental growth (Olich, 2012).

Active

Active teaching method is a method in which the student is mainly responsible for learning and teacher is a guide in learning process. Rousseau says: let your child solve problems. Expose him to issues but let him solve it. He mustn't accept you but he must get it himself. He mustn't learn science but he must explore tit. The art of teacher is to let the student enjoy while learning. In order to do this his mind should not be kept silent in response to what you say. In other words he must try to learn. Concepts must be perceived but not necessarily by saying a to z of something. The one who explains it all would not transfer more. If the student made a mistake let him do and do not correct. Wait for him to understand his mistake and correct it himself (Rousseau, 2013).

Explorative

Rousseau realized the importance of exploration in learning and therefore emphasized that teachers and trainers must leave room for exploration. He says: Let your child explore facts by himself because if you replace information source with reasoning in his mind he won't reason anymore. If speech penetration replaces intellect the student won't think anymore and later he will agree upon any new idea (Rousseau, 1963).

Table 3. Learning-teaching methods in Al- Farabi and Rousseau's opinion

Al-Farabi	Staircase, persuasion, ascending, descending, memorizing and
Rousseau	Cooperation, negative, experimental, exploration, active

4.3 Evaluation Curriculum

Evaluation is a systematic activity which provides benchmarks for validating along with providing information about event or

topic of evaluation. Then comparing the two data shows how beneficial and valuable a topic or event is (Mosapoor, 2011).

4.3.1 Farabi's opinion

By studying Farabi's training opinions we conclude that his evaluation system consists of the following methods.

Pre-evaluation

In ascending teaching method Farabi suggests that students must be evaluated about their qualifications (Jberimoghaddam, 2003:197). This suggests how qualified someone is.

Verbal

In defining this method Farabi states that encouraging and triggering student against what satisfies his mind and intellect without needing his full faith. (Daq, Rashi Oyman, translation Koshafar, 1995).

Farabi believes that a teacher must be able to apply ask and answer method in his strategy and also in evaluating students' learning in order to properly judge their level of learning.

Self-evaluation

In Ihsa-al-Uloom the valuable book of Farabi, logic science is introduced as the science of thinking properly. Farabi says: Logic helps us avoid mistakes and corruption (Farabi, 2010). According to this logic science plays a kind of self-evaluation role for us.

4.3.2 Rousseau

Self-evaluation

Rousseau believes that evaluation on students must be in the form of self-evaluation and teachers shouldn't hurry in judging their learning. He says If the student made a mistake let him do and do not correct. Wait for him to understand his mistake and correct it himself (Rousseau, 2013).

Practical evaluation

Rousseau believes that students must act practically and not all the materials must be taught theoretically and evaluation can be practical regarding their knowledge. It's really bad to send youth to life with theoretical information only (Reusseau, translation Zirak Zadeh, 1963).

Table4: evaluation in curriculum in Al- Farabi and Rousseau's opinion

Al- Farabi	Pre-evaluation, verbal and self-evaluation
Rousseau	self-evaluation , practical

Second research question: How much these components overlap or do not overlap in Farabi and Rousseau's opinions?

4.4 Goals

Overlapping

Both experts believe that final goal of the education is improving ethics. It is ethics that affects other training aspects and controls other abilities.

Non-overlapping

- Farabi believes that physical training must start from playing games in childhood and follow up with military activities in adulthood. But I think physical training grows with playing game and we must always put emphasize play time.
- In ethical training, Farabi views ethical virtues as the way of nearness to God. But Rousseau views avoidance from corrupted environment as the ethical virtue.
- Farabi believes that the way to reasonable ethical training is through ideal curriculum But Rousseau's opinion tends to nature's role in this regard.

- In social training Farabi focuses on social presence from early stages but in the same matter Rousseau emphasized on avoiding society and corrupted environment till adolescence.
- Farabi views religious training is in Islamic teaching path but Rousseau does not believe in teaching any specific religion and lets the student be free in this field.
- Farabi believes that art is a tool for complete effect on emotions. Rousseau thinks that finding patterns in nature is the best way of training in the field of art.

4.5 Content

Overlapping

Both experts believe that noting individual differences is important in learning. Learner's needs is important in their views as a common point. Curriculum content must be adjusted with learners' age.

Non-overlapping

Farabi categorizes science into different groups and again divides each of them into a subsidiary branch. When choosing content these categories must be considered and teaching content must be taken from sciences. But Rousseau did not categorize as Farabi did. Although he thinks learning different sciences is important for students, but mainly emphasizes on natural learning from nature and thinks teaching history, geography, arithmetic and music via game is beneficial.

Rousseau believes the best content for students is nature till students get 12 and rejects formal book like contents. But because Farabi believes in early stage presence in society don't think avoidance from it is regarded as a good thing so in his opinion book and formal content from early stages has no negative side.

4.5 Teaching-learning methods

Overlapping

- Both experts believe that education must be gradual.
- Both of the think that teaching method must be adapted to age.

Non-overlapping

- Teachers' role in Farabi's suggested teaching method is more pronounced while Rousseau defines a few roles for the teacher.
- Farabi's teaching methods include: persuasion, dialectical, ascending, descending, memorizing, repetition and observation. And Rousseau's includes: cooperation, experiment, observation, active and exploration.

4.6 Evaluation

Overlapping

Due to the gradual process of learning according to both experts, it seems that both believe in formative evaluation by trainer.

Non-overlapping

Studying Farabi's training notions shows that he mostly emphasized on verbal evaluation while Studying Rousseau's training notions shows that practical evaluation of pervasive learning level makes sure how much has been learnt.

5. Conclusion

The present study aimed at comparatively reviewing Farabi and Rousseau's opinion about curriculum components. To do this, four main curriculum components (goal, content, teaching-learning methods and evaluation) was derived from their training notions and discussed. In the goal section, first their opinion was divided to two goals: final and mediational. Farabi thinks that final goal is having good ethics. The result of discussion in content section was that Farabi thinks content must encompass different sciences and adjusted with students' age. While

Rousseau believed that the best content is what nature sets and teaching formal content must start from the age of 12. In teaching-learning methods we realized that Farabi suggests many different teaching methods and mostly emphasizes on those with higher involvement of the learner. He believes that in different conditions these methods would work. On the other hand Rousseau has another set of suggested methods with a focus on those with higher activity of the learner. Eventually regarding evaluation component we concluded that Farabi highlights verbal evaluation regarding question-answer method. After reviewing Rousseau's opinion in this field we realized that pervasive evaluation should be practical and observational. At the end of the article the amount of overlapping and non-overlapping of contents in both curriculums is somehow clear.

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OPTIMIZING THE NUMBER OF STOPS WITHIN THE LOGISTIC ROUTES USING THE MATHEMATICAL MODEL

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Abstract: Presented paper focuses on the possibility of using mathematical models in marketing, specifically to optimize the number of stops on the distribution routes. It is devoted to proposing an allowance routes and number of stops on each route, length distribution routes and distances between stops on the route. Subsequently, the proposed procedures for the design of experiments as well as the statistical procedures and methods for processing measured data and the ways in which it is possible to evaluate the suitability of the data. There is designed a mathematical model through analysis of variance and other methods that describes the impacts on the logistics process. The conclusion is an evaluation of the use of the proposed model in practice, with specific methods to be evaluated. The most important of these is the method of response surface (whose output is a 3D graphical graph) through which we follow the characteristics of selected parameters which have the greatest impact on the process.

Keywords: *logistic, optimizing, mathematic model, distribution and logistics trends, innovation*

1. Introduction

Today, it is necessary to optimize operations and processes in order to increase their efficiency. The same applies in the area of logistics, or in designing and dealing with logistics routes. In analyzing the conditions and the subsequent design of logistics (distribution) route it is necessary to look at these activities from two perspectives. The first one is the time resources which are available at the said activities. In practice, this means that our efforts is to optimize distribution routes so that at that time the greatest number of stops is realized in order to serve the greatest number of customers (in this case to serve means to deliver goods). The other very important aspect is the financial aspect which is as important as the time required. In financial terms it is necessary to optimize distribution routes so that the costs necessary for the overall distribution routes are reduced to the minimum possible value. To realize such an optimization, it is necessary to know which factors affect the logistics process and upon influencing of which of them we can achieve such result. Precisely because of the knowledge of influential factors and their consequent influence, the next step is to create a model that describes the process. Finally, it is important to use the results of modeling and consequently of numerical or graphical interpretation. In graphical interpretation we use in this case a response surface, since it represents appropriate 3D display of correlation of influencing factors.

2. Impact specifications on logistics route

For each model creation it is important to firstly define the factors that affect the process. Subsequently, from such factors it is necessary to determine those ones whose impact is the most significant. Often, in the case of more complex processes there is the fact that in designing model not only the individual factors are used but also their mutual interactions, or higher-level factors. In the first step, therefore, we define the factors that affect logistics process, in this case affecting the logistics route and we briefly describe them:

Distance - is an essential factor from which further depends number of stops and the total length of the distribution route

Number of stops - this factor is based on the fundamental nature of the business and the related logistics. The aim is that the number of stops to a route is as high as possible, i.e. so that we are able to serve as many customers as possible

Time for one stop - represents the time required for the driver to unload or load goods at the customer. For our needs and better

treatment of the issue, the one stop will represent time from the moment of stop at the client, unloading/loading of goods up to the next stop.

Total time on the route - this factor means the time spent by a driver on logistic route from the beginning till the moment of final parking of the vehicle.

Minimum time for one stop - is the minimum time which is necessary for stop and unloading and loading of the smallest contract possible, under ideal conditions

Financial costs of one stop - represent the sum of all costs calculated for the unit price for one stop expressed in €.

Costs of the entire route - this factor is very important as it represents the total costs of the logistics route. In practice, the sum of all logistic routes represents total costs of delivery of goods. The total costs is treated because the price of one stop reflects all costs associated with logistics calculated per one stop (salary of the driver, vehicle depreciation, fuel, etc.).

2.1 Selection of suitable factors

In the previous section we have defined all factors influencing the process which in our case is a selection of distribution routes. Further we choose a factor affecting the process in the largest way and with whom we will continue to work. The reason why such a selection of factors is made is that we don't want to work unnecessarily with too many factors whose impact on the process or on value measured by us is negligible. In our case, we chose the following factors: the Length of the route, Number of stops, One stop financial costs. These three variables are called the independent or explanatory variables. It's because these are variables that affect the final measured value. This value will be called dependent, since its variation depends on the change of the independent, explanatory, variables. In our case, the dependent variable value is: The costs of the entire route. The reason why we chose this value for our work is, as we have already described in the introduction, that we decided to optimize distribution route and therefore its stops as well with respect to its financial aspects, i.e. costs of such distribution route. In the next section we will show experimental design method through which we will measure all the necessary values of the factors so that we are able to create a model through them and consequently, in the graphic display, also response surface.

3. Creating the model and interpretation of results

Given the complexity of this process and the fact that we are working with three independent factors we use in our case non-linear model, the shape of which is:

$$w_i = a_0 + \sum_{j=1}^{k} a_j t_{ji} + \sum_{j=1}^{k-1} \sum_{l=j+1}^{k} a_{jl} t_{ij} t_{il} + \dots + \sum_{j=1}^{k} a_{jj} t_j^2$$

(1.1)

where:

w_i represents ith measured dependent variable , a_0, a_u .... a_{kk} are unknown parameters,, t_{1i}, t_{2i}, ..., t_{ji} are individual parameters and their interactions

In our case, due to the high number of examined factors and number of their levels (the level of individual factors will be chosen with regard to their feasibility and credibility in the home process) we have decided for centred composite design of experiment consisting of three parts:

Core of design – is formed by factorial design 2^k. As it will be shown below, if we want to reduce the number of measurements, the core can be used as reduced experiment 2^{k-p}. For number of

factors $k < 4$ only complete experiment 2^k can be used as a core, for $5 < k < 7$ we use the complete experiment 2^k or the reduced experiment 2^{k-p} as a core, for $k > 7$ also reduced experiment 2^{k-2},

Axial points – points that are on the axes in distance of $a > 0$ from the centre of design. Their number is $n_s = 2k$,

Central points – points in the centre of the design. There are $n_0 > 0$ of central points. By suitable selection of "*a*" and the number of central points - "n_0," the proposals characteristics can be influenced. Centred composite design is presented in Table. 1.0.

Tab. 1: Centred composite design

t_1	t_2	...	t_k	Number of points	Design part
-1	-i	...	-1		
-1	-i	...	+1	$n_c = 2^k$	
...	...	...	...	or $n_c = 2^{k-p}$	Design core
+1	+i	...	+1		
-α	0	...	0		
+α	0	...	0		
0	-a	...	0		
0	+a	...	0	$n_s = 2k$	Axial points
...	...	...	...		
0	0	...	-α		
0	0	...	+α		
0	0		0		
0	0		0		
...	...		...	n_0	Central points
0	0		0		

Source: SVÁTEK, M. - KRIŽAN, P. 2015

In the next step, the individual measurements and the data processing or measured data analysis proceeds. During the data processing, firstly the data are verified by the following tests:

Normal distribution verification: *Shapiro-Wilk test*

Diagnosing the residuals: S*tudentized residuals*

Outliers determination: *Dean-Dixon* non-parametric test of outliers and a *Grubbs test*

Testing of homoscedasticity of dispersions: *Levene test* or its modification *Brown-Forsythe test*, or *Bartlett* test. Its disadvantage is the high sensitivity against normality violation.

Then, after the data analysis, we proceed with the experiment model design using the ANOVA method (all of the above analysis, because of the complexity of matrix notation, effected through the available statistical software, for example JMP, STATGRAPHICS etc.):

In our case it is the experiment a x b x c, because we consider 3 factors while factor A has a levels, B has b and C has c levels, etc.

The model of complete factorial design which contains all possible interactions is in our case of 3-factorial design as follows:

$$y_{ijklm} = \mu + \alpha_i + \beta_j + \gamma_k + (\alpha\beta)_{ij} + (\alpha\gamma)_{ik} + (\beta\gamma)_{jk} + (\alpha\beta\gamma)_{ijk} + \varepsilon_{ijklm}$$

(1.2)

where

μ is the rate constant, or also called absolute term,

α_i is the contribution of i-times *level of* factor *A,*

β_j is the contribution of j-times level of factor *B,*

γ_k is the contribution of k-times level of factor *C,*

$(\alpha\beta)_{ij}$ is combined contribution of i-times level of factor A and j-times level of factor B (interaction)

$(\alpha\gamma)_{ik}$, $(\beta\gamma)_{jk}$, $(\alpha\beta\gamma)_{ijk}$, …, etc., individual combined contributions of given factors (their mutual interactions),

ε_{ijklm} is contribution of m-times observation (error)

while $i, j, k, l, = 1, 2, ... , m$

Subsequently, from the thus calculated values a 3D graph will be created, the area of which represents a characteristic behavior of the said process and is called response surface.

4. Conclusion

In the interpretation and subsequent application of the result a numerical or graphical form of the result may be used. In the first case it is for clarity of our dependent variable, depending on the change of the independent variables, or vice versa. In the second case, for example, the response surface is used which represents a 3D graph whilst surface or its curvature expresses dependence or change in the dependent variable if two independent variables change.

Fig. 1 illustrates a sample of response surface graph and this graph may be used for cases of analysis of dependency of the change in total costs (z axis) on change of number of stops (x axis) and the costs of one stop (y axis), or to express the dependence of the length of route (z axis) on the costs claimed (x axis) and the total number of stops along the route (y axis). In general it can be said that the response surface is a very good tool for the graphical representation of the changes of the observed variable depending on changes in the other two variables whose influence on it we follow.

In our case, as we have said, we have focused on optimizing distribution route, namely the number of stops in regard to its financial (costs) aspect. As we mentioned in the same way, by defining the appropriate factors an experiment and subsequent evaluation of distribution routes may be realized, or optimize it with regard to the time available to us.

Fig. 1: Surface response with several level settings
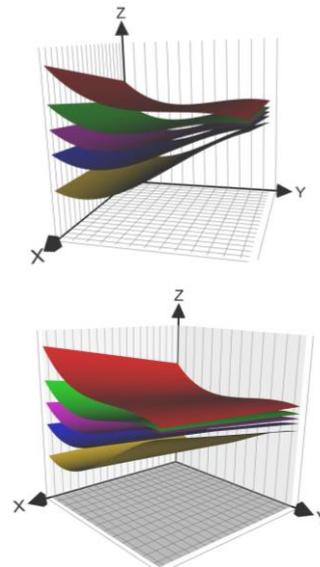
Source: Križan, P. - Šooš, Ľ. - Matúš, M. - Beniak, J. - Svátek, M.: 2015

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COMPLIANCE OF DIFFERENT STANDARDS IN CONSTRUCTION MANAGEMENT AND APPLYING THEM COMPARED TO CONVENTIONAL METHODS IN IRAN

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Abstract: Following widespread implementation of large projects with huge budgets and the need to finish them on time; as well as the importance of the final product quality and safety standards in Large-scale projects, the necessity of this field of management was felt more than ever. This study is conducted to investigate and evaluate compliance of various and well-known standards of project management in civil projects. To achieve this, efforts are being made using statistical analysis and multi-criteria decision analysis method and expert opinions, to analyze the compliance of these standards in the country's development projects and provide usable solutions to improve the management of these projects. According to the results, it was observed that the PMBOK standard is the best option followed by PRINCE2 and OPM standards, respectively.

Keywords: Compliance, Competence of standard, project management, TOPSIS.

1. Introduction

Project management is the application of necessary knowledge, skills, tools and techniques to manage the flow of actions in order to meet the needs of the project through the initiation, planning, execution, control and termination processes. Due to the significant development of science and technology in the industrialized world and subsequently production, formation of human needs in the form of various projects, led project managers to utilize new knowledge and skills, fitted the type and nature of the projects, to perform the required activities at good level of quality and the anticipated duration and cost (Scott et al. 2006). Project management, with its modern structure, is formed by emerging two institutions of IPMA and PMI in the middle of twentieth century in the planning and construction of aerospace equipment. Following widespread implementation of large projects with huge budgets and the need to finish them on time as well as the importance of the final product quality and safety standards in large-scale projects, the necessity of this field of management was felt more than ever. As a result, did not last long that the large project-based companies active in the different areas of engineering and most importantly, construction projects, recognized the need to adhere to the principles of project management and have developed different standards in this area. Accordingly, the large project-oriented companies operating in different areas of software engineering, IT, telecommunications, construction and infrastructure development, aerospace equipment manufacturers, creation and modernization of city services and most importantly, civil projects, have found the importance of adherence to recognized principles of project management and different standards were developed in this area (Dabbagh et al. 2005). Nowadays, different standards in managing different projects including civil projects are reviewing and developing by various countries so that in this way, the new standards are designed. This leads to a lot of efforts to design a global standard in the field of civil project management. However, it should be noted that only producing new standards of project management is not sufficient in detailed and comprehensive management of projects and the important issue in this field, is checking compliance of different standards and how to apply these standards (ZeinAl-Abedin, 2006). Many researchers have studied in this field that some of them have been referred in this section. In an article by Dabbagh et al, (2005), entitled "Evaluation and comparison of project management standards of PMBOK and ISO10006", two known standards have been examined and compared given the importance of the use of standards and systematic methods in projects, and in order to utilize the 10006 Standard in projects, diversity and adaptability as well as ISO standard 10006 applied to the face with it have been discussed while considering

PMBOK standard as the basis of comparison. Naqvi et al, examined the efficiency PMBOK standard for Project Management with Fuzzy modeling, so that can investigate and assess the appropriateness of the exploitation and efficiency of these knowledge and skills, based on the nature or type and complexity of the projects in one of the country's research centers. They concluded that a proper sequence to prioritize activities PMBOK standard are applicable based on the project life cycle and the interaction between project management process groups (Naghavi et al. 2006). Zwerman and Thomas (2000), emphasizing the cultural structuralism PMBOK standard, have stated that specifically, original ideas are naturally transmitted by the communication; Since culture is drawn from a common system of beliefs and values based on a common understanding, a body of knowledge based on culture like PMBOK, can have a significant impact on creating this culture and common language towards integration of project common language. Because by taking it into account, project managers can use this culture as a common language in a multinational team and it has also been the aim of creating PMBOK standard. Fotwe and Caffer (2000), conducted a study on competence development of project management in the construction industry. They have identified the knowledge and skills required to project management in the construction industry. Brill et al. (2006), conducted a study on the competencies and attributes required for effective project management based on Delphi method. They used two analytical methods that one of them included 147 respondents, all with 20 or more than 20 years of project management experience; the result of which was to identify 78 competencies; in the second analysis, they showed that 42 of the 78 competencies are crucial in the successful management of projects. Ahlemann et al, (2009) comparing the results of a case and empirical study of on the use of project management standards in Germany and Switzerland assessed the spread and application of them. Their results showed that, in general, standards have been only rarely used in project management in Germany and Switzerland and the use of standards in these countries is subjected to the adoption of programs implemented in previous projects. Finally, the recommendations are provided to organize standards in order to move forward in the efforts in the mentioned countries. Rifon (2010), used standards and their features to define competency. They used standardized work like ISO and CEN which are the result of formal standardization to identify the competencies, skills and their definitions. ILIEŞ et al., (2010) studied best practices in project management. In their paper, the concept of best practices, the advantages of guidelines for compliance with project management as well as comparing two of the best methods used in project management practices (PMBOK and PCM) and their advantages and disadvantages have been discussed. Antonio and Sanjuan (2013), have examined the use of project management standards and success factors in the development of project management. They base their studies to produce useful and efficient tool to use the standard more optimally and using detailed studies on their selected projects, have examined the conformity of work done with the different guidelines in each project; they used the comparative comparison of well-known standards of PMBOK, IPMA, ICB and PRINCE2 and evaluated application of these standards in their case studies.

Given the importance of systematic use of standards and methods, this study is conducted to assess the compliance of known standards of project management in major civil projects. To reach this goal, we have attempted to evaluate the compliance of different standards such as PMBOK and PRIENCE2 in a comprehensive framework and the level of their application and success by introduction of various standards of civil projects management in Iran.

2. Theoretical principles of project management standards

Different standards have been developed in the field of project management; the four most commonly used standards in Iran are introduced in the following.

2.1 PMBOK 2008 standard

The Project Management body of knowledge manual is a recognized standard for project management profession that provides guidelines for managing individual projects. This standard was compiled in 1976 and its fourth edition was published by PMI in 2008. The best practices of project management practitioners have been also used in developing it. This standard renews the subset of project management body of knowledge as a generally recognized best practice. "Generally recognized" means that the mentioned knowledge and strategies are applicable in most of the projects and most of the time and there is consensus about their value and usefulness. It also provides and promotes a common vocabulary within the profession of project management in order for discussing, writing and implementing the project management concepts (Lynda, 2005).

2.2 PRINCE2 Standard

The "Sympket system" company in 1975 developed the original methodology that was known as PROMOT2. Since the beginning of the introduction of PRINCE2, it is widely used in the private and public sectors and today, it is considered as a known standard in project management in United Kingdom.

2.3 OPM3 Standard

The third standard which will be described here is the Organizational Project Management Maturity Model (OPM3). This standard has been developed by the Project Management Institute (PMI). The institute has developed this standard in order for implementing project management principles at the organizational level and it is looking for creating a framework that organizations can assess the level of compliance with their strategic objectives through Project Management Best Practices Lynda, .

2.4 ISO-10006 Standard

ISO 10006 manual provides quality management principles and techniques of project management. This document gives guidance on quality issues that affect the project. This guide is applicable in the projects with the different levels of complexity, size and timespan. ISO 10006 manual can be used in projects that conducted by a person or a management team and also to manage several projects simultaneously. The overall objective of ISO 10006 is to create and maintain the quality in the projects using a systematic process.

According to surveys and studies on standards for project management competency, following 8 cases can be considered among the differences between competency standards:

- Applicable in large-scale and complex projects
- using in a variety of projects
- Providing competencies according to the globally accepted definitions
- Matching knowledge competencies
- Matching functional competencies
- reviewed competencies levels
- The number and type of organizations or institutions involved in the implementation of projects
- type of admission
- Evolution in the behavioral competencies

3. Research Methodology

In this paper, to understand how to use the checklists in order for achieving project success in implementing the requirements of project management body of knowledge standard, audit checklists were completed by people involved in the project at different organizational levels using a field study that the results are presented in the following. The Percentage of conformity is calculated based on the ratio of responses to total number of questions and the results are included in the charts. Finally, using the audit results, analysis of the gap between company's processes and the processes of project management body of knowledge standard is calculated that can be an appropriate basis for designing comprehensive system of project management. After collecting the data, they have been analyzed using analytical methods. In this study, to determine the test internal reliability, Cronbach's alpha and SPSS software have been used and their reliability has been proven. This method is used for calculating the internal consistency of the measurement tool which measures the different features and each test question will be compared with the other single question. The higher the Cronbach's alpha in a research project, the higher the reliability of the questions. Cronbach's alpha coefficient can be calculated using the following equation:

$$r_\alpha = \left(\frac{k}{k-1} \right) \left(1 - \frac{\sum \sigma_j^2}{\sigma^2} \right) \tag{1}$$

where r_α is the total reliability of the test, k is the total number of questions of test (sections), σ_j^2 is the variance of the Questions scores (section) j and σ^2 is the variance of the scores of all questions. Also, if the alpha coefficient is greater than 7.0, it has acceptable level of reliability (McHugh and Hogan, 2010).

The questionnaire prepared in the previous steps has been presented to a number of experts and professors in order to confirm its content validity. Then, 20 questionnaires have been experimentally presented to subjects and Alpha coefficient was obtained for all questions. The results obtained using Cronbach's alpha for evaluating the questions related to various studied factors are presented in the table below. The overall Cronbach's alpha coefficient for the research variables is 0.78 that indicated the acceptability of the questionnaire reliability. The results of describing the demographic characteristics of respondents including age, work experience have been provided in the following.

Based on data required, from 82 respondents, 14 respondents were between 20 and 30 years, 28 of them were between 30 and 40 years, 21 of them between 40 and 50 years and 19 patients were above 50 years. Percentage of respondents has been referenced in the table above. So the highest frequent is related to the group of 30 to 40 years. As can be seen, the distribution is normal. Also, among 82 respondents, nine patients have less than 5 years of work experience, 36 people have work experience between 5 and 15 years, 22 people have work experience between 15 to 25 years, and 15 of them have over 25 years of work experience. Percentage of respondents in each of groups has been mentioned in the above table. The highest frequency is related to the group with 5 and 15 years of work experience.

4. Findings and conclusions

4.1 Part I: Statistical analysis of the current status of projects in terms of project management standards

In order to statistical survey of the current status of the projects in terms of project management standards, checklists for main areas of project management knowledge including time, cost, quality and area of tender have been designed that included in forms of tables below:

Table 1: Checklist of standard audit for the knowledge body of the project area management

Code: Date:	Field of Knowledge: Project area management		Auditor name Audited name and position:				
Question Code	Questions	very low	low	Intermediate	High	Very high
1-1	How much of the project chart has been used for the planning of the project area?	11	14	22	18	16
1-2	How much of the preliminary explanation for the project area has been considered for planning?	15	18	21	12	16
1-3	Has the project management planning ever been considered for the area planning?	9	24	20	14	9
1-4	Has the deliverable material been considered to audit the area?	18	17	19	12	16
1-5	Has the information of the work performance been used to control the area?	7	12	28	21	14
1-6	Are the approved change requests used to define the area?	19	22	24	10	7
1-7	Are the environmental factors of the organization used for project area planning?	14	24	23	12	9
1-8	What amount of organization process assets was used to plan the project area?	8	21	31	12	0
1-9	Has a systematic approach been considered to apply the variations of the project?	24	15	14	11	6
1-10	Has a system been defined in order to change the work breakdown structure (WBS), area explanation, etc. based on the possible variations?	26	24	9	3	0

Table 2: Checklist of standard audit for the knowledge body of the project time management

Code: Date:	Field of Knowledge: Project area management		Auditor name Audited name and position:				
Question Code	Questions	very low	low	Intermediate	High	Very high
2-1	Is the explanation of the project area involved in defining the project activities?	17	26	14	13	12
2-2	Is the work breakdown structure system (WBS) used to define the project activities?	14	27	23	14	4
2-3	Is the project management planning considered to define the project activities?	9	14	29	18	12
2-4	How much does it consider resource access to provide the project schedule?	8	18	24	16	16
2-5	How much is the availability of resources for evaluating the resources of the project activity?	10	15	37	12	8
2-6	Is the estimation of activity cost used to estimate the duration of the project activity?	10	13	34	13	12
2-7	Is the risk record considered to estimate the duration of the project activity?	16	22	22	12	10
2-8	How much the performance reports has been applied to control the timing of the project?	6	15	34	13	15
2-9	How much the past records of the previous projects has been considered to define the project activity?	9	14	27	18	14
2-10	Is the project-scheduling plan prepared?	7	13	35	17	10
2-11	Given the results of timing control, are the proposed modification measures determined?	4	16	30	17	15

Table 3: Checklist of standard audit for the knowledge body of the of the project cost management

Code: Date:	Field of Knowledge: Project area management		Auditor name Audited name and position:				
Question code	Questions	very low	low	Intermediate	High	Very high
3-1	Is the explanation of the project area considered to estimate costs?	10	22	28	14	8
3-2	Is the Cost Management Plan considered for cost estimation?	11	16	31	13	11
3-3	Are the contracts of purchasing the engineering services applied for budgeting?	4	14	25	21	25
3-4	Is the project scheduling plan used for budgeting?	8	13	25	21	25
3-5	Are the performance reports used to control costs?	12	19	26	13	12
3-6	Are the archived data and past records used to estimate costs?	15	19	26	12	10
3-7	Are the organizational policies served to estimate costs?	13	18	25	16	10
3-8	Are the market conditions considered to estimate costs?	16	19	22	13	12
3-9	Are the commercial databases used to estimate costs?	21	26	22	11	2
3-10	Are the cost estimations considered for the requests of variations?	17	24	22	12	7
3-11	Are the cost estimations updated based on the results of cost control?	14	17	23	16	12
3-12	Is the cost of project implementation anticipated based on the results of cost control?	12	16	27	16	11

Table 4: Checklist of standard audit for the knowledge body of the of the project quality management

Code: Date:	Field of Knowledge: Project area management		Auditor name Audited name and position:			
Question Code	Questions	very low	low	Intermediate	High	Very high
4-1	Is the explanation of the project area considered for the Quality Planning?	8	13	20	23	28
4-2	Is the project management Plan considered for the quality planning?	5	12	36	19	10
4-3	Are the executed requested variations considered for quality assurance/ control?	13	16	19	22	12
4-4	Are the executed modification measures considered for quality assurance/ control?	13	21	25	14	9
4-5	Is the implemented troubleshooting considered for quality assurance / quality control?	7	14	24	23	14
4-6	Are the preservation measures performed before, considered for the quality assurance / control?	10	15	27	18	12
4-7	Has the deliverable material been considered for performing the quality control?	6	9	37	15	15
4-8	Are the standards and governmental rules considered for the quality planning?	12	16	24	14	16
4-9	Are the commercial databases considered for performing the quality planning?	15	24	28	12	3
4-10	Are the quality policy, approaches and guidelines of the quality planning considered?	7	15	29	17	14
4-11	Are the previously learned points considered for quality planning?	6	14	27	20	15
4-12	Is the Quality Management Plan prepared?	5	10	28	24	15
4-13	Are the quality standards determined?	13	18	26	13	12
4-14	Given the results of quality control, are the modification measured and requests of variations performed?	13	17	15	19	18

4.2 Discussion of evaluations in the current situation

After investigation and assessing the responses of experts, these answers are to be collected. The obtained results will be discussed as follows:

▪ In part of project management, in response to the question "is the project management plan considered for the area planning?" most experts have positively responded.

▪ The question, "Are the approved change requests used to define the area?" has faced less positive answers.

▪ In the case of tenth item of the project management, the least positive response has been assigned to "defining an area explanation based on the possible variations in systematic project in order to change the work breakdown structure (WBS)"

▪ In time management, presenting the performance reports and preparing scheduling plans have received the least negative response.

▪ In cost management, the choice of "applying the commercial databases to estimate costs" has received the least positive answer.

▪ In quality management, the choices of quality planning and applying the commercial databases for quality planning have received the least negative score and the least positive response, respectively.

The results of summarizing the audit results and completing the corresponding checklist forms are provided in the following graph. The horizontal axis represents the qualitative verbal expressions.

As you can see, the highest rate of compliance is related to:

1. the factors of project management body of knowledge about time management and quality management.

2. project management knowledge of scope and quality management.

As the completed checklists imply, in both cases, the presence of specific processes and high levels of compliance is due to the fact that they are entered into the organization through project contract documents and as input data:

▪ A time schedule attached to the project contract contains key project milestones and is an appropriate basis for time management.

▪ The technical specifications and the contract conditions of the project are considered a good basis for quality management and scope management.

But what is clearly evident is that there are many weaknesses in the factors outside the standard scope of the project management body of knowledge.

Figure 1: summarizing qualitative assessment of the standard in IRAN projects

(1) very low, (2) low, (3) average, (4) high, (5) very high

4.3 Part II: The evaluation of distinguishing standards criteria by using TOPSIS method

Multi-Attribute Decision Making (MADM) approaches are formal methods used to organize the information and evaluate decisions in areas with multiple conflicting objectives. These methods can help decision-makers understand the results of comprehensive assessments and use the results in a systematic way. MADM methods are widely used in many fields of research from which different approaches have been proposed by various researchers (Wang et al. 2010, Momenzadeh et al., 2017).

TOPSIS method was originally developed by Hwang and Yoon in 1981. According to this technique, the best alternative has the shortest distance from the positive ideal solution (PIS) and the longest distance from the negative ideal solution (NIS). The positive ideal solution is one that has the maximum benefit and minimum cost and the negative ideal solution is that with the

minimum benefit and maximum cost. In TOPSIS method, in addition to taking the distance of alternative A_i from the ideal point, its distance from the negative ideal point is also considered. This means that the chosen alternative must have the shortest distance from the ideal solution while having the longest distance from the negative ideal solution. As its name implies, the ideal solution is the best one in every respect which is virtually not possible and one will try to approach it (Moraveji, 2009, Shey 2017).

In this part of the article, TOPSIS analysis approach used in most engineering problems is utilized to evaluate, analyze and compare the result. The standard prioritization and the distinction criteria in project management have been achieved using the expert judgments in this area and by analysis parameter assessment TOPSIS software. The standards and criteria have been categorized into four groups and eight criteria presented in the table below.

Table 5: Prioritization of standards and standard criteria for project management

Standard	Attribute	Criterion	Attribute
PMBOK2008	A1	1. The distinction between project management and competency standards	C1
PRINCE2	A2	2. Application in various projects	C2
0PM	A3	3. Provide competency with respect to the definitions accepted in the world	C3
ISO-10006	A4	4. Compliance of knowledge competency with the standards	C4
		5. Compliance of performance competency with the standards	C5
		6. Levels of examined competency	C6
		7. Type of admission	C7
		8. Evolution of behavioral competence	C8

4.4 Create a decision matrix

A matrix will be drawn at this step having alternatives in its rows, attributes in its columns and the weight of each attributes

in the last row, and the intersection of rows and columns gives the importance of each respondent for any of the alternatives with respect to the corresponding attributes (table 6).

Table 6: Decision matrix (N)

Index criteria	C_1	C_2	…	C_n
A_1	r_{11}	r_{12}	…	r_{1n}
A_2	r_{21}	r_{22}	…	r_{2n}
•	•	•		•
•	•	•		•
•	•	•		•
A_m	r_{m1}	r_{m2}	…	r_{mn}
W_j	W_1	W_2	…	W_n

r_{ij} is the score of i th alternative in j th attribute and w_j is the weight of j th attribute.

The following algorithm provides the relations of standards and criteria in TOPSIS pattern of the project.

Note that the decision matrix (Table 7) is the arithmetic mean of all expert judgments.

A1-A4: standards, C1-C8: criteria

Table 7: Decision Matrix (N)

	C1	C2	C3	C4	C5	C6	C7	C8
Index type	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive
A1	6.5	5.7	7.7	6.5	7.5	8.935	6.5	6.5
A2	5.5	5.5	5.9	6.5	7.5	7.25	5.3	5
A3	6.5	5.4	6.8	6.54	7.5	7	5.35	4.88
A4	6.5	6.25	6.27	5.5	7.5	6.5	5.5	6

4.5 Normalize the decision matrix

In order to be comparable, the decision matrix is converted to the normalized (incommensurable) matrix using Eq. (2).

$$n_{ij} = \frac{r_{ij}}{\sqrt{\sum_{i=1}^{m} r_{ij}^2}} \qquad (2)$$

Table 8 shows the incommensurable matrix:

Table 8: Incommensurable matrix (N1)

	C1	C2	C3	C4	C5	C6	C7	C8
A1	0.334	0.298	0.361	0.34	0.353	0.452	0.32	0.345
A2	0.283	0.287	0.278	0.34	0.353	0.366	0.261	0.266
A3	0.334	0.282	0.323	0.34	0.353	0.354	0.264	0.259
A4	0.334	0.326	0.32	0.288	0.353	0.329	0.271	0.319

4.6 Obtain the incommensurable weighted matrix

To obtain the incommensurable weighted matrix (*V*), the incommensurable matrix (obtained from the second step) is multiplied by the square matrix ($w_{n \times n}$) whose main diagonal elements are weights of attributes and other elements are zero.

$$V = N_1 \times w_{n \times n} \qquad (3)$$

Table 9 shows the in commensurable weighted matrix.

Table 9: Incommensurable weighted matrix (*V*)

	C1	C2	C3	C4	C5	C6	C7	C8
A1	0.024	0.021	0.026	0.024	0.025	0.032	0.024	0.025
A2	0.02	0.02	0.02	0.024	0.025	0.026	0.019	0.019
A3	0.024	0.02	0.023	0.024	0.025	0.025	0.02	0.019
A4	0.024	0.023	0.023	0.02	0.025	0.023	0.02	0.023

4.7 Determine the positive and negative ideal factors

At this step, such options should be identified that are considered by the respondents as most important and least important factors. In other words, for positive indices, the positive and negative ideals are the largest and smallest *v* value, respectively; also, for negative indices, the positive and negative ideals are the smallest and largest *v* value, respectively. This is expressed by Eqs (3) and (4).

Positive ideal

$$A^+ = \left\{ \left(\max_i V_{ij} \,\middle|\, j \in J \right), \left(\min_i V_{ij} \,\middle|\, j \in J' \right) \middle| i = 1,2,...,m \right\} = \left\{ V_1^+, V_2^+,...,V_n^+ \right\} \qquad (4)$$

Negative ideal

$$A^- = \left\{ \left(\min_i V_{ij} \,\middle|\, j \in J \right), \left(\max_i V_{ij} \,\middle|\, j \in J' \right) \middle| i = 1,2,...,m \right\} = \left\{ V_1^-, V_2^-,...,V_n^- \right\} \qquad (5)$$

In this relations, *J* is positive index and J' is negative index. Table 10 shows the positive and negative ideals. The performance criteria obtained the least positive ideal and the 'number and type of involved organizations' and 'type of competence' criteria obtained the least negative ideals.
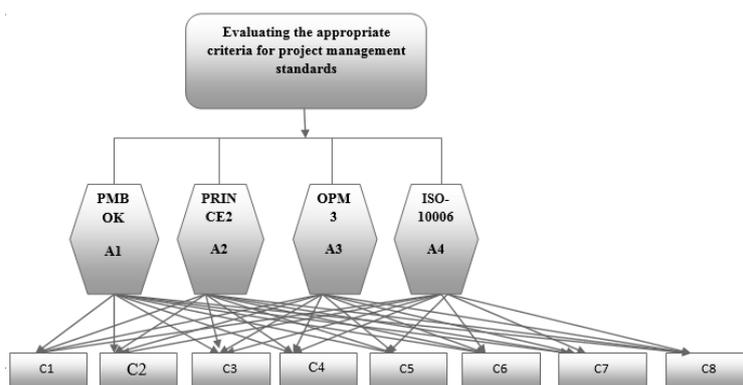
Fig. 2: TOPSIS network diagram for standard methods and criteria in project management

Table 10: Positive and negative ideals of each index

Criterion	Positive	negative
C1	0.029	0.02
C2	0.028	0.02
C3	0.026	0.02
C4	0.028	0.02
C5	0.025	0.022
C6	0.032	0.02
C7	0.031	0.019
C8	0.029	0.019

Table 11: Ranking of Options

Rank	CL	The ideal distance from negative	The ideal distance from Positive	choices
1	0.48	0.02	0.022	A1
2	0.425	0.019	0.031	A2
3	0.33	0.016	0.027	A3
4	0.295	0.014	0.022	A4

4.8 Calculate the distance from the positive and negative ideals

At this step, the distance of each option from positive and negative ideals is determined according to Eqs (6) and (7).

