ISSN 1648-7974

LIETUVOS VERSLO KOLEGIJA
LITHUANIA BUSINESS UNIVERSITY OF APPLIED SCIENCES

VADYBA

2017 Nr. 1 (30)

Journal of Management

KLAIPĖDOS UNIVERSITETO LEIDYKLA
Klaipėda
2017

Name of publication: **Journal of Management** (ISSN: 1648-7974)
Issue: Volume 30/Number 1/2017
Frequency: Semianual
Languages of articles: English,
Office of publication: Klaipeda University Press
Herkaus Manto 84
LT-922294, Klaipėda
Lithuania

Editorial Office: Assoc. prof. Jurgita Martinkienė
Scientific Research Department
Public Institution Lithuania Business University of Applied Sciences
Turgaus st. 21, LT-91429
Klaipeda, Lithuania

Phone +370 46 311 099
Fax +370 46 314 320
E-mail: jurgita.martinkiene@ltvk.lt

Journal of Management Homepage: https://www.ltvk.lt/VADYBA

The journal is reviewed in:
Index Copernicus (IC) database http://www.indexcopernicus.com, http://jml2012.indexcopernicus.com/VADYBA,p24783103,3.html
Central and Eastern European online Library (CEEOL) database http://