The distance of *i*th option from the positive ideal is

$$d_i^+ = \sqrt{\sum_{j=1}^n \left(V_{ij} - V_j^+\right)^2} \;\; ; \;\; i = 1, 2, ..., m$$

(6)

The distance of *i* th option from the negative ideal is

$$d_i^- = \sqrt{\sum_{j=1}^n \left(V_{ij} - V_j^-\right)^2} \;\; ; \;\; i = 1, 2, ..., m$$

(7)

Calculate the closeness level (CL) of each factor to the positive and negative ideals

At this step, the closeness level of each option to the positive and negative idealsis obtained by Eq. (8).

$$CL_i = \frac{d_i^-}{d_i^- + d_i^+}$$

(8)

Table 11 shows the CL values for each option.

4.9 Step Seven: Rank the options

At this step, the options are ranked based on CL values; in other words, any option having a higher CL will earn a better ranking. Table 11 shows the ranking of options.

The results obtained from the ranking of options with TOPSIS technique indicate that the PMBOK standard in this country has taken a high priority over other options.

5. Solutions

If the weakness and distance from the requirements of project management body of knowledge are based on process plans related to the cases within each of the nine areas of project management, continuing and going through a recovery process and performing periodic audit could be done to amend the procedure and reduce the distance to the standard. The organizational project management is the systematic management of projects in order to achieve the strategic goals of the organization. This concept that there is a direct relationship between the skill and ability of an organization to manage its projects and its success in implementing strategies, is the fundamental and theoretical basis of organizational maturity and organizational project management.

Although each of the projects may arise short-term, or at most, medium-term issues for the organization, the project management in an organization can create a strategic competitive advantage for the organization. The successful implementation of project management in the organization will lead to selecting the projects proportional to the organization's goals, properly allocating resources of project organizations, successfully completing the projects, and ultimately, the success of organization. An organizational maturity model represents a conceptual framework with relevant components to show the degree of maturity of the organization in the respective field. For some models, the process of transforming the organization from lower levels to higher ones may be described. The model may also be step by step (discrete) or continuous. Project management, time management, cost management and quality together can provide a complete view of the status of project management in an organization that also identify the susceptible areas of possible improvements. Accordingly, the following

steps are recommended to be followed in the studied organization:

5.1. First step: Preparation for assessment

In the first step, the organization is prepared for the assessment of project management maturity. This objective is met through the perception of organizational project management and its benefits and understanding the standard components and performance.

5.2. Second step: Assessment

In the next step, the organization assesses its situation in different aspects described in the model. The first step is to define the superior strategies available in the organization and to determine the overall maturity of the organization in implementing the project management. Then, in second step, the skills proportional to any of the superior strategies that are available or not, are identified in the organization. Based on the assessment, an organization may 1) repeat assessment, 2) plan to establish and improve, and 3) get out of the standard cycle (for a given period). In the latter (which would be selected if the organization is satisfied with the current status of management),it is recommended that a time is set for repeating the assessment and reviewing the status of organization. The assessment check lists and documents are widely adopted in this step.

5.3. Third step: planning the improvement

In management standards, organizations deciding to improve the project management use the results of previous steps as a basis for planning. Identifying the capabilities an organization may have or not, allows them to be prioritized based on the organization requirements depending on the interaction between them. According to this prioritization, organization can make a plan to achieve the results representing the presence of any of the required capability for implementing a superior strategy.

5.4. Fourth step: Implementing the improvement

In this step, the necessary organizational change occurs in the organization. The successful implementation of such organizational changes will lead to the acquisition of new skills by the organization and eventually, the progress of organization in implementing the project management.

5.5. Fifth step: Repeating the process

After implementing the planned improvements, organization can return to one of the second (re-assessment of organization maturity in project management) or third step (planning further improvements based on the previous assessment). Hence, after dynamic and continuous implementation and application of the standard within the organization and achievement of relevant results, one can carry out the tender management model in the studied organization. It is evident in implementing the recovery process that the weaknesses of organization should reach aright level of compliance in the areas of greatest importance, ahead of the rest and with the passage of time and introduction of the aforementioned steps in other areas.

6. Conclusion

Although in recent years, the project management has been received much attention from many organizations and a considerable growth in this area has been made, improving the performance of project staff and particularly, project managers who are the foundation of project management, has received little attention. For a successful project to achieve its time, cost, and quality goals, a fundamental and important factor is having competent project managers. Therefore, it is essential to study the various competency standards of project management and their features as well as to identify similarities and differences between them. Hence, comparing competency standards and choosing the best option enables organizations to achieve their goals by using it given to the characteristics of the project. In this study, four applicable standards in the construction projects of the country were studied and compared. By comparing the

competency standards of project management using TOPSIS technique and the obtained results, it was observed that the PMBOK standard is the best option followed by the PRINCE2 and OPM standards in the next priorities.

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ATTRIBUTES THAT DEFINE THE CATEGORY OF CONSUMER FASHION BRANDS FROM CUSTOMER´S POINT OF VIEW

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This article focuses on the common brands of clothing. From the perspective of buyers, the fashion market in the Czech Republic can be divided into nine categories, each according to price and quality. Of these, the category of common fashion was selected for this article. Among the common fashion brands are, for example, H&M, C&A and New Yorker. The goal is to define the attributes that best cover this category according to professional literature and establishes a hierarchy of importance for these attributes from a customer point of view, as well as to identify how these attributes may be changed by the demographic factors of the customers. The results were evaluated using descriptive statistics, as well as a single-factor analysis of dispersion. Wide availability in stores, easy accessibility and fashionable design were identified as the most important attributes of common clothing brands.

Keywords: common clothing brands, fashion, attributes of common clothing brands, price, quality

1 Introduction

Fashion is a field that has attracted the attention of marketing specialists for a long time (Bakewell et al., 2006). It is an exciting, dynamic and creative global business that blends aesthetics, technology and trade. Fashion is about self-expression, emotions and wearer identity. In the larger context it defines cultural and social boundaries (Hines and Bruce, 2007). Over the last twenty years, the field of fashion developed quickly (Djelic and Ainamo, 1999) and has become a dynamic environment due to mass production (Doyle et al., 2006). Profits primarily increase due to increased consumption in the female segment, as women have ever growing income and purchase practically anything they desire (Jones and Hayes, 2002). Yet despite this growth, sellers continually try to increase turnover (Workman and Kidd, 2000) by decreasing production prices and production costs (Priest, 2005; Jones and Hayes, 2002). This strategy caused the production of a number of companies to be relocated to countries with low labor costs (Kilduff, 2005; Lowson, 2001; Mattila et al., 2002), particularly the Middle East and Italy, Portugal and Turkey (Da Silva et al., 2002). Much attention is currently paid to China, where the pressure on production speed, along with low costs lead to environmentally-unfriendly and often unethical production. This problem arises in the awareness of certain customers from Western countries and forces producers into new production strategies (Priest, 2005).

Frings (2002) points out the continually changing needs of customers in relation to their lifestyles, thanks to which they continually demand new fashion trends. Therefore, one cannot win in the market based on price alone, but also by the ability to introduce the latest products (Christopher et al., 2004; Evans, 1989). Birtwistle (2003) remarks that a successful fashion company must remain flexible in creating new designs and thus respond to the latest trends as well as customer demand.

For these reasons, the original fashion goods cycle is no longer useful. Traditionally, the fashion cycle was dependent on fashion shows of prestigious houses that typically took place twice a year (Birtwistle et al., 2003). Nowadays, customers want to buy the next day what they saw celebrities wearing on TV. The fashion cycles has therefore shortened to approximately one month (Sull and Turconi, 2008). Due to these many changes, there are also structural changes to the supplier chains as well as end stores (Doyle, et al., 2006) and the market is becoming more complicated and confusing.

Simová (2015) focuses on the retail fashion market structure in the Czech Republic. Her research is based on exact data concerning the number of stores, as well as their size and type of assortment. When defining the term *"common fashion"* in this

article, we work based on our previous research in the fashion market from a customer point of view (Novotová, 2016). The qualitative research aimed to establish categories according to price and product quality, thus clarifying the subject of market structure for further research. From the customer point of view, there are nine categories of fashion. These include second hand, Vietnamese shops, discount, supermarkets, cheaper common fashion, more expensive common fashion, boutiques, luxury and fashion designers. This article focuses only on the categories of cheaper common fashion and more expensive common fashion that are similar in their intense distribution strategy, sales in shopping centers, as well as a focus on younger and less rich clientele segment. The typical brands of cheaper common fashion are for example: C&A, Tako, H&M, Cropp, Reserved and New Yorker. Well recognized brands from more expensive common fashion categories are Camaieu, Time out, Zara, Promod, Lindex, Mango or Marks&Spencer. The differences between these categories were mainly identified through price and product quality levels. Due to the great similarity between those two categories, they will be analyzed together for the purposes of this article.

Our research focused on both the determination of these individual fashion categories and the attempt to identify specific attributes within these categories. The goal of this article is to quantitatively determine the importance of these attributes of common fashion brands using a sample of 794 responders from across the entire Czech Republic. Three research questions were established:

RQ1 Which attributes best define the category of common fashion brands from the customer point of view?
RQ2 How does the view of these common fashion brand attribute changes in relation to the demographic characteristics of customers?
RQ3 Which demographic characteristics of customers have the greatest influence on perceptions of the common fashion brand attributes?

2 Common Fashion

In professional publications, *"common fashion"* is a frequently described category due to its popularity with the general public. However, authors focusing on fashion do not share a unified terminology for this category. One of the most popular terms used is *"high street fashion"* (Sorensen 1995; Bruce and Daley 2006). Sorensen (1995) uses it as an equivalent to the term *"mass market"* that emphasized the attribute of mass production and takes into consideration the size of the segment of customers who purchase this fashion. Moore and Burt (2007) divide common fashion into three categories according to the type of assortment and the size of the segment for which the products are intended. The first category is the *"product specialist fashion retailers"*, meaning specialized shops for narrow segments of customers, for example shops with sports clothing (Nike, Adidas), women's clothing (La Senza) etc. The second category is called *"general merchandise retailers"*, offering both fashion and other products. The best known example of this category is Marks & Spencer. The last category is *"general fashion retailers"*, intended for the widest segment of customers and typically with a wide selection of lower-priced goods.

In 2003, Lee introduced the term *"McFashion"*. These are international chains characterized by very cheap chic fashion. This fashion category is based on the same principles as fast food – a reasonable quality for reasonable price available to the widest class. Thanks to mass production, they also bring about considerable uniformity and lack of originality. Lee cites Zara, H&M as well as Marks&Spencer as the representatives of this category, but also clothing found in supermarkets (Lee 2003). For several years now a more common term used for this category is *"fast fashion"* (Bruce and Daley 2006). The concept

was developed in France and intended for teenagers and young women who want trendy, cheap clothing (Doeringer and Crean 2006). Thanks to mass advertising and the internet, awareness about fashion trends spread with enormous speed nowadays. Fast fashion brings new collections four to six times per year and even weekly collections aren't unusual (Sheridan et al. 2006; Doyle et al. 2006; Doeringer and Crean 2006). Therefore, companies must quickly respond to the market (Cachon & Swinney 2011), copying famous brands at record speeds and getting product to a large mass of customers at reasonable prices (Bruce and Daley 2006; Cachon and Swinney 2011; Sheridan et al. 2006; Lloyd and Luk 2010).

3 Attributes of Common Fashion Brands

According to the MarketLine case study, this fast-fashion approach is spreading through the entire segment of high street fashion or the common fashion brands. It is therefore possible to include the characteristics typical for fast fashion, such as fast-changing assortment and store availability, among the attributes of common fashion brands. Common fashion brand stores are most often located within large shopping malls accessible both by car and public transport. According to Moye and Kincade (2003) customers will not waste more time than necessary and therefore store availability is critical nowadays. Another important attribute is the scope of the assortment within the store. According to Broniarczyk et al. (1998) it is important for stores to offer a wide assortment, including varied quality of products, clothing design, colors, materials and the range of accessory assortment (shoes, jewelry, scarfs, etc.). Very wide assortment is typical for fashion chains located in shopping centers. The breadth of assortment particularly differentiates common fashion from higher levels of fashion in boutiques that are typical by their narrower selection of goods offered. In researching common brands, design was defined as one of the most important attributes (Novotová 2016). Authors Bruce and Daly (2006), Bhardwaj and Fairhurst (2010) also cite design as one of the key attributes, noting that the latest trends are most often demanded by younger customers. They also often prefer extravagant fashion (Novotová 2016).

According to Moye and Kincade (2003) the renown of the fashion brand is important in the purchase of clothing. Their theory states that knowledge of the brand first forms on the level of brand awareness. It is a certain imprint in the memory of the consumer and represents the ability to identify the brand under various conditions (Russiter and Percy 1987). Brand awareness relates to the likeliness that the name of the brand comes easily to mind. A number of authors divided brand awareness into stimulus-based brands and top-of-mind awareness, abbreviated as TOMA (Aaker 1991; Keller 1993; Ballantyne et al. 2006). In general, it is easier to recognize a brand than to recall it from memory (Keller 2007). TOMA represents situations in which the brand comes to mind without help. Thanks to their long term existence as well as worldwide expansion of common brands, these brands are globally recognized by their customers and become traditional (Alexander and Doherty 2010). Knowledge of brands such as H&M, C&A or Marks & Spencer are typically ranges at the TOMA level (Novotová 2016).

Kotler (1998) mentions that the meaning of factors that influence customer orientation in the market significantly raised, while price remains a determining factor. Many customers see price as a quality indicator, according to the principle of 'customers get what they paid for' (Erickson and Johansson 1985). This was confirmed by Hasen, who identified a positive relation between price and perceived quality in the food segment using the LISREL (Hansen 2005) as well as by authors such as Ding et al. (2010) and Beneke and Carter (2015). However, unlike quality, price is immediately recognizable and can therefore suggest a level of quality among unknown products (Yoon et al. 2014). There are customers who are only influenced by price in their purchase decision making. Most consumers evaluate price and quality along with other factors (Beneke and Carter 2015; Das, 2015). Prices are often driven downward, however some research shows that in certain product categories, while

discounts may increase sales, they also have a negative impact on the brand and its perceived quality and actually damage the image of the brand. Fast fashion, and thus from a certain point of view including common brands, are typical with low quality (de Klerk and Tselepis 2007). Customers being highly sensitive to price. Therefore the stores often display discount specials that increase sales volume (Tokatli, 2008).

Based on this knowledge, it was determined ten attributes of common fashion brands: fast-changing assortment, store availability, wide assortment, design, extravagance, global recognition, tradition, low price, lower quality and discounts, that will be further statistically tested.

4 Methodology

Quantitative research using an electronic questionnaire was selected to determine answers to the research question stated in the introduction of this article. The questioning was organized using the Google – Disk electronic questionnaire service, enabling the respondent to answer in the comfort of their home at a time of their choice. The electronic questionnaire can also be considered clear and easily intuitively navigable, therefore a very convenient tool for data collection. The questionnaire was distributes via the Facebook social network. This method was chosen for a very fast and free distribution of the questionnaire. The actual collection of data took place between April and May 2016.

An initial set of responders was established, the main criteria of which were that they were Czech citizens over 18 years old and that they, at least occasionally, purchase clothing from common fashion brands. It was not possible to use random methods of respondent sample selection due to the absence of sampling frame. The judgmental selection method appeared as most suitable. According to this author's previous article, the largest customer group of common fashion brands was identified as the category of people under 30 years of age and this group was therefore most present in this research (Novotová 2016).

The electronic questionnaire was divided into three sections. First, the respondents were asked to write down three common brands of clothing they buy. This opening question filtered out those respondents who purchase brands other than the common fashion category. The second part of the questionnaire contained ten attributes of common fashion brands, evaluated according to their importance for customers, using a Likert scale from '1 – absolutely agree' to '7 – absolutely disagree'. The final part of the questionnaire contained questions regarding age, sex, education, income and clothing purchase frequency of the responders.

4.1 Data Evaluation

The evaluation of data obtained through the questionnaire research was performed using the Statgraphics XVII statistical program. First, a descriptive statistic was used for the analysis, specifically for the characteristics of location. In the second part of the research, the individual statements were analyzed using the ANOVA single-factor dispersion. The above stated demographic characteristics of respondents and purchase frequency were used as independent factors. The ANOVA was chosen on the basis of the premise that used evaluation scales in the questionnaire were cardinal variables, but also due to the high number of selection units that amounted to more than 20. Thanks to these characteristics, the normality of the data sets was not validated (Churchill 1987). A double-selection t-test was performed in case of factors with two values (Budíková et al. 2010; Meloun and Militký 2002). The second condition of using the dispersion analysis, meaning the conformity of the dispersion, was evaluated using the Levene test that is less sensitive to the breach of the presumption of normality. ANOVA was calculated in the situation that the Levene test resulted in more than 0.05 of P-value (Šimonová 2006). In case that this condition was not met, Kruskal-Wallis non-parametric text was chosen, where the condition of conformity of the dispersion is

not necessary (Meloun and Militký 2002). When using the Kruskal-Wallis test, a zero hypothesis assumes that the measurement in the groups have the same medians (Hendl 2004). Hypotheses H0 were established for all statistical methods regarding the conformity of dispersion, specifically the medians, as well as hypotheses H1 regarding the differences and the statements were tested on the 95% level of significance. To establish significant differences between individual groups, the Fisher post-hoc test was used in the parametric ANOVA test and Scheffe test was used in the non-parametric Kruskal-Wallis test (Šimonová 2006).

4.2 Respondent Sample

In total, 794 respondents participated in the test, meeting the key criteria that they purchase clothing of common brands. As initially expected, the age categories over 55 years old very seldom purchase clothing from common brands. Due to the very small number of respondents, this category was therefore merged with the age group 45 – 54 years (the right side of Table 1).

Tab. 1: Division of respondents according to age
(Source: author)

Age	Frequency	%	Age new	Frequency new	% new
18 - 24	251	31,6	18-24	251	31,6
25 - 34	281	35,4	25-34	281	35,4
35 - 44	160	20,2	35-44	160	20,2
45 - 54	92	11,6	45 and more	102	12,9
55 - 64	10	1,3			

More women participated in the research (Table 2), and women are more aware of the brands they purchase. Men were very often disqualified as they were not able to fill out the questionnaire correctly.

Tab. 2: Division of respondents according to gender
(Source: author)

Sex	Frequency	%
men	353	44,5
women	441	55,5

Mostly those who had university degrees participated in the research, followed by those with high-school leaving exams. Thanks to the small number of respondents with only basic education for the purpose of the dispersion analysis, this category was merged with the category of high-school level education without leaving exams (right side of Table 3).

Tab. 3: Division of respondents according to education
(Source: author)

Education	Frequency	%	Education new	Frequency new	% new
primary	7	0,88	secondary without diploma	76	9,58
secondary without diploma	69	8,7			
secondary with diploma	319	40,2	secondary with diploma	319	40,2
colledge	399	50,3	colledge	399	50,3

Net monthly income of the household is shown in Table five in Euros. Due to the great variance in the number of respondents in individual categories, the initial categories were merged into four groups. The left side of the table shows the original division and the right side the four new categories.

Tab. 4: Division of respondents according to income
(Source: author)

Incom Euro	Frequency	%	Incom new	Frequency new	% new
to 370	34	4,4	the lowest	119	15,5
371-741	85	11,1			
742-1111	168	22	low	328	42,9
1112-1482	160	20,9			
1483-1852	120	15,7	high	215	28,1
1853-2222	95	12,4			
2223 and more	103	13,5	the highest	203	13,5

Purchasing frequency of was originally divided into six categories. For clarity and due to the small number of respondents in classes 1 and 6, these categories were also merged into three (the right side of Table 5).

Tab. 5: Division of respondents according to purchase frequency
(Source: author)

Frequence of purchase	Frequency	%	Frequence of purchase new	Frequency new	% new
every week	11	1,4	several times per month	143	18
several times per month	132	16,6			
once a month	182	22,9	several times per quarter	332	41,8
several times per quarter	150	18,9			
several times per year	277	34,9	several times per year	319	40,2
maximum once a year	42	5,3			

5 Results

The first research question RQ1 focused on identifying the most important attributes of common fashion brands from the customer point of view. Ten attributes of common fashion brands, were evaluated by respondents according to their importance, using a Likert scale from '1 – absolutely agree' to '7 – absolutely disagree'.

As is apparent from the results of the descriptive statistic in Table 2, the most important attributes in common fashion brands are wide assortment in stores, store availability and fashionable design of clothing. The second level is represented by attributes of low price, discount and frequent change of assortment. Tradition, extravagance and low quality are attributes that respondents found least important.

In further parts of the text, both the differences in the perception of attributes of common brands by customers according to demographic factors and purchase frequency will be analyzed, as well as answers to questions RQ2 and RQ3. The table 3 represents the results that appeared on the 95% level as statistically significant. The test used for the analysis is indicated in the table, as well as the testing criteria, P-value and the averages with an indicated difference between the attribute groups. The individual groups are identified using the upper indexes a,b,c.

Tab. 6: Attributes of common fashion brands and descriptive statistics (Source: author)

	Wide sortiment	Availability of shop	Design	Lower price	Discount
Mean	**2,11**	**2,21**	**2,42**	**2,79**	**2,8**
Median	2,0	2,0	2,0	2,0	2,0
Mode	1,0	2,0	2,0	2,0	2,0
Standard deviation	1,18259	1,29082	1,39371	1,40947	1,71924
	Changing sortiment	Global acquaintance	Tradition	Extravagance	Lower quality
Mean	**2,8**	**4,02**	**4,2**	**4,41**	**4,43**
Median	3,0	4,0	4,0	4,0	4,0
Mode	2,0	2,0	4,0	4,0	4,0
Standard deviation	1,46479	1,97815	1,96076	1,92502	1,81364

1) Wide Assortment

Table 6 shows statistically significant differences in factors gender, education and income. Particularly women without high-school leaving exams and low incomes appreciated this attribute.

2) Store Availability

Table 6 shows statistically significant differences in factors gender, education and purchase frequency. Availability is particularly demanded by women, people without a final leaving exam and those who shop several times per month.

3) Design

Table 6 shows statistically significant differences in factors gender and purchase frequency. Fashionable design is particularly important for women and people who shop very often, up to multiple times per month.

4) Low Price

Gender is statistically significant for the low price attribute. Women are the customers that most expect low price in common fashion brands (Table 6).

5) Discounts

Table 6 shows statistically significant differences in factors gender, education and income. Women expect discounts more, including those a without high-school leaving exam and particularly among those with lower incomes.

6) Changing Assortment

Table 7 shows statistically significant differences in factors gender, education and purchase frequency. Changing assortment is particularly expected by women and those without high-school leaving exams as opposed to those with leaving exams and university education, as well as by consumers who purchase monthly or once every quarter.

7) Global Recognition

Table 7 shows statistically significant differences in factors age, education and purchase frequency. Global Recognition is most demanded by the youngest customers of 18 – 24 years, those without high-school leaving exams, as well as those purchasing monthly.

8) Tradition

Table 7 shows statistically significant differences in factors gender, age and education. Surprisingly, tradition is more expected by men, further preferred by those over 35 years of age and consumers with high school education.

9) Extravagance

Table 7 shows statistically significant differences in factors age and education. Consumers up to the age of 24 years expect extravagance, along with those with a high-school education.

10) Low Quality

Table 7 shows statistically significant differences in factor gender. Women assign lower quality to common brands.

6 Discussion and conclusion

The important attributes defining common fashion brands were determined in the first part of the research using descriptive statistics (research question RQ1). The primary attributes include wide assortment in the store, store availability and fashionable design of the clothing. We can therefore say that consumers associate common clothing brands with large stores that also offer an assortment of accessories and are located within shopping malls that are easily accessible. Design is also a common attribute corresponding to the latest trends. Other attributes can be defined as low prices, discounts and frequently-changing assortments. As is apparent from the results of the research, common fashion brands correspond to the category of fast fashion, based on trending, fast-changing assortments, low prices and wide availability of stores (Cachon and Swinney 2011; Christopher et al. 2004). The result of the low-quality attribute might be considered surprising, as it was evaluated as the least determining factor of common brands. According to customer perception, the attribute of low quality is not a factor for common brands and this prevails even in situations when low price was determined as a significant attribute. The classic strong positive relation between price level and quality, as described in a number of professional articles (Hansen 2005; Ding et al. 2010; Beneke and Carter 2015), was not proven in this case. The correlation coefficients for the dependency of quality and price only resulted at 0.35 and is therefore only a very weak dependency. In the case of Czech customers the lower price of clothing does not therefore necessarily cause a sense that the goods will be of lower quality. This result may be caused by the fact that each consumer has their own idea of what quality means

Tab. 6 *The ANOVA, T-test and Kruskal-Wallis for all attributes*

Wide Assortment				
gender	**T-test**	**t statistic**	**P-Value**	**mean**
women		4,3755	0,0001	1,96
men				2,34
education	**Kruskal-Wallis**	**Test statistic**	**P-Value**	**mean**
without high-school leaving exams		19,1309	0,0000	1,63[a]
with high-school leaving exams				2,25[b]
college				2,11[b]
income	**Anova**	**F-Ratio**	**P-Value**	**mean**
the lowest		2,84	0,0371	1,91[a]
low				2,09[ab]
high				2,25[b]
the highest				2,29[b]
Store Availability				
gender	**T-test**	**t statistic**	**P-Value**	**mean**
women		4,4307	0,0001	2,04
men				2,46
education	**Kruskal-Wallis**	**Test statistic**	**P-Value**	**mean**
without high-school leaving exams		33,1815	0,0000	1,58[a]
with high-school leaving exams				2,49[b]
college				2,11[c]
purchase frequency	**Kruskal-Wallis**	**Test statistic**	**P-Value**	**mean**
several times per month		12,2459	0,0022	1,90[a]
several times per quarter				2,20[ab]
several times per year				2,36[b]
design				
gender	**T-test**	**t statistic**	**P-Value**	**mean**
women		5,52273	0,0000	2,16
men				2,73
purchase frequency	**Kruskal-Wallis**	**Test statistic**	**P-Value**	**mean**
several times per month		43,3582	0,0000	1,89[a]
several times per quarter				2,27[b]
several times per year				2,74[c]
low price				
gender	**T-test**	**t statistic**	**P-Value**	**mean**
women		4,4106	0,0001	2,6
men				3,03
discounts				
gender	**T- test**	**t statistic**	**P-Value**	**mean**
women		2,3074	0,0210	2,69
men				2,97
education	**Anova**	**F-Ratio**	**P-Value**	**mean**
without high-school leaving exams		7,77	0,0005	2,2[a]
with high-school leaving exams				3,03[b]
college				2,76[c]
income	**Anova**	**F-Ratio**	**P-Value**	**mean**
the lowest		3,06	0,0275	2,47[a]
low				2,76[ab]
high				3,0[c]
the highest				3,04[c]

Tab. 7: *The ANOVA, T-test and Kruskal-Wallis for all attributes*

Changing Assortment				
gender	**T-test**	**t statistic**	**P-Value**	**mean**
women		4,3789	0,0000	2,62
men				3,08
education	**Anova**	**F-Ratio**	**P-Value**	**mean**
without high-school leaving exams				2,41[a]
with high-school leaving exams		3,97	0,0192	2,81[b]
college				2,92[b]
purchase frequency	**Anova**	**F-Ratio**	**P-Value**	**mean**
several times per month				2,54[a]
several times per quarter		11,80	0,0000	2,66[a]
several times per year				3,13[b]
Global Recognition				
age	**Anova**	**F-Ratio**	**P-Value**	**mean**
18-24				3,7[a]
25-34		3,72	0,0113	4,2[b]
35-44				4,21[b]
45 and more				4,3[b]
education	**Anova**	**F-Ratio**	**P-Value**	**mean**
without high-school leaving exams				2,99[a]
with high-school leaving exams		18,66	0,0000	3,82[b]
college				4,36[c]
purchase frequency	**Anova**	**F-Ratio**	**P-Value**	**mean**
several times per month				3,74[a]
several times per quarter		3,53	0,0297	3,92[ab]
several times per year				4,23[b]
Tradition				
gender	**T-test**	**T staitstic**	**P-Value**	**mean**
women		-2,91368	0,0035	4,38
men				3,97
age	**Anova**	**F-Ratio**	**P-Value**	**mean**
18-24				4,51[a]
25-34		6,99	0,0001	4,32[a]
35-44				3,76[b]
45 and more				3,76[b]
education	**Anova**	**F-Ratio**	**P-Value**	**mean**
without high-school leaving exams				3,14[a]
with high-school leaving exams		21,23	0,0000	3,97[b]
college				4,57[c]
Extravagance				
age	**Anova**	**F-Ratio**	**P-Value**	**mean**
18-24				4,02[a]
25-34		5,51	0,0010	4,66[b]
35-44				4,44[b]
45 and more				4,63[b]
education	**Kruskal-Wallis**	**Test statistic**	**P-Value**	**mean**
without high-school leaving exams				4,05[a]
with high-school leaving exams		17,9984	0,0001	4,12[a]
college				4,71[b]
Low Quality				
gender	**T-test**	**t statistic**	**P-Value**	**mean**
women		3,3615	0,0007	4,24
men				4,67

for them. This idea depends on his understanding of the concepts of quality as well as, to some degree, their expectations related to each product (Gill 2009). According to research from the Hospodářské noviny, most Czechs with the concept of quality especially connect long-lasting, with only 21% imagining quality material and 9% quality manufacture (Hospodářské noviny 2012). Clothing from common brands may well be long-lasting, however the quality of material and manufacturing with comparatively low. This fact may be the reason why Czechs do not consider lower price of clothing for lower quality.

In the second part of the research, dispersion analysis was used to determine how the views of the common-brand attributes change according to the demographic characteristics of customers (research question RQ2). The most interesting findings regarding design, global renown, tradition and extravagance are discussed here. Fashionable design is mostly important for those women who shop very frequently, even several times per month. By this result it could be recognized a correlation with the theory of fashion innovators, meaning people who understand fashion and continually purchase the latest fashion trends (Sproles 1979 as cited in Martinez and Kim 2012). Women were identified as the most frequent fashion innovators (Mason and Bellenger 1973-1974). Fashionable product design is specifically most important for fashion innovators. The global renown of a brand is most demanded by the youngest customers, those without high-school leaving exams as well as frequently-shopping customers. In the case of these consumers, a certain attempt to increase their prestige through clothing of renowned brands can be expected, while often they may not be as interested in either the quality or design, as the renown of the brand. On the other hand, particularly older men without high-school leaving exams are accustomed to certain standards and do not care to change their established habits. This category of customers might be identified as very traditional and loyal to established brands. Unlike tradition, an extravagant clothing style is important for young people between 18 – 24 years of age with high-school educations, essentially those who are unafraid to let go and differ from others.

The goal of the third part of the research was to define the demographic characteristics of customers that have the greatest influence on the perception of common brand attributes (RQ3). A statistically significant difference was proven between men and women in most of these attributes. Women are the ones who perceive fashion brand attitudes as more important. These results confirm the fact that women are generally more interested in fashion (Mason and Bellenger 1973-1974; O'Cass 2000; Gould and Stern 1989). On the other hand, foreign research indicates that the difference between men and women in terms of purchasing fashion is beginning to disappear (Kacen 2000; Patterson and Elliot 2002). In fact, even nine-year-old boys are interested in fashion and know clothing brands (Hogg and Bruce 1998). In 2001 a research even showed that young men are more influenced by fashion than their female counterparts (Manrai et al. 2001). They therefore find that the male generation Y (Millennials) is far more involved in the world of fashion than was the case with their fathers (Manrai et al. 2001). This international trend was not proven in the case of Czech men. As is apparent from these results, men in the Czech Republic continue to not consider fashion as that important and do not pay as much as attention as men in other countries.

The results regarding education might be considered rather surprising, as it was significant for seven common fashion brand attributes. Five of them (wide assortment, availability, discounts, changing assortment and global renown) were important for respondents with high-school educations without leaving exams. These results show that the less education prefer precisely the attributes typical of fast fashion. Fast fashion is therefore very attractive for this type of customers. On the other hand, the factors of frequency of purchase (for 4 attributes), age (for 3 attributes) and income (for 2 attributes) are not anywhere near as

important for common fashion brands as are gender and education.

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Secondary Paper Section: AE

THE RELATIONSHIP BETWEEN HOSPITAL EMPLOYEES' LEARNING LEVELS AND JOB SATISFACTION (THEMODERATING ROLE OF THE TYPE OF HOSPITAL OWNERSHIP)

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Abstract: This study aimed at investigating the possible relationship of employees' learning levels and job satisfaction with the type of hospital ownership as the moderating variable. This descriptive study was applied correlational research conducted in 2016. The study population included all 2,162 employees working in two Teaching hospitals, one Social affairs hospital and one Private hospital, all located in Lorestan State, Iran. 339 employees were selected proportionally by using Cochran's sampling formula. Two questionnaires were administrated: Watkins and Marsick's learning organization questionnaire and Minnesota Job Satisfaction Questionnaire. Data was analyzed in SPSS 20. The mean rates of learning capacity and job satisfaction were 2.79$\pm$0.75 and 3.10$\pm$0.66, respectively. The correlation between learning and job satisfaction in the studied hospitals was significantly positive (r=0.691, r= 0.466 and r= 0.645 in Teaching, Social affairs, and Private hospitals, respectively, p<0.01). The correlation coefficients between learning and job satisfaction in hospitals was a significantly positive relation, but with different extent. The managers of hospitals with different types of ownership can improve their employees, learning capacities and consequent job satisfaction that in turn result in organizational development.

Keywords: *Hospitals, Iran, Job Satisfaction, Organizational Learning.*

1 Introduction

The speed of the change in knowledge and technology is increasing more than ever   (Hult, Hurley, & Knight, 2004). Modern organizations tend to control this change by applying more practical methods. As one of great and complicated organizations, hospitals have entered a competitive space in order to respond their customers (Talarposhti, Mahmodi, & Jahani, 2016). Learning in the organizational space is one of the main considerable issues in fitting organizational capacities and human resources to the organization's needs and requirements (Lynn & Akgun, 2000). The rate of organizational development and effectiveness depends heavily on organizational learning (Jerez-Gomez, Céspedes-Lorente, & Valle-Cabrera, 2005).In addition, the rate of an organization's focus on development and innovation is of factors affecting organizational learning (Fang, Chang, & Chen, 2011; Jerez-Gomez et al., 2005). The existence of such relations between organizational development and learning capacity results in organizations' emphasis on increasing organizational learning and creating a learning organization   (Chiva & Alegre, 2009; Gah, Elliott, & Quon, 2012) .

Nowadays, all agree that measuring organizational performance requires some criteria other than those of financial ones, such as invisible assess, intellectual capital, and knowledge-based property (Yaghoubi, Karimi, Javadi, & Nikbakht, 2011). survival and dynamic of great and all-inclusive organizations, such as hospitals (O'Donnell, Bo Henriksen, Voelpel, & Abeysekera, 2006).Some studies investigated the relationship of organizational learning capacity and job satisfaction (Chiva & Alegre, 2009; El Badawy, Srivastava, & Sadek, 2014; Erdem, İlğan, & Uçar, 2014; Jolodar & Jolodar, 2012). The effect of organizational learning on the employees' ability to accept and adjust changes, organizational commitment and professional development and adequacy has been confirmed (Chaston, Badger, Mangles, & Sadler-Smith, 2001).

One of the variables affected by organizational learning is the job satisfaction, as a main issue in the health care (Datobar, Alijanpour, Khafri , Jahani , & Naderi, 2016), Studies showed

that job satisfaction is one of motivating factors stemming from the work nature and determined by organizational structure and culture. It influences employee's individual performance and organization's total performance (Egan, Yang, & Bartlett, 2004). Developing organizational learning is one of the factors increasing job satisfaction (Chang & Lee, 2007). In addition, there is a significant relationship between organizational learning capacity and job satisfaction (Chiva & Alegre, 2009).

Medical knowledge develops and changes increasingly (Hajitabar , Nasiripour, & Jahani, 2016). One of the main differences between hospitals and other organizations is that the hospital is service-based and customer-oriented (Nasiripour, Tabibi, Raeisi, & Jahani, 2010). Patients' physical and mental conditions required hospitals to have motivated staff. In addition, applying scientific methods such as organizational learning is necessary for hospital staff training. This study aimed at investigating the possible relationship of employees' learning levels and their job satisfaction with the type of hospital ownership as the moderating variable in some selected hospitals located in Lorestan State, Iran.

2 Research Methodology

This descriptive study was applied correlational research conducted in 2016. The study population included all 2,162 administrational, clerical, clinical and paraclinical employers working in two Teaching hospitals (Ashayer Hospital with 350 active beds), Shahid Rahimi with 207 active beds), one social affairs hospital (Tamin-e Ijtemai Hospital with 256 active beds) and one private hospital (ShafaHospital with 110 active beds), all located in Khoram-Abad City, Lorestan State, Iran. 339 employers were selected proportionally as the study sample by using Cochran's sampling formula in 95% confidence interval.

Two questionnaires were administrated: Watkins and Marsick's learning organization questionnaire (Marsick& Watkins, 2003)and Minnesota Job Satisfaction Questionnaire (Weiss, Dawis, & England, 1967).The former included three levels (individual learning level with 6 questions, group learning level with 2 questions and organizational learning level with 9 questions). Its questions were in 5-option Likert type (1= never-5= ever). The validity of the scale was confirmed by some specialists and its reliability was α= 0.91 in the study by Nadi and colleagues (Nadi, Bakhtiar Nasrabadi, & Farahmandpour, 2011).The latter included 19 items in three dimensions: work nature with 7 items, work environment with 3 items, and organizational environment with 9 items. It items were in 5-option Likert-type (ranging from 1=completely disagree-5=completely agree). The validity of the scale was confirmed by some specialists and its internal consistency was α=0.78 in the study by Kakemam and colleagues   (Kakemam, Irani, Sokhanvar, Akbari, & Dargahi, 2016).

The researcher entered the hospitals and after receiving the agreement of responsible managers, entered different clinical and non-clinical parts and distributed the questionnaires. He explained the aims and answered the questions subjects had, if any. The completed questionnaires were analyzed in SPSS 22.

3 Data Analysis

Out of the subjects, 143 (42.2%) were male. The mean of age was 35.34$\pm$ 6.99 years and that of work length was 10.97$\pm$7.07 years. Most (38.9%) had the work length ranging from 6-14 years. 64.4% and 73.3% were MD and clinical specialists, respectively.

As table 1 shows, the variable "learning" had the mean of 2.79 out of 3.00 and was lower than the moderate level (t= -5.19, p<0.001). In contrast, the variable "job satisfaction" with mean

of 3.10 out of 3.00 was relatively higher than the moderate level (t= 2.73, p<0.007).

Table1. The state of study variables (learning and job satisfaction) in the studied hospitals

Variable	Mean	t	df	p-value
Individual learning	2.82±0.80	-4.13	338	0.000
Group learning	2.80±0.87	-4.24	338	0.000
Organizational learning	2.75±0.79	-5.84	338	0.000
Learning	2.79±0.75	-5.19	338	0.000
Organizational factors of job satisfaction	3.19±0.76	4.56	338	0.000
Environmental factors of job satisfaction	2.81±0.90	-3.82	338	0.000
Work-related nature factors of job satisfaction	3.06±0.69	1.73	338	0.085
Job satisfaction	3.10±0.66	2.72	338	0.007

Based on K-S test, research data distribution was normal (Z=0.74, p-value= 0.64 for the variable "learning", and Z= 1.27, p-value= 0.08 for the variable job satisfaction).

As shown in Table 2, in the case of Teaching hospitals, the correlation coefficients among the dimensions of employees' learning and job satisfaction were significantly positive (p-value< 0.01). In total, the correlation between learning and job satisfaction in the studied Teaching hospitals was significantly positive (r= 0.691, p-value <0.01)

Table2. Correlation matrix of the variable 'learning' and its components vs. the variable "job satisfaction" and its components in the hospitals owned by teaching Sector

Variable	Individual learning	Group learning	Organizational learning	Learning	Organizational factors of job satisfaction	Environmental factors of job satisfaction	Work-related factors of job satisfaction	Job satisfaction
Individual learning	1							
Group learning	0.611**	1						
Organizational learning	0.696**	0.710**	1					
Learning	0.863**	0.885**	0.904**	1				
Organizational factors of job satisfaction	0.657**	0.511**	0.591**	0.660**	1			
Environmental factors of job satisfaction	0.603**	0.531**	0.605**	0.654**	0.762**	1		
Work-related nature factors of job satisfaction	0.544**	0.396**	0.492**	0.536**	0.640**	0.699**	1	
Job satisfaction	0.681**	0.528**	0.633**	0.691**	0.923**	0.877**	0.864**	1

*p<0.05, **p<0.01

As shown in Table 3, in the case of the hospitals with Social Affair ownership, the correlation coefficients among the dimensions of employees' learning and job satisfaction in the studied social affair hospital were significantly positive (p-

value<0 .01).In total, the correlation between learning and job satisfaction in the studied social affaire hospitals was significantly positive (r= 0.466, p-value<0.01)).

Table3. Correlation matrix of the variable 'learning' and its components vs. the variable "job satisfaction" and its components in the hospitals owned by Social Affair

Variable	Individual learning	Group learning	Organizational learning	Learning	Organizational factors of job satisfaction	Environmental factors of job satisfaction	Work-related factors of job satisfaction	Job satisfaction
Individual learning	1							
Group learning	0.705**	1						
Organizational learning	0.812**	0.641**	1					
Learning	0.926**	0.877**	0.901**	1				
Organizational factors of job satisfaction	0.430**	0.323**	0.400**	0.424**	1			
Environmental factors of job satisfaction	0.358**	0.272*	0.366**	0.366**	0.755**	1		
Work-related nature factors of job	0.347**	0.336**	0.344**	0.380**	0.476**	0.483**	1	

satisfaction								
Job satisfaction	0.453**	0.368**	0.443**	0.466**	0.918**	0.840**	0.755**	1

*p<0.05, **p<0.01

As shown in Table 4, in the case of private hospital, the correlation coefficients among learning components and job satisfaction were significantly positive (p-value<0.01). In total, the correlation between learning and job satisfaction in the studied private hospital was significantly positive (r= 0.645, p-value<0.01).

Table4. Correlation matrix of the variable 'learning" and its components vs. the variable "job satisfaction" and its components in the hospitals owned by Private Sector

Variable	Individual learning	Group learning	Organizational learning	Learning	Organizational factors of job satisfaction	Environmental factors of job satisfaction	Work-related factors of job satisfaction	Job satisfaction
Individual learning	1							
Group learning	0.909**	1						
Organizational learning	0.864**	0.838**	1					
Learning	0.967**	0.961**	0.940**	1				
Organizational factors of job satisfaction	0.600**	0.568**	0.604**	0.617**	1			
Environmental factors of job satisfaction	0.461**	0.470**	0.398**	0.645**	0.509**	1		
Work-related nature factors of job satisfaction	0.333*	0.344*	0.335*	0.353*	0.325*	0.597**	1	
Job satisfaction	0.628**	0.619**	0.603**	0.645**	0.865**	0.782**	0.715**	1

*p< 0.05, **p<0.01

4 Discussion and Conclusion

The rate of employees' organizational learning was in the moderate level among the studied hospitals. This result accords with the findings of some studies (Kakemam et al., 2016; Lu, Barriball, Zhang, & While, 2012; Sadeghifar et al., 2014). In line with other studies (Islam, Khan, Bukhari, Tuggle, & Chauvel, 2016; Jolodar & Jolodar, 2012; Kakemam et al., 2016), the rate of employees' job satisfaction was higher than the moderate level. Considering the importance of organizational learning, it can be said that the studied hospitals need to improve their conditions for better using the potentials of the organizational learning.

For better use of human resources' capacities for organizational development, it is needed to maintain their job satisfaction in higher levels, as possible. Unsatisfied employees cannot satisfy the requirements of their work environment. Considering the effect of job satisfaction on employees' maintenance (Ma, Samuels, & Alexander, 2003) and their performance (Jolodar & Jolodar, 2012), the studied hospital should attempt to activate different motivating factors for improving their staff's job satisfaction.

Based on the results of this study, there were significant correlations among individual, group and organizational learning from one hand and job satisfaction on the other hand in the studied hospitals by their ownership type. There were no studies on comparing the hospitals based on their ownership type. In a study, it was found that the organizational and environmental factors for job satisfaction affect organizational learning and employees feeling no satisfaction from their job tend to have low organizational learning and work performance (Maleki, Faghihi, & Hamedi, 2013).

The results of this study showed a significantly positive relation between employers' organizational learning and job satisfaction. This result is in line with that found in the study by Kakemmam and colleagues (Kakemam et al., 2016)that conducted in the educational hospitals in Tehran, Iran. In the study by Mastaneh and Mouseli, it was found that the collaboration and communication component, as one of team learning aspect, has the highest relation with job satisfaction of nurses working at educational hospital under supervision of Hormozgan University of Medical Sciences (Mastaneh & Mouseli, 2013). This is in line with that of this study, regarding the closeness of the two study populations and research setting.

In some studies out of health domain, including among others, Jolodar and Jolodar (Jolodar & Jolodar, 2012) and Civa and Alegre (Chiva & Alegre, 2009), there was a significant relation between staff's organizational learning capacities and job satisfaction. Dekoulou and Trivellas found learning-based activities as the significant predictors of individual performance and job satisfaction among the staff working at Greek consulting sector (Dekoulou & Trivellas, 2015). The only study that was not in line with this study was that by Islam and colleagues in which there was no significant relation between employees' organizational learning and their displacement, as a factor at hand in job satisfaction (Islam et al., 2016). The reason may be due to the different samples of the two studies and the consideration of different factors in job satisfaction. Chang and Lee claimed that promoting organizational learning is one of the motivations of job satisfaction (Chang & Lee, 2007) .

The results of this study showed that in total, the mean rate of learning in the studied hospitals was lower than moderate and that of job satisfaction was relatively higher than moderate. Considering the correlation coefficients between learning and job satisfaction in hospitals with different ownership types, it was observed that there was a significantly positive relation between these variables, but with different extent. As a result, it is recommended that the managers of hospitals of different ownership types promote the learning capacity and it's affecting factors and consequent job satisfaction. This in turn causes their organizations to be developed.

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Primary Paper Section: A

Secondary Paper Section: AE

MODELING AND SOLVING THE PERMUTATION FLOW SHOP SCHEDULING PROBLEM WITH LIMITED BUFFERS AND THE OBJECTIVES OF THE MINIMIZATION OF TOTAL ENERGY CONSUMPTION AND MAKESPAN

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Abstract. A lot of energy, by machines that are unemployed, it is a waste. In this paper during the workshop on the issue of permutations with limited buffers and energy considerations will be discussed. The goal is minimizing total system cost that is included energy costs and overhead machinery. For a number of periods of unemployment is minimized to reduce energy waste with limited capacity buffers between two consecutive machine we have taken. Because high computational complexity point of review, of the Genetic Algorithm and simulated annealing is used to solve it. Three sets of problems with small, medium and large for the performance of the algorithm is established that the results obtained the proper functioning of both the algorithm and the dominance compared with simulated annealing genetic algorithm for all aspects of the show.

Keywords: Permutation flow shop scheduling, limited buffers, Total energy consumption, Makespan

1. Introduction

Our planet has recently encountered a serious issue on fuel reduction, carbon dioxide emission and global Warming, because of the vast usage of energy resources. Industrial sector accounts for 31% of energy consumption and 36% of carbon dioxide emission (Bruzzone et al. 2012). 34% of energy was consumed by manufacturing departments in USA in 2006 (Fang et al. 2011). Saving energy is an important issue and many researchers have focused on this subject to find strategies to reduce its consumption. Some international standards (EN 16001, ISO 50001) have been designed to manage the energy consumption of industrial plants and other sectors (Bruzzone et al. 2012). In this article we present a method that aims to select the optimum sequence work and unemployment as well as the interval of the machine must be idle or turned off and turned on again to continue operation (launch), So that the total cost of the overhead costs of equipment and systems that minimize their energy costs.

2. Literature review

A great amount of energy is being used in industry and it's very important to utilize proper policies that can reduce the energy consumption in this sector. Because of the importance of the energy consumption, many researchers have been attracted to this area and some investigations have been done recently. There are various strategies to prevent the waste of energy in industry that have been studied so far. One of the strategies is to turn the machines on and off while they are not processing any job. Mouzon and Yildirim (2008), introduced a multi-objective mathematical model for the mentioned strategy on a single machine, they tried to optimize the total tardiness and total energy consumption of the system by deciding the start time and the length of turn off/turn on periods while the machine is idle. They considered release date of jobs in the model and proved their problem is in the set of NP-hard problems so they utilized a randomized multi-objective adaptive search meta-heuristic to solve the problem. Liu et al. (2013), studied a similar problem for job shop environment. They assumed that each machine has three levels of power consumption: idle power, switched into run-time power and the process power. They proposed a bi-objective mathematical model. The objective included total electricity consumption and total weighted tardiness. A non-dominant Sorting Genetic Algorithm was employed as the solving method to obtain a proper pareto-front for the problem. Dai et al. (2013), investigated the flexible flowshop problem by considering the energy consumption. A multi-objective

mathematical model and an improved genetic-simulated annealing algorithm were presented in their paper to obtain a trade-off between makespan and total energy consumption. In many industrialized countries the time of day has a significant influence on the price of the power consumption. Time of the day is usually divided in to three parts: peak load, mid-peak load, off-peak load. The peak time will lead to the most power cost so the goal is to schedule the jobs in off-peak time as the first priority and mid-peak time as the second and scape scheduling in peak time. Moon et al. (2013), studied the unrelated parallel machine scheduling problem in a 24 hour of a day divided to peak, mid-peak and off-peak to minimize the weighted sum of makespan and time dependent electricity cost. They suggested a hybrid genetic algorithm to solve the problem. Hybrid flowshop scheduling problem considering time dependent electricity cost is studied by Luo et al. (2013), they presented a new ant colony optimization meta-heuristic to solve the problem. Problem of scheduling a single machine considering variable energy prices during a day was investigated by Shrouf et al. (2014). They proposed a mathematical model and solved the problem by genetic algorithm. In industry one of the most effective factors that influence the energy cost of workshops, is their peak power consumption. Peak power is the maximum amount of the power is being used during a specific time period, if a workshop can reduce its peak power it can save a great amount of energy cost, the best solution to do so is to omit the overlap of the processing jobs at any time of the planning horizon but in other hand in will led to the maximization of time-based objectives such as makespan, so the goal is to find a trade-off between these objectives. Bruzzone et al. (2012), studied the flexible flowshop problem by limiting the peak power of the system and proposed a Mixed Integer Programming (MIP) model to minimize the sum of makespan and total tardiness. They provided a randomized neighborhood Search to solve the problem. Fang et al. (2013), studied the flowshop scheduling problem with peak power constraint and investigated both mathematical programming and combinatorial approaches to this problem. There is another way to decline power consumption of a workshop, in this strategy the manufacturer have to decide which job have to be done with which speed on each machine to reduce energy factors such as peak power or total power consumption. The flowshop scheduling problem with the objective function of makespan, peak total power and carbon footprint has been studied by Fang et al. (2011), in this problem they assumed each machine has multiple speeds, and the suitable speed has to be chosen for each one of jobs in the sequence. A multi-objective mathematical programming model has been presented for the problem. Strusevich, (1995) studied two-machine flowshop problem with no-wait while the machine speeds are controllable. He described an algorithm to solve the problem. Fang and Lin (2013), investigated the parallel machine scheduling problem to minimize total weighted tardiness and power cost. They presented a mathematical model for the problem. The purpose of the problem was to assign the products to parallel machines meanwhile the most suitable processing speed has to be selected for each job on each machine it is assigned to. They proposed two heuristics to solve the problem and used particle swarm optimization (PSO) to compare the solutions. Sharma *et al.* (2015), examined the so-called econological speed-scaling scheduling problem for multi-part multi-machine setup operating under TOU tariffs. The aim is to minimize the electricity cost and environmental impact for a target production quota by using a multi-criterion meta-heuristic optimization. Mikhaylidi *et al.* (2015), studied a manufacturing operations scheduling problem under TOU tariffs with a rechargeable battery. They proposed a dynamic programming algorithm to decide the time to process each operation such that the total electricity consumption and operations postponement penalty costs are minimized.

3. Problem description

The permutation flow shop scheduling with limited buffers considered in this paper can be described as follows. There are n jobs $J = \{1, 2, \dots, n\}$ and m machines $M = \{1, 2, \dots, m\}$. Each of the n jobs is to be sequentially processed on through machine $1 \sim m$. At any time, no job can be processed on more than one machine, while no machine can process more than one job simultaneously. The processing time of job j on machine i is given as t_{ij}. Between each successive pairs of machines i and i -1 there exist a buffer with the size b (i.e., at most b jobs can be held simultaneously), and jobs obey the FIFO (first in first out) rule in each buffer. Besides, the permutation of all jobs to be processed on each machine is the same. Drake et al. (2006) realised that in manufacturing environment, large quantities of energy are consumed by non-bottleneck machines as they lie idle, and that whenever a machine or is turn on or turn off, there are significant amounts of start-up or shut-down energy consumption. As a result, we have to decide at the time that the machine remains idle, turn it off and restart it to continue operations or put the machine in stand by mode. For this purpose, Mouzon and Yildirim (2008) proposed formula (1) in single machine environment.

$$tb = max \left\{ \frac{Energy_{setup}}{Power_{idle}}, T_{setup} \right\} \qquad (1)$$

In the above formula tb is defined as the least amount of duration required for a turn off/turn on operation (i.e. time required for a setup) and the amount of time for which a turn off/turn on operation is logical instead of running the machine at $stand\ by$. $Energy_{setup}$, $Power_{idle}$ and T_{setup} are the energy needed to setting up the machine, the power of idle working and the time needed to set up the machine respectively. In this paper, because we work on flow shop, we calculate tb for each machine, so the formula (1) is changed to (2):

$$tb_i = max \left\{ \frac{es_i}{pi_i}, ts_i \right\} \qquad (2)$$

In the above formula es_i, pi_i and ts_i are set up energy, idle power and set up time length for the machine i respectively. In the above formula tb_i is defined as follows:

If idle time of machine i is larger than tb_i, then $turn\ off / turn\ on$ option is selected and if it is less than or equal to tb_i, then $stand\ by$ option is selected.
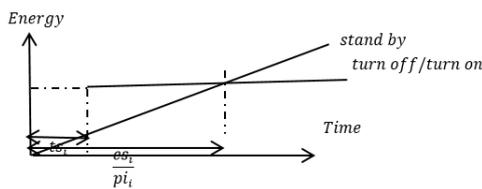
Fig.1 $tb_i = max \left\{ \frac{es_i}{pi_i}, ts_i \right\} = \frac{es_i}{pi_i}$

In the above graph the $stand\ by$ line is the time that the job stays on machine and the machine is $stand\ by$ mode, i.e. the state that the machine does not turns off so that there is no need to energy while starting. So in this state it uses fixed energy so that it has a linear diagram with time. The $turn\ off / turn\ on$ line is about the time that the job stays on machine and we turn it off and we start it again for the operation. So fixed energy is needed for setting up. It is apparent in figure 1 that when the time length of the idle is less than tb_i, we should machine i $stand\ by$ and when the time length of the idle is more than tb_i the machine i should be turned off and start it again for the operation.
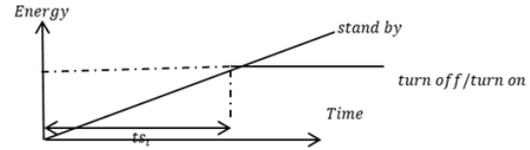
Fig. 2 $tb_i = max \left\{ \frac{es_i}{pi_i}, ts_i \right\} = ts_i$

The objective function of the problem that we are considering is composed of two parts, the first part is about overhead costs of machines and the second part is about consumed electric costs. Obtaining departure time of the last processed job on the last machine and multiplying by the overhead cost of all machines (c), the overhead cost of the all machinery is calculated. The second part of objective function is about electric consumption of machinery. It is assumed that electric consumption of machines is consist of job processing energy (the energy that is consumed for operation on the job) and stand by energy (the energy the machine uses while stand by work) and set up energy (the energy that is used for setting the machine up). For obtaining the set up energy of machine i for a special operation we use formula (3). In this formula es_i and Tof_{io} are setup energy of a machine i and a binary variable which if the turn off/turn on operation on machine i between positions of o and o+1 was done that variable would be 1 and otherwise it would be zero respectively.

$$setup\ energy\ of\ machine\ i\ = Tof_{io} es_i \qquad (3)$$

For obtaining stand by energy of machine i for a special operation we use formula (4) which in it is refereed in Halliday et al. (2010). In this formula pi_i and SCD_{io} show the idle power of machine i and the the time length of idle between positions of o and o+1 for machine i which in this time length machine i is ready to start (stand by).

$$\begin{aligned} stand\ by\ energy\ of\ machine\ i \\ = power \times Time \qquad (4) \\ = pi_i SCD_{io} \end{aligned}$$

By adding the values of equation (3) and (4) and multiplying that value with total electricity costs (ec), we can get the energy cost of the system and then we will get the total system cost by adding the energy costs with overhead costs. Note that the total processing energy ($\sum_{i=1}^{m} \sum_{j=1}^{n} P_i t_{ij}$) is not included in the optimization problem, since it is a fixed constant regardless of the sequence. In this formula P_i and t_{ij} are processing power of machine i and processing time of job j on machine i respectively.

Assumptions contained in the question under consideration include:

- Preemption in jobs is not allowed.
- An operation cannot be performed by more than one machine at the same time.
- Each machine can process at most one job at a time.
- Jobs are independent of each other.
- All parameters are certain.
- Buffer space is limited.
- Two types of energy that are intended for the machine, including total setup energy and total stand by energy.
- All jobs have equal priorities.
- Machines are so flexible, so that we can turn them off and on any time we need.

4. Solution method

The studied problem is strongly NP-hard. Therefore, two meta-heuristic algorithms: a genetic algorithm (GA) and a simulated annealing (SA) algorithm are proposed to solve the problem.

4.1 Genetic algorithm

The genetic algorithm was introduced in 1970 by Holland. It's an efficient stochastic search method that has been used by many researchers in various fields such as scheduling problems. This algorithm is a kind of evolutionary algorithms and is inspired by natural behavior of human body. In the first step it starts by an initial population (a set of solutions), which are coded as a sequence of numbers, called chromosome. New chromosomes (offsprings) are created by applying crossover and mutation operations to the parents. Crossover operator creates new offsprings by exchanging some parts of the selected parents, and the mutation operator tries to make slight changes in the parents by swapping its elements or other known methods. The algorithm uses a fitness function to evaluate the quality of existing solutions to select the elitist ones and create the next generation by probabilistic methods. The outline of the proposed genetic algorithm is given in Fig. 3.

Genetic algorithm procedure

Initialization

Parameter setting (p_c, p_m, Stopping Criteria)

Generate initial population by some heuristic methods or using random solutiRepeat

Select elite parents for crossover and generate new offsprings

Select randomly parents for mutation and generate new offsprings

Evaluate the fitness of parents and generated offsprings

Select the solution with the best fitness as the best solution of that generation

If the fitness of the best solution in current generation is the same as the fitness of the previous generations

Then Give a shock to the system by keeping the best solution and regenerating new populations

End if

If the stop criterion is satisfied

Then stop

Else Select the bests of parents and offsprings to enter to the next generation

Fig. 3 Encoding, Initial solution and fitness function of GA

4.1.1 Encoding

Showing the chromosome response, the order of jobs is obtained. So the refereed chromosome is defined so that the first number of chromosome from the left shows the number of first job of order and the second number of chromosome from the left shows the number of the second job of the order and so on. So the length of the chromosome is n. For clarification an example is given in Table 1. In that example it is assumed that four jobs are there for processing. The numbers 2,3,4 and 1 shows the first, the second, the third and the last job of the order.

Table 1: Chromosome representation

2	3	4	1

4.1.2 Initial population

Two initial populations are used in the algorithm, and the other populations are generated randomly. Two methods are used to generate different sequences of jobs. In the first method, we use the well-known NEH[1] method to generate the sequence of jobs, the second method is a SPT[2]-based heuristic.

4.1.3 Crossover

Crossover is a significant operator to create the next generation. Two parents have to be selected among the existing solutions to create crossover offsprings. The algorithm tries to select the best solutions as parents to obtain decent offsprings with suitable fitness values. There are two common ways to select parents: Roulette wheel, Tournament. In the proposed algorithm, Roulette wheel is used as the selection operator. Parents are selected according to their fitness. Better solutions have more chances to be selected. After the parents are selected, one point crossover is used to generate new offsprings. After the crossover is implemented, some offsprings may need to be reformed to become a feasible solution. It occurs because of the identicality of some job numbers in the chromosome. Reformers remove the job number replications and replace the missing job numbers in the blank places. For more illustration of the crossover operation see Figure 4. Suppose we have nine jobs and the break-point is 6. As it is shown in offspring 1, job number 6 is repeated two times. The same situation is happened in offspring 2 for job 3, therefore, a reformation is done in the next step to correct the chromosomes.

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[1] Nawaz, Enscore, Ham
[2] Shortest Processing Time
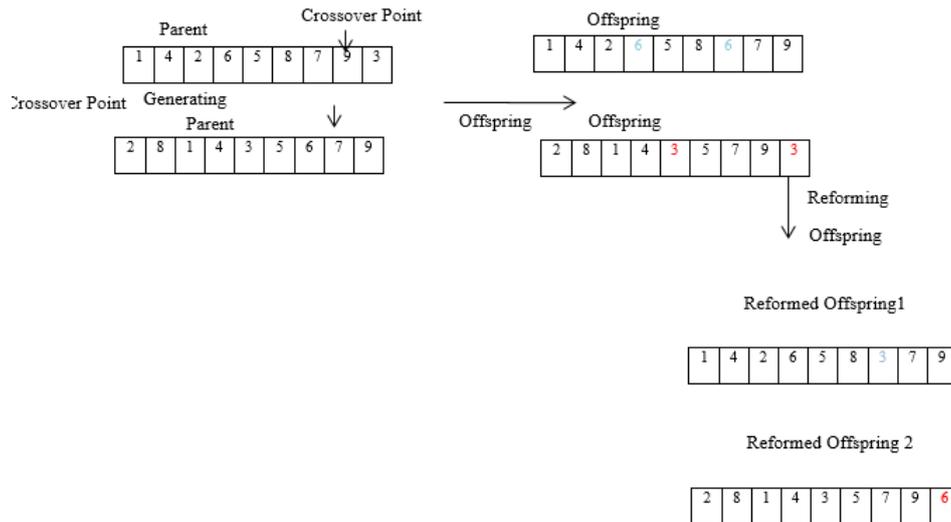
Fig. 4 An example of crossover operation for nine jobs

4.1.4 Mutation

After crossover, the strings are subjected to mutation. Mutation is a genetic operator used to maintain genetic diversity from one generation of a population of genetic algorithm chromosomes to the next. It is analogous to biological mutation. Mutation alters one or more gene values in a chromosome from its initial state. In mutation, the solution may change entirely from the previous solution. Hence GA can come to better solution by using mutation. Mutation occurs during evolution according to a user-definable mutation probability. This probability should be set low. If it is set too high, the search will turn into a primitive random search. The purpose of mutation in GAs is preserving and introducing diversity. Mutation should allow the algorithm to avoid local minima by preventing the population of chromosomes from becoming too similar to each other, thus slowing or even stopping evolution. This reasoning also explains the fact that most GA systems avoid only taking the fittest of the population in generating the next but rather a random (or semi-random) selection with a weighting toward those that are fitter. Referring to Abdoun et al. (2012), five modes of mutation are used in the proposed algorithm to keep diversity of chromosomes in all iterations.

4.1.4.1 Twors Mutation

Twors mutation allows the exchange of position of two genes randomly chosen.
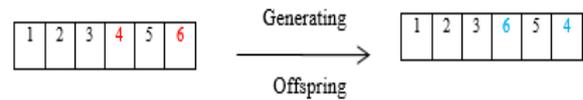
Fig. 5 Mutation operator TWORS

4.1.4.2 Centre inverse mutation (CIM)

The chromosome is divided into two sections. All genes in each section are copied and then inversely placed in the same section of a child.
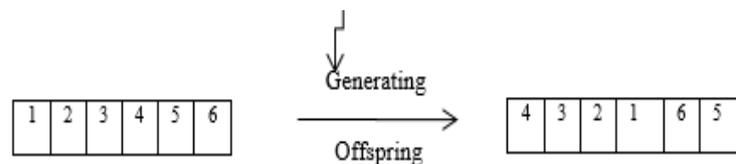
Fig. 6 *Mutation operator CIM*

4.1.4.3 Reverse Sequence Mutation (RSM)

In the reverse sequence mutation operator, we take a sequence S limited by two positions i and j randomly chosen, such that i<j. The gene order in this sequence will be reversed by the same way as what has been covered in the previous operation. The algorithm (Figure 7) shows the implementation of this mutation operator.
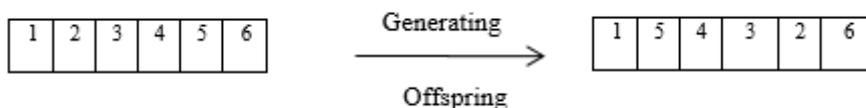
Fig. 7 *Mutation operator RSM*

4.1.4.4 Throas Mutation

We construct a sequence of three genes: the first is selected randomly and the two others are those two successors. Then, the last becomes the first of the sequence, the second becomes last and the first becomes the second in the sequence.
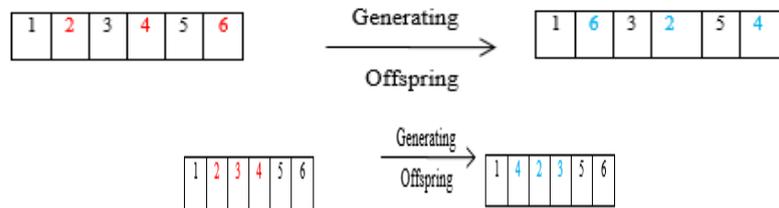
4.1.4.5 Thrors Mutation

Three genes are chosen randomly which shall take the different positions not necessarily successive i < j < l. the gene of the position i becomes in the position j and the one who was at this position will take the position l and the gene that has held this position takes the position i .

Fig. 8 *GA Operators*

4.1.5 Fitness Function

After performance of mutation and crossover operators, the problem has three population which is consist of offsprings, main population and mutants. So the chromosome of these three population according to the quality of their answers and depending on the objective function of the problem are joined together and compose the composed population. In other words the corresponding amount of each chromosome is in the objective function of the problem and the chromosomes with the best answer is chosen. in this paper the amount of the objective function is consist of energy costs and the costs related to makespan which is put according to the amount of buffers obtained among machines and put as fitness of each chromosome. As the size of the buffer gets bigger, the amount of objective function decreases. The reason is that bigger size of the buffer can decrease the number of blocks (blocking product line). So the number of the times that the machine goes stand by and also the number of the times that the machine shuts down and starts again for the operation (setup) decreases and so less energy is used. And also growing the size of buffer makespan decreases, so the total amount of objective function decreases and the fitness increases.

4.2 Simulated annealing

Kirkpatrick et al. (1983), were the first researchers who introduced simulated annealing. Simulated annealing (SA) is a stochastic iterative search algorithm which was successfully implemented by many researchers to solve different optimization problems. The first step of this algorithm deals with the creation of initial solution, then a specific number of neighbors is created for initial solution. In the next step, the neighbors of each solution are compared to each other and the best neighbor is selected. The difference between the objective (fitness) values of a solution (S) and its neighbor (S') is calculated as follows: $(S') - C(S)$, where $C(S)$ denotes the fitness value of solution S. In the problems with minimization objective functions, if < 0 , the base solution (S) is omitted and the best neighbor is replaced with it. Because we have obtained a solution with better objective value, but if $E \geq 0$, then the acceptance of the new (neighbor) solution depends on an exponential probability function called Boltzmann. It helps SA not to be trapped in local optimums, and its formula is as follows: $pr = \exp(^{-E}/_T)$, where T is the Temperature of the algorithm which is reduced by the means of a cooling function in each iteration. This process is repeated for all solutions in all iterations until the stopping criterion is met. The outline of the algorithm is shown in Fig. 9.

Fig. 9 Encoding, Initial solution and fitness function of SA

Encoding form, initial solutions and fitness function of SA are the same as GA and the same methods used in mutation of GA are used to create new neighbors of each solution in SA.

4.3. Parameters of GA and SA

Meta-heuristic algorithms are too sensitive to the value of their parameters and it is important to select a suitable parameter set for each algorithm. In this paper we selected the most effective parameters which seem to have efficient influences on the solutions. GA and SA algorithms are implemented to solve the problem with different solve the problem with different parameters and finally the most proper parameter is selected among the others Parameters of GA have set as follows.

- p_c, is the crossover percentage. Suppose the population size (popsize) is set to be 100, in each iteration we have to create 100 other offsprings, merge them with the old ones and select the best 100 chromosomes. There are two operators to create new offsprings, namely crossover and mutation. p_c is the proportion of the new offsprings made by crossover operator compared to the number of offsprings made by mutation. For example if $p_c = 0.7$, we will have 70 of the new offsprings made by crossover operator.
- p_m, is the mutation percentage. In the implemented GA, $p_m = 1 - p_c$. Hence following the above example, $p_m = 1 - 0.7$ and the number of new offsprings made by mutation operator will be equal to 30.
- Stop criterion is defined in section 5.

Parameters of SA have set as follows.

- Number of neighbors, is the number of new neighbors created for each solution.
- T_0, is the initial temperature. We have used the formula $T_0 = {}^{-E}\!/_{\ln(P_0)}$, to obtain the value of T_0, where E is the difference between the objective values of a solution and its best neighbor, P_0 is the acceptance probability of Boltzmann function in the 1st iteration. The obtained value of T_0 in small size problems is 5.12 and for large scale problems we have used the value 6.64.
- α $(0 < \alpha < 1)$, is the cooling ratio. It is applied to reduce the temperature as the algorithm goes on.
- Stop criterion, is defined in section 5 (same as GA).

5. Computational experiments

Because of the lack of benchmarks for the studied problem, we have generated some sample instances to investigate the efficiency effectiveness of the proposed algorithms. Three types of instances have been generated, namely small size (ARFS), medium size (ARFM) and large size (ARFL) problems. 40 small size, 60 medium size and 48 large scale problems have been generated. Each problem instance is defined by 3 parameters which describe the size of the problem, these parameters are the number jobs (n), the number of machines (m), the number of buffers (b). For small size problems, number of jobs, machines and buffers are as follows respectively: {4, 6}, {2, 3, 5, 7}, {0,1,2,4, ∞}, for medium size instances, the numbers are {8, 10, 15}, {2, 3, 5, 7}, {0,1,2,4, ∞} and for large scale problems, the numbers are: {20, 30, 40, 50}, {10, 12, 15}, {0,2,4, ∞}.

The minimum processing time of jobs, i.e. the time with full power of machines are generated randomly by the uniform distribution [1,100]. Set up energy of machine of each machine is generated by the uniform distribution of $\left[\frac{11}{10}, \frac{50}{10}\right]$. Idle power of each machine is generated by the uniform distribution of $\left[\frac{2}{10}, \frac{50}{10}\right]$. Set up time of each machine is generated by the uniform distribution of [1,20]. Total overhead costs is generated by the uniform distribution of $\left[\frac{5}{60}, \frac{50}{60}\right] \times m$, that m is number of machines. Total electricity costs is generated by the uniform distribution of $\left[\frac{4}{60}, \frac{30}{60}\right]$.

We have used five different values of 0.1, 0.3, 0.5, 0.7 and 0.9 for crossover percentage (p_c) in GA, and therefore the values of p_m will be equal to 0.9, 0.7, 0.5, 0.3 and 0.1 respectively.

As mentioned in section 4, we have used the formula: $T_0 = {}^{-E}\!/_{\ln(P_0)}$ to calculate the values of T_0, and two different values have been obtained for small and large size problems. The values

20, 30 and 0.97, 0.985, 0.99 are selected for parameters nn, α, respectively. So we have six combinations of the values of these two parameters for SA.

For small size problems, we can obtain the optimal solutions by using Lingo software. But because of the complexity of the problem, Lingo is unable to obtain the optimal solutions in time limit of 300 minutes for some medium and all large size problems.

The results of the numerical experiments are given in Tables 2 to 8. The bolded values in column four of Tables 1 to 4 are the optimal solutions obtained by Lingo.

We have used equation (5) to calculate Dev value for the obtained solutions.

$$Dev = \frac{Obj(GA, SA) - Best\ Obj}{Best\ Obj} \times 100 \qquad (5)$$

In which $Obj(GA, SA)$ shows the the answer of GA or SA algorithms and $Best\ Obj$ shows the best answer obtained by the lingo software and SA and GA algorithms.

According to Tables 2 & 3, genetic algorithm with crossover percentage of 0.1 has the best performance and the lowest Dev value for small size problems in comparison with the other parameter settings. Tables 4 and 5 show the same results for medium size problems.

Figure 10 shows the objective values obtained by Lingo and GA with crossover percentage of 0.1 for small and medium size problems. It shows that the performance of GA is better than Lingo to obtain optimal or near optimum solutions.

In the large size problems for obtaining the amount of Dev we use (6) formula. In this formula, $Obj(GA, SA)$ shows the answer of GA or SA algorithms and $Best\ Obj$ shows the best answer obtained by SA and GA algorithms.

$$Dev = \frac{Obj(GA, SA) - Best\ Obj}{Best\ Obj} \times 100 \qquad (6)$$

Tables 6, 7, 8 show the objective and Dev values for large size problems.
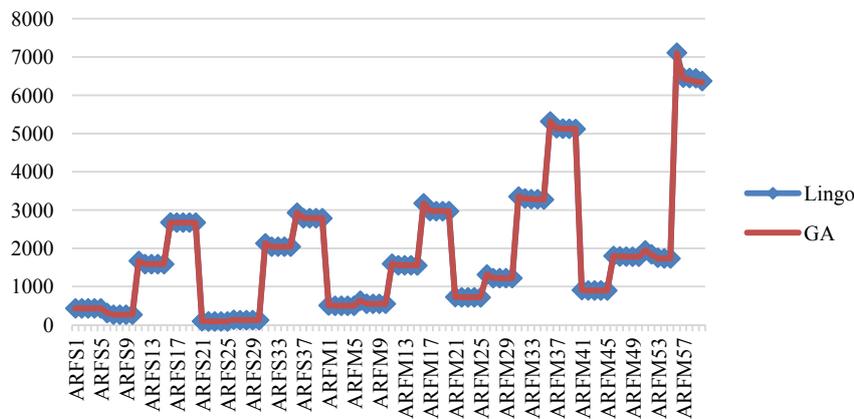

Fig. 10 Comparison between the objectives of Lingo and GA

To have a fair comparison between two algorithms, a time-based stop criterion of $0.2 \times n \times m \times (b+1)$ seconds is used for both algorithms. Table 6 shows the best, worst and mean objective values obtained by GA for each values of after five runs for each instance, and Table 7 shows the results obtained by SA. Bolded values in these tables are the best objective values those have

been reached by the use of all 11 different parameter setting of both GA and SA algorithms. Table 7 shows the *Dev* value of all different cases of GA and SA and the mean deviations show that GA with the p_c of 0.1 has the best performance for large scale problems in comparison with the others.

Table 3 Objective and Dev values of Lingo and GA for small size problems

Instance Name	n	m	b	Lingo	Makespan	$p_c = 0.1$		$p_c = 0.3$		$p_c = 0.9$	
						Mean	Dev	Mean	Dev	Mean	Dev
ARFS1	4	2	0	**432.1326**	317	432.1326	0.00000	432.1326	0.00000	432.1326	0.00000
ARFS2	4	2	1	**430.5105**	315	430.5105	0.00000	430.5105	0.00000	430.5105	0.00000
ARFS3	4	2	2	**430.5105**	315	430.5105	0.00000	430.5105	0.00000	430.5105	0.00000
ARFS4	4	2	4	**430.5105**	315	430.5105	0.00000	430.5105	0.00000	430.5105	0.00000
ARFS5	4	2	∞	**430.5105**	315	430.5105	0.00000	430.5105	0.00000	430.5105	0.00000
ARFS6	4	3	0	**310.9288**	286	310.9288	0.00000	310.9288	0.00000	310.9288	0.00000
ARFS7	4	3	1	**267.3215**	279	267.3215	0.00000	267.3215	0.00000	267.3215	0.00000
ARFS8	4	3	2	**267.3215**	279	267.3215	0.00000	267.3215	0.00000	267.3215	0.00000
ARFS9	4	3	4	**267.3215**	279	267.3215	0.00000	267.3215	0.00000	267.3215	0.00000
ARFS10	4	3	∞	**267.3215**	279	267.3215	0.00000	267.3215	0.00000	267.3215	0.00000
ARFS11	4	5	0	**1671.6182**	468	1671.6182	0.00000	1671.6182	0.00000	1671.6182	0.00000
ARFS12	4	5	1	**1587.6182**	425	1587.6182	0.00000	1587.6182	0.00000	1587.6182	0.00000
ARFS13	4	5	2	**1586.7947**	423	1586.7947	0.00000	1586.7947	0.00000	1586.7947	0.00000
ARFS14	4	5	4	**1586.7947**	423	1586.7947	0.00000	1586.7947	0.00000	1586.7947	0.00000
ARFS15	4	5	∞	**1586.7947**	423	1586.7947	0.00000	1586.7947	0.00000	1586.7947	0.00000
ARFS16	4	7	0	**2676.8394**	556	2676.8394	0.00000	2676.8394	0.00000	2676.8394	0.00000
ARFS17	4	7	1	**2673.4894**	552	2673.4894	0.00000	2673.4894	0.00000	2673.4894	0.00000
ARFS18	4	7	2	**2673.3094**	552	2673.3094	0.00000	2673.3094	0.00000	2673.3094	0.00000
ARFS19	4	7	4	**2673.3094**	552	2673.3094	0.00000	2673.3094	0.00000	2673.3094	0.00000
ARFS20	4	7	∞	**2673.3094**	552	2673.3094	0.00000	2673.3094	0.00000	2673.3094	0.00000
ARFS21	6	2	0	**95.0842**	351	95.0842	0.00000	95.0842	0.00000	95.1397	0.05800
ARFS22	6	2	1	**89.5112**	334	89.5112	0.00000	89.5112	0.00000	89.5112	0.00000
ARFS23	6	2	2	**89.0778**	334	89.0778	0.00000	89.0778	0.00000	89.0778	0.00000
ARFS24	6	2	4	**89.0778**	334	89.0778	0.00000	89.0778	0.00000	89.0778	0.00000
ARFS25	6	2	∞	**89.0778**	334	89.0778	0.00000	89.0778	0.00000	89.0778	0.00000
ARFS26	6	3	0	**132.8124**	528	132.8124	0.00000	132.8124	0.00000	133.7791	0.72700
ARFS27	6	3	1	**123.4331**	453	123.4331	0.00000	123.4331	0.00000	123.833	0.32300
ARFS28	6	3	2	**123.2332**	453	123.2332	0.00000	123.2332	0.00000	123.3664	0.10800
ARFS29	6	3	4	**123.2332**	453	123.2332	0.00000	123.2332	0.00000	123.2332	0.00000
ARFS30	6	3	∞	**123.2332**	453	123.2332	0.00000	123.2332	0.00000	123.2332	0.00000
ARFS31	6	5	0	**2131.2345**	625	2131.2345	0.00000	2131.2345	0.00000	2131.2345	0.00000
ARFS32	6	5	1	**2043.534**	604	2043.534	0.00000	2043.534	0.00000	2043.534	0.00000
ARFS33	6	5	2	**2043.534**	604	2043.534	0.00000	2043.534	0.00000	2043.534	0.00000
ARFS34	6	5	4	**2043.534**	604	2043.534	0.00000	2043.534	0.00000	2043.534	0.00000
ARFS35	6	5	∞	**2043.534**	604	2043.534	0.00000	2043.534	0.00000	2043.534	0.00000
ARFS36	6	7	0	**2930.88**	862	2930.88	0.00000	2930.88	0.00000	2930.88	0.00000
ARFS37	6	7	1	**2787.29**	828	2787.29	0.00000	2787.29	0.00000	2787.29	0.00000
ARFS38	6	7	2	**2787.29**	828	2787.29	0.00000	2787.29	0.00000	2787.29	0.00000
ARFS39	6	7	4	**2787.29**	828	2787.29	0.00000	2787.29	0.00000	2787.29	0.00000
ARFS40	6	7	∞	**2787.29**	828	2787.29	0.00000	2787.29	0.00000	2787.29	0.00000
Mean							0.00000		0.00000		0.03040

Table 4 Objective and *Dev* values of Lingo and SA for small size problems

Instance Name	n	m	b	Lingo	Makespan	α = 0.97 nn = 20		α = 0.97 nn = 30		α = 0.985 nn = 20		α = 0.99 nn = 30	
						Mean	Dev	Mean	Dev	Mean	Dev	Mean	Dev
ARFS1	4	2	0	432.1326	317	432.1326	0.00000	432.1326	0.00000	432.1326	0.00000	432.1326	0.00000
ARFS2	4	2	1	430.5105	315	430.5105	0.00000	430.5105	0.00000	430.5105	0.00000	430.5105	0.00000
ARFS3	4	2	2	430.5105	315	430.5105	0.00000	430.5105	0.00000	430.5105	0.00000	430.5105	0.00000
ARFS4	4	2	4	430.5105	315	430.5105	0.00000	430.5105	0.00000	430.5105	0.00000	430.5105	0.00000
ARFS5	4	2	∞	430.5105	315	430.5105	0.00000	430.5105	0.00000	430.5105	0.00000	430.5105	0.00000
ARFS6	4	3	0	310.9288	286	310.9288	0.00000	310.9288	0.00000	310.9288	0.00000	310.9288	0.00000
ARFS7	4	3	1	267.3215	279	267.3215	0.00000	267.3215	0.00000	267.3215	0.00000	267.3215	0.00000
ARFS8	4	3	2	267.3215	279	267.3613	0.01500	267.3412	0.00007	267.3412	0.00700	267.3613	0.01500
ARFS9	4	3	4	267.3215	279	267.3215	0.00000	267.3215	0.00000	267.3517	0.01100	267.3215	0.00000
ARFS10	4	3	∞	267.3215	279	267.3215	0.00000	267.3314	0.00400	267.3215	0.00000	267.3215	0.00000
ARFS11	4	5	0	1671.6182	468	1671.6182	0.00000	1681.6182	0.60000	1671.6182	0.00000	1681.5390	0.60000
ARFS12	4	5	1	1587.6182	425	1587.6182	0.00000	1587.6182	0.00000	1588.6512	0.06500	1587.6182	0.00000
ARFS13	4	5	2	1586.7947	423	1586.7947	0.00000	1586.7947	0.00000	1586.7947	0.00000	1586.7947	0.00000
ARFS14	4	5	4	1586.7947	423	1586.7947	0.00000	1586.7947	0.00000	1586.7947	0.00000	1586.7947	0.00000
ARFS15	4	5	∞	1586.7947	423	1586.7947	0.00000	1586.7947	0.00000	1586.7947	0.00000	1586.7947	0.00000

Name	n	m	b			Mean	Dev	Mean	Dev	Mean	Dev	Mean	Dev
ARFS16	4	7	0	2676.8394	556	2676.8394	0.00000	2676.8394	0.00000	2676.8394	0.00000	2676.8394	0.00000
ARFS17	4	7	1	2673.4894	552	2673.4894	0.00000	2673.4894	0.00000	2673.4894	0.00000	2673.4894	0.00000
ARFS18	4	7	2	2673.3094	552	2673.3094	0.00000	2673.3094	0.00000	2673.3094	0.00000	2673.3094	0.00000
ARFS19	4	7	4	2673.3094	552	2673.3094	0.00000	2673.3094	0.00000	2673.3094	0.00000	2673.3094	0.00000
ARFS20	4	7	∞	2673.3094	552	2673.3094	0.00000	2673.3094	0.00000	2673.3094	0.00000	2673.3094	0.00000
ARFS21	6	2	0	95.0842	351	95.0842	0.00000	95.0842	0.00000	95.0842	0.00000	95.0842	0.00000
ARFS22	6	2	1	89.5112	334	89.5112	0.00000	89.5112	0.00000	89.5112	0.00000	89.5112	0.00000
ARFS23	6	2	2	89.0778	334	89.0778	0.00000	89.0778	0.00000	89.0778	0.00000	89.0778	0.00000
ARFS24	6	2	4	89.0778	334	89.0778	0.00000	89.0778	0.00000	89.0778	0.00000	89.0778	0.00000
ARFS25	6	2	∞	89.0778	334	89.0778	0.00000	89.0778	0.00000	89.0778	0.00000	89.0778	0.00000
ARFS26	6	3	0	132.8124	528	132.8124	0.00000	132.8124	0.00000	132.8124	0.00000	132.8124	0.00000
ARFS27	6	3	1	123.4331	453	123.4331	0.00000	123.4331	0.00000	123.4331	0.00000	123.4331	0.00000
ARFS28	6	3	2	123.2332	453	123.2332	0.00000	123.2332	0.00000	123.2332	0.00000	123.2332	0.00000
ARFS29	6	3	4	123.2332	453	123.2332	0.00000	123.2332	0.00000	123.2332	0.00000	123.2332	0.00000
ARFS30	6	3	∞	123.2332	453	123.2332	0.00000	123.2332	0.00000	123.2332	0.00000	123.2332	0.00000
ARFS31	6	5	0	2131.2345	625	2131.2345	0.00000	2131.2345	0.00000	2131.2345	0.00000	2131.2345	0.00000
ARFS32	6	5	1	2043.534	604	2043.534	0.00000	2043.534	0.00000	2043.534	0.00000	2043.534	0.00000
ARFS33	6	5	2	2043.534	604	2043.534	0.00000	2043.534	0.00000	2043.534	0.00000	2043.534	0.00000
ARFS34	6	5	4	2043.534	604	2043.534	0.00000	2043.534	0.00000	2043.534	0.00000	2043.534	0.00000
ARFS35	6	5	∞	2043.534	604	2043.534	0.00000	2043.534	0.00000	2043.534	0.00000	2043.534	0.00000
ARFS36	6	7	0	2930.88	862	2930.88	0.00000	2930.88	0.00000	2930.88	0.00000	2930.88	0.00000
ARFS37	6	7	1	2787.29	828	2787.29	0.00000	2787.29	0.00000	2787.29	0.00000	2787.29	0.00000
ARFS38	6	7	2	2787.29	828	2787.29	0.00000	2787.29	0.00000	2787.29	0.00000	2787.29	0.00000
ARFS39	6	7	4	2787.29	828	2798.22	0.39200	2797.15	0.35400	2788.39	0.00039	2796.36	0.32500
ARFS40	6	7	∞	2787.29	828	2797.18	0.35500	2787.29	0.00000	2797.14	0.00353	2787.29	0.00000
Mean							0.01900		0.02400		0.01200		0.02300

Table 5 Objective and *Dev* values of Lingo and GA for medium size problems

Instance Name	n	m	b	Lingo	Makespan	$p_c = 0.1$		$p_c = 0.3$		$p_c = 0.9$	
						Mean	Dev	Mean	Dev	Mean	Dev
ARFM1	8	2	0	507.3121	546	507.3121	0.00000	507.3121	0.00000	507.3121	0.00000
ARFM2	8	2	1	498.9009	434	498.9009	0.00050	499.1509	0.05011	499.7409	0.16837
ARFM3	8	2	2	498.9009	434	498.9009	0.00000	498.9009	0.00000	498.9009	0.00000
ARFM4	8	2	4	498.9009	434	498.9009	0.00000	498.9009	0.00000	498.9009	0.00000
ARFM5	8	2	∞	498.9009	434	498.9009	0.00000	498.9009	0.00000	498.9009	0.00000
ARFM6	8	3	0	630.81	642	630.81	0.00000	630.81	0.00000	630.81	0.00000
ARFM7	8	3	1	552.15	663	552.15	0.00000	552.15	0.00000	552.53	0.06882
ARFM8	8	3	2	549.69	629	549.69	0.00000	549.75	0.01092	549.84	0.02729
ARFM9	8	3	4	549.69	629	549.69	0.00050	549.69	0.00000	549.69	0.00000
ARFM10	8	3	∞	549.69	629	549.69	0.00000	549.69	0.00000	549.69	0.00000
ARFM11	8	5	0	1598.5583	910	1598.5583	0.00000	1598.5583	0.00000	1601.349	0.17458
ARFM12	8	5	1	1557.0355	733	1557.0355	0.00000	1562.0662	0.32309	1557.0355	0.00000
ARFM13	8	5	2	1557.0355	733	1557.0355	0.00000	1557.0355	0.00000	1557.3954	0.02311
ARFM14	8	5	4	1557.0355	733	1557.0355	0.00000	1557.097	0.00000	1557.3731	0.02168
ARFM15	8	5	∞	1552.0662	700	1552.0662	0.00000	1552.0755	0.00000	1552.0762	0.00064
ARFM16	8	7	0	3177.487	940	3177.487	0.01197	3177.3083	0.00000	3177.43	0.01018
ARFM17	8	7	1	2974.37	985	2974.37	0.00000	2975	0.02118	2975	0.02118
ARFM18	8	7	2	2971.15	923	2971.15	0.00050	2971.4417	0.01397	2971.4417	0.01397
ARFM19	8	7	4	2971.15	923	2971.15	0.00000	2971.4417	0.00000	2971.505	0.01195
ARFM20	8	7	∞	2971.15	923	2971.15	0.00000	2971.4417	0.01128	2971.6283	0.01756
ARFM21	10	2	0	727.7255	729	727.6255	0.08437	727.0121	0.00000	727.5266	0.07077
ARFM22	10	2	1	718.5122	681	718.5122	0.00000	718.5122	0.00000	718.5122	0.00392
ARFM23	10	2	2	718.5122	681	718.5122	0.00050	718.5122	0.00000	718.5122	0.00000
ARFM24	10	2	4	718.5122	681	718.5122	0.00000	718.5122	0.00000	718.5122	0.00000
ARFM25	10	2	∞	718.5122	681	718.5122	0.00000	718.5112	0.00000	718.5122	0.00014
ARFM26	10	3	0	1315.0115	829	1315.0115	0.00000	1319.3836	0.33248	1315.8957	0.06724
ARFM27	10	3	1	1222.5296	789	1222.5296	0.00000	1222.5296	0.00000	1223.494	0.07889
ARFM28	10	3	2	1222.5296	789	1222.5296	0.00000	1222.5296	0.00000	1222.9884	0.03753
ARFM29	10	3	4	1222.5296	789	1222.5296	0.00000	1222.5296	0.00000	1222.8329	0.02481
ARFM30	10	3	∞	1222.5296	789	1222.5296	0.00000	1222.5296	0.00000	1222.8329	0.02481

Table 6 Objective and *Dev* values of Lingo and GA for medium size problems

Instance Name	n	m	b	Lingo	Makespan	$p_c = 0.1$		$p_c = 0.3$		$p_c = 0.9$	
						Mean	Dev	Mean	Dev	Mean	Dev
ARFM31	10	5	0	3352.0593	1063	3352.0593	0.05096	3351.9173	0.04672	3352.6818	0.06954
ARFM32	10	5	1	3305.1966	1036	3305.1966	0.04833	3303.6001	0.00000	3308.4358	0.14638
ARFM33	10	5	2	3283.7372	1010	3283.7372	0.03673	3283.7372	0.03673	3283.7372	0.03673
ARFM34	10	5	4	3283.7372	1010	3283.7372	0.00000	3283.7372	0.00000	3283.7372	0.00000
ARFM35	10	5	∞	3274.9061	990	3274.9061	0.00000	3274.9061	0.00000	3274.9061	0.00000
ARFM36	10	7	0	5318.0434	1124	5318.0434	0.00000	5318.0434	0.00000	5318.0434	0.00668
ARFM37	10	7	1	5139.9375	1028	5139.9375	0.04449	5139.688	0.03963	5138.0363	0.00748
ARFM38	10	7	2	5128.0152	1012	5128.0152	0.05224	5126.5662	0.02397	5127.6585	0.04528
ARFM39	10	7	4	5123.2875	1020	5123.2875	0.03382	5123.66	0.04110	5122.1375	0.01137
ARFM40	10	7	∞	5119.0775	1038	5119.0775	0.01240	5119.7675	0.02588	5119.2463	0.01570
ARFM41	15	2	0	910.402	853	910.402	0.04236	910.0165	0.00000	910.0815	0.00714
ARFM42	15	2	1	898.723	761	898.5886	0.27978	897.0869	0.11220	896.0815	0.00000
ARFM43	15	2	2	898.723	761	898.5886	0.26708	896.912	0.08000	896.7802	0.06530
ARFM44	15	2	4	898.723	761	896.561	0.10287	895.71	0.00000	896.5114	0.09733
ARFM45	15	2	∞	898.723	761	896.561	0.16009	895.71	0.06502	896.5114	0.15455
ARFM46	15	3	0	1801.24	1125	1801.24	0.09150	1799.5933	0.00000	1804.5466	0.27525
ARFM47	15	3	1	1786.9466	1022	1782.9466	0.03553	1782.3133	0.00000	1782.3866	0.00411
ARFM48	15	3	2	1784.4	973	1782.2	0.16890	1781.3866	0.12318	1781.7266	0.14229
ARFM49	15	3	4	1781.27	1119	1781.2	0.11118	1781.3266	0.11829	1781.83	0.14659
ARFM50	15	3	∞	1781.27	1119	1781.2	0.17017	1781.3266	0.17729	1781.5033	0.18723
ARFM51	15	5	0	1945.5209	1287	1945.5209	0.08128	1944.6771	0.03787	1945.1943	0.06448
ARFM52	15	5	1	1842.97	1062	1835.8887	0.00000	1837.7205	0.09978	1840.6977	0.26194
ARFM53	15	5	2	1756.62	1052	1733.1944	0.00000	1733.7795	0.03376	1735.7731	0.14878
ARFM54	15	5	4	1737.433	1063	1733.1028	0.03390	1732.5154	0.00000	1736.2767	0.21710
ARFM55	15	5	∞	1734.45	960	1732.4865	0.09958	1732.0066	0.07185	1733.5913	0.16341
ARFM56	15	7	0	7113.25	1567	7106.1205	0.00000	7109.8561	0.06221	7107.017	0.02225
ARFM57	15	7	1	6463.77	1380	6438.2879	0.07591	6433.4041	0.00000	6439.655	0.09716
ARFM58	15	7	2	6451.37	1508	6409.8226	0.09076	6408.5056	0.07020	6408.8179	0.07507
ARFM59	15	7	4	6443.723	1480	6356.9092	0.06981	6355.0682	0.04083	6356.6365	0.06552
ARFM60	15	7	∞	6372.13	1288	6340.0028	0.00000	6343.7085	0.05845	6341.8284	0.02879
Mean							0.03563		0.03746		0.05718

Table 7 Objective and *Dev* values of Lingo and SA for medium size problems

Instance Name	n	m	b	Lingo	Makespan	$\alpha = 0.97$ $nn = 20$		$\alpha = 0.97$ $nn = 30$		$\alpha = 0.985$ $nn = 20$		$\alpha = 0.99$ $nn = 30$		
						Mean	Dev	Mean	Dev	Mean	Dev	Dev	Mean	Dev
ARFM1	8	2	0	507.3121	546	507.3121	0.00000	507.3121	0.00000	507.3121	0.00000	0.00000	507.3121	0.00000
ARFM2	8	2	1	498.9009	434	498.9009	0.00000	498.9009	0.00000	498.9009	0.00000	0.00000	498.9009	0.00000
ARFM3	8	2	2	498.9009	434	498.9009	0.00000	498.9009	0.00000	498.9009	0.00000	0.00000	498.9009	0.00000
ARFM4	8	2	4	498.9009	434	498.9009	0.00000	498.9009	0.00000	498.9009	0.00000	0.00000	498.9009	0.00000
ARFM5	8	2	∞	498.9009	434	498.9100	0.00000	498.9009	0.00000	498.9009	0.00000	0.04398	498.9009	0.00000
ARFM6	8	3	0	630.81	642	630.81	0.00000	630.81	0.00000	630.81	0.00000	0.00000	630.81	0.00000
ARFM7	8	3	1	552.15	663	552.15	0.00000	552.15	0.00000	552.15	0.00000	0.00000	552.15	0.00000
ARFM8	8	3	2	549.69	629	549.69	0.00000	549.73	0.00000	549.81	0.02183	0.00000	549.69	0.00000

Instance	n	m	b	Lingo	Makespan	Mean	Dev	Mean	Dev	Mean	Dev	Dev	Mean	Dev
ARFM9	8	3	4	549.69	629	549.71	0.00000	549.69	0.00000	549.69	0.00000	0.00000	549.80	0.02001
ARFM10	8	3	∞	549.69	629	549.69	0.00000	549.69	0.00000	549.69	0.00000	0.00000	549.69	0.00000
ARFM11	8	5	0	1598.5583	910	1598.5583	0.00000	1598.5671	0.00000	1598.5583	0.00000	0.00000	1598.5583	0.00000
ARFM12	8	5	1	1557.0355	733	1557.1241	0.00000	1557.1352	0.00000	1557.0355	0.00000	0.07255	1559.5674	0.16261
ARFM13	8	5	2	1557.0355	733	1557.0355	0.00000	1557.0355	0.00000	1557.0355	0.00000	0.00000	1557.0355	0.00000
ARFM14	8	5	4	1557.0355	733	1557.0355	0.00000	1557.0355	0.00000	1557.0355	0.00000	000000	1557.0355	0.00000
ARFM15	8	5	∞	1552.0662	700	1552.0662	0.00000	1552.0662	0.00000	1552.0662	0.00000	0.00000	1552.0662	0.00000
ARFM16	8	7	0	3177.487	940	3177.487	0.01197	3177.487	0.01197	3177.487	0.01197	0.01197	3177.487	0.01197
ARFM17	8	7	1	2974.37	985	2974.37	0.00000	2974.37	0.00000	2974.37	0.00000	0.00000	2974.37	0.00000
ARFM18	8	7	2	2971.15	923	2972.1451	0.03764	2971.15	0.00000	2971.15	0.00000	0.00000	2971.1443	0.00000
ARFM19	8	7	4	2971.15	923	2971.15	0.00000	2971.15	0.00000	2971.15	0.00000	0.00000	2971.15	0.00000
ARFM20	8	7	∞	2971.15	923	2971.1661	0.00000	2971.1743	0.00000	2971.15	0.00000	0.00000	2971.15	0.00000
ARFM21	10	2	0	727.7255	729	727.6343	0.08558	727.4466	0.05977	727.6341	0.08556	0.09813	727.7255	0.09813
ARFM22	10	2	1	718.5122	681	718.5034	0.00000	718.4849	0.00000	718.4840	0.00000	0.00000	718.5122	0.00000
ARFM23	10	2	2	718.5122	681	718.5122	0.00000	718.5122	0.00000	718.5122	0.00000	0.00000	718.5122	0.00000
ARFM24	10	2	4	718.5122	681	718.5122	0.00000	718.5122	0.00000	718.5122	0.00000	0.00000	718.5122	0.00000
ARFM25	10	2	∞	718.5122	681	718.5122	0.00000	718.5122	0.00000	718.5122	0.00000	0.00000	718.5122	0.00000
ARFM26	10	3	0	1315.0115	829	1315.0115	0.00000	1315.0115	0.00000	1315.0115	0.00000	0.00000	1315.0115	0.00000
ARFM27	10	3	1	1222.5296	789	1222.5296	0.00000	1222.5296	0.00000	1222.5296	0.00000	0.00000	1222.5296	0.00000
ARFM28	10	3	2	1222.5296	789	1222.5376	0.00000	1222.5296	0.00000	1222.5481	0.00000	0.00000	1222.5296	0.00000
ARFM29	10	3	4	1222.5296	789	1222.5296	0.00000	1222.5296	0.00000	1222.5296	0.00000	0.00000	1222.5296	0.00000
ARFM30	10	3	∞	1222.5296	789	1222.5296	0.00000	1222.5296	0.00000	1222.5296	0.00000	0.00000	1222.5296	0.00000

Table 8 Objective and *Dev* values of Lingo and SA for medium size problems

Instance Name	n	m	b	Lingo	Makespan	$\alpha = 0.97$ $nn = 20$		$\alpha = 0.97$ $nn = 30$		$\alpha = 0.985$ $nn = 20$		$\alpha = 0.99$ $nn = 30$	
						Mean	Dev	Mean	Dev	Mean	Dev	Mean	Dev
ARFM31	10	5	0	3352.0593	1063	3351.6362	0.00000	3352.0044	0.04932	3352.0418	0.05043	3352.0593	0.05096
ARFM32	10	5	1	3305.1966	1036	3305.1746	0.03833	3305.1966	0.04833	3305.1966	0.04833	3305.1966	0.04833
ARFM33	10	5	2	3283.7372	1010	3283.7372	0.04766	3283.7372	0.03673	3283.7372	0.03673	3283.7372	0.03673
ARFM34	10	5	4	3283.7372	1010	3283.7372	0.03673	3283.7372	0.00000	3283.7372	0.00000	3283.7372	0.00000
ARFM35	10	5	∞	3274.9061	990	3274.9061	0.00000	3274.9061	0.00000	3274.9061	0.00000	3274.9061	0.00000
ARFM36	10	7	0	5318.0434	1124	5318.0434	0.00000	5318.0434	0.00000	5318.0434	0.00000	5318.0434	0.00000
ARFM37	10	7	1	5139.9375	1028	5139.9375	0.00000	5139.9375	0.04449	5139.9375	0.04449	5139.9375	0.04449
ARFM38	10	7	2	5128.0152	1012	5129.1943	0.04449	5129.1774	0.07492	5139.9375	0.28486	5139.9375	0.28486
ARFM39	10	7	4	5123.2875	1020	5124.956	0.07525	5124.01991	0.04812	5123.2875	0.03382	5124.2341	0.05231

ARFM40	10	7	∞	5119.0775	1038	5119.0019	0.06640	5119.0118	0.01112	5119.0775	0.01240	5118.4428	0.00000
ARFM41	15	2	0	910.402	853	910.3212	0.01092	910.2115	0.02143	910.402	0.04236	910.402	0.04236
ARFM42	15	2	1	898.723	761	898.666	0.03348	898.594	0.28039	898.723	0.29478	897.2341	0.12863
ARFM43	15	2	2	898.723	761	896.195	0.28842	896.9124	0.08005	898.2150	0.22540	898.723	0.28208
ARFM44	15	2	4	898.723	761	896.012	0.00000	896.8150	0.13122	896.7112	0.11964	897.1943	0.17357
ARFM45	15	2	∞	898.723	761	895.1963	0.04157	898.723	0.40162	896.1542	0.11464	895.1280	0.00000
ARFM46	15	3	0	1801.24	1125	1801.24	0.00000	1801.24	0.09150	1800.8141	0.06784	1801.24	0.09150
ARFM47	15	3	1	1786.9466	1022	1783.9370	0.09150	1783.6050	0.07247	1785.3387	0.16975	1784.6243	0.12966
ARFM48	15	3	2	1784.4	973	1780.19	0.09110	1779.6112	0.02339	1779.1950	0.00000	1780.4370	0.06981
ARFM49	15	3	4	1781.27	1119	1779.2219	0.05592	1779.3114	0.00000	1779.2219	0.00000	1781.27	0.11511
ARFM50	15	3	∞	1781.27	1119	1779.1871	0.00000	1778.1741	0.00000	1781.27	0.17411	1778.237	0.00000
ARFM51	15	5	0	1945.5209	1287	1944.922	0.05697	1944.1774	0.01217	1944.2050	0.01359	1945.388	0.07444
ARFM52	15	5	1	1842.97	1062	1840.568	0.05047	1840.7544	0.26503	1839.371	0.18968	1839.5367	0.19870
ARFM53	15	5	2	1756.62	1052	1744.9271	0.25488	1740.9066	0.44497	1739.7095	0.37590	1739.637	0.37172
ARFM54	15	5	4	1737.433	1063	1735.906	0.67694	1735.7441	0.18636	1733.7536	0.07147	1735.196	0.15472
ARFM55	15	5	∞	1734.45	960	1732.186	0.19570	1731.295	0.03074	1732.687	0.11116	1731.225	0.02669
ARFM56	15	7	0	7113.25	1567	7108.713	0.08222	7108.435	0.04221	7106.5365	0.01549	7105.4357	0.00000
ARFM57	15	7	1	6463.77	1380	6442.763	0.04612	6441.75	0.12973	6435.2766	0.02911	6441.4266	0.12470
ARFM58	15	7	2	6451.37	1508	6421.401	0.14547	6419.7475	0.24574	6417.0431 3313131	0.20351	6419.23	0.23766
ARFM59	15	7	4	6443.723	1480	6368.6273	0.27156	6365.5124	0.20524	6368.476	0.25190	6367.538	0.23713
ARFM60	15	7	∞	6372.13	1288	6344.21 0.25428		6341.143	0.01798	6343.14	0.04948	6344.151	0.06543
Mean							0.05152		0.05111		0.05250		0.05557

The mathematical model is coded and solved by the modeling language Lingo 9.0. Meta-heuristic algorithms are coded in Matlab software, version 2013. A personal computer with the configuration of Core i5 2.5 GHz and 4 GB Ram is applied to solve the test problems.

In the next part the best answers obtained from lingo software and two GA and SA algorithms in the 8 to 10 tables are examined, and the percentage of using *stand by* and *turn off/turn on* in the answers according to the factor of the buffer numbers in theses tables are presented. As shown in the tables increasing the amount of buffer factor the number of setting up decreases. So the number of stand by increases and the number of *turn off/turn on* decreases.

Table 9: Percentage of using stand by and turn off/turn on in small size problems according to the factor of the buffer numbers

Buffer	Stand by	turn off/turn on
0	24%	76%
1	32%	68%
2	44%	56%
4	59%	41%
∞	86%	14%

Table 10: Percentage of using stand by and turn off/turn on in medium size problems according to the factor of the buffer numbers

Buffer	Stand by	turn off/turn on
0	27%	73%
1	35%	65%
2	42%	58%
4	63%	37%
∞	91%	9%

Table 11: Percentage of using stand by and turn off/turn on in large size problems according to the factor of the buffer numbers

Buffer	Stand by	turn off/turn on
0	21%	79%
2	52%	48%
4	67%	33%
∞	97%	3%

5. Conclusion

In this paper we investigated the permutation flow shop scheduling problem with limited buffers and the objectives of the minimization of total energy consumption and makespan. We formulated a mathematical model for the described problem. Since the proposed problem is NP-hard, so two well-known meta-heuristics namely; genetic algorithm and simulated annealing, have been used to produce approximate solutions in a reasonable time. We generated three different sizes of the problem, small, medium and large size problems. Lingo was able to give us the exact solution for all small size problems in time limit of 300 minutes, but for medium and large scale problems, Lingo is inefficient, so GA and SA have been used to reach near optimal solutions. The computational experiments show that with the used parameter settings of the algorithms for all problem sizes GA outperforms SA. At the end the best answers obtained from lingo software and two GA and SA algorithms in the 8 to 10 tables are examined, and the percentage of using *stand by* and *turn off/turn on* in the answers according to the factor of the buffer numbers in theses tables are presented. For future work it's suggested to use some other metaheuristic methods to solve the problem and compare the solutions with the existing ones, or maybe suggest a new heuristic for the problem. In our future research, the proposed algorithm might be extended to other machine environments such as job shop. Another extension is considering multi-objective optimization method such as the Non-dominated Sorting Genetic Algorithm-II (NSGA-II) for the problem.

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FACTORS INFLUENCING EMPLOYEE ENGAGEMENT

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Abstract: The objective of the article is to establish whether individual aspects of employee engagement (i.e., Atmosphere in the workplace, Satisfaction with the management style and Potential fluctuation) show statistically significant differences. It was established via Friedman´s ANOVA test that employee ratings show a statistically significant difference between the specified variables. The Atmosphere in the workplace variable was rated the best, unlike the Management style, with the lowest level of rating. The comparison of the ratings according to age established that workforce aged over 40 show greater satisfaction in the Potential fluctuation variable, hence, they can be considered more stable and loyal employees.

Keywords: Employee engagement, automotive, fluctuation of employees, Friedman´s ANOVA, management

1 Introduction

Great attention has been paid to employee engagement recently. Despite the lack of an exactly uniform designation of engagement or any uniform methodology for how to measure it, the issue has been a point of interest for both academics as well as HR managers. Currently, i.e., in the period of economic growth, companies are doing well. There is a growing demand for their products. Businesses wish to take the opportunity to expand production. A lack of workforce is a common problem. The unemployment rate is low. New employees are more difficult to recruit and keep in the company. It is expensive to recruit new employees in such circumstances. Not only do HR managers endeavour to recruit new staff members but they also pay more attention to current employees they want to keep. So, they care more about the loyalty of their employees since a greater number of employees leaving could be a threat to the company's further growth, competitiveness or, in some cases, its existence.

However, engagement is not only about loyalty to the employer. Kahn (1990) defined employee engagement as a process of getting involved where employees do their best to activate their physical, cognitive and emotional potential in their role at work. At the same time, i.e., as early as in the 1990s, Gallup Inc., a research-based, global performance-management consulting company, started to investigate the issue as well (Truss et al, 2013). According to Reilly and Brown (2008), engagement includes satisfaction with work, motivation and devotion. Other authors who also focused on the issue were Harter, Schmidt and Hayes (2002). They identify engagement as employee involvement in work, their satisfaction with work and enthusiasm for a job. Alfes et al (2010) divides engagement into three areas; intellectual engagement – employees think about the work and look for ways of how to improve it; emotional engagement – employees have a good feeling about the work completed and the results achieved; and the last one is social engagement, with employees actively participating in what is happening and in discussions on how to do things better.

According to Saks (2006), employee engagement comes from the social exchange theory. He anticipates that the interaction between the parties encourages a gradual building of mutual confidence, loyalty and devotion as long as the partners abide by the identified rules of exchange. These rules are typically based on reciprocity or equality, so the action of one party usually causes a reaction from the other party. Employee engagement is not a unilateral but a mutual relationship.

Employee engagement influences the subsequent effectiveness of work (Fatos, 2014; Muscalu, Hulpuş Ioana and Faloba, 2015; Alfes et al, 2013; Shantz, Alfes and Latham, 2016.), which is why it is necessary to pay increased attention to it.

2 Materials and Methods

The above-stated shows that engagement is a complex concept which is divided into individual components by different approaches. In our enquiry, employee engagement was segmented into the following areas: atmosphere in the workplace, satisfaction with the style of management and potential fluctuation. The objective of the research was to identify which of the specified areas will obtain the best or worst ratings by the employees. The next objective was to find out whether the results obtained in the specific areas differ depending on the age of employees.

Automotive bottom-line employees were included in the research group. 315 employees in total were inquired (of which 207 males and 108 females), who work in four different automotive companies in a position of bottom-line workforce. The method selected was a questionnaire. It was inspired by questions from the already mentioned research conducted by Gallup Inc. It comprised 16 items. The items related to specific groups (areas). *Potential fluctuation* includes, for example, the questions: Would you leave if you had an equal offer from another company? Have you considered leaving the company over the last 6 months? Have you been looking for another job? The group of questions designated as *Atmosphere in the workplace* includes, for example, the questions: Are you happy with the atmosphere among coworkers? Have you got a good friend at work? Are your coworkers ready to deliver high-quality work? The third group of questions marked as *Satisfaction with the management style* includes the following questions: Does your superior show interest in you as a human being / Are you treated as a human being by your superior? If you perform well at work, are you recognised for that? Does your superior encourage your development?

Answers to individual questions were evaluated according to the type of answer by the scores 1 to 5, from complete dissatisfaction to absolute satisfaction, or according to the rate of agreement, from definitely not up to definitely yes. The scores of answers to individual questions in each of the three above-stated groups were totalled. Since the groups did not include the same number of items to allow comparability of individual groups, each group was represented by a score obtained as an arithmetic mean of the scores of the answers to individual items.

The following tests were used for statistical processing: normality tests (Lilliefors, Shapiro-Wilk), Friedman´s ANOVA, Wilcoxon test, Kendall´s coefficient of concordance, Mann-Whitney test. The tests were developed in the Statistica and SPSS software.

3 Results

First, a descriptive data evaluation was carried out and then Table 1 was created. It shows the results of the descriptive statistics of each of the three groups.

Table 1: Descriptive statistics (n = 315)

| variable	arithmetic mean	median	minimum	maximum	standard deviation
Atmosphere in the workplace	3.609	3,750	1	5	0.765
Satisfaction with management	3.259	3.333	1	5	0.820
Potential fluctuation	3.389	3.500	1	5	0.857

Source: own processing

Table 1 shows that the highest average score, the highest median and, at the same time, the lowest variability are seen in the Atmosphere in the workplace group. This is also apparent in the boxplot chart in Figure 1.

To verify whether these differences are statistically significant, data characteristics were first established, which influenced the

choice of a suitable test. The authors tested whether the data come from the normal distribution.

The following three histograms of the variables - Potential fluctuation, Atmosphere in the workplace and Satisfaction with the style of management - in Figures 2, 3 and 4, also show the results of the Lilliefors and Shapiro-Wilk normality test. In all three cases and in each of the tests, p-values are lower than the conventional levels of significance, which is why we reject the hypothesis that the data come from normal distribution in all three cases.

Figure 1: Boxplot – Median comparison of monitored variables
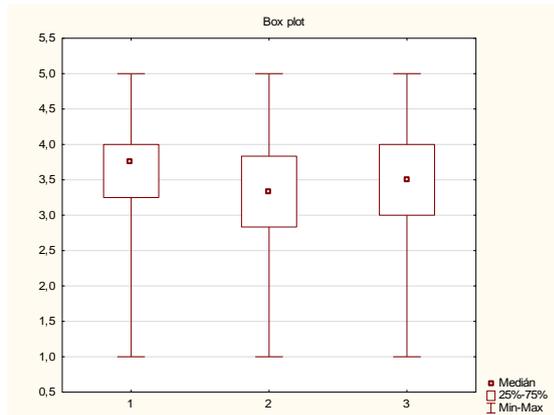

Legend:
1 Potencional fluctuation variable
2 Satisfaction with managament variable
3 Atmosphere in the workplace variable
Source: own processing

Figure 2: Histogram of the Potential fluctuation variable
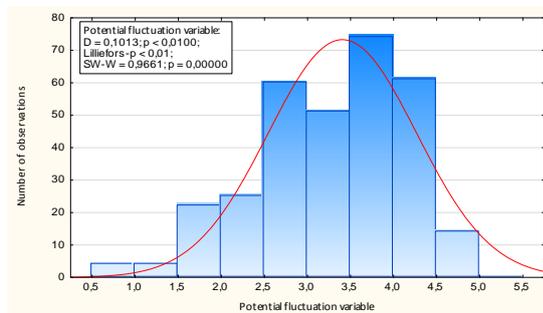

Source: own processing

Figure 3: Histogram of the Satisfaction with the style of management variable
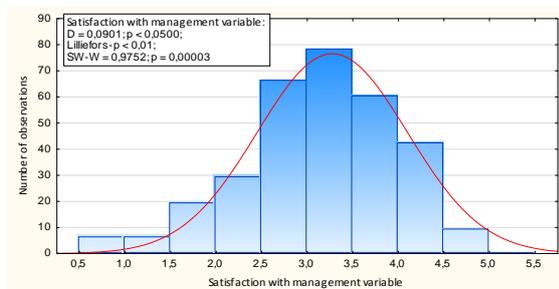
Source: own processing

Figure 4: Histogram of the Atmosphere in the workplace variable
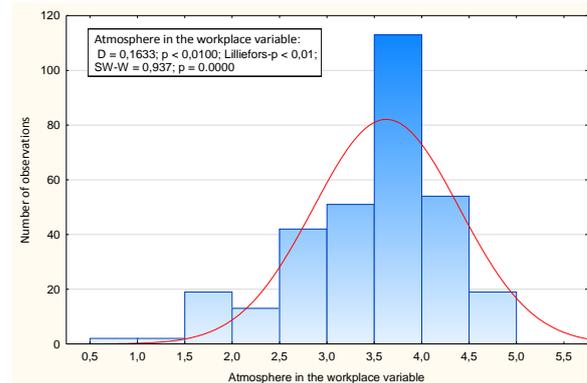
Source: own processing

The results in Figures 2, 3 and 4 show this is not a normal distribution. To estimate the agreement of medians it was necessary to use a nonparametric test. The test can examine whether what was true for the interviewed employees (differences in score medians of all three groups), can be related to the whole basic group (all employees of the examined companies). Friedman´s ANOVA test was selected since random samples were used. The rate of agreement was expressed by Kendall´s coefficient of concordance. The results of Friedman´s ANOVA test and Kendall´s coefficient of concordance are as follows: Friedman´s ANOVA N = 315, degree of freedom = 2, F= 57.97150 p = .00000. The value of the coefficient of concordance is 0.09202.

The results show that the medians of all three groups are not congruent and the evaluations given by employees differ in these three groups. However, the coefficient of concordance is low, so the rate of agreement is weak. To establish the relationship between individual pairs of variables, every three values were tested in pairs by the Wilcoxon test.

Table 2: Testing of the variables of Potential fluctuation, Satisfaction with the style of management and Atmosphere in the workplace

Variable		n	Mean Rank	Sum of Ranks
Satisfaction with management and Potential fluctuation	Negative Ranks	153[a]	142.99	21878
	Positive Ranks	116[b]	124.46	14437
	Ties	46[c]		
	Total	315		
Satisfaction with management and Atmosphere at the workplace	Negative Ranks	72[a]	111.77	8047.5
	Positive Ranks	204[b]	147.93	30178.5
	Ties	39[c]		
	Total	315		
Atmosphere at the workplace and Potential fluctuation	Negative Ranks	112[a]	128.83	13756.5
	Positive Ranks	170[b]	153.8	26146.5
	Ties	33[c]		
	Total	315		

Legend:
a satisfaction with management < potential fluctuation
a satisfaction with management > potential fluctuation
c satisfaction with management = potential fluctuation
d atmosphere in the workplace < satisfaction with management
e atmosphere in the workplace > satisfaction with management
f atmosphere in the workplace = satisfaction with management
g atmosphere in the workplace < potential fluctuation
h atmosphere in the workplace > potential fluctuation
i atmosphere in the workplace = potential fluctuation
Source: own processing

Table 3: Wilcoxon Signed Ranks Test

	Satisfaction with the style of management - Potential fluctuation	Atmosphere in the workplace - Satisfaction with the style of management	Atmosphere in the workplace - Potential fluctuation
Z	-2.916[b]	-8.343[c]	-4.524[c]
Asymp.Sig.	0.004	0.000	0.000

b Based on positive ranks
c Based on negative ranks
Source: own processing

The results of the indicated p-values in Table 3 show that all medians are statistically significantly different. The highest satisfaction is indicated by employees in the Atmosphere in the workplace variable. The worst result of the evaluation is Satisfaction with the style of management.

It was established in the research that 61 questioned persons would leave the company if they had a comparable offer elsewhere. It is a group where the wage is not the reason why employees would leave their current career. The reason for this potential fluctuation can be dissatisfaction with the management style.

It was further surveyed whether age influences the Potential fluctuation variable. The set was divided into two groups according to age (below and over 40). The basic characteristics of both groups are shown in Table 4.

Table 4: Basic characteristics of age-classified groups – Potential fluctuation variable

Potential fluctuation	Employees aged below 39	Employees aged above 40
Arithmetic average	19.66814	22.04494
Median	20	24
Modus	18	25
Standard deviation	5.138141	4.776624
variance	26.40049	22.81614
Kurtosis	-0.18262	0.06407
Skewness	-0.50844	-0.67292
Minimum	6	8
Maximum	30	30
Sum	4445	1962
Number	226	89

Source: own processing

The proved average values as well as the medians and modes show that the group of older respondents provided a higher-value rating on the scale. This was also confirmed by the Mann-Whitney test (U=7290, Z=-3.813, p=0,000). Employees in the group over 40 years of age show greater satisfaction in the Potential fluctuation variable.

The next thing the authors wanted to establish was whether there are significant differences between the age categories in the Satisfaction with the style of management variable, too.

The two groups do not show such a big difference in ratings for Satisfaction with the style of management. The Mann-Whitney test on the agreement of medians also showed limit values (U=8490.5, Z=-2.158, p=0.031). The agreement of medians is not rejected until at 5% of the level of significance. Also in this case, i.e., the questions related to Satisfaction with management, the group of older employees provides more positive ratings.

Table 5: Basic characteristics of age-classified groups – Satisfaction with the style of management variable

Satisfaction with the style of management	Employees aged below 39	Employees aged above 40
Arithmetic average	19.21681	20.42697
Median	19.5	21
Modus	18	21
Standard deviation	4.693436	5.399679
variance	22.02834	29.15654
Kurtosis	0.207443	-0.09739
Skewness	-0.56431	-0.53854
Minimum	6	6
Maximum	28	30
Sum	4343	1818
Number	226	89

Source: own processing

The third variable is Atmosphere in the workplace. Accordingly, the basic characteristics of the groups were developed according to this variable. The results are shown in Table 6.

Table 6: Basic characteristics of age-classified groups – Atmosphere in the workplace variable

Atmosphere in the workplace	Employees aged below 39	Employees aged above 40
Arithmetic average	14.31858	14.74157
Median	15	15
Modus	16	17
Standard deviation	3.1064537	3.050812
variance	9.391386	9.307457
Kurtosis	0.1887478	-0.18406
Skewness	-0.91129	-0.60855
Minimum	4	7
Maximum	20	20
Sum	3236	1312
Number	226	89

Source: own processing

In this case, the ratings of both groups show very little differences in terms of the medium values as well as variability in both groups. The Mann-Whitney test confirmed (U=9132.5, Z=-1.283, p=0.20) that the agreement of medians is not rejected. Hence, the difference in the assessment of satisfaction in the field of the Atmosphere in the workplace variable is not confirmed between the group of younger and older employees.

4 Discussion

The results of the research apparently show that it is very important how happy staff members are with their management. This factor significantly influences the total rate of employee engagement.

The approach of management was looked into by Jenkins and Delbridge (2013) as well. However, their view of management slightly differs from ours. They examined the influence of different styles of management on employee engagement. They selected two businesses for their research. One company had a "soft" management style introduced, the second one had a "hard" management style in place. The "soft" management style company placed emphasis on good relationships between managers and good working conditions, whereas productivity was not a priority. The "hard" management organisation looked primarily for better work performance of the personnel and the objective was to increase the quantity of outputs. The result was

that the "softly" managed company showed much higher engagement than the "hard" managed organisation.

There are other risks in pursuing the "hard" management style. They concern especially employees who show a very high rate of engagement. As the authors Maslach and Jackson (1981) note, such employees are a more endangered group which can develop burnout syndrome. This can result from, for example, long-term work pressure the employees face.

According to Macey and Schneider (2008), company management can increase employee engagement positively if they clearly specify their requirements for work and then fairly evaluate their employees in the fulfilment of their requirements. Such behaviour encourages affection for work in personnel.

Little and Little (2006) come to the conclusion in their study that civil behaviour is manifested in employees in connection with satisfaction with employment and loyalty to the employer. Such behaviour can include willingness to help coworkers, good-will to do more than required at the cost of their own free time or to do one´s best in completing assignments. Little and Little assume that such type of behaviour depends more on the situation in the working environment rather than the abilities of individual personnel.

According to Rees, Alfes and Gatenby (2013) as well, the management style has a great influence on employee engagement. They came to the conclusion that employees show a positive approach if they feel sufficiently respected and valued. Employee performance increases if they have the possibility to discuss problems, share ideas and opinions and if the management listens to them.

Many employers currently face the problem of large fluctuations in employees, particularly in bottom-line positions. Yalabik et al (2013) confirm that staff members who leave are those unhappy at work with prevailing negative emotions. Satisfaction at work and emotional attachment to the employer is for them an essential condition for engagement at work. Many employers currently conduct surveys of employee satisfaction. However, this is not enough. Satisfaction cannot be interchanged with engagement. These are two different variables which closely correlate with each other, though (Ariani, 2015; Gadenne, Sands & Mia, 2012). Further studies have also confirmed that employee engagement positively influences empathy and attention from management and appreciation of good quality work (Mekiš, Maletič and Maletič, 2016).

5 Conclusion

The objective of the investigation was to identify whether individual components of employee engagement (i.e., atmosphere in the workplace, satisfaction with management and potential fluctuation) show statistically significant differences. Friedman´s ANOVA test confirmed that there is a statistically significant difference between the medians of all three groups and the assessment by the employees differs in these three groups. It was also established via the Wilcoxon test that all medians are statistically significantly different. The best ratings (i.e., the greatest satisfaction) was established in the field of Atmosphere in the workplace, the worst ratings (the greatest dissatisfaction) being in Satisfaction with the management style.

Comparing the ratings according to age, workers over 40 show greater satisfaction in the Potential fluctuation questions. Hence, they can be considered more stable and loyal employees than younger staff members (the group aged below 30).

No apparent difference was established in the assessment of the Satisfaction with management variable between the groups. In any case, the over-40 group of employees shows greater satisfaction here as well.

The questions related to Atmosphere in the workplace show no differences between the groups.

Obviously, if employers want to keep their employees, eliminate fluctuation and increase their engagement, they should pay more attention to how the management treats them. The management style was identified and confirmed as the weakest point in current employers. Currently, there is no uniform methodology, however, to measure employee engagement, which makes it rather difficult to compare the findings of individual academic teams. We would like to focus on this issue in our future research.

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Primary Paper Section: A

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IMPORTANCE OF STAKEHOLDER GROUPS IN PURSUIT OF SUSTAINABLE DEVELOPMENT OF MANUFACTURING COMPANIES

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Abstract: In an effort to ensure sustainability, a business cannot be considered as an isolated entity. Enterprises operating in different industries need to take account of the specifics of their business and to place emphasis on developing relationships with relevant stakeholder groups.
The aim of the article was to highlight, on the basis of the quantitative survey and statistical verification, the importance and the development of relations with different stakeholder groups in order to ensure the competitiveness and sustainable development of manufacturing companies.

Keywords: stakeholders, sustainability, manufacturing companies

1 Introduction

Current trends in the society confirm the increasing importance of sustainable development and the active search for ways to achieve it. An important role in this process is played by businesses that shape the economy and society as a whole through their economic activity. What is a prerequisite for achieving sustainability in today's competitive environment? How is it possible to ensure the sustainable development of enterprises in the manufacturing sector? Development trends in this area point to a change in the orientation of businesses from traditional product sales to value delivery to individual stakeholders. Creating value in current market conditions requires the involvement of key competences going beyond one enterprise. In the pursuit of sustainable development, an enterprise must take into account a wide range of stakeholders who have different requirements and ideas in relation to its business. First of all, it has to set up all its departments and the processes in them so that the created and provided value meets the needs and interests of all stakeholders in the economic, environmental and social spheres. If an enterprise prefers the interests and needs of one stakeholder group in the pursuit of its activities while neglecting the requirements of other groups, its approach to business cannot be considered as sustainable. Individual stakeholder groups affect or are affected by the organisation's activities. Many businesses, however, in today's market conditions are still focusing solely on the customer and do not realize that this approach neglecting other stakeholders and their requirements and needs is not sustainable in the long run. For this reason, it is necessary to clarify the importance and the need to develop relations with the various stakeholder groups which ultimately lead to a reduction in transaction costs for companies, better knowledge exchange, more efficient use of resources and the creation of competitive barriers.[1]

2 Literature review

The traditional approach is primarily concerned with perceiving value from the point of view of one stakeholder group - customers who are the focal point of business interest and their perception of the created and provided value is superior to the perception of other stakeholders. This approach can be supported by the argument that, from the point of view of an enterprise, customers are the only stakeholders that bring profit.[2] However, this argument may not always be true, for example, there are printed media that are available to customers - readers for free and the sources of income are the advertisers. It is therefore possible to define a new concept that assumes that profit generation also depends on other stakeholder groups, and thus many of these groups can influence the success of the business. For this reason, customers are not perceived to be the single most prominent business group.[3] Paying attention and providing value to these key stakeholders is an important issue, as their satisfaction is crucial to the success of the business in a highly competitive environment.[4]

Freeman defines a stakeholder as *"any group or individual who can affect or is affected by the achievement of the organization's objectives"*.[5]

Částek defines a stakeholder approach as a view of the organisation as the place of the relationship and interests of stakeholders of the organisation, assuming that the organisation should maximize the benefits for all these groups or maximise the benefits for the groups concerned to maximise their performance.[6] Paying attention to multiple interest groups will provide the enterprise with tangible and intangible resources, including knowledge and reputation, which ultimately create value for business owners.[7] On the basis of the above, it can be stated that it is desirable for an enterprise to take into account the interests of the various stakeholder groups.

The need for stakeholder engagement is also confirmed by Murphy et al., who defined a stakeholder approach as *„nurturing of mutually beneficial, long-term, ethical relationships between stakeholders of a business based on affirmation, integrity, efficiency and equity, in order to create sustainable economic, social and environmental value for all stakeholders"*.[8]

This definition refers to the concept of the triple bottom line, whose implementation leads to the creation of long-term sustainable value for various stakeholder groups of enterprises and thus contributes to their sustainable development.[9]

In the literature, we find different definitions of the term stakeholder. The most frequently cited stakeholders are the customers, employees, suppliers, owners, shareholders and competitors. Other stakeholders are also local communities, financial actors / creditors, State government, local authorities, media, the wide public, the research communities, environmental interest groups and top management of businesses.[10, 11, 12, 13, 14, 15]

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Individual stakeholder groups can be considered in terms of formality or existence of a contractual basis of their relationship with an enterprise, in terms of the willingness of relationship with the enterprise or their importance for the enterprise.[16] In addition, each stakeholder has several attributes that determine the degree of his ability to influence the business, and hence its importance to the business and, ultimately, the degree of attention it receives from the business. Mitchell et al. proposed a model consisting of three attributes, namely:

- power, i.e. the ability of a stakeholder to achieve their goals;
- legitimacy, i.e. the recognition that the requirements are justified;
- urgency, i.e. the call for immediate attention.[17]

On the basis of the quantity of different attributes of each stakeholder can be distinguished *latent stakeholders* (they have only one attribute, so attention from the business gets them only after other stakeholders have been satisfied), *expectant stakeholders* (having two attributes, distinguishing dominant stakeholders with power and legitimacy, dependent stakeholders who have legitimacy and urgency but lack the power to enforce the demands, and dangerous stakeholders who have power and urgency, but their demands are not legitimate and therefore have the potential to harm the business) and the *definitive stakeholders* who have all three attributes and the business's attention to their requirements will be the first.

Based on the results of the research carried out, Myllykangas et al. state that the significance of each stakeholder in the sense of the Mitchell's model is variable over time and therefore the relationships of the enterprise with the individual stakeholders are dynamic processes.[18]

This typology of stakeholders is the most used in scientific literature and in practice. Nevertheless, the above model shows some shortcomings that can be summarised as follows: the three attributes are perceived binary, that is, the stakeholder either has or does not have the given attribute. There is no indication of the degree to which the attribute is available (for example, a stakeholder may have more or less power), but the company needs to have a different approach to stakeholders based on the amount of attributes. Similarly, a stakeholder having all three attributes, but only to a minimum degree, is perceived as a definitive stakeholder requiring priority attention to the business. It follows that different stakeholders having the same attributes, although to a different degree, cannot be ranked according to the Mitchell's model by priority for the enterprise.[19]

In relation to the implementation of sustainable development activities, the distribution of stakeholder groups according to Henriques and Sadorsky is also significant in terms of their impact on sustainable business activities:[20]

- *Regulatory stakeholders* – governmental and local authorities responsible for the adoption of legislative measures in the field, trade unions and associations gathering information on current and forthcoming legislation, informal networks and clusters that are an important source of information, selected competitors, who can become leaders in sustainable activities through the use of new approaches that can become industry-specific standards or can be enshrined in legislation;
- *Organisational stakeholders* – those groups that have direct ties to the business and are directly able to influence its activities. This includes primarily suppliers, customers, employees, top management, and shareholders. These groups give a positive or negative feedback to the business sustainability activities by their actions;
- *Community stakeholders* – local communities, the general public, environmental interest groups and other potential stakeholders that are able to influence public opinion in favour of, or to the detriment of the perceived sustainable business activities;
- *Media* – various types of media have the ability to influence public perception through the dissemination of business information, especially in case of negative events.

This division further served to categorize the individual surveyed stakeholders in the framework of the conducted survey.

3 Methodology and data

The aim of the article was to highlight, on the basis of the quantitative survey and statistical verification, the importance and the development of relations with different stakeholder groups in order to ensure the competitiveness and sustainable development of manufacturing companies. The object of survey was the most important manufacturing companies in terms of turnover, operating in the Slovak industrial market. Of the total of 87 businesses addressed, the total return of 47.12% was reached. 12.64% was comprised of the metallurgical-glass-building industry, 5.75% were enterprises of the food industry, 10.34% enterprises of the printing and reproduction industry and 18.39% enterprises of the machinery industry.

Hypothesis: The importance of individual stakeholder groups depends on the business sector. In order to verify the relationship, a non-parametric Kruskal-Wallis test was used, as the dependent variable was scaled ordinarily, and four independent selections (belonging to one of the four sectors surveyed) were the subject of testing. The use of this method makes it possible to determine the significance of the differences between the medians of the individual independent samples at the chosen significance level, which in the case of hypothesis testing in social sciences in general is standardly set at 0.05.

For the purpose of the above-mentioned study, it was necessary to associate individual stakeholders into homogeneous groups, which were made on the basis of the theoretical backgrounds.[21] The consistency of the individual groups created was then verified by calculating the Cronbach alpha coefficient.

Table 1: Calculation of the Cronbach alpha coefficient for each stakeholder group

Variable	Cronbach alpha
Regulatory stakeholder groups	
- local authorities	0.724
- State government	
Organisational stakeholder groups	
- suppliers	
- financial subjects / creditors	
- competitors	0.764
- top management	
- owners / shareholders	

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- customers		
- employees		
Community stakeholder groups		
- environmental interest groups		
- local communities	0.858	
- wide public		
- research communities		
Media	-	

Source: own processing

For all three newly formed stakeholder groups, the calculated Cronbach alpha coefficient value was higher than 0.7, so that the internal consistency of the groups can be ascertained.[22] The media are a separate stakeholder group and therefore have not been the subject of the internal consistency verification. The key differences between the importance of each stakeholder group for each enterprise on the industrial market are also revealed by the differences identified by descriptive statistics.

Table 2: Indicators of descriptive statistics – minimum, maximum, average, standard deviation

	Min	Max	Mean	Std. deviation
Regulatory	2.50	6.00	3.9634	1.07465
Organisational	4.57	6.71	5.6411	0.61538
Community	1.75	6.50	3.8537	1.29781
Media	1.00	6.00	3.29	1.453

Source: own processing

To measure the intensity of the monotonic relationship between individual pairs of data, the nonparametric Spearman's correlation coefficient was used to test the interdependence between the importance of individual stakeholder groups for business success and the development of relationships with these groups in the companies surveyed.

4 Data analysis

In order to understand the issue of developing relationships with individual stakeholders, it is necessary to clarify the perceived importance of these groups for the success of business in the sectors studied, as well as the actual level of developing relationships with these groups. Respondents replied to the questions through the seven-point Likert scale, where the first point corresponded to a definite unimportance and a definite non-developing of relationships respectively, and the seventh point corresponded to a definite importance and a definite developing of relationships respectively. On the basis of the results obtained, the average response values for each stakeholder group were established, where the average value over 4 represents the importance and the development of relationships respectively and the value under 4 represents the unimportance and non-development of relationships with the given group.

The realised survey shows that the most important stakeholder groups in metallurgical-glass-building industry are organisational (5.40), regulatory (4.59), and community stakeholder groups (4.31). On the contrary, the companies surveyed in this industry do not consider the media to be important for business success (2.64). Companies of the printing industry consider important organisational stakeholder groups (6.20), whereas the regulatory groups (3.50), the media (2.80) and the community stakeholders (2.50) are considered to be of very low importance to the success of the business. Companies of the food industry consider important all the groups studied – organisational groups (5.76), community groups (5.00), media (5.00), as well as regulatory groups (4.16). Enterprises of the machinery industry perceive the most important organisational interest groups (5.56), with regulatory groups (3.56), community groups (3.31) and the media (2.94) not being important.

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In general, it is noted that the most important stakeholders within groups, irrespective of the industry, are suppliers, customers and employees where the average value of responses in all sectors surveyed was greater than 6. In the printing and food industry, owners / shareholders and management are also important – the average responses were also greater than 6 in these cases. For the success of the food business (5.67), the wide public is also important. In the machinery, printing and metallurgical-glass-building industries, one of the least significant groups are the media (average values are approximately at 3.00). However, this claim is not valid for the food industry, where the importance of the media is 5.00. Further differences can be identified with the printing industry, where the least significant groups are the research communities (2.20) and local communities (also 2.20). Unlike the printing industry, the research communities for other industries have significance, with average responses ranging from 4 to 5. There is also a difference in the approach of the food industry and metallurgical-glass-building industry in relation to the local communities, where this stakeholder group is important for business success (the average response value is 4.5-5).

Regarding the comparison of approaches to developing relationships with stakeholders within sectors, some common and distinct features can be observed. It can be said that the metallurgical-glass-building industry develops relations to the greatest extent with the regulatory stakeholder groups (5.63), followed by organisational (5.49) and community stakeholder groups (5.15) and, to a lesser extent, the media (4.91). The printing industry develops relationships with organisational groups (6.14) and does not develop relationships with the regulatory groups (3.30), the media (3.20) and the community stakeholder groups (2.70). Food business companies develop relationships with all stakeholder groups, namely with regulatory groups (5.66), community groups (5.58), organisational (5.42), and media (5.00). Enterprises of the machinery industry develop relationships with organisational stakeholder groups (4.96), and do not develop relationships to a greater extent with regulatory groups (3.68), media (3.56), and community stakeholder groups (3.50).

The internal analysis of the groups studied has shown that enterprises in all four sectors surveyed intensively develop relationships with customers and employees, and do not develop relationships with competitors. However, there are slight differences in the stakeholder groups concerned, in particular in the approach to customers, where the companies in the metallurgical-glass-building sector declared a higher degree of relationship development than the other three sectors, as well as in the approach to competitors where printing and reproduction businesses have reported a higher degree of relationship development compared to other three sectors surveyed. Significant differences can be observed for those groups with which businesses are least likely to develop relationships. For companies in the machinery industry, in addition to competitors (2.56), these are financial groups and creditors (3.19), environmental interest groups (3.25), the wide public (3.38) and State government (3.44). For the other three sectors, however, financial groups and creditors are a relatively significant stakeholder group. Another difference can be observed in the case of scientific research communities with which the enterprises of the machinery and printing industries do not develop relations (1.80 and 3.81 respectively), however the enterprises of the food and metallurgical-glass-building industries do (5.67 and 4.82 respectively). Another difference can be observed in the case of suppliers and top management with which the printing industry enterprises surveyed develop relationships to a maximum extent (7.00), while the other three industries are developing relationships with these groups to a significantly lesser extent.

5 Results and discussion

In order to verify the statistical significance of differences in the importance of each stakeholder group depending on the business sector, a Kruskal-Wallis test was carried out which proves that there are statistically significant differences in the perceived

importance of regulatory groups, community groups and media for business success depending on the business sector, since in these cases the p-value is below the significance level of 0.05. Based on these results, we confirm the hypothesis, as statistically significant differences were confirmed in three of the four groups. In the case of organisational stakeholders, the statistical significance of the differences was not confirmed. This can be justified by the fact that the organisational groups including employees, customers, owners or competitors are about equally important for businesses regardless of their industry.

Table 3: Relation between the importance of stakeholder groups for business success and sector of industry

Variable 1	Variable 2	p-value	Decision
Regulatory groups	Sector of industry	0.015	reject
Organisational groups		0.112	accept
Community groups		0.001	reject
Media		0.001	reject

Source: own processing

In the same way, it is possible to identify whether there are statistically significant relations between the degree of development of relationships with individual stakeholder groups and the sector of industry. Since in all cases the p-value was found to be lower than the established significance level of 0.05 as shown in Table 4, we can say that the degree of development of relationship with the studied groups is dependent on the sector of industry.

Table 4: Relation between developing relationships with stakeholders and sector of industry

Variable 1	Variable 2	p-value	Decision
Regulatory groups	Sector of industry	0.000	reject
Organisational groups		0.022	reject
Community groups		0.000	reject
Media		0.002	reject

Source: own processing

Following the findings, we further investigated the level of correlation between the extent to which the companies surveyed develop relationships with each stakeholder group and the extent to which these groups are important to the success of their business, using the Spearman's correlation coefficient. The goal was to identify whether businesses are focusing their efforts in developing relationships with those groups that are key to them in their business. For regulatory groups, the correlation is at the level of 0.782, for organisational groups the correlation is at the level of 0.755, for community groups the correlation is at the level of 0.842 and for the media the correlation is 0.619. All the above values were determined at a significance level of 0.01. On the basis of the findings, a strong positive correlation can be observed between the degree of development of relationships with individual groups and their importance for business success. Examined companies therefore develop relationships to a great extent with those groups that have the greatest impact on the success of their business.

By creating partnerships with individual stakeholder groups, businesses overcome the constraints resulting from the complexity of the business environment and the range of technologies needed to produce a product that often goes beyond the capabilities of one enterprise. The creation of these important relationships makes it possible to share the unique capabilities of individual companies together, and also contributes to the transfer of knowledge among the partners.

From this innovated point of view on various stakeholder groups of the company, focusing on sustainable aspects, the interests of the various stakeholders are not only taken into account but also,

the cooperation of the enterprises with their key stakeholders is becoming increasingly important.[23]

6 Conclusions

The interest in issue of managing stakeholder relations and the resulting positive impact on sustainable development becomes stronger and stronger. Developing relationships with stakeholders is greatly influenced by the specific conditions in the company's business environment and management priorities in relation to the implementation of individual business activities. Businesses therefore take decisions to develop relationships with specific stakeholders, depending on their belonging to the industry. On the basis of the average responses found within the most important businesses operating in the Slovak industrial market, we identified those stakeholder groups which are relevant to building relationships, depending on the specific business activity.

Identifying significant interest groups and determining the extent of their impact that they are able to apply to an enterprise makes it possible subsequently to take qualified management decisions in relation to these groups. However, in the context of their decision-making processes, businesses should take into account the overall context of their operations, and also the development of relationships with other groups that may be relevant in individual cases. In managing several stakeholder groups, an enterprise may apply a so-called stakeholder marketing.

On the basis of the results of the survey conducted, it is possible to say in general the positive approach of the managers of manufacturing companies operating on the Slovak market to carry out activities in support of sustainable development. On the other hand, there were significant differences in the approach of enterprises to managing relationships with individual stakeholder groups, which affects subsequent decision-making in relation to other activities.

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Primary Paper Section: A

Secondary Paper Section: AH

MODELING AND POWER CONTROL OF DFIG-BASED WIND TURBINES UNDER UNBALANCED GRID VOLTAGE CONDITION

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Abstract: This paper emphasizes on control of a doubly fed induction generator (DFIG) grid-connected wind turbine system to track the highest absorbable power in different wind speeds. This study proposes an improved control strategy for Rotor Side Controllers (RSC) and Grid Side Controllers (GSC) in a Doubly Fed Induction Generator (DFIG) connected to grid using Genetic Algorithm (GA) technic. In this new proposed method, design of DFIG control based on analysis of characteristic functions and DFIG system reaction has been used to estimate wind speed and GA has been employed to obtain favorable features. The main objective of this plan is to control optimal power extracted from wind considering power of characteristic curve speed of DFIG wind turbine. In this paper, GA has been employed in both control methods of RSC and GSC to achieve an optimal output power. Also, MATLAB/SIMULINK software is employed for simulation.

Keywords: wind turbine, power control Doubly Fed Induction Generator (DFIG), Genetic Algorithm (GA)

1. Introduction

Wind turbines are applied in two types of fixed-speed and variable-speed. Fixed-speed turbines have 1% Rotor speed change and are directly connected to grid. In fixed-speed turbines, speed is stabilized to grid frequency and wind speed influences on voltage; it means that speed oscillations are effective in turbine function and output voltage. Rotor speed controlling is possible in variable-speed turbines in which, generators are controlled by power electronic equipment. In this method, power oscillations are controlled by wind changes within rotor speed change.

Variable-speed wind turbines are increasingly becoming substituents of fixed-speed turbines due to their higher power quality and on the other hand, DFIGs are more employed due to their injection ability and reactive power control and no need of capacitors. Presence of active and reactive power controllers to control output power of DFIG-based wind turbines would lead to interference of these controllers with other system modes such as torsional modes of turbine-generators, controller modes of power system, etc.

If unbalanced grid voltage is not considered in DFIG control system, there will be a disruption in grid or harm to wind turbine parts and grid stability. In this case, DFIG-based wind turbines with no control system might be harmed or disconnected from grid due to unbalanced voltage. Vertical Control (VC) is one of technics used to control Rotor Side Controller (RSC) and Grid Side Controller (GSC) that may control active and reactive power.

In this research, a new design method for DFIG control is discussed based on the analysis of characteristic functions and DFIG reaction system. To achieve favorable features, NSGA-LL algorithm was employed. Finally, a model, which indicates reactive power control under unbalanced voltage in DFIG, will be simulated in MATLAB/SIMULINK environment and obtained results will be examined.

2. Research Background

With raising oil prices in 1973, industrial developed countries more paid attention to energy issue and this became the start point of long-term programs in field of energy use optimization and frugality (Zandzadeh and Vahedi, 2014; Choo et al., 2010). Among renewable energy sources, wind energy is more attractive. Wind plant is more used because of its low cost and environmental pollution. One of the most important issues is that the turbine generator should be such controlled to track and generate maximum power in moment. Wind turbine systems equipped with DFIG have numerous advantages (Zamanifar et al., 2014; Kim yet al., 2016; Jiabing and Yikang, 2009). Among induction turbines, doubly fed induction generators have better function than other induction generators. Some of the mentioned advantages include active ad reactive control, grid voltage control, frequency control in grid-disconnected mode, and lack of need to capacitor banks to provide induction generator with required reactive power. DFIG power is controlled through rotor side power electronic controller (Jiabing and Yikang, 2011; SHeate and Gerges, 2013; Hu et al., 2013; Santos-Martin and Rodriguez- Amended, 2010).

In reference (Kim, 2016), voltage control of a DFIG-Based wind power for a grid fault is studied using adaptive hierarchal method and voltage adjustment is done with proportional-integral controllers and filter design. Reference (Firouzi et al., 2016) studied power control and short circuit limitations of wind farms using unified inter-phase power controller. Mathematical and equivalency aspect of circuits was done using equivalent circuit of power system. Also, three-phase short circuit was examined.

Reference (Choo et al., 2010) studied DFIG-based wind system under unbalanced grid voltage. This system was modeled using Synchronous then active and reactive powers were controlled through analysis of functions. In this system, output power of stator was has been compensated by RSC (Rotor Side Convertor).

In reference (Pulgar, 2011) capability of passing fault in DFIG system with high order sliding mode is studied. Control of capability of passing through low voltage in adaptive conditions with DFIG system with design of a controller for this nonlinear system has been done using Genetic Algorithm (NSGA-II).

In reference (Choo et al., 2008), effective factors in disruption and fault in grid such as change in wind speed, which has an important role in rotor flow swings, have been studied providing a genetic algorithm for better performance in DFIG system.

Analysis of mathematical model of DFIG under unbalanced grid voltage has been studied. Flow control of RSC and GSC under unbalanced voltage is examined and finally, simulation of wind power generation system is done in 15MV (Slootweg, 2003; Akhamtov, 2002).

In reference (Hess and Muljadi, 2000), Direct Power Control (DPC) has been studied. Active and reactive power swings with GSC is examined to achieve constant active and reactive power.

In references (Benbouzid et al., 2014; SHeate and Salma, 2013), a proposed model is designed to control RSC and GSC for a wind system to remove swings of these convertors. The result of this design is achieving constant output active power in an unbalanced system.

In reference (Zhang et al., 2011), the effect of wind power on constant frequency of power systems is examined. Also, inertia control, rotor side and angular control are analyzed in different wind speeds (low, moderate, high).

In reference (Harnefors, 2007), analysis of constant frequency modulation in DFIG is studied using three different methods. First method: reducing bandwidth of rotor flow controller, second method: BACK-IMS of high bandwidth control loops and rotor direct flow regulation adapted by flux derivate, third method: biaxial damping system in which, rotor flow is adapted by changes in system parameters such as stator flux and α angle.

In reference (Gardenas et al., 2013), different options including control and operation of brushless DFIG system, direct operations for system control in two balanced and unbalanced grid-connected, sensor-less control, DFIG frequency improvement and voltage drop of equipment were studied.

In reference (SHuhui et al., 2012), DC Vector Control method is presented for DFIG wind system to control direct-current DFIG system, control reactive power, and improve grid voltage under variable-speed wind conditions.

Reference (Tsili and Papathanassiou, 2009) has expressed a review of grid technical codes and connections for system operators.

In reference (Hailling et al., 2012), integrated modeling and Enhanced Control of DFIG under Unbalanced and Distorted Grid Voltage Conditions is presented with extensive mathematical operations, negative sequences and low-order harmonics of grid voltage as well as enhanced control of this system under unbalanced grid voltage conditions.

In reference (Behera et al., 2016), pitch control is used for Wind Energy Conversion System (WECS) in high wind speeds to keep constant output (speed and frequency). The proposed model in this study is designed based on a discrete model of grid-connected WECS including Line to Grand (LG) error. In this study, Proportional-Integral (PI) controllers with K_p and K_i interests in angle control loop was used. Proportional and Integral interests of K_p and K_i are adjusted in optimization process of Particle Swarm (PSO) and Pattern Search (PS). Comparison of two different target functions with their weight coefficients is provided in this paper.

Yancai Xiao et al., 2016, presented a paper to examine accuracy and speed of reaction of permanent magnet direct drive (PMDD) wind turbines. In their research, they proposed a fuzzy PI controller with a new control method for wind turbine convertors. The objective of this control strategy is to achieve a general optimization for quantization factors (K_e, K_{ec}) and scale factors (K_{up}, K_{ui}) in a fuzzy PI controller with improved PSO method. Advantages of improved PSO and fuzzy controller strength can be used in optimization process control.

In reference (Syahputra and Soesanti, 2016), DFIG control scheme of wind power using ANFIS Method is proposed. This design proposed to control a part of wind speed in power grid system. In this paper, wind turbine is derived by a DFIG, which have AC power supply in distribution grid.

In reference (Jamal et al., 2016), a paper is presented for performance evaluation of wind turbine with doubly fed induction generator (DFIG). In this research, directed control stator flux has been used for performance of variable-speed DFIG. Controlling generator excitation current, stator EMF domain is regulated by grid voltage domain.

In general, wind turbines are divided to four categories. Two types of A and B are induction generator-based that Type A provides fixed-speed operation and type B provides variable-speed operation with limited domain (Choo et al., 2008). Swinging the transmitted power to the grid due to changes in wind speed is a major defect of turbines type A and B; C and D types of wind turbines, which are DFIG-based and Permanent Magnet Synchronous Generators-based (PMSG), respectively, provide variable-speed operation in a more extensive interval. The main advantage of latter (types C and D) is reducing swings of output power and extraction of maximum power from wind. Configuration of type C is the most common option in wind farm projects.

Mechanical power of wind turbine extracted from wind is calculated by following formula:

$$P_t = \frac{1}{2}\rho A v_\omega^3 C_\rho \tag{1}$$

Where, P_t is extracted power from wind turbine, ρ is air density, A is the area swept by the rotor, v_ω is wind speed, and C_p is power coefficient of wind turbines. Power coefficient of C_p is a function of pitch angle of rotor blade (β), design type of blades and ratio of blade speed to wind speed (λ) and is calculated as follows:

$$C_p(\lambda, \beta) = 0.5176\left(\frac{116}{\lambda_i} - 0.4\beta - 5\right)e^{21/\lambda_i} + 0.0068\lambda$$

$$\lambda_i = \left(\frac{1}{\lambda + 0.08\beta} - \frac{0.035}{\beta^3 + 1}\right)^{-1} \; ; \; \lambda = \frac{\omega_{tur}R}{V_\omega} \tag{2}$$

Where, ω_{tur} is angular speed of blade and R is blade length.

Wind turbine consists of blades, central shaft, low-speed axis, gearbox, high-speed axis and generator. Increase in generation power level of wind turbines up to 8MW and having some unique features such as high inertia of turbine opposed low inertia of generator as well as low stiffness coefficient of axis have led to modulation of wind generator-turbine collection in two mass three mass groups. Modes related to these masses are

called torsional modes and oscillations related to them are called torsional oscillations. Interference of other power system components with turbine-generator shaft would drive torsional modes and increase torsional oscillations imposed to shaft; therefore, interference between system modes and torsional modes should be accurately examined. In figure 1, three-mass model is illustrated. In fact, mechanical part of wind turbine is modeled with three masses; hence, six stat variables are considered for it, which are as follows:

$$\omega_{gen}, \omega_{hub}, \omega_{blade}, \theta_{gen}, \theta_{hub}, \theta_{blade} \tag{3}$$

Mass1=blade
Mass2=hub
Mass3=Gearbox, Low Speed Shaft, Generator
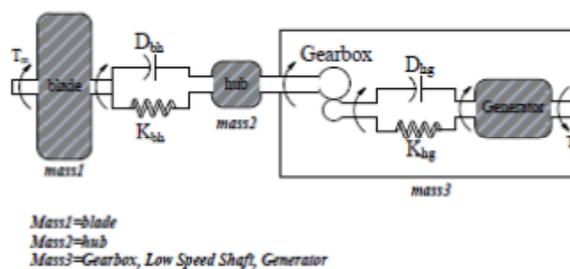
Figure 1. Components of three-mass model for wind generator-turbine system (Slootweg, 2003)

Equation 4 indicates electrical-mechanical balance relations of all three masses after transmitting to generator.

$$\frac{d\omega_{blade}}{dt} = \frac{1}{2H_{blade}}\begin{bmatrix} T_m - K'_{bh}K^2_{gear}(\theta_{blade} - \theta_{hub}) \\ -D'_{bh}K^2_{gear}(\omega_{blade} - \omega_{hub}) \end{bmatrix}$$

$$\frac{d\theta_{blade}}{dt} = \omega_{blade}$$

$$\frac{d\omega_{hub}}{dt} = \frac{1}{2H_{hub}}\begin{bmatrix} -K'_{bh}K^2_{gear}(\theta_{hub} - \theta_{blade}) \\ -K_{hg}K_{gear}(K_{gear}\theta_{hub} - \theta_{gen}) \\ -D_{hg}K_{gear}(K_{gear}\omega_{hub} - \omega_{gen}) \\ -D'_{bh}K^2_{gear}(\omega_{hub} - \omega_{blade}) \end{bmatrix}$$

$$\frac{d\theta_{hub}}{dt} = \omega_{hub}$$

$$\frac{d\omega_{gen}}{dt} = \frac{1}{2H_{gen}}\begin{bmatrix} -T_e - K_{hg}(\theta_{gen} - K_{gear}\theta_{hub}) \\ -D_{hg}(\omega_{gen} - K_{gear}\omega_{hub}) \end{bmatrix}$$

$$\frac{d\theta_{gen}}{dt} = \omega_{gen}$$

(4)

In these equations, ω_{blade}, ω_{hub}, and ω_{gen} are related to blades, central hub, and generator rotor, respectively and H_{blade}, H_{hub}, and H_{gen} are inertia of blades, hub, and generator, respectively. θ_{blade}, θ_{hub} and θ_{gen} are angular displacements related blades, hub, and generator. D_{bh} is damping coefficient between blades and hub, D_{hg} is damping coefficient between central hub and generator rotor. K_{hb} is stiffness coefficient between blades and hub, K_{hg} is stiffness coefficient between hub and generator. K_{gear} is the conversion ratio of gearbox, T_e is electrical torque, and T_m is aerodynamic torque supplied by wind.

The other technic used in this paper is GA. GA is a member of calculative models adopted from evolution trend. These algorithms code potential solutions of an issue in frame of simple chromosomes and then operate combined operators on these structures. Genetic Algorithms are usually recognized as a method for functions optimization, of course these algorithms are more widely used (Syahputra and Soesanti, 2016; Shir and B¨ack, 2005; Limouzade, 2013). Genetic Algorithm is different with search methods, which use random selection for their search methods, because this algorithm does not behave randomly in search space although uses chance and accident to define decision-making methods (Michalewicz, 1994). Genetic Algorithm follows probability rules not definite rules (Jamal et al., 2016).

3. New Theory

First, an initial population is chosen randomly without considering any specific criterion. Fitness amount is determined for all zero generation chromosomes (individuals) considering processing function that can be simple or complex. Then, a subset is chosen from initial population is chosen using different defined mechanisms for selection operator and then mutation and crossover operations is implemented on the elected individuals if it is required based on the problem.

Now, these individuals, who are affected by GA mechanism, should be compared to individuals of initial population (zero generation) based on fitness value. (Certainly, it is expected that individuals of initial generation have more competency in accordance with once implementation of GA on them; however, it is not mandatory). However, there would be some individuals with highest fitness value and such individuals are the initial population for the next step of GA.

Every replication in algorithm step would create a new generation that tends to be evolved due to modifications received. It is worthy noted that although Genetic Algorithms have no sound mathematical base, have shown their effectiveness as an accurate executive model that can be simply implemented.

General scheme of an algorithm is as follows:

Start: Generate random population of n chromosomes (suitable solutions for the problem)

Evaluation: Evaluate fitness f(x) of each chromosome x in the population

New population: Create a new population by repeating following steps until the new population is complete

Selection: Select two parent chromosomes from a population according to their fitness (the better fitness, the bigger chance to be selected)

Crossover: With a crossover probability cross over the parents to form a new offspring (children)

Mutation: With a mutation probability, mutate new offspring at each locus (position in chromosome)

Accepting: Place new offspring in a new population

Replace: Use new generated population for a further run of algorithm

Based on experience, the number of population would be better between 10 and 160. Initial population size is usually related to coded set. For instance, if chromosomes are 32-bit in a problem, the selected initial population should be surely more than the state, in which chromosomes are 16-bit.

Usually, jumping probability expected to between 80 and 95%, mutation probability 0.5-1% and population size 20-30 members. Then, a real value (that indicates chromosomes' value) is given to selected chromosomes in accordance with a fitness function and GA steps continue.

We now consider equivalent circuit of DFIG illustrated in synchronous reference system in figure 2, in order to match this method with present problem (Xu and Agelidis, 2002).
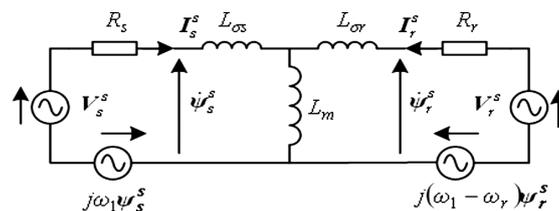

Figure 2. Equivalent circuit of DFIG in synchronous reference system

Stator and rotor voltage vectors in synchronous reference system are expressed as follows:

$$V_s^s = R_s I_s^s + j\omega_1\psi_s^s + \dot{\psi}_s^s \qquad (5)$$

$$V_r^s = R_r I_r^s + j(\omega_1 - \omega_r)\psi_r^s + \dot{\psi}_r^s \qquad (6)$$

Where, ψ_s^s is stator flux, ψ_r^s is rotor flux, I_s^s is stator circuit and I_r^s is rotor circuit in synchronous reference system.

According to the figure above (2), stator and rotor vectors are as follows:

$$\psi_s^s = L_s I_s^s + L_m I_r^s \qquad (7)$$

$$\psi_r^s = L_r I_r^s + L_m I_s^s \qquad (8)$$

If these equations are combined, will obtain:

$$I_s^s = \frac{\psi_s^s}{\sigma L_s} - \frac{L_m \psi_r^s}{\sigma L_s L_r} \qquad (9)$$

Stator flux domain is calculated as follows:

$$|\psi_s| = \left|\int (V_s - R_s I_s)dt\right| \approx \left|\int V_s dt\right| \qquad (10)$$

With presumption of constant grid voltage and regardless of stator copper losses, stator flux domain will be constant in above equation. Therefore, input active and reactive power from grid is as follows:

$$P_s = -k_\sigma \omega_1 |\psi_s||\psi_r|\sin\theta \qquad (11)$$

$$Q_s = k_\sigma \omega_1 |\psi_s|(|\psi_r|\cos\theta - \frac{L_r}{L_m}|\psi_s|)$$

In which, θ is angle of rotor and stator flux vectors in following figure 3 and k_σ is defined as follows:

$$k_\sigma = \frac{1.5 L_m}{\sigma L_s L_r} \qquad (12)$$
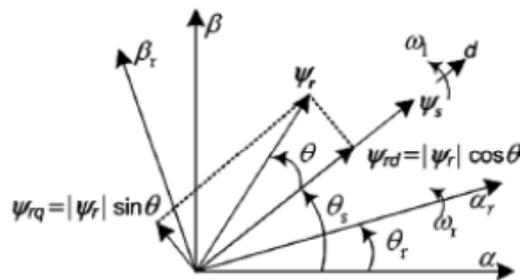
Figure 3. Spatial relation between stator flux, rotor flux and rotor voltage

As can be seen in figure 3, stator flux is on the axis d of synchronous reference system; therefore, $\left|\psi_s\right| = \psi_{sd}$. The

$$P_s = -k_\sigma \omega_1 \psi_{sd} \psi_{rq}$$

$$Q_s = -k_\sigma \omega_1 \frac{L_r}{L_m} \psi_{sd}^2 + k_\sigma \omega_1 \psi_{sd} \psi_{rd}$$

This equation indicates that active power with ψ_{rq} regulation

and reactive power with ψ_{rd} are independently controlled.

Principles of DC (direct-control) predictive power consist of following aspects:

$$P_s = -k_\sigma \omega_1 \psi_{sd} \psi_{rq}$$

$$Q_s = -k_\sigma \omega_1 \frac{L_r}{L_m} \psi_{sd}^2 + k_\sigma \omega_1 \psi_{sd} \psi_{rd}$$

Therefore, a fast dynamic response power control and a constant switching frequency will be obtained.

$$\delta P_s(k) = P_s^*(k) - P_s(k)$$

$$\delta Q_s(k) = Q_s^*(k) - Q_s(k)$$

At the end of sampling period, active and reactive power errors should be zero, which means:

$$\delta P_s(k+1) = P_s^*(k+1) - P_s(k+1) = 0$$

$$\delta Q_s(k+1) = Q_s^*(k+1) - Q_s(k+1) = 0$$

Therefore, power changes during sampling period are as follows:

$$\Delta P_s(k) = P_s(k+1) - P_s(k) = P_s^*(k+1) - P_s^*(k) + \delta P_s(k)$$

$$\Delta Q_s(k) = Q_s(k+1) - Q_s(k) = Q_s^*(k+1) - Q_s^*(k) + \delta Q_s(k)$$

On the other hand, we have:

$$P_s^*(k+1) = P_s^*(k)$$

$$Q_s^*(k+1) = Q_s^*(k)$$

Therefore, power changes during K sampling period are as follows:

$$\Delta P_s(k) = \delta P_s(k)$$

$$\Delta Q_s(k) = \delta Q_s(k)$$

equations provided for active and reactive power can be revised as follows:

(13)

1)	Vector space modulation is used to generate suitable voltage vectors during constant sampling period.
2)	To calculate required rotor voltage directly during a constant sampling period, the following power model can be used:

(14)

(15)

Active and reactive power errors at the beginning of sampling period are calculated as follows:

(16)

(17)

(18)

(19)

(20)

Therefore, the objective of DC predictive power is to generate required high power changes using correct rotor voltage. Since stator flux is constant, active and reactive power changes during a short sampling period is projected as follows:

$$\Delta P_s = -k_\sigma \omega_1 \psi_{sd}(k) \Delta \psi_{rq}(k) \tag{21}$$

$$\Delta Q_s = k_\sigma \omega_1 \psi_{sd}(k) \Delta \psi_{rd}(k)$$

Rotor flux changes also are calculated as follows:

$$\Delta \psi_r^s = \int_{Ts} (V_r^s - R_r I_r^s - j\omega_s \psi_r^s) dt \tag{22}$$

Rotor flux changes are obtained as follows:

$$\Delta \psi_{rd}(k) = \psi_{rd}(k+1) - \psi_{rd}(k) = [V_{rd}(k) - R_r I_{rd}(k) + \omega_s \psi_{rq}(k)]T_s \tag{23}$$

$$\Delta \psi_{rq}(k) = \psi_{rq}(k+1) - \psi_{rq}(k) = [V_{rq}(k) - R_r I_{rq}(k) - \omega_s \psi_{rd}(k)]T_s$$

Rotor voltage is obtained from mentioned equations:

$$V_{rd}(k) = R_r I_{rd}(k) - \omega_s \psi_{rq}(k) + \frac{1}{T_s} \frac{\Delta Q_s(k)}{k_\sigma \omega_1 \psi_{sd}(k)} \tag{24}$$

$$V_{rq}(k) = R_r I_{rq}(k) + \omega_s \psi_{rd}(k) - \frac{1}{T_s} \frac{\Delta P_s(k)}{k_\sigma \omega_1 \psi_{sd}(k)}$$

$$V_r^s(k) = V_{rd}(k) + jV_{rq}(k) = R_r I_r^s(k) + j\omega_s \psi_r^s(k) + \frac{1}{T_s} \frac{\Delta Q_s(k) - j\Delta P_s(k)}{k_\sigma \omega_1 \psi_{sd}(k)}$$

Regardless of rotor resistance, theses equations can be simplified as follows:

$$V_{rd}(k) = -\omega_s \psi_{rq}(k) + \frac{1}{T_s} \frac{\Delta Q_s(k)}{k_\sigma \omega_1 \psi_{sd}(k)} \tag{25}$$

$$V_{rq}(k) = \omega_s \psi_{rd}(k) - \frac{1}{T_s} \frac{\Delta P_s(k)}{k_\sigma \omega_1 \psi_{sd}(k)}$$

$$V_r^s(k) = j\omega_s \psi_r^s(k) + \frac{1}{T_s} \frac{\Delta Q_s(k) - j\Delta P_s(k)}{k_\sigma \omega_1 \psi_{sd}(k)}$$

Also, we have:

$$\psi_{rq} = -\frac{P_s}{k_\sigma \omega_1 \psi_{sd}} \tag{26}$$

$$\psi_{rd} = \frac{Q_s + k_\sigma \omega_1 \dfrac{L_r}{L_m} \psi_{sd}^2}{k_\sigma \omega_1 \psi_{sd}} \tag{27}$$

Substituting equations above, will obtain:

$$V_{rd}(k) = \omega_s \frac{P_s(k)}{k_\sigma \omega_1 \psi_{sd}} + \frac{1}{T_s} \frac{\Delta Q_s(k)}{k_\sigma \omega_1 \psi_{sd}(k)} \tag{28}$$

$$V_{rq}(k) = \omega_s \frac{Q_s(k) + k_\sigma \omega_1 \dfrac{L_r}{L_m} \psi_{sd}^2}{k_\sigma \omega_1 \psi_{sd}} - \frac{1}{T_s} \frac{\Delta P_s(k)}{k_\sigma \omega_1 \psi_{sd}(k)} \tag{29}$$

As can be seen, rotor side convertor (RSC) can be controlled in this method if machine, voltage and stator circuit parameters are given. Now, these two voltages are transferred to rotor reference system and changed to three-phase voltage using reverse Park conversion. This voltage is given to vector modulation to provide required pulses for RSC.

4. Simulation Result

Genetic Algorithm was used in this research and data related to DFIG existed in MATLAB software was used in proposed GA strategy. Wind speed is assumed constant (10m/s) in this model. The applied circuit in MATLAB software is for a 120 kv system. It should be mentioned that real time simulation (RTS) is used to control software loops or accelerate model speed, control, and test. This time was predetermined value usually equal to 5, 10, or 20 ms and used to read input signals such as sensors, calculations, controlling algorithms and to control analog/digital outputs. Genetic Algorithm is applied to obtain and control measured power values to grid and the purpose is to make control parameters equal to reference values or close to them. Generated reference active power is determined based on wind speed and mentioned feature in wind turbine, whereas, reactive power, as a determinant for reactive power conversion performance, is considered for loss compensation. This paper has studied a wind system with DFIG connected to grid through a back-to-back convertor. Generator side convertor regulates generator speed and grid side convertor controls reactive power. The purpose of controller and proposed algorithm is to control input active power to generator and to control bus reactive power of generator terminal side under different states such as load change, error and presence of non-linear load. Control parameters are determined by GA optimization algorithm for a better performance. Results of simulation indicate ability of proposed control strategy. To keep turbine speed in considered value, Direct Torque Control with 1.09 PU was applied. To regulate controllers and optimization with GA, considered target functions were designed. Target function of RSC is as follows:

$$F_1 = \int \left| (i_{dr_{ref}} - i_{dr}) \right| + \left| (i_{qr_{ref}} - i_{qr}) \right| + \sqrt{v_{dr}^2 + v_{qr}^2} \tag{30}$$

Also, to have better control and obtain favorable parameters, target function of GSC was added as follows:

$$F_2 = \int \left| (i_{dg_{ref}} - i_{dg}) \right| + \left| (i_{qg_{ref}} - i_{qg}) \right| + \sqrt{v_{dg}^2 + v_{qg}^2} \tag{31}$$

Where, i_{qg}, i_{dg}, i_{qr}, i_{dr}, v_{dg}, v_{qg}, v_{dr}, and v_{qr} are circuit and voltage factors for RSC and GSC. The purpose of designing proposed target function is to minimize flow on TSC and GSC in circuits and functions related to grid as well as flow of RSC. In addition to controlling flows (i_{qg}, i_{dg}, i_{qr}, i_{dr},), voltage reduction, which might be realized through related conditions to (v_{dg}, v_{qg}, v_{dr}, v_{qr}), is done to minimize losses in power system. Therefore, the applied GA method is an optimal method to find favorable parameters in both RSC and GSC controllers in order to optimize target functions. DC voltage (external loop) and grid flow (internal loop) can be controlled optimizing control parameters of system. Realization of considered objectives is done as follows:

First: use of GA for both RSC and GSC using target functions F1 and F2.

Second: use of GA for RSC only for optimizing first target function that is related to rotor side convertor (RSC).

Interest coefficients, control parameters, and favorable values obtained using GA are indicated in tables 1 and 2 and the obtained results are illustrated in figures 4-8.

Table 1. Gain control of first option

coefficients	LB	UB	Genetic Algorithm
Kp1	0	0.01	0.0061
Ki1	0.01	0.1	0.01733
Kp2	1	10	2.5709
Ki2	400	600	400.0042
Kp3	0	0.1	0.001
Ki3	1	20	15.082
Kp4	0.05	1	0.05035
Ki4	1	0	1.0175

Table 2. Gain control of second option

| coefficients	LB	UB	Genetic Algorithm
Kp3	0	0.1	0.013
Ki3	1	20	1.34
Kp4	0.05	1	0.054
Ki4	1	20	10.589
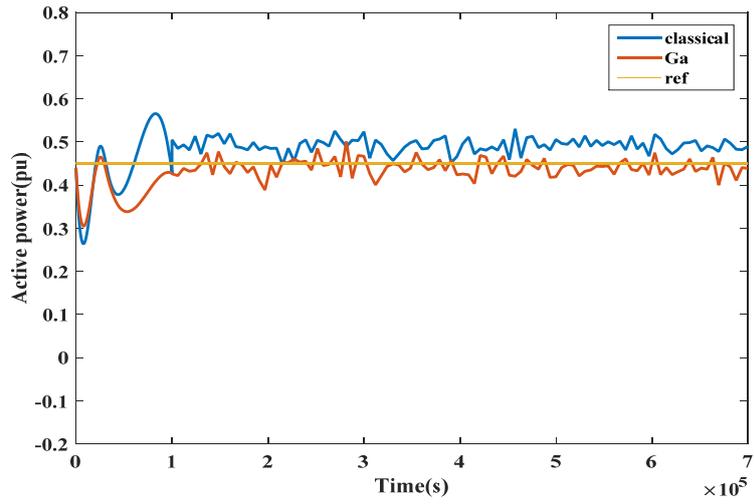
Figure 4. Active Power
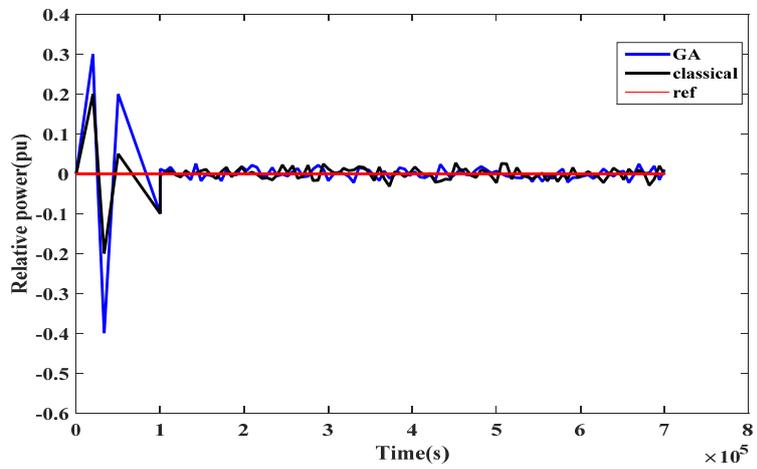
Figure 5. Reactive Power
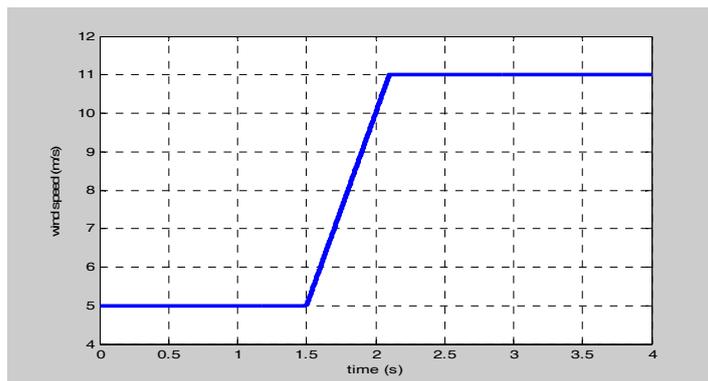

Figure 6. Wind speed changes curve
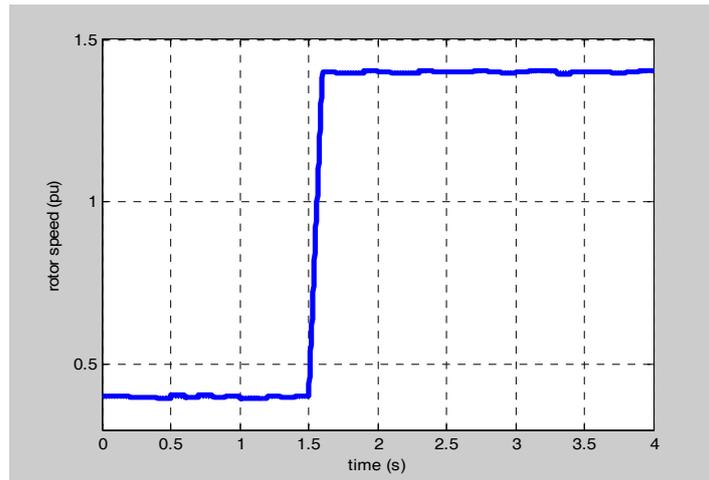
Figure 7. Rotor speed changes
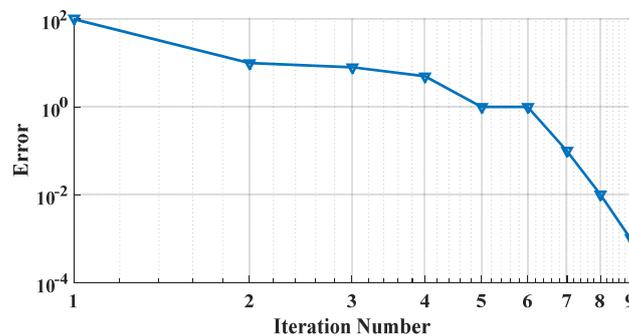
Figure 8. Reduction in errors with iteration

5. Conclusion

As can be seen, convergence to references signal is done well and performance is better in GA. In different time intervals, wind speed changes and non-linearity of loads are applied and these options can be seen as blue color in figure of reference signal. With optimizing parameters, although we have some positive and negative errors in different intervals such as 1-2 seconds and 2-5 seconds, error average is a minor value and optimized signal follows reference signal properly and is capable of removing errors and oscillations.

Error level from reference values will be reduced with iterations and in almost 40st iteration, error value is negligible. Convergence speed is illustrated in figure 8 properly using GA.

In this paper, a new strategy was proposed using GA to control direct active and reactive powers in a DFIG system. This proposed method was used besides a suitable voltage vector selection based on the stator flux position and errors of active and reactive powers to eliminated problems related to rotor flux estimation. Results obtained from simulation indicate that the proposed GA method adjusted with target function would provide the best control parameters in RSC loop and GSC of DFIG to achieve the optimal power from wind speed.

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FIGHT WITH THE "WHITE HORSES" IN SLOVAKIA AND THE DISQUALIFICATION REGISTRY

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Abstract: The author focuses on the topic of the position of the companies´ statutory bodies in relation to the current trends of the legal science and judiciary. The article is specifically dedicated to fight with the "white horses" in Slovakia and with the disqualification registry. The author analyses current situation with the executive directors and the tools for fighting against the abuse of the position of the executive directors/ statutory bodies of the company. Author brings closer view to relatively new institute of the disqualification registry in Slovakia and analyses the establishment of the disqualification registry in Slovakia with possible impact of criminal law on the position of the statutory bodies of the business companies in Slovakia.

Keywords: statutory body, discretionary power of the statutory body, "whitehorse", disqualification registry, criminal liability.

1 Introduction

Limited Liability Company became the mostly used corporate vehicle in Slovak legal environment for the performance of many entrepreneurial plans of Slovak businessmen. Limited liability of the company and relatively low amount of initial capital needed by the members (shareholders) to establish the company plays very important role for Slovak businessmen when it comes to starting a business. That means that more than 90% of the business companies within Slovak Republic are represented by limited liability companies.[1]

In every fictitious legal person there are natural persons standing behind the legal person that "vitalize" the company itself. In case of limited liability company, these natural persons are company members (shareholders), who contribute to the entrepreneurial activity with their initial monetary or non-monetary contribution and executive directors who represent the "brain" of the company. The executive director acts within the law and its legal boundaries including the boundaries set in the Articles of Association of the company. Executive directors make fundamental decisions connected with the day-to-day business linked with the entrepreneurial activities of respective companies.

Executive directors are considered to be a neuralgic part of the limited liability company and are the subject of many academic debates initiated by legal scholars including attorneys practicing law. The person of the executive director is subject to severe and tight legal regulation as for his performance as the executive director and for the liability connected therewith. Slovak legislator is aware of executive directors´ importance and therefore limits them with the duty of care and loyalty. Executive directors are obliged to exercise their powers with professional care, in accordance with the interests of the company and all of its shareholders while having sufficient information base. Executive director does not enjoy an advantage of the limited liability as the shareholders but he might be held liable for the harm caused to the company and to be obliged to compensate the company also by using his personal assets.

2 Comparison of Slovak legal regulation with foreign legal regulation

In terms of Slovak Civil Code[2], legal acts in the name of the company are executed by its statutory body. Legal regulation set forth in Slovak Civil Code is considered to be the general legal regulation related to all types of the legal persons. This legal regulation is supplemented with an Article 133 of the Slovak Commercial Code which stipulates that the company's statutory body consists of one or more executive officers and that the executive director within this company may only be a natural person. Exact specification of the statutory bodies´ position is further stipulated in Article 13, section 1 of the Slovak Commercial Code which sets forth that a legal person (legal entity) shall act through its statutory body or its representative.[3] Legal persons might act either in person or in representation. Acting in person is deemed to be acting of the company´s statutory body on behalf of the company. Doctrine of "ultra vires" shall not be applied within Slovak legal regulation. This legal regulation means that the statutory body might act on behalf of the company in full scope of the company´s legal personality granted by law. Legal acts executed by the statutory bodies of the legal persons are deemed to be the legal acts of the legal persons themselves. We distinguish direct and indirect acts of the company itself, while direct acts of the company are considered to be the acts executed by its statutory body. Acts executed by the company´s representative are considered as indirect acts of the company. The acts are executed on behalf of the company and at its expense.

Slovak Commercial Code expressly stipulates who is the statutory body of respective business companies. It is very important to mention that these provisions are imperative (not optional) which means that the parties cannot stipulate otherwise in the Articles of Association, Agreement of Association or bylaws. According to Slovak legal system, acts of the statutory body are considered to be acts of the company itself. Such direct acts of the executive director represent different situation when compared to the situations when proxy[4], legal representative[5] or agent (attorney) acts on behalf of the company. Slovak legal view mentioned hereinabove completely differs from most of the foreign countries legal regulation. Those foreign legal rules are based on the fact that the acts of the company´s statutory body are the acts of the company´s attorney or proxy and therefore they are not considered to be the direct acts of the company itself.[6]

The executive director of the limited liability company may only be a natural person. Legal regulation that does not allow legal persons to be the executive director of the company is rather rare. For instance Dutch or British legal regulation allows the legal persons to be the statutory body of the companies. Except for the legal requirements stipulated for the executive directors by law, the companies in their Articles of Association or bylaws are allowed to prescribe more various requirements for the executive directors to comply with. In practice, the companies modify their Articles of Association or bylaws and stipulate stricter requirements for the executive directors in the queries concerning gained knowledge (degree) of the executive directors or experience in the field of company´s business activities.[7] Executive directors shall be aware of such specific regulation in the companies´ internal documents. Special requirements are inserted into these documents as for the fact that the shareholders have strong incentives for their company to be managed by the persons who adhere to all the necessary requirements and who will be able to govern the company properly in order to make profit. While performing as executive director of the company, the director is obliged to act with due care which is aligned with certain standard of knowledge. From my point of view, it is

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[1] Other types of companies in Slovak Republic are represented by an unlimited company, a limited partnership and a joint stock company.
[2] Article 20, Section 1 of Slovak Civil Code

[3] See more: LUKÁČKA, P.: Aktuálne otázky výkonu funkcie konateľa s.r.o. In Sborník příspěvků 5. mezinárodní vědecké konference doktorandů a mladých vědeckých pracovníků Karviná : Obchodně podnikatelská fakulta, 2012, p. 192-198, ISBN 978-80-7248-800-1
[4] Article 14 of Slovak Commercial Code
[5] Article 15 and 16 of Slovak Commercial Code
[6] VÍTEK, J.: Odpovědnost statutárních orgánů obchodních společností. Praha: Wolters Kluwer ČR, 2012, s.65, ISBN 978-80-7357-862-6
[7] LUKÁČKA, P.: Zodpovednosť štatutárneho orgánu spoločnosti s ručením obmedzeným za škodu spôsobenú pri výkone svojej pôsobnosti. In: Míľniky práva v stredoeurópskom priestore 2011. Zborník z medzinárodnej vedeckej konferencie doktorandov a mladých vedeckých pracovníkov. 1. Vyd. Bratislava: Univerzita Komenského v Bratislave, Právnická fakulta, 2011, p. 177

significantly important for the executive director to get proper education and to educate himself continuously as well as to gain information from respective business area of expertise.

3 Roots of Establishment of the disqualification registry

According to previous lines related to position of the executive director in the limited liability company I assume that it is really necessary to address developing legal regulation of disqualification registry in Slovak Republic and at least partially approach the functioning system of such registry.

Legislative Intent of Act on Disqualification Registry[8] introduced the legislator´s activity as the legal regulation which shall not constitute another administrative burden for the entrepreneurs, but this regulation intends to emphasize enforcement of already-existing duties of executive directors. Such intent has been transformed into law as we will disclose later. After making short analysis of actual and valid Slovak legal framework related to liabilities of statutory and supervisory bodies of limited liability companies, I conclude that current legislator´s solutions in this area shall be seen as insufficient for the long-term viewpoint. Such conclusion is based on a fact that hereinabove mentioned legislation shall serve as the protective mean for the creditors of the business companies, but fails to meet the purpose of such legislation. Protection of creditors should be enhanced by the doctrine of minimal capital requirements of the capital companies. Truth to be said, the institute of minimal capital requirements pursued and supported by the European Union does provide only illusion of the protection for the creditors.

4 Minimal capital requirements

Minimal capital maintenance is currently being discussed by many scholars within European Union. Current trends following these discussions tend to lower the minimal amount of capital that shall be initially invested into the company as for the amount of 1€. On the one hand, there is even slighter protection of creditors by lowering the minimal capital requirements and the satisfaction of the creditors might be endangered. On the other hand, high capital requirements for national companies are seen as a competitive disadvantage when compared to other types of companies established under other member-state law, which allows the companies to be established while using minimal capital funds. High capital requirements are seen as extra costs for the companies trying to move the company into another legislative regime within European Union free market.[9]

Based on aforementioned, we can say that legal regulation of statutory and supervisory bodies liabilities seems as the most vital tool for creditors´ protection. To conclude, the legislator is entitled to enact stricter legal requirements for supervisory and statutory bodies of the company as for their liability for the harm incurred by the company. Slovak Commercial Code does not specifically stipulate legal requirements for the person that intend to become members of statutory or supervisory bodies. On the other hand, every company that runs a business based on the Trade Certificate issued by the Trade Registry of Slovak Republic shall comply with certain minimal legal requirements related to statutory bodies of the company that are contained in the Trade Licencing Act and in other particular legal acts related

thereto.[10] General requirements according to Article 6 of the Act on trade law include[11] impeccability, which is proved by an extract from the police record. Another requirement for statutory body is to be at least 18 years old and to have his residence in Slovak Republic or in any European Union member state. The same applies for OECD members. Moreover, there is a incompatibility restriction based on the Slovak Commercial Code meaning that the member of statutory body of the company shall not simultaneously be a member of the supervisory board.[12] Even though I will address the liability of executive directors in the last chapter of my monograph, I find it necessary to address the basics of this doctrine in the following lines. Clarification of basic executive director´s liability principles and principles related to drawing the consequences of illegal behaviour and sanctions imposition is necessary for better understanding of the topic.[13]

Concerning the capital character of the limited liability company there is more detailed legal regulation concerning the executive director liability when compared to other non-capital personal companies, limited partnership for example. Standards of executive director´s performance are legally stipulated by general obligation to act on behalf of the company while maintaining certain level of expertise and due care. Standards of such care consist of two elements which are professional care and loyalty towards the company and her members.

5 Professional care and potential actions against executives

Article 135a of Slovak Commercial Code pointedly enumerates obligations of the executive director of the limited liability company. There is a liability of executive director arising in case of breach of these obligations. Liability of the executive director might also arise when breaching other obligations than pointedly enumerated in the Commercial Code because of the fact that executive director is liable for breach of every obligation that is vested into statutory body scope of action.[14] Breach of obligation occurs in case of violation of obligations stipulated by law, Articles of Association, bylaws or obligations stipulated by company´s general meeting decisions.[15]

When reviewing the statutory bodies liability for damages incurred by the company there is a significant importance of the Article 261, section 6, subsection a) of Slovak Commercial Code. This article stipulates that the relationship between the statutory body and the company itself shall always be considered as commercial law obligation. Therefore, the liability of company´s statutory body will always be reviewed and governed by the Commercial Code as for the nature of the relationship between the statutory body and the company. In Slovak law, the relationship that will always be governed by Commercial Code rather than Civil Code is called an "absolute commercial relationship". Moreover, article of Commercial Code stipulating that such relationship is always governed by Commercial Code is imperative which means that the parties might not stipulate otherwise and they always have to adhere to such regulation. Due to the aforementioned facts, an executive director of Limited Liability Company bears objective liability for the harm/damages incurred by the company when he is acting on behalf of the company.

In practice, there are some discrepancies when it comes to enforcement of the company´s claims against the statutory body

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[8] See: https://lt.justice.gov.sk/Material/MaterialWorkflow.aspx?instEID=-1&matEID =403&langEID=1
[9] Proposal on the regulation related to the European Company; COM (2008) 396/3; Explanatory report, 7th explanation of the In order to facilitate start-ups, the Regulation sets the minimum capital requirement at €1. The proposal departs from the traditional approach that considers the requirement of a high minimum of legal capital as a means of creditor protection. Studies show that creditors nowadays look rather at aspects other than capital, such as cash flow, which are more relevant to solvency. Director-shareholders of small companies often offer personal guarantees to their creditors (e.g. to banks) and suppliers also use other methods to secure their claims, e.g. providing that ownership of goods only passes upon payment. Moreover, companies have different capital needs depending on their activity, and thus it is impossible to determine an appropriate capital for all companies. The shareholders of a company are the best placed to define the capital needs of their business. Available at: http://ec.europa.eu/internal_market/company/docs/epc/proposal_en.pdf, http://ec.europa.eu/prelex/detail_dossier_real.cfm?CL=sk&DosId=197172

[10] Such conditions are stipulated by an Act 483/2001 Z. z. on banks, Act No. 95/2002 Z. z. on insurance companies, Act No. 594/2003 Z. z. on collective investments, Act No. 429/2002 Z. z. on stock exchange functioning etc..
11 Act No. 455/1991 Coll. on trade law as amended
12 Article 139, section 2 of Commercial Code
13 For criminal sanctions see: MEZEI,M.: System of criminal sanctions In Corporate criminal liability : (in the Czech Republic, Slovakia and Poland) Brno : Masaryk University, 2016. p. 125-143, ISBN 978-80-210-8382-0
14 As for the term liability, see: LUKÁČKA,P.: Teoretické východiská pojmu zodpovednosť v slovenskom právnom poriadku In Zodpovednosť za vady diela: Wolters Kluwer, 2016, s. 60-67, ISBN: 978-80-8168-416-6.
[15] For the closer view on the potential claims against the executive directors see: LUKÁČKA, P.: *Vybrané aplikačné problémy uplatňovania zodpovednosti voči konateľom s.r.o.* In: Bratislavské právnické fórum 2013 [elektronický zdroj]. Bratislava : Univerzita Komenského, Právnická fakulta, 2013.

of the company. Commercial Code intends to maintain and support the right of the company for indemnification against the statutory body of the company when the company is harmed. Therefore, there are the company law institutes that broaden the liability of the executive director company not only in relation to company itself and company´s shareholders but also in relation to the third parties. There is a so-called "shareholder action" according to an Article 122 of Commercial Code that allows the shareholder himself to bring action against the statutory body in the name of the company. There is another special institute called "the creditor action" stipulated by the Article 135a of the Commercial Code.

The basis for bringing hereinabove mentioned creditor action against the statutory body of the company is the existence of the creditor´s claim against the company where the statutory body is performing. Another prerequisite for the creditor action is the fact that the claim cannot be satisfied from company´s assets because of the fact that they are insufficient for setting the claim. If these two mentioned criteria are met, the creditor is entitled to bring a legal action against the statutory body of the company (debtor). Creditor action is brought in the name of the creditor and on his own account. The amount of money that is cause of the creditor action is legally limited. The limitation of money to be sued from the company´s statutory body is set as the exact amount of the creditor´s claim including the claim accessions.

The creditor action (lawsuit) may be successfully filed only in case that the statutory body of the company failed to perform within due and professional care and therefore the damage was incurred by the company itself. Even though the institute of creditor action seems as a solid protective measure for the creditors, the creditors still face difficulties while lodging for their claims. The position of the creditor in the court proceedings is complicated as for the fact that the creditor is obliged to prove the company´s claim against the statutory body (the creditor de facto bears the burden of proof), to prove the existence of the creditor´s claim against the company concurrently with the fact that creditor´s claim cannot be satisfied from company´s assets which are insufficient for setting the claim. Failure to bear the burden of proof by the creditor means that the creditor action will be unsuccessful. From my point of view, the institute of "creditor action" does not really serve as efficient protective manner for the creditors. From the creditor´s position, there is a huge difficulty to prove the director´s failure to perform with due care and causal connection with the harm incurred by the company. Moreover, potential court hearing fees and costs in connection with the length of such court hearing in Slovak Republic are the main reasons for lack of an interest to file the creditor action and initiate court proceedings. In case that the company has ceased to exist or the shares have been transferred to a person that "can´t be traced" [16], the creditor´s claim in fact becomes unenforceable. In practice, nothing prevents the former shareholders and members of the statutory bodies from continuing with the dubious business activities by using newly-created business entity.

From the general point of view we can say that the term professional care of company´s executive director is not defined by law. The same applies to the terms "honest business relations" or "good manners". I share the same opinion as Vítek[17] that such rules, which lawmaker intentionally does not define, lay down advanced demands on judges. On the other hand, it offers bigger discretion for judges to make a decision

pursuant to specific circumstances of the case and also to take into account current situation of both parties to the case. The basic element of professional care in a sphere of Slovak legal system is that law prescribes only indefinite legal provisions relating to executive director´s duty of professional care while performing on behalf of the company. It means that law prescribes main standard of care which statutory body or its member is obliged to adhere to when fulfilling duties given by law or company´s Articles of Association.

Allow me to stress slightly more precise and appropriate legal regulation of executive directors´ liability. My aim is not to criticise Slovak legal regulation, but I would like to point at Czech legal regulation which consistently distinguishes between the terms "care of the prudent treasurer" and professional care". The Czech Commercial Code stipulates for statutory body members to perform actions on behalf of the company with care of the prudent treasurer. In other words, executive director, while performing on behalf of company, should act with due care such as prudent administrator while performing his own affairs. The explanatory report of the Czech Commercial Code mentions that the standard of care should be reasonable. Such care shall be defined as due, proper and preferring the interests of the company itself. There is no need to be professionally qualified when it comes to care of the prudent treasurer for executive directors, while acting on behalf of a company. On the other hand, there is a necessity to handle company´s affairs as efficiently as possible. It is presumed that executive director who is properly acting on behalf of company is able to recognize when professional help from qualified authority is necessary. Furthermore, in such cases he is capable to provide such qualified authority to help for the company. [18]

6 Criminal law consquences[19]

The difference between terms professional care and care of the prudent treasurer can be illustrated by decision issued by Supreme court of Czech Republic, identification number 5 Tod 875/2009, which dealt with reasonable care of executive director, while acting on behalf of a company. Supreme Court stipulated that according to care of the prudent treasurer, the executive director performs legal acts concerning the business company responsibly and studious. He is also required to keep and maintain the property of the company equally as his own property. Such care undoubtedly contains care of company´s assets not just in the sense to prevent damages on such property by its decrease or devaluation but also in the sense in which assets are invested and valorised as much as possible in current market conditions. Performance of the executive director with care of the prudent treasurer does not presume executive director to have all the professional skills, which are connected to position of the statutory body of the company. The basic element of care of the prudent treasurer is the ability to recognize potential damages for the company and to prevent damages from occurring. Moreover, care of prudent treasurer includes duty of statutory body member to recognize when professional help of specially qualified entity is needed and to supply the company with such help. The proceedings with the statutory body were held in front of criminal court so the court reviewed the actions of the executive director also from criminal law aspects.

If the executive director fails to comply with the standards of care of the prudent treasurer while administering the assets of the company (the entrusted assets), the executive director might be found guilty according to the respective articles of the Criminal

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[16] A person who can´t be traced shall be understood as socially weak person that is willing to acquire a company. Such person obtains small amount of money in order to acquire the company with the debts amounting to millions of euros. Such person also becomes an executive director of the company. Such person does not continue in the entrepreneurial business of the company. It is very common that such person is he shareholder and the executive director in more than company at the same time. Next type of these persons is represented by persons that are in position of the executive directors of the companies but they act in accordance with the instructions of the third persons (shadow directors, shadow shareholders). Such situation established the violation of Slovak law as the law forbids the situations related to the shadow directors.
[17] VÍTEK, J.: Odpovědnost statutárních orgánů obchodních společností. Praha: Wolters Kluwer ČR, 2012. s.137, ISBN 978-80-7357-862-6

[18] Decision of the Supreme Court of Czech Republic marked 5 Tdo 1224/2006 says that the executive director shall act with act of the prudent treasurer. This means that the executive director does not have to be gifted with all the professional characteristics. The executive director shall have at least basic knowledge sufficient to recognize the harm that might occur. The care of the prudent treasurer entails the duty of the executive director to recognize that the professional help is needed. Therefore, executive director shall be capable of ensuring such professional help for the company.
19 For further specification of criminal liability see: LACIAK, O.: Some notes about criminal law in the Slovak Republic In Shizuoka law journal no. 4 (March 2012), p. 107-114, ISSN 1882-7306.

Code. The Criminal Code protects the standards of the relationship between the company as the legal person and the executive director as a natural person who is entrusted with the company´s assets. The Court expressed that the executive director of the limited liability company is the person entitled to deal with the company´s assets in order to maintain the assets and to valorise them but despite these facts, he cannot administer them arbitrarily as his own property. If the executive director fails to comply with the duty of careful maintenance of the company´s assets and causes damages to the third persons (creditors for instance), under certain circumstances he might be found guilty under the Article 239 of the Slovak Criminal Code, which criminally punishes damages caused to the creditors.[20] According to new legal regulation also the legal entity itself may be held liable for conducting the crimes.[21] [22]

The duty of the executive director to perform with care of the prudent treasurer is stipulated by law and the law itself stipulates minimal standards of care for the executive director to comply with. This legal duty may not be limited or excluded in the written agreement on performance of an office or by subsidiary application of mandate agreement. Article 135a, section 4 stipulates that agreements between the company and its executive officer that exclude or limit the executive officer's liability are prohibited; neither the agreement of association nor articles of association may limit or exclude an executive officer's liability. It is therefore unambiguous that the standards of executive director´s performance and duties are imposed directly by imperative provisions of law and the parties to the contract (the company and the executive director) might not deviate from these standards and stipulate other provisions in their mutual contracts or agreements.

I do agree with those legal scholars that the aforementioned statement is fully valid and applicable for the situations concerning the lowering and decrease of the professional care (care of prudent treasurer in Czech Republic) standards. Such limitation or exclusion would be "ex lege" invalid. On the other hand, it is questionable whether the company itself can increase legally imposed standards of executive director´s duties and whether the company may demand that the executive director complies with the standards even stricter that the standards of professional care in Slovak Republic (or standards of care of prudent treasurer in Czech Republic). There are the scholars stating that such contractual provisions imposing higher standards for executive directors of the companies shall be seen invalid due to the conflict with imperative provisions of Commercial Code. The other part of scholars (including myself) can imagine the rationale behind the imposing stricter standards of care than those imposed by law for the executive directors. If the executive director himself (in most cases due to his professional education and experience) agrees to be subject to higher standards of his performance (higher standards of his performance are usually bound with higher remuneration of the executive director); I personally think that such higher standards shall be seen as acceptable and therefore admissible in the agreements on performance of an office.

7 Establishment of disqualification registry

I assume that the establishment of disqualification registry will have positive effect on the members of statutory and supervisory bodies of the company. From my point of view, the existence of such registry might discourage these persons from conducting illegal behaviour harming the creditors. The disqualification registry shall have been available online via official governmental website (www.orsr.sk), but in contrary with the

legislative intent such registry is not public yet. Registry ought to contribute to efficient enforcement of legal rules related to statutory bodies of the company. Enactment of the registry shall simplify the simplicity and smooth process when it comes to punishment of the executive directors (statutory bodies) who fail to comply with legal standards of professional care, in correlation with the company´s interests and the interests of all of its shareholders. As stated in the legislative intent for the disqualification registry enactment, the registry should enhance the business culture in the Slovak Republic and clarify the relationships between the statutory bodies, shareholders, company and the third parties as a whole. Moreover, the government would dispose with more information about the acts of the statutory bodies and therefore the increase in successful claim enforcement against the statutory bodies shall occur.

Punishment of disqualification shall be understood as an injunction and prohibition of further business activity that is imposed by court. Such punishment would be granted not only in criminal proceedings but also within civil proceedings in case that violation of director´s duties arising from commercial and insolvency law is proved in court hearing. Disqualification should not be only seen as a similarity to a criminal law punishment. In current practice, punishment by injunction (similar to disqualification) is imposed very rarely and only within the criminal proceedings. In this case the criminal proceedings are initiated only in connection with illegal business activities falling into the scope of Slovak Criminal Code. Except for the provisions regarding the injunction under the Criminal Code, the legislator also intends to punish the passivity (failure to comply with the duty to perform actively and cautious) regarding the legal standards of professional care of the limited liability company´s executive director.

The biggest problem concerning the issuance of injunction under the Criminal Code when intending to punish business activities is in the length of the trial and the scope of the criminal evidence and proving the illegal intention of the director. All of that shall be done in order to issue a criminal injunction. When granting a punishment by disqualification under intended new legal regulation there would be a possibility to grant such punishment without proving the intentional behaviour of the executive director and the intention of such conduct will be presumed. It is caused by the fact that the professional care is integral and inseparable part of executive director´s performance and being passive and negligent does not meet the standards of professional care. Moreover, if the court does not issue an injunction in the criminal proceedings for the executive director´s failure to comply with duty to act with professional care as for the lack of his intent, court in civil proceedings might issue a punishment of disqualification, provided that the violation of professional care is proved. [23]

If the executive director does not comply with imposed punishment by disqualification, such conduct shall be considered as a crime according to the Criminal Code. The legislator intended to create new body (subject) of the criminal offence to be called "deviation from disqualification". However, such new criminal offence has not yet been introduced in the Criminal Code.

On the one hand, I am not certain that extension of the criminal offences as for the executive directors´ failure to comply with professional care and loyalty is necessary. Current Criminal Code entails many examples of criminal offences which cover the abovementioned failure to comply with the executive director´s duties. Embezzlement, violation of the prohibition of competition, abuse of participation in tenders or misuse of information in commercial relations are the examples of current criminal offences in valid Slovak Criminal Code. On the other hand, with reference to creditors´ and shareholders´ protection, I consider broadening of the criminal punishments of the

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[20] Executive director may be held criminally liable also for money laundering, see more in: ČENTÉŠ, J.: Legalizácia príjmov z trestnej činnosti, Ars notaria No.2/2004, p. 41-46, ISSN: 1335-2229
[21] See: ČENTÉŠ, J.: Specifics of criminal proceedings against legal entities In Corporate criminal liability : (in the Czech Republic, Slovakia and Poland) Brno : Masaryk University, 2016. p. 145-160, ISBN 978-80-210-8382-0
22 For corporate criminal liability see: ĽORKO,J.: Fundaments of corporate criminal liability In Corporate criminal liability : (in the Czech Republic, Slovakia and Poland) Brno : Masaryk University, 2016.p. 97-123, ISBN 978-80-210-8382-0

[23] In relation to the professional care of the executive director see: MAMOJKA,M. in Obchodný zákonník. Veľký komentár. 1 zväzok.Bratislava: Eurokódex, 2016, p.538, ISBN: 978-80-8155-065-2.

executive directors quite acceptable as these acts cause significant harm to the company, shareholders, creditors and a society as a whole.

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TAXATION OF INCOME FROM INVOLVEMENT IN PARTNERSHIPS IN POLAND

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Abstract: Tax systems in different countries take various approaches to the problem of income taxation of partnerships. The Polish legislation has based the taxation of income from partnerships on aggregate theory. Consequently, income arising from involvement in a partnership is typically taxed at the level of its partners (natural or legal persons). This paper presents Polish tax regulations applicable to incomes received from partnerships.

Keywords: partnership taxation, income taxes

1 Background

The method of taxation applicable to partnerships is one of the fundamental advantages provided by the tax law to such forms of conducting economic activity. Tax systems in different countries take various approaches to the problem of income taxation of partnerships. Some countries recognize partnerships as individual entities (*separate entity theory*), and sometimes even employ the same taxation rules as apply to companies.[1] In other countries, however, it is established that a partnership should be treated as an association of individual entrepreneurs *(aggregate theory)*. Consequently, income arising from involvement in a partnership is typically taxed at the level of its partners (natural or legal persons).[2] In the latter case, partnerships are transparent under applicable tax acts.[3] Within some legal systems, despite the fact that income generated by partnerships is subject to one-time taxation, partnerships are nevertheless obliged to report the level of generated income to relevant taxation bodies.[4]

The first of the solutions enumerated above is beneficial in that the choice of a partnership/company form is determined largely by attributes granted to such entities under the private law rather than the taxation method. The second of the solutions takes into greater account the nature of partnerships as a form of cooperation between partners (mainly natural persons) aimed at expanding the potential for their economic activity and creating a possibility for the division of costs and risks in the event of business failure. The recognition that partnerships are transparent entities results in the taxation of income at the level of partners. Consequently, legislators are required to take into account the specific nature of business operations conducted in partnerships when determining revenues and costs. With some exceptions, the Polish legislation has based the taxation of income on the second of the solutions discussed above, which relies on the premise that partnerships represent associations of partners. The approach is consistent with the legal status of civil law partnership, whereas commercial partnerships have been endowed with legal capacity in the domain of private law, which is why they exist as separate entities. The diverging approach

existing within the framework of private and tax law leads to difficulties in determining the tax effects of economic events in commercial partnerships. The basic research method adopted in the study is the method of dogmatic analysis. The economic method of legal analysis was granted a supplementary role

2 General rules of taxation applicable to income generated from partnerships

Polish partnerships (with the exception of limited joint-stock partnerships) are not *de iure* income tax payers, neither with respect to personal income tax nor to corporate income tax. The tax acts in force essentially fail to include any provisions which are directly applicable to partnerships (since partnerships themselves are not subject to income taxes). Instead, the provisions defining rules of income taxation focus on partners. The objective and subjective scope of taxation is defined in Article 1 of the Act on Personal Income Tax. In conformity with the provision, the Act stipulates the rules and requirements for the payment of income tax by natural persons. The subjective scope of the Act on Corporate Income Tax, which is defined in Article 1 section 1, encompasses legal persons and companies in the process of incorporation. Pursuant to Article 1 section 2 of the Act on Corporate Income Tax (ACIT), the provisions of the Act also apply to organizational entities without a legal personality, with the exception of companies not having a legal personality, subject to provisions laid down in sections 1 and 3. Article 1 section 3 stipulates that ACIT has application to:

1) limited joint-stock partnerships having a registered office or management in the territory of the Republic of Poland;
2) companies without a legal personality which have their registered office or management in a another state in which, under the tax law regulations of that state, they are treated as legal persons and are subject in such state to taxation on the entirety of their income irrespective of the place where it is earned.

As the above regulations demonstrate, the Polish tax law incorporates both the concept of "multiple entrepreneurs" (with respect to the taxation of income generated by Polish partnerships) and the competing concept of "unity of enterprise" with regard to the taxation of foreign partnerships in cases where, based on the tax regulations of the state in which they have their registered office, they are treated as legal persons and are taxed on the entirety of their income), and (since 1 January 2014) also limited joint-stock companies.[5] The recognition of a foreign partnership as a corporate income taxpayer is determined by the tax regulations which are in force in the state in which the entity concerned has its registered office. The norms stipulated in the private law of a foreign state, particularly the question of having or not having a legal personality, however, are irrelevant for determining the scope of applicability of the Act.[6] The concept of corporate income taxpayer refers to commercial partnerships and civil law partnerships having a tax residence in a state in which such partnerships are not transparent in tax term (e.g. in Spain and Portugal). Partnerships which have their residence in such states are equated for tax purposes with companies.

In the light of the regulations discussed above defining the subjective scope of the acts on income taxes, it can be assumed that Polish partnerships (except for limited joint-stock companies) are tax-transparent entities, meaning that income generated from partnership activity is taxed at the partner level. The Supreme Administrative Court, in its judgement of 27 June

[1] In Portugal, for example, partnerships have legal personality and are subject to income tax also at the partnership level. Even civil law partnerships, which are not legal persons, are subjec to income tax. See M. Bandzmer *Status spółek osobowych w międzynarodowym prawie podatkowym [Status of partnerships in the international tax law],* Warsaw 2015.

[2] W. S. McKee, W. F. Nelson, R. L. Whitmire, *Federal taxation of partnerships and partners*, Warren, Gorham & Lamont 1996, p. 8; A. D. Youngwood, D. B. Weiss, *Partners and Partnership—Aggregate vs. Entity Outside of Subchapter K.*, Tax Lawyer. Fall 1994, Vol. 48 issue 1, p. 39. 31; Ch. Trump, M. Graham, *In search of a Normative Theory of Partnership Taxation for International Tax (or How We Learned to Stop Worrying and Love Subchapter K),* Taxes the Tax Magazine 2015, p.123.

[3] B. T. Borden, *Aggregate-plus theory of partnership taxation*, Georgia Law Review 2009, vol. 43, pp. 716-784; A. Monroe, *Integrity in Taxation: Rethinking Partnership Tax*, Alabama Law Review 2012, vol. 64, pp. 289- 334. N. B. Cunningham, L. E. Cunningham, *The Logic of Subchapter K: A Conceptual Guide to the Taxation of Partnerships*, St. Paul, West, 2011.

[4] For example in Australia, Singapore, South Africa or Sweden. See A. Easson, V. Thuronyi, Tax Law Design and Drafting, vol. 2; International Monetary Fund 1998, p. 9.

[5] Ł. Franczak, *Wpływ prawa podatkowego na popularność i zastosowanie instytucji spółki komandytowo–akcyjnej w Polsce [Effect of Tax Law on the Popularity and Application of the Institution of Limited Joint-Stock Company in Poland],* Transformacje Prawa Prywatnego [Private Law Transformations] 2009, issue 3-4, p. 8.

[6] M. Bandzmer, *Kwalifikacja podatkowoprawna korporacyjnych podmiotów zagranicznych [Fiscal Law Qualification of Foreign Corporate Entities]*, Monitor Podatkowy [Tax Monitor] 2013, issue 9.

2012,[7] emphasizes that the premise that income earned from involvement in a partnership which is not a legal person is taxed separately for each partner in proportion to the partner's share should not be taken to mean that every partner individually earns revenues and incurs costs related to the partnership's economic activity. In order to establish a partner's income from a partnership, it is necessary to determine the partnership's revenues and costs. Until the end of 2000, Article 8 of the Act on Personal Income Tax (APIT) indicated that income earned from involvement in a partnership without a legal personality was taxed separately for each person in proportion to their share. What the provision meant was that partnerships were not income taxpayers. Instead, the taxpayer status was held by partners, based on their income generated from partnership involvement. Consequently, a dual phase procedure had to be employed for income determination. The first phase involved determining a partner's income, and the second phase – the partner's income earned from partnership involvement. Starting in 2001, the above rules were amended by introducing the requirement to assign appropriate proportions of revenues and costs. Consequently, revenues, costs and expenditures not constituting costs are now determined at the partnership level, and the level of income is assessed at the partner level.[8]

The fundamental role in the taxation of income achieved from partnerships is played by tax rules set out in Article 8 section 1 of APIT and Article 5 of ACIT. The provisions of Article 8 section 1 of APIT and Article 5 section 1 of ACIT establish that the level of income attributable to a partner due to their partnership involvement is determined in proportion to that partner's right to participate in the partnership's profits. The same rule should be adopted for the determination of costs of generating revenue from the shared source which are attributable to a given partner. In accordance with Article 8 section 2 point 1 of APIT, the rule set out in Article 8 section 1 of APIT must be applied, as appropriate, for the settlement of costs of generating revenues. The rule laid down in Article 8 section 1 of APIT imposes an unambiguous obligation to determine the revenue of a partner in a partnership without a legal personality in proportion to that partner's right to participate in profits. Without evidence to the contrary, it is thus assumed that the rights to share in profits are equal. The provision stipulates that revenues earned in a partnership should be combined with other revenues, the income of which is subject to tax according to the tax scale set out in Article 27 section 1 of APIT. The proper application of rules contained in Article 8 section 1 of APIT for the settlement of costs of generating revenue requires adopting a proportion corresponding to a partner's share in their partnership's profits for:

a) calculating the share in the partnership's costs and for combining the costs with other costs incurred by the taxpayer to earn revenues, the income of which is taxable according to the tax scale in force;[9]
b) tax reliefs applicable to economic activity conducted in the form of a partnership not having a legal personality.[10]

According to Article 5 section 2 of ACIT, the rules set out in Article 5 section 1 must be applied, as appropriate, for the settlement of:

a) costs of generating revenues,[11]
b) expenditures not classifiable as costs of generating revenues,

c) tax exemptions and reliefs and income reduction,
d) taxation or tax base.

In order to assess the taxpayer's revenues, the following are necessary:[12]

a) determining the share in the partnership's profit in accordance with the partnership agreement or principles laid down in the Code of Commercial Companies and Partnerships;
b) determining an appropriate share in revenues attributable to the partner (taxpayer).

The revenues of partners being natural persons earned from their shares in a partnership, determined pursuant to Article 8 section 1 of APIT in accordance with Article 5b section 2 of APIT are recognized as revenues earned from the source mentioned in Article 10 section 1 point 3 of APIT, i.e. revenues from non-agricultural economic activity. Economic activity or non-agricultural economic activity, pursuant to Article 5a point 6 of APIT, refers to profit-gaining activity in the business of:

a) production, construction, trade and services,
b) prospecting for, exploration and extraction of minerals,
c) using products and intangible assets,

conducted in one's own name regardless of its outcome in an organized and continuous manner, generating revenues which are not classified as other revenues from sources enumerated in Article 10 section 1 points 1, 2 and 4-9 of APIT.

Tax authorities and administrative courts recognize that the general principle applicable to the qualification of revenues generated in partnerships is restricted through the operation of specific regulations. As justification, they point to the final part of the definition of non-agricultural economic activity which provides that "generated revenues are not classified as other revenues from sources enumerated in Article 10 section 1 points 1, 2 and 4-9 of APIT.[13] The Supreme Administrative Court, in its judgement of 6 March 2013[14], ruled that a partner's revenues generated from involvement in a partnership not having a legal personality and conducting non-agricultural economic activity are recognized, pursuant to Article 5b section 2 of APIT, as revenues from non-agricultural economic activity on the stipulation that they may not be classified as revenues from sources enumerated in Article 10 section 1 points 1, 2 and 4-9 of the Act on Personal Income Tax. In the justification of the resolution of 26 April 2010[15], the Supreme Administrative Court stated that a situation in which management services within non-agricultural economic activity are provided by a partnership not having a legal personality is not subject to Article 5b section 2 of APIT, since revenues earned in relation with the provision of management services represent revenues achieved within non-agricultural economic activity in which the sole revenue source is the activity conducted personally.[16]

Whenever economic activity is conducted by a partnership which is not a legal person, revenues earned by a partner (payer of corporate income tax) from involvement in such a partnership, determined under Article 5 section 1 of ACIT, are recognized as revenues from economic activity (Article 5 section 3 of ACIT). Rules applicable to the taxation of taxpayers, i.e. partners in partnerships which are corporate income taxpayers and personal income taxpayers, are not identical. The disparity stems mainly

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[7]File ref. no. II FSK 2439/10.
[8]H. Litwińczuk, *Opodatkowanie wspólników spółek nie mających osobowości prawnej [Taxation of Partners in Partnerships without Legal Personality]*, Przegląd Podatkowy [Tax Review] 2001, issue 7, p. 3.
[9]Taxpayers and small taxpayers starting economic activity may, in cases indicated in Article 22k section 7 of APIT, make one-off depreciation write-offs to an amount not exceeding EUR 50,000. For partnerships not being legal persons, the amount of depreciation write-offs refers to the total value of write-offs allocable (under Article 8 of APIT) to the partnership's partners.
[10]Judgement of the Supreme Administrative Court of 12 March 2013, file ref. no. II FSK 1421/11.
[11]Judgement of the Supreme Administrative Court of 30 June 2015, file ref. no. II FSK 1182/13: if a limited partnership suffers losses, the taxable base of its partner (being a legal person) is decreased (in proportion) or its "total" loss, which a company may settle within five years, is increased (Article 7 section 5 of ACIT).

[12]K. Gil, A. Obońska, A. Wacławczyk, A. Walter (eds.), *Podatek dochodowy od osób prawnych. Komentarz [Corporate Income Tax. A Commentary]*, Warsaw 2016, p. 89.
[13]Compare J. Marciniuk (ed.) *Podatek dochodowy od osób fizycznych. Komentarz [Personal Income Tax. A Commentary]*, Warsaw 2016, pp. 80-81. A partnership's acquisition of shares in a company in return for a contribution in kind in a form other than an enterprise, the disposal of securities by a partnership and – until the end of 2014 – the achievement of interest on bank deposits, consistently favour the classification of revenues of this type as revenues from capital gains or property rights.
[14]File ref. no. II FSK 1364/11.
[15]File ref. no. II FPS 10/09.
[16]A. Pęczyk-Tofel, M. S. Tofel, *Opodatkowanie dochodów ze „spółki menedżerskiej" (interpretacje podatkowe) [Taxation of income generated by "management partnerships" (tax interpretations)]*, Monitor Podatkowy [Tax Monitor] 2007, issue 5.

from differences in the construction of taxes with respect to revenue sources. The Act on Corporate Income Tax fails to provide a catalogue listing sources of revenue. Furthermore, it lacks regulations corresponding in terms of content to Article 5b section 2 of APIT[17] The Minister of Finance, in the general interpretation issued on 11 May 2012[18], pointed out that in Article 5b section 2 of APIT the legislation in place provides directly that whenever non-agricultural economic activity is conducted by a partnership not having a legal personality, revenues earned from partnership involvement by a partner being a natural person are regarded as revenues from economic activity. The clarification of the nature of income earned by a partner in a partnership which is included in the Act on Personal Income Tax – and the lack of a corresponding provision in the Act on Corporate Income Tax – stem from the fact that the former Act differentiates the method of taxation applicable to payers of that tax depending on the source of income (economic activity, property rights, capitals, economic activity conducted personally, etc.). No such differentiation is made in the provisions of the Act on Corporate Income Tax. With the exception of income from a share in profits of legal persons and income from agricultural activity, the Act in question employs a uniform qualification of income achieved by payers of the tax (i.e. without any division into income sources), and applies uniform rules for their taxation, treating them in principle as revenues relating to the conducted economic activity. Therefore, based on the opinion of the Ministry of Finance, it is to be assumed that a provision equivalent to Article 5b section 2 of APIT is not needed in the Act on Corporate Income Tax (…). This is because it is untenable to assume that any reasonable legislator would allow a possibility that the tax qualification of any given gain – identical as to its nature – would depend solely on whether the gaining entity is a natural or legal person. The rule of the legislator's rationality implies that any effects resulting from the interpretation of Article 5b section 2 of APIT which contradict the rule should be rejected, and those which are in accord should be adopted. Revenue (income) arising from being a partner in a partnership may not be recognized as revenues from capital gains. Consequently, amounts paid to a partner (legal person) do not constitute, for tax purposes, capital gain payments, and so the partnership is under no obligation to collect advances on income tax (from any title or source) from amounts paid to (placed at the disposal of) the partner.[19] For the avoidance of doubt, the Act of 8 November 2013[20] which came into effect on 1 January 2014 was provided with Article 5 section 3 of ACIT stipulating that in situations where economic activity is conducted by a company not being a legal person, revenues earned by a partner from involvement in such a partnership are to be recognized as revenues from economic activity.

The concept of determining income at the partner level, on the basis of share in the partnership, has created a possibility to individualize tax settlements for the partners.[21] Since partnerships may involve natural and legal persons, the taxation of partnership profits is regulated by norms of specific substantive law laid down in two separate tax acts.[22]

The legislation relies on the principle of accrual-based identification of revenues and costs generated through partnerships by their partners.[23] The rule of assigning partnership revenues and costs to partners applies regardless of whether partners during the period in which they keep a share in the partnership actually receive any payments or no payments are made (e.g. the partnership retains profits for further investment). The assumption that revenues generated by a partnership are taxed at the level of its partners irrespective of any payments received from the partnership concerned (i.e. regardless of whether partners have obtained an actual financial gain) means that cash flows taking place between the partnership and its partners should be neutral in tax terms. If the revenues and costs related to partnership involvement were taxed "on an ongoing basis" (i.e. on the accrual basis) and were then taxed again – in the case of actual cash flows between the partnership and its partners – on the cash basis, there is a risk of double taxation. Consequently, deviations from the accrual principle may be introduced only exceptionally, if the legislator includes an explicit provision to that effect in the tax act.

Pursuant to Article 24 section 1 of APIT, in the case of taxpayers keeping books of account, income from economic activity is deemed to refer to income reported in correctly kept books reduced by the amount of tax-free income and increased by expenditures not classifiable as costs of generating revenues previously charged against costs of generating revenues. The income of taxpayers achieving income from economic activity and keeping books of revenues and expenditures is determined in line with the principles laid down in Article 24 section 1 of APIT. The obligations contained in the Accounting Act are binding only upon natural persons, civil law partnerships of natural persons, registered partnerships of natural persons and limited liability partnerships, if their net revenues from the sale of commodities, products and financial operations for the preceding financial year constitute at least the Polish zloty equivalent of EUR 1,200,000 (Article 2 section 1 point 2 of the Accounting Act). If partners to a civil law partnership or a commercial partnership include at least one entity that is not a natural person, the partnership is obligated to follow the provisions of the Accounting Act.

The regulation contained in the Code of Commercial Companies and Partnerships which permits partners to freely define the obligation to participate in the partnership's costs, independently of rules adopted for the settlement of profit, refers to settlements between partners, and hence relations under civil law, without affecting tax law effects regulated by norms laid down in the tax law[24]. In this regard, the tax law introduces provisions differing from the Code of Commercial Companies and Partnerships. Under Article 51 of the Code of Commercial Companies and Partnerships, every partner is entitled to an equal share in profits and participates in losses in the same proportion irrespectively of the type and value of the contribution. The provision is dispositive in nature (which stems from the provisions of Article 37 § 1 of the Code of Commercial Companies and Partnerships). What this means is that partners are free to differently define in the partnership agreement the method applicable to the division of profit and to the determination of costs associated with partnership activity which are assigned to individual partners. Solutions adopted in the partnership agreement and in partners' resolutions, providing for disproportionate shares to be had by different partners in the partnership's revenues (compared to their participation in costs), do not translate into tax obligations in a straightforward manner. Provisions laid down in the Code of Commercial Companies and Partnerships should not be viewed as a source of a tax obligation and taxation rules other than those contained in relevant tax acts.[25] Partners to partnerships are free to define the right to share in the partnership's profit at any proportion (permitted under the Code of Commercial Companies and Partnerships) that will be employed for the settlement of revenues arising from the share in the partnership. Nevertheless, the same proportion should be consistently applied for settling costs of generating revenues for tax purposes.[26] The position

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[17]Judgement of the Supreme Administrative Court of 20 April 2015, file ref. no. II FSK 2459/13.
[18]File ref. no. DD5/033/1/12/KSM/ DD-125, Official Journal of the Minister of Finance, 18 May 2012, item 24.
[19]Individual interpretation issued by the Director of the Inland Revenue Chamber in Katowice on 2 February 2016, file ref. no. IBPB-1-1/4510-217/15/BK.
[20]Polish Journal of Laws 2013, item 1387.
[21]A. Lewicki, *Opodatkowanie zysku spółki osobowej – wybrane problemy [Taxation of profit in partnerships: selected problems]*, Glosa 2001, issue 6, p. 3.
[22] G. Matysek, *Opodatkowanie dochodów spółek osobowych – konieczność zmian [Taxation of partnership income: need for changes]*, Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu [Research Papers of Wrocław University of Economics] 2013, issue 306, p. 249.
[23]Judgement of the Supreme Administrative Court of 22 May 2014, file ref. no. II FSK 1471/12.

[24]Judgement of the Supreme Administrative Court of 6 October 2011, file ref. no. II FSK 704/10.
[25]Judgement of the Supreme Administrative Court of 30 June 2015, file ref. no. II FSK 1182/13.
[26]Judgement of the Voivodship Administrative Court in Warsaw of 11 February 2011, file ref. no. III SA/WA 1380; Individual interpretation of the Director of Inland

excluding the possibility of applying different proportions for the settlement of revenues from involvement in a partnership not being a legal person, and for the settlement of costs of generating revenues, has been consistently rejected by administrative courts.[27] In the judgement of 1 June 2011 [28], the Supreme Administrative Court rules that if a tax act stipulates specific tax law effects with respect to rules of determining revenues and costs of generating revenues for partnerships to a registered partnership, the taxpayer has no grounds to demand a revocation or modification of any such effects on the sole claim that the partnership agreement concluded by the partner provides otherwise. In fact, the opposite correlation is in place: the partnership agreement should take into account legal norms of an absolutely binding nature which are laid down in the tax law, also with respect to rules governing the assignment of revenues and costs to partners, and to settlement periods during which appropriate values should be assigned. In the judgement of 30 June 2015, the Supreme Administrative Court ruled[29] that the reference, contained in Article 8 section 2 point 1 of APIT, to an appropriate application of principles set out in Article 8 section 1 of APIT (for the settlement of costs of generating revenues, expenditures not classifiable as costs of generating revenues and losses) does not modify the provision adopted in section 1 introducing a rule for the settlement of revenues in such a manner as to allow a method of determining partner shares in costs of generating revenues or from involvement in a partnership not being a legal person other than in proportion to the partners' right to participate in profits.

When concluding a partnership agreement, partners are free to establish that their share in the partnership's profits and losses will be agreed on a monthly basis, depending on the actual work contribution made by each of the partners or the revenue generated by respective partners for the partnership in any given month. Consequently, the share in profits and losses attributed to respective partners may change up to twelve times over the space of one year. Both the provisions of the Civil Code (in Article 867) and the Code of Commercial Companies and Partnerships (in Articles 48 and 51) describing the principles governing partners' due share in profits and losses do not exclude the possibility that the assignment changes on a month-to-month basis in accordance with the terms of the partnership agreement. Therefore, there is no obstacle in the current laws (including the tax law) that would preclude providing the partnership agreement with a clause stating that the share of respective partners in the partnership's profits and losses is to be determined in proportion to the revenue they generate for the partnership or the amount of work they put in. In the opinion of tax authorities, the Act on Personal Income Tax does not ban the adoption of partnership agreements which specify the share of partners in profits and losses differently depending on the month, as laid down in applicable provisions of the partnership agreement[30]. It is also an acceptable practice to amend partnership agreements with respect to provisions defining a partner's share in profits.[31] Such amendments become effective

the moment they are implemented, unless partners agree on a different effective date for amendments in the future. It is crucial, though, that the principles governing partners' share in profits are defined in a manner allowing their unambiguous assignment to respective partners. In situations when a partner's right to share in profits cannot be unambiguously determined from the partnership agreement because of specific provisions that make the scope of that right variable in time and fluid, there is a risk of tax authorities assuming that the partners' rights to a share in profits are equal and, consequently, the revenues and costs of generating them should also be divided equally between the partners.[32] In the opinion of tax authorities, if the share in profit at the end of the tax year changes in relation to the share adopted for the purpose of calculating income tax advance payments, then the level of income for the tax year in question should be established on the basis of the share in profit determined at the end of the tax year rather than the share in profit adopted for the calculation of individual income tax advance payments.[33] The method for the assessment of share in the partnership's revenues/costs in such cases will crucially depend on the rules of participation in profit indicated in the partnership agreement.

Unlike in companies, the payment of profit in partnerships does not require partners to adopt a resolution on the allocation of profit for payment. This is the position taken by the Supreme Court in its judgement of 3 July 2008.[34] Also, it needs to be stressed that profit defined as an excess of the partnership's property over and above the value of partners' contributions is objective in nature. Another vital factor is that partners may receive an advance payment towards a future profit even if their partnership does not generate any profits. The above claim is consistent with rulings passed by the Supreme Court.[35] The most important provisions regulating advance payments towards profit must be included in the partnership agreement. At the same time, however, the decision-making powers with regard to payments made on an ongoing basis should be left to the partners. Yet another aspect must be mentioned. If during the financial year a partner has collected – through advance payments – a sum exceeding the portion of the annual profit attributable to that partner, there is no obligation to return the surplus. The approach is justified by the fact that, ultimately, partners are personally liable for the partnership's obligations. In the judgement of 5 March 2009, the Supreme Court ruled[36] that if a partnership fails to achieve a profit, the partner who (through the consent of all other partners) has collected advance payments towards participation in future profits, has no obligation to return any amounts to the partnership by way of settlement of the advance payments collected. This is because settlements are made in the consecutive financial year in which the partnership generates a profit. Under the tax law, any advance payments collected by a partner are treated as gratuitous benefits provided by the partnership to the partner (Article 11 section 2a of APIT, Article 12 section 1 point 2 of ACIT). In such cases, the partner's revenue is equal to the amount of interest which a partner would be required to pay when obtaining a loan equivalent to the difference between advance payments collected by a partner and the amount of profit due to that partner.[37]

The difficulty with determining the principles of taxation applicable to partnerships is also manifest in other constructs and

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Revenue Chamber in Katowice issued on 4 August 2015, file ref. no. IBPB-1-1/4511-205/15/BK.
[27]Compare judgement of the Supreme Administrative Court of 1 June 2011, file ref. no. II FSK 140/10, or judgements by Voivodship Administrative Courts in Gdańsk: 26 November 2009, I SA/GD 731/09 and 10 December 2009, I SA/GD 729/09; and in Cracow: 2 March 2010, I SA/KR 1592/09.
[28]File ref. no. II FSK 140/10.
[29]File ref. no. II FSK 1267/13.
[30]Individual interpretation of 24 January 2014, file ref. no. IBPBI/1/415-1109/13/AB.
[31]Judgement of the Supreme Administrative Court of 11 June 2015, file ref. no. II FSK 1527/13: the term "due revenue" (Article 12 section 3 of ACIT) from the involvement of a legal person in a partnership should – for the purpose of calculating advance payments for corporate income tax – be interpreted as referring to a part of the revenue, assignable to a partner, generated in the partnership during its financial settlement period, which corresponds to proportions applicable to the share in profit existing on the date of arising of the obligation with respect to the advance payment (Article 5 section 1 of ACIT). A change in the proportions during the tax year, even if the changes are considered as being in force from the beginning of the year, produces specific effects for the future, meaning that the "new proportions" for sharing in the profit must be taken into account beginning from the month in which the partnership agreement was amended to introduce them. Determining the amount of the consecutive (i.e. calculated after the amendment of the partnership agreement) advance payment requires calculating the amount of income gained from the beginning of the year according to new rules and subtracting from that sum the amount of advance payments already paid for the preceding months.

[32]Judgement of Supreme Administrative Court of 6 October 2011, file ref. no. II FSK 704/10.
[33]Individual interpretation issued by the Director of the Inland Revenue Chamber in Katowice on 4 March 2015, file ref. no. IBPBI/1/415-1457/14/AB and individual interpretation issued by the Director of the Inland Revenue Chamber in Katowice on 12 January 2016, file ref. no. IBPB-1-1/4511-648/15/EN.
[34]File ref. no. IV CSK 101/08. In registered partnerships, as opposed to companies (Article 191 § 1 and Article 347 § 1 of the Code of Commercial Companies and Partnerships), profit payment is not conditional on the partners adopting a resolution on the allocation of profit for payment. Profit, defined as an excess of partnership's property over and above the value of partners' contributions is objective in nature. It arises and exists irrespective of whether the partners adopt a resolution approving the financial statement for the past financial year. In partnerships preparing financial statements profit results from a given partnership's balance sheet.
[35]Judgement of the Supreme Court of 5 March 2009, file ref. no. III CSK 290/08.
[36]File ref. no. IV CSK 101/08.
[37]Individual interpretation issued by the Director of the Inland Revenue Chamber in Katowice on 25 November 2014, file ref. no. IBPBI/2/423-1043/14/PC.

concepts present in the tax law and private law. In the light of Article 8 section 1 of APIT, there is a difference between profit earned by a partnership and the source of the profit (e.g. donation) and a partner's revenue from participating in a partnership's profit which is subject to personal income tax.[38]. Based on provisions laid down in Article 14 section 1 of APIT, revenue from economic activity refers to amounts due, either actually received or not, after the subtraction of the value of returned goods, granted rebates and discounts. In the case of taxpayers selling goods and services which are subject to the tax on goods and services, revenue from the sale should be thought of as referring to the total revenue reduced by a due amount of tax on goods and services. In principle, it encompasses all revenues generated from economic activity conducted by a partnership with the exception of revenues defined in Article 14 section 3 of APIT. As set out in Article 44 section 1 point 1 of APIT, taxpayers achieving income from economic activity referred to in Article 14 are obliged, without any request to that effect, to make income tax advance payments over the course of the tax year in conformity with rules provided in section 3, subject to sections 3f-3h. Accordingly, partners to a partnership are obligated to make requisite advance payments during the tax year. Payment arising from the division of profit is a reflection of income earned by partners from their economic activity conducted in the form of a partnership. That income, as indicated above, is taxed at the level of each partner in proportion to the right of respective partners to share in the profits which is specified in the partnership agreement. In view of the above, the payment of share in the annual balance-sheet profit of a partnership made pursuant to Article 52 § 1 of the Code of Commercial Companies and Partnerships, will represent a tax neutral activity for the partnership's partners, since profit achieved in the partnership represents, in point of fact, the already taxed gains of its partners.[39]. The profit obtained by division may not correspond in terms of actual amounts to the income reported by a partner during the tax year. However, it must be noted that tax regulations are concerned with the right to a share in profit rather than to claims for payment (according to the agreed proportions at the end of the financial year) or the amount actually received for partnership involvement. In effect, tax applies to the amount of difference between revenues and costs determined for taxation purposes, not amounts actually received by partners[40].

Until the amendment of the income tax acts which came into effect on 1 January 2015, it was debatable whether the payment of a part of the profit due to a partner on an in-kind basis is taxable. The positions taken by administrative courts and tax authorities were divergent. While it is true that the majority of courts ruled that the transfer of ownership (e.g. of property) via profit payment did not constitute revenue-generating disposal (not being a transaction performed for consideration),[41] a major part of tax authorities classified the transfer of non-cash (in-kind) benefits as disposal against consideration[42]. In the opinion of courts, "since it does not stem directly from the provisions of law that the payment of a non-cash dividend causes the arising of a tax obligation for the taxpayer, then *a contrario* the catalogue of revenue sources may not be *a priori* extended for income tax purposes".[43]

The doubts were removed by the introduction of Article 14 section 2e of APIT and Article 14a of ACIT, under which if a

taxpayer – through the performance of a non-cash benefit – settles either in its entirety or in part – an obligation (…), the taxpayer's revenue is equal to the amount of obligation settled as a consequence of the benefit. However, if the market value of the non-cash benefit in question is higher than the amount of obligation settled through the benefit, the revenue is determined as being equivalent to the market value of the non-cash benefit concerned. The provision set out in Article 19 of APIT (Article 14 sections 1-3 of ACIT, as appropriate) is applied accordingly. Under Article 14 section 2f and Article 14 a section 2, the principles are applicable, as appropriate, to cases involving the performance of a non-cash benefit by a partnership not being a legal person. Consequently, the payment is equated with disposal against consideration of a thing or property rights, and is therefore subject to taxation. The payment of non-cash profit to a partner represents revenues for partners to a partnership in proportion to their share in profits. Another vital aspect is the problem of accurate valuation of assets transferred to a partner. Preferably, their value should correspond to the value of profit paid.

With regard to capital share in the partnership, every partner is entitled to receive annual interest equal to 5% of the value of the capital, even if the partnership has recorded a loss. The interest is calculated based on the value of the partner's capital share which is equal to the value of the contribution made by that partner. Article 53 of the Code of Commercial Companies and Partnerships, which provides the legal basis for the payment of interest, is dispositive in nature. What this means is that partners are free to exclude the application of the provision or modify it in the partnership agreement. Interest paid in respect of that represents, in the opinion of tax authorities[44], revenue from the so-called "other sources" which are mentioned in Article 10 section 1 item 9 of APIT. The payment of interest on capital share is independent of income generated from economic activity, hence revenues achieved in this manner are not classified as revenues from economic activity. Likewise, revenue arising from the payment of interest on capital share may not be classified as a source of revenue in the form of monetary capital, for Article 17 section 1 of APIT does not mention interest paid on the value of capital share in a partnership as revenue from that source and – a point to be made – the catalogue contained in that provision is exhaustive in nature. Revenues can be classified as coming from other sources in situations where a specific revenue cannot be classified into sources of revenue mentioned in Article 10 section 1 points 1-8 of APIT. Consequently, revenues from other sources include those revenues which do not arise from sources discussed above and, at the same time, constitute income within the meaning of the Act on Personal Income Tax. The classification means that revenue from interest paid on the capital share is taxed according to the tax scale in force, without an option of choosing the flat rate, and may not be settled together with revenues and costs associated with economic activity. Revenue arising from interest paid pursuant to Article 53 of the Code of Commercial Companies and Partnerships cannot be reduced by the amount of loss in economic activity.

Revenues from activity performed within the framework of a partnership by a natural person can be taxed under general principles. In this case, tax is calculated according to the applicable tax scale after subtracting costs of generating revenue. Revenues from activity performed within the framework of a partnership by a natural person can be taxed with a linear tax rate. In such cases, the tax rate of 19% is applied after subtracting costs of generating revenue.

3 Conclusion

For persons choosing a legal form of conducted business activity the manner of company taxation is one of the main selection criteria. Partnerships are different from joint-stock companies mainly because of the lack of legal personality and the

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[38]Judgement of the Supreme Administrative Court of 8 January 2013, file ref. no. II FSK 1347/11.
[39]Compare the individual interpretation issued by the Director of the Inland Revenue Office in Warsaw on 17 April 2014, file ref. no. IPPB1/415-131/14-2/EC.
[40]A. Pęczyk, M. S. Tofel, *Podatkowe skutki zmiany wysokości udziału w zysku spółki osobowej w roku podatkowym [Basic effects of changes in the share of partnership profit during the tax year]*, Prawo i Podatki [Law and Taxes] 2006, issue 11, p. 13.
[41]Judgement of the Voivodship Administrative Court of 30 December 2013, file ref. no. I SA/Ke 658/13; judgement of the Voivodship Administrative Court of 18 February 2014, file ref. no. I SA/Wr 2375/13; judgement of the Supreme Administrative Court of 8 February 2012, file ref. no. II FSK 1384/10.
[42]Individual interpretation issued on 20 February 2013, no. IBPBI/2/423-1538/12/MS; individual interpretation issued on 30 September 2011, file ref. no. IBPBI/2/423-787/11/JD.
[43]Judgement of the Voivodship Administrative Court of 5 December 2012, file ref. no. I SA/Po 699/12.

[44]Individual interpretation issued on 16 March 2010, file ref. no. ITPB1/415-997a/09/TK.

possibility of personal liability for company liabilities. The most important differences are visible in income taxes, since partnerships are not granted the taxpayer status, which makes them tax transparent entities. Polish legislator has assumed that income in partnerships is taxed with income tax only at the level of the partners (only the partner is the taxpayer, not the partnership). The adoption of separate principles of taxation of partnerships should result from the specific structure of these companies, which is different from the structure adopted by the legislator in the case of joint-stock companies. The most important structural difference between them is due to the fact that partnerships are the unity of persons, and not the unity of capitals, as is the case of joint stock companies.

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NEUROMARKETING APPROACH TO EFFICIENT FOOD STYLING

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Abstract: This study explores the use of neuromarketing eye-tracking methods in verifying the efficiency of food styling, which focuses on creating food photographs to appeal to consumers and to use them for marketing purposes. The aim of this study is to verify the effect of styling on the respondent using the Eye Tracking method.

Key words: neuromarketing, effectiveness, eye tracking, marketing communication, food styling

1. Introduction

Marketing in today's hyper-competitive environment is being applied in a variety of areas so that the company is able to compete with others. At the same time marketing is introducing new approaches and methods, such as neuromarketing, to achieve higher marketing communication effectiveness. This study focuses on the use of Eye Tracking's neuromarketing method in verifying the effectiveness of food styling, which focuses on creating food photographs to appealing to consumers so that they can be used for marketing purposes. A number of consumers first "consume by sight", so the food picture must at first glance evoke appetite, desire.

The main objective of this study is to verify the effect of food styling on respondents using Eye Tracking method.

2. Neuromarketing

The notion of neuromarketing began to appear around 2002, when American society as SalesBrain and Brighthouse started offering services related to neuromarketing research.[1] Neuromarketing is a marketing discipline that studies sensorimotor, cognitive and emotional responses of consumers to marketing incentive.[2] Neuromarketing can be understood as linking of the application of biomedical technology and marketing research.[3] Because of this link, for example, the effectiveness of marketing communication tools can be verified, even before they are launched, to determine the potential of the marketing tool.

3. Methodology of its own investigation

Following the goal set, a survey was carried out using the Eye Tracking method to test the effect of food styling on the respondents.

Eye Tracking - The Eye tracking method allows to monitor the human eye's movements with the eye camera while also recording where the person looks, for example on the picture.[4] The graphical output is the so-called "heat map" (maps) that can be used to trace the places where the person looked most.[5] Furthermore, it is possible to determine the paths of sight and the time delays at individual points, ie to indicate certain "areas of interest". The method allows to test prints, promotional materials, or plain text of a magazine or other material. Through this method, the respondents' eye track was monitored throughout the research period, which allowed to determine what visual stimulus the respondents watched during the research. It is possible to identify and evaluate the "visual behavior" of the respondents.

Three photos of food and beverages were presented to respondents, each in two versions - one set of photographs displayed the product naturally without any modification, in the other set the products were adjusted according to the principles of food styling. In particular, they were photos of hamburger, pancakes and freshly brewed light beer. The foods and beverages mentioned were not chosen randomly. Pancakes, hamburger and beer are among the 10 most popular visual stimulus for food and beverages presented on the Instagram social network. In addition, the most popular decoration of these foods and beverages was carried out using the Google images search. After entering the names of the dishes into the search, the first 50 final pictures were taken into account, the decoration style of which was categorized and the most frequently used decoration was used in the preparation of meals.

As part of the food styling, a more effective visual presentation of the hamburger required the melting of the embedded cheese with a hair dryer, and a hairspray was used to obtain the necessary luster. When shooting a modified hamburger, additional lights were added to enhance the gloss of the food. In the case of pancakes, the hairspray was used again to obtain the necessary gloss of ingredients, instead of the rapidly flowing maple syrup, the pancakes were covered with a more "photogenic" engine oil. The visual presentation of freshly brewed beer was adjusted so that the drink glass was sprinkled with sugar water through the sprayer to make the glass look more "dewy". This resulted in a total of 6 photographs.

The prepared photos were projected on a Philips 22-inch monitor on which the Gazepoint GP3 Eye Tracker, a static camera was attached using light pupil viewing technology. A total of 10 respondents recruited from the full-time students of the University of Finance and Administration in Most, each photograph was screened for 5 seconds. Respondents were subjected to the survey individually so they could not influence one another. When analyzing the data, so-called AOIs (Areas of Interest) were selected on each presented image, and then statistical data of the time volume of the views devoted to these areas were analyzed. For each photograph, a so-called heat map was generated, which summarizes the penetration of all realized measurements into one graphical output. Each photo was seen by respondent for 10 seconds.

The Eye Tracking method was further complemented by a post-test, in which respondents were asked five questions focused on the cognitive level of perceived. Each of the tested photos was rated by the respondents in connection with the statement "The meal in the photo looks very tempting and tasty" on the five-point Likert scale. Their preferences were further confirmed by the respondents in the open question: " Which photo and why is appealing to you tastier?". In the third question, the respondents had to sort the photos of the dishes according to their taste. Quite simply, from 1 to 6, when the first photo of the food is the most delicious for the respondents, the sixth is the food which photos are the least appealing to the respondents.

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The prerequisite for the survey is the claim that visual presentation of "unnatural" dishes, i.e. those that have undergone subsequent modifications, will make the respondents more attractive. And this fact will also be reflected appropriately on both the eye camera record and the subsequent post-test interview.

4. Results

To evaluate the data recorded during the realization of Eye Tracking, several basic indicators were used:

a) The time of first look indicates the exact length (thousandths of a second) of the first view of a particular area on the presented image.
b) The average tracking time indicates the average time interval for each area of interest during the entire survey (10 seconds).
c) The average fixation of the view indicates the cumulated length of all views given to individual areas during testing.
d) The return of respondents indicates the tendency to return with the sight to individual areas of interest repeatedly.

The resulting data for the first pair of photographs is given in Table 1 and Table 2, where the areas of interest (AOI) were selected for the photograph for which their statistics of tracking were calculated. In the tables, the AOIs are sorted according to the second column - i.e. in order of their follow-up by the respondents.

Tab. 1: AOI of untreated hamburger

	Time of first look (Sec.)	Average tracking time (Sec.)	Average fixation of the view (Sec.)	Return of respondents
Cheese	0,72	0,67	2,65	5
Bacon	1,23	0,17	1,17	2
Bun	1,35	0,87	2,22	7
Meat	1,72	0,50	2,63	7
Salad	2,02	0,77	2,43	5
Tomato	2,39	0,32	1,67	1

Table 1 above shows Area of Interest tracking statistics (AOI) for the original untreated photograph of hamburger. Below is statistics of hamburger picture arranged according to food styling principles.

Tab. 2: AOI of hamburger according to food styling

	Time of first look (Sec.)	Average tracking time (Sec.)	Average fixation of the view (Sec.)	Return of respondents
Bun	0,63	0,69	2,71	9
Cheese	1,27	0,97	1,60	7
Bacon	2,27	0,25	1,25	2
Meat	2,44	0,31	1,12	3
Salad	2,93	0,21	1,01	0
Tomato	0,00	0,00	0,00	0

Based on a comparison of the values in Table 1 and Table 2, the respondents' views changed in the view of the original hamburger photo and the food-styled photography, on which the food is presented brighter and, above all, with more intense colors evoking a fuller flavor. From the values, it is obvious that the bun and cheese were followed first, which are brighter and more distinct from the original photograph. This is also evidenced by the number of sight returns restored back to the area of interest already surveyed, in this case the bun where the number of returns increased by 4.

Figure 1 and 2 below show the heat maps of the hamburgers tested, using the color spectrum to indicate the intensity of the viewing of the areas of the photograph. Because the center of the photo was selected for both images, it is clear from the shape and location of the heat map that the eyesight of the respondents

were focused to the center of the photograph. The comparison of both heat maps also shows that higher intensity is focused on the edited photograph of cheese and ham, which are brighter and in full color.

Fig. 1: Heat maps of the original untreated hamburger

Fig. 2: Heat map of hamburger map according to food styling

The second tested pair of photos were pancakes. Recorded data are given in Table 3 and Table 4.

Tab. 3: AOI of untreated pancakes

	Time of first look (Sec.)	Average tracking time (Sec.)	Average fixation of the view (Sec.)	Return of respondents
Blueberries	1,65	0,86	2,51	7
Sauce	2,48	0,42	1,32	0
Strawberries	2,66	0,26	1,10	1

The above Table 3 lists the statistics that relates to the degree of tracking of selected areas of interest for the original, untreated pancake photo. The following table lists statistics of photo modified by food styling.

Tab. 4: AOI pancakes according to food styling

	Time of first look (Sec.)	Average tracking time (Sec.)	Average fixation of the view (Sec.)	Return of respondents
Blueberries	0,02	1,65	3,12	7
Strawberries	1,33	1,06	1,58	8
Sauce	1,96	0,40	0,29	1

Based on a comparison of the data from the original food photo and the food styled photo, it is clear that on the modified photos were blueberries and strawberries more intensively followed with which were more carefully arranged in the dishes, especially strawberries, which show an increase in returns (7 returns extra), which points to a higher level of passion.

Fig. 3: Heat maps of original untreated pancakes

Fig. 4: Heat map of pancakes according to food styling

Comparing the two photos, higher height of the pancakes is also noticeable, which are fluffier. At the same time, when adjusting the food, emphasis on their symmetry was placed so that they are not tilted to the side. On the basis of this, a shape of the heat map is noticeable, where the symmetrically arranged pancakes attracted the attention of the respondents.

The third tested visual stimulus was a photograph of freshly brewed beer. The results are shown in Table 5 and Table 6.

Tab. 5: AOI of untreated beer

	Time of first look (Sec.)	Average tracking time (Sec.)	Average fixation of the view (Sec.)	Return of respondents
Foam	0,15	1,78	3,20	10
Glass	1,21	0,90	1,03	4

The above Table 5 shows statistics of areas of interest for untreated fresh beer. Due to the neutral background, two areas of interest were selected in the photograph - foam and glass, for which their tracking statistics were calculated.

Tab. 6: AOI of beer according to food styling

	Time of first look (Sec.)	Average tracking time (Sec.)	Average fixation of the view (Sec.)	Return of respondents
Glass	0,03	2,10	3,44	8
Foam	1,05	1,16	1,33	7

When comparing the values in Table 5 and Table 6, it is obvious that the order of element tracking in the photo has changed - for the beer adjusted according to the principles of food styling (especially the dewing of the glass with sugar water), the attention of the respondents is first focused on the glass. There is also an increase in the time of focus on the glass and also the increase in the number of returns on the glass compared to the first photograph. It is obvious, therefore, that the dewy glass has attracted the attention of the respondents. On the contrary, the

modified foam, which was more consistent and more regular in shape, impressed less compared to the glass.

Fig. 5: Heat maps of the original untreated beer
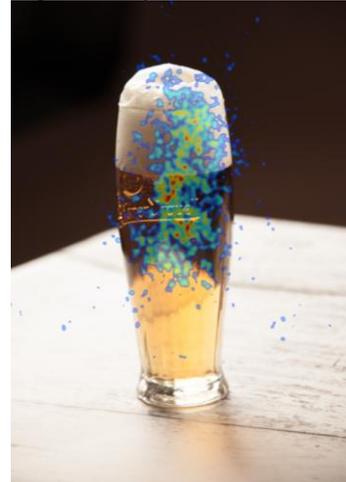
Fig. 6: Heat map of beer according to food styling

When comparing the heat maps of Figures 5 and 6, it can be stated that in Figure 6 the heat maps are more spread out at beer photograph, which indicates higher level of passion of the photograph. However, it is possible to discuss to what extent the interest is influenced by the name of the beer that is shaped on the glass. However, it is necessary to add that heat maps are not only aim at the inscription but also well below and above the inscription.

As a complement to the Eye Tracking method, this short post-test, consisting of a brief query, was also performed. The post-test brought these major outputs:

a) All respondents preferred the food, which went through a subsequent food styling treatment. Both hamburger, pancakes and beer earned a significantly better average value on the five-point Likert's scale when compared to the original untreated dishes. The average values of the five-point Likert scale are summarized in Table 7.

Tab. 7: Average values of the 5-point Likert scale

	Untreated food	Food according to food styling
Hamburger	2,1	1,0
Pancakes	2,7	1,2
Beer	3,2	1,4

The following table 8 lists the modus and average values calculated on the basis of a 6-point scale, where the respondents

evaluated which food impresses as most delicious. Value 1 was the most positive rating, the most delicious food.

Tab. No. 8: Appraisal of the taste of dishes

	Untreated food		Food according to food styling	
	Average	Modus	Average	Modus
Hamburger	4,4	4	1,3	1
Pancakes	4,7	5	2,3	2
Beer	5,5	6	2,8	3

b) The same result were also provided by the third, control question, the results of which are shown in Table 8 above. When creating a preferential ladder of the photographs tested, the photos of processed food on the basis of food styling appeared at three leading positions.

c) When it comes to verbal reasoning and the reflection of respondents over the possible taste of food, the hamburger at processed photography looks better, fresher, all the ingredients will excel, and the bun is more fresh and crunchy. Adjusted pancakes contain according to respondents fresh fruit, strawberries are even considered as sweeter. Neither motor oil - syrup did not miss the attention of the respondents. According to them, it has better consistency on the edited photo and is more appealing. The modified beer was felt more refreshing, had a richer foam and was also better chilled.

5. Conclusion

The survey shows that food styling practices have a real impact on consumers' perceptions. At the cognitive level of perception, this statement is unambiguous. Respondents always consciously preferred photos that have undergone food styling modifications. They marked them as more attractive, the food appealed to them with more appetizing impression, creating the appearance of greater freshness.

As for measurements using the Eye Tracking method, the intentional adjustment of the food presented in the photos also affected the respondents' attention (view fixation, monitoring time) in this respect. In just one case, the photo of the original untreated food was so featureless that the responders had to give a little more effort to its perception than their modified variant. Even in this case, however, all respondents definitely preferred a modified alternative in the post-test.

This survey, among other shows, why modified food photography is so popular nowadays. Food styling can be considered as a good marketing tool. For many companies, this means that they can hire a professional food stylist, along with a professional photographer, to create attractive photos of their meals. This marketing tool can lead to increased revenue from the offered meals. Many restaurants have no photos in their offer of their meals. Restaurants could make much more use of their website to promote and share their food pictures. Just as ordinary people take photos of their meals, restaurants can take pictures in the same way and then adjust their meals. The use of photo sharing is countless; we can just mention the company websites themselves or social networks, such as the already mentioned Instagram and the most commonly used social network that is Facebook.

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Primary Paper Section: A

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I   INFORMATICS

IN   INFORMATICS

IMPLEMENTING VIRTUAL REALITY INTO EMPLOYEE EDUCATION IN PRODUCTION SECTOR OF AUTOMOTIVE INDUSTRY: CREATING WORKER TRAINING FOR ASSEMBLING CAR DASHBOARD IN VIRTUAL REALITY

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Abstract: Education represents an ongoing and never ending process aiming to prepare learners for processing and execution of future tasks. Employee training in business organizations equips workers with know-how that is essential for their work. Diverse educational methods are utilized in various fields of industry with different efficiency. Traditional educational methods consisting of static texts and pictures are perceived as protractive, boring and time consuming. These aspects of established learning processes hamper further self-development and lack demonstrativeness. This paper analyses actual situation of currently utilized educational methods in selected industry sectors with focus on application of innovative methods using ICT and describes implementation of virtual reality into employee training in automotive industry.

Keywords: education employee training, learning, innovative technologies, information and communication technology (ICT), virtual reality, gamification, learning by doing.

1 Introduction

The primary goal of each business entity is to achieve and maximize gains from trade. This can be attained by applying diverse measurements. One of those is the continuous efficiency improvement of conducted tasks by introducing new processes and educating employees and their specialization. Therefore, each company should devote considerable attention to their internal organizational employee education system to ensure its timeliness, user-friendliness, attractiveness and motivational influence. Qualified employees who underwent attractive, interactive and innovative trainings compose invaluable base of the organization's future success and sustainable positive performance. The availability of skills has become the key to achieving innovation[1], sustainable existence and precondition for achieving success of business entities.

Information and communication technology (ICT) enable applying various innovative methods for employee training. Applying ICT in education may improve the quality of education and the active participation of trainees on educational process[2]. One of it represents the virtual reality technology that represents interactive virtual environment with the most possible resemblance to physical reality. Virtual reality denotes an environment modeled by a computer to simulate the physical reality[3]. Its emergence can be tracked back to 60th 20th century when visualizing and computational technology were at very low level and such appliances are called "amateur attempts" if compared with today's technology[4]. During the last decades, various innovative cutting edge technologies for virtual reality entered the market that can be used for education, graphical design, architecture etc. Among those appliances belong virtual technologies by Oculus and by Valve companies[5].

The most suitable sectors for implementing virtual reality trainings are e.g. flying trainings of pilots, simulating surgical interventions in chirurgery, remote control of robots or production and assembling[6]. Therefore, this paper proposes and describes implementing of virtual reality for employee training in production sector for assembling a car instrument board of a personal car. It describes the development process stage by stage including brief description of processing at individual stages for better demonstration. This contribution also provides a calculation of such a solution based on actual tax rates for described specification.

This paper is organized as follows: next section 2 provides in-depth description of the development process for an employee training implementing virtual reality technology. Section 3 demonstrates cost calculation of proposed solution. The conclusion briefly summarizes the content of this paper.

2 Process steps for creating training in virtual reality

This section depicts the process of creating virtual reality training for employee education in automotive industry. The a description deals with one selected assembling activity that the worker has to learn during this training and that he will execute in his job later on. The chosen task represents only one example of possible applications of virtual reality in employee training in production sector.

The process of creating training content in the environment of virtual reality consists of several steps. Creating simulation trainings in virtual reality is analogue to creating simulations for computer games and console game applications[7]. The whole process will be demonstrated on a concrete example: dashboard installation in personal car 3.5t.

The process compounds following steps (fig. 1):

1. Selection of an object which shall be virtualized, supplying documents and scenarios by customer.
2. Photo shooting of objects not included in documents provided by the customer, creating Detailed Functional Technical Specification (DFTS) documents.
3. Editing and processing of photos for textures, materials and panorama photos.
4. Modeling of objects.
5. Creating textures and materials.
6. Control and summary of objects.
7. Animation.
8. Creating virtual scenery and programming of logic.
9. Testing of simulation.
10. Customer delivery.

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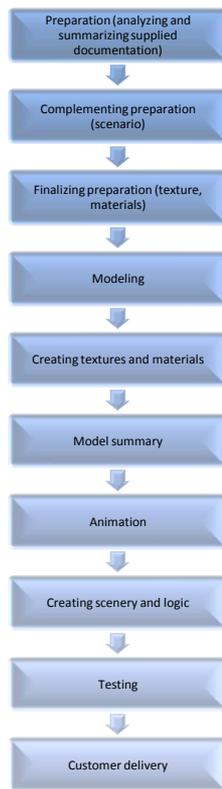
Fig. 1 Process for creating training using virtual reality

2.1 Preparation

First step contains the selection of the object to virtualize. In other words, the object is photographed for digitalizing, a digital 3D model is created and parsed in the virtual reality environment. For this step the cooperation of the required customer/organization is necessary. Thus, the production company provides available technical documentation for all objects to be virtualized, preferably in electronic format or in printed form.

This step is also called creating scenarios for designing simulation in virtual reality. Besides these aforementioned documents containing technical information about machinery, equipment and rooms, the customer company has to collaborate in designing scenarios mirroring the individual working processes along the assembly line to be reality close emulated by the virtual reality simulation.

The outcomes of this first step is the summary of all documents for all objects and scenarios for all work processes necessary for creating the required training in virtual reality environment.

To demonstrate activities of this step on selected concrete example of dashboard installation in a personal car, it means the selection of the dashboard to be installed with all its assembly parts and the place of installation at the assembly line. The producing company provides all materials denoting all 3D components and objects that are available in electronic form including all technical drawing documents containing the technical drawing of the assembly hall, tools and equipment utilized for the installation. Alongside with all these aforementioned documents the producing company delivers also process descriptions including workflows and textual description denoting manuals for the assembling that provide the scenarios of the dashboard assembly and installation. The realizing team is then able to compose and build the dashboard in digital form in virtual reality and create the training for workers.

2.2 Complementing

Completing first preparation step the second step follows. Its main purpose is to complement all missing data for virtualization of all objects required for the virtual reality training. In other words, during this step it is necessary to physically visit the producing company in person and to analyze if all necessary documents for all needed objects and components are available for digitalization.

At this step, the personnel of the realizing team identifies and documents all objects that shall be included in the virtual reality training and for which the necessary documents and descriptions are missing from the preparation step. This means to shoot photos of all missing objects, to measure them to document their dimensions and to create their digitalized reproductions.

During this second complementing step the individual processes building the training scenarios are digitalized as well. This is done with camera recording of the processes, if possible. If recording is not possible, the process is emulated following the process descriptions delivered in first step in collaboration with representatives of the customer company to identify any gaps, unclear or forgotten activities or components and to clarify ambiguous parts.

Last, but not least task of this step to be done is the final summary of all data necessary for simulating the training in virtual reality environment. This summary is compiled into so called functionality and technical solution specification that is sent to the customer company for review and confirmation and builds the mandatory fulfillment of the contract.

To demonstrate this step for the selected activity of assembling dashboard and its installation into a personal car, it means the realizing team visits the producing company including their assembly line and observes the reproduction of the assembling activity and records it with a camera. The realizing team examines whether all components and objects utilized during the observed activities were already in possession of the realizing team for virtualization and identifies objects that are missing or deviating from delivered documents. It shoots photos of all components needed for the assembling of the dashboard and records all its attributes including dimensions, descriptions of surfaces and other features. The outcomes of all these analyses and specification tasks are summarized and compiled into functional and technical specification of proposed solution. It concludes in-depth description of all objects and detailed depiction of the assembly process step by step. The underlying document also narrowed determination of the functionality included in the final simulation in virtual reality environment along with the detailed description of the creating process.

2.3 Finalizing preparation

After all complementing tasks were finalized, the third step compounds photo shooting of all component parts and other parts as well as documenting the working space for assembling to be virtualized and reproduced in virtual reality. The photos that are recorded can be divided into three types: reference photos, texturing photos and panorama photos.

Reference photos of all individual objects document those in various view points and angles. These photos serve for better demonstrativeness and base for the 3D designer to accomplish his/her task. These photos are then used also to confront the 3D model depicting the imagination of the 3D designers with the real, physical and actual state of the virtualized object.

Second type of taken photographs denotes photos for texturing and material covering. The very important requirement for these photos is the conditions of shooting them in right angle to the surface of given object parts that are texturized. These photos are taken without perspective by utilizing special tilt-shift objectives. These photos are captured in high resolution at the lowest possible sensitivity of the recording camera device. At

this photo shooting, camera stand is necessary for better picture stability also by inconvenient light conditions.

Third and last photo types represent panorama records that are used for virtualization of surroundings. In other words, these photos build the background of the whole scenery and virtual workplace. These photos serve for reality close perception of the whole virtual training.

To demonstrate the aforementioned activities on the assembling and installation of a instrument panel for a personal car, this step compounds next personal visit of the realizing team representatives to the producing company. During this visit, the team members take photos of all components and objects using perspective mode to create reference photos. After all reference photos were created, the realizing team shoots photos without perspective for texturing and modelling the surface of the material.

After all components including screws, bolts, gripping, anchoring, front case cover of the dashboard, doors, tachometer, r. p. m. counter and other objects were documented and photographed, the working tools utilized for the assembly is being photo shoot including industry screw driver and air screw drivers. The photos are taken of the working table and assembly line too, including all utilized stands, technical drawings and support tables, eventually cranes or other levering tools. This all servers for the documentation of the surroundings.

Last, but not least, panorama photos of the whole working place and assembly hall are shoot. These are made from the middle of the working place of the future assembling team. These photos are later combined in the virtual reality environment to build 360° panorama to emulate the reality close perception of the trained worker.

2.4 Modeling

Finalizing all the documenting part, the real physical objects and components are reproduced in virtual reality. Each single component, object and tool is reproduced individually using the lowpoly (low polygon technology) technology. This processing mode denotes modelling in simple forms where all complex surface characteristics are emulated through texturing[8], e.g. the threads of a screw etc. The selection of this technological procedure for modelling allows faster processing of the objects and also higher processing speed of the final software application due to lower visualizing complexity. At the same time, it allows placing broader number of objects into the virtual scenery and working place by lower demands on computational performance.

Electronic and #D models provided by the customer company are transformed into lowpoly format. Components documented only in paper form by technical documentation and drawings or reference photographs are being created from the scratch by 3D modelers. All in lowpoly format. Combining all these components, the scenery of the working place is being created. Several experience and high expertize in creating 3D models is necessary for all members of the 3D modeling team, as the 3D object models build the base and the essential part of the scenery with highest importance.

Finalizing the 3D modeling part, the created objects are equipped with events and logic in subsequent process steps.

To demonstrate the processing activities on chosen procedure for assembling of car dashboard, it means that all materials and documents received from the producing company in first process step and created by the realizing team in second process step are delivered to designer team responsible for 3D modeling. They process component by component and transform it into lowpoly format.

Most important objects like the working tools and utensils used for the installation are being modeled from scratch or reused from other projects if available. This is mostly true for screw drivers, air wrench, allen key, hex key tools etc.

The modeling of the scenery for the working place is usually created from scratch, based on reference photos, technical drawings and documentation describing the workplace. Step by step the 3D model of the workplace gets equipped with floor, walls, and ceiling. All small details including lamps, cabling, crane anchors etc. are modelled too to provide reality close virtual reproduction of the workplace.

2.5 Texturing

Next step, the texturing, is usually done simultaneously in parallel with 3D modeling step. During this step, the textures and surface emulating models for the materials are being created based on photographs without perspective.

Textures are prepared utilizing special technological procedure to eliminate the visibility of connecting lines and to ensure smooth flow.

During this step, part of the team is dedicated to model unwrapping. It stands for creating 2D visualizations of 3D models. Graphic designers combine textures with unwrapped 2D visualizations and manually remodel necessary parts and create details like oil flecks etc. to emulate real physical working environment to the greatest possible extend[9].

To demonstrate this processing on selected training activity, at this step a major part of the 3D designers creates 3D models of all objects and the remaining team members are dedicated to model unwrapping of composed 3D models of all objects including screws, pads, matrixes and bolt nuts as well as individual parts of the car dashboard like tachometer, r. p. m. counter etc. The unwrapping is done also for working tools and utensils like screw driver, air wrench etc. and the working table, stand for technical drawings, crane anchors etc. Each unwrapped object is then provided to 2D graphical team to get "dressed" which cover all models with appropriate corresponding textures and manually remodel all imperfections including oil flecks, scratches, corroded parts of the working tools and utensils to provide traces of usage to these objects. These imperfections contribute to extended reality close perception of the vectored digital virtual reality environment.

The reality close textures are then delivered back to 3D graphical designers who wrap the 3D models with these coverings. At this state, the modeling part and the graphical processing of 3D models for these objects is finished.

2.6 Model summary

Finalizing the texturing step, the next sixth step compounds the check and summarizing of all objects according to planned scenarios and reference photographs. Thus, the comparison of created wrapped 3D models with reference photos is carefully assessed.

Finishing verifying produced models with reference photos, the planned and described scenarios are reviewed to double control whether all wrapped 3D models of needed objects are created in the virtual reality environment. All missing objects are processed to ensure the availability of all necessary objects for programming of business logic.

To demonstrate the processing of this step on selected activity for assembling car dashboard, it concludes the verification of all created models through their comparing with technical drawings and documentation provided by the producing company. Each single model is checked to assure its creating, its compliance

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[8]Webster, N. L. High poly to low poly workflows for real-time rendering. *Journal of Visual Communication in Medicine*, 2017, vol. 40, no.1, pp.40-47.

[9]Hassan, M. *Proposed workflow for UV mapping and texture painting*. Dissertation. 2016. 41 p.

with provided documentation and reference photographs, its similarity to real components with reality close visual appearance after remodeling. All assembling components and working tools must be available.

Similar reviewing is conducted for the workplace scenery, working equipment and surroundings. After all objects were reviews and their compliance with physical reality was confirmed, the programming step providing each object with business logic can start.

2.7 Animation

At this seventh step dedicated to animation, the modeled objects are enriched with events and business logic. Animating team consisting of animators and riggers are provided with all 3D wrapped object models for processing.

A rigger creates digital skeletons, bones, bone joints and muscles of all 3D object models[10]. At first task, the rig of given object is being created. It represents the base for object animation. In other words, the rig serves for flexibility where nodes are matching the moving of other nodes during animation. For example during smile animation, the corners of the mouth are moved to the top is accompanied by the matched movement of other face muscles to this movement.

After rigs of all objects are accomplished, the animators create animations for all necessary events and available models in produced scenery according to provided scenarios. These animations include also events triggered by the end user through his/her interaction.

This step denotes the processing of created models by riggers and animators for the chosen activity of assembling a car dashboard. A rigger reads and analyses all training scenarios accomplished in previous steps in collaboration with the customer and identifies all animation necessary parts. He/she prepares the crane pulley blocks and analyzes how the chain is moving after a gear wheel has been manipulated. The rigger identifies the skeletons necessary for animation of given objects and equips the 3D models with these rigs. The same is done for all working tools like drill, air screw driver, angular grinder, etc. All these utensils are analyzed how they behave when on at various intensity levels.

When all objects are furnished with rigs, animators start to animate objects through creating visualizations of moving behavior, e.g. rotating gear wheels, rotating sharpener of the angular grinder, rotating drill, etc. All the rotations are reproduced in virtual environment emulating various intensity levels of moving objects.

When all moves are animated, the business logic and events triggering those animations are programmer in next step.

2.8 Programming business logic

At this eight step, the prepared modeled and animated objects are inserted into the software for creating simulations and trainings in virtual reality. Finishing the input of all objects into the environment, the scenery of the working place is created based on underlying scenarios. Objects are placed to their positions according to the description of workplace in given scenario. The created workplace with all its components compounds the base for programming of business logic of given training scenario. Each object is equipped with physical or non/physical attributes interaction logic and events triggered by user interaction and timers. Collisions among objects are also event triggers enriched by business logic. In other words, all buttons and other interactive fields are assigned programmed events how to react. Everything interactive to be manipulated by the end user is created at this step. During this processing, the application logic

and various persistent services connecting this particular application with other 3rd party software applications are created if necessary[11].

To demonstrate the processing of this step on selected training activity for assembling car dashboard in automotive industry, all animated and wrapped 3D model objects are inserted into the software for creating virtual reality simulations to create new scenery. All objects are placed to their positions described in the scenarios, technical drawing specification and reference photographs. For the surrounding of the scenery 360° panorama photo is used. After finishing the graphical visualizations, the programming for creating interactive dynamic content starts.

Each single manipulable objects is provided interaction events according to specification of the business logic. Working tools are equipped with logic how they have to be gripped, how they may be moved and with which object they may be used and on the other hand, with which object they might not be used. The programmed logic contains also handling for such event like object falling on the floor and what happens to the object, e.g. destroyed, scratched, damaged or the object might be bounced back etc.

At this step, all components are processed and assigned interaction logic object by object until the whole dashboard is not completed. Afterwards, the working place and the surrounding scenery is provided interactive business logic, too. This means that a table, a stand or technical drawings are equipped with interaction logic, in particular for collision handling. In other words, what can be laid down on the table, where are the borders and edges of the table, etc.

2.9 Testing

When all objects are modeled, animated and enriched with interaction logic, the testing can start. The testing compounds several testing aspects: testing the graphical interface containing all model objects of the simulation, testing all required and programmed functionality of all objects and the simulated workplace surroundings, etc. Finishing the internal testing made in-house by the developing company successfully without any bugs and/or noteworthy deviations from the specified scenarios, further testing involve the customer representatives for further tuning of all imperfections reported by the customer that are not in compliance with the functional and technical specification of the solution agreed on at the beginning.

The testing consists of several testing scenarios applied in software development industry in following order[12]:

- Integration tests – testing all individual features separately and common interaction of all software objects working together;
- System testing – the application is tested as whole with focus on compliance with functional requirements and technical specification;
- Regression testing – analyzing whether adding new objects, functionality and/or bug fixes has no influence on previously achieved and tested functions and/or no new bugs were produced;
- Installation testing – the overall computational performance and load capability of the whole system is sufficient with regards to end hardware, operating system and installed software;
- Acceptance testing – end to end testing following various cases described in the specified scenarios and test cases. This testing is performed in collaboration with the customer and subsequently by the customer representatives individually.

[10]Zeman, N. B. *Essential Skills in Character Rigging*. Boca Raton: CRC Press, 2016. 224 p.

[11]Tavakkoli, A. *Game Development and Simulation with Unreal Technology*. Boca Raton: CRC Press, 2016. 701 p.
[12]Lewis, W. E. *Software testing and continuous quality improvement*. Boca Raton: CRC press, 2016. 688 p.

To demonstrate the processing of this step on selected training activity for assembling a car dashboard, during integration testing each component is tested in a virtual reality environment, whether it can be properly grasped, what is going on when it is dropped on the floor and if it handles the collisions correctly.

In system testing, the entire dashboard is scrapped according to scenarios agreed on and the process flows are verified to assure the compliance with all defined scenario steps.

During regression testing, a new object is inserted into the simulation and monitored whether the behavior of the application as a whole changes and/or the behavior of all objects that are directly in contact with the newly inserted object as well is still not influenced and correct.

For installation testing, the programmed and created software simulation is installed on the client hardware and test the computational performance with the application software. The software development company specialized in creating virtual reality trainings can recommend the appropriate hardware to assure achieving the best performance on customer demand.

Acceptance testing is performed at first internally where in-house personnel perform the end to end tests according to the scenarios. Subsequently, the acceptance tests are conducted by a person from the customer side according to the scenarios. It means the assembling and installation of the whole car dashboard; testing the functionality of all the components and tools by focusing on their reality close perception and reliability.

All detected bugs and undesired behaviors are processed for identifying the root cause based on logged events[13] and finding appropriate software solution in form of bug fixes and patches. This whole process represents an iterative process until no further bugs are detected and customer satisfaction is achieved.

2.10 Customer delivery

The last, but not least, step of the whole process is the delivery of the created product solution to the customer. A handover protocol is created containing all important information including the documentation of the whole software as well as manual for simulation utilization. The software is then commissioned into the educational environment of the customer organization, in other words it is installed on customer hardware at customer side under supplier's supervision and tested. First employee trainings are conducted by the supplier to school the employees and future trainers how to use the virtual reality training.

The final form of the proposed solution composes the virtual environment of the assembly line for assembling a car dashboard that resembles the reality to the greatest possible extend in graphical design as well as in functional features. Employees, trained in virtual reality via appropriate hardware suitable for virtual reality application, can execute all tasks of the car dashboard assembly that emulates real works on physical system.

The created simulation works also in testing regime where the employee conducts all his/her tasks in compliance with the scenario and in case his/her handling deviates from pre-described process flow and requirements, the event is logged in a report that is sent to the learning management system of the company or/and to the responsible lecturer afterwards.

The training solution in virtual reality integrated gamification factors that support trainee interaction and motivation and prevent monotony and tedious static learning based on text and pictures as is valid for traditional educational methods. At the

same time, the trainee is forced to involve more senses and can control the learning process through his/her own interactions that provide better demonstrativeness and contribute to greater internalization of taught content[14].

Among the advantages of virtual reality training, besides the aforementioned benefits, belong the reality close perception of the training and the immense similarity of conducted tasks with physically executed activities and the graphical visualization of all components, tools and objects alike physical reality[15].

3   Cost calculation

For the development of described training solution in virtual reality a large group of experts is necessary including:

- Team of programmers with experience in programming virtual reality;
- 3D designers;
- 2D designers;
- Animators;
- Riggers;
- Photographer;
- Project manager;
- etc.

The cost of described solution can be estimated to approximately 20.000 euros where 3.000 euros represents the hardware costs. This estimated cost calculation does not include travel costs for individual visits at customer side as well as no profit margin of the seller or risk costs. Project management practices traditionally recommend increasing the estimated calculation by approximately 20-30% to include the profit margin and costs induced by the project risk. However, such orders are usually not only for simulating one activity, but multiple activities of similar processes e.g. assembling various car dashboards with diverse appearance, but with similar assembly scenario. In such a case, each additional dashboard with similar assembling process flow at similar/the same work place could be estimated to represents additional 5.000 euro costs. These estimated costs include the use of existing logic and scene for new components. For above mentioned calculation the rates of specialized companies in given field in Slovak Republic were used as reference[16] as it is a very narrow segment with very few specialists available with necessary experience for the intended purpose.

The development of described final solution takes approximately 3 months from the customer's delivery of all necessary documents on.

The hardware needed for implementing the described virtual reality training is estimated at the price of 3.000 euros where 2.200 euros corresponds to desktop computer with the appropriate parameters for such type of virtual reality simulation[17] and 800 euros corresponds to the displaying device for virtual reality[18] such as glasses etc.

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[13]Dávideková, M. and Greguš, M. ml. Software Application Logging: Aspects to Consider by Implementing Knowledge Management. In: Awan, I. and Younas, M. (eds.) *Proceedings of IEEE 2nd International Conference on Open and Big Data (OBD 2016).* Vienna, Austria, pp. 102- 107, 2016.

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Table 1: Estimated calculation of presented training solution in virtual reality

Process step	Role	Experts in persons	Hourly tax	Number of hours	Sum
1	Architect	1	40€	40	1600€
2	Photograph	1	30€	8	240€
	Architect	1	40€	16	640€
3	Photograph	1	30€	24	720€
4	3D Graphic	1	30€	80	2400€
5	2D Graphic	1	30€	80	2400€
6	Architect	1	40€	8	320€
7	Rigger	1	30€	40	1200€
	Animator	1	30€	40	1200€
8	Programmer	2	30€	80	4800€
	Architect	1	40€	40	1680€
9	Tester	1	20€	16	320€
In total					**17 520 €**

4   Conclusion

Emergence of information and communication technology allowed new ways of processing and enabled innovation of established methods and techniques. In the field of education, ICT provide interactive and attractive education in virtual reality environment with high resemblance to physical reality. The learners are acquiring new knowledge through attempts and failures in dynamic and interactive environment that provide the empirical "learning by doing" experience.

This paper proposed implementation of virtual reality into employee education in production sector of car dashboard assembly in automotive industry. It outlined and described the development process of such a training with estimated cost calculation to provide more insights for applying virtual technology in education to broad public.

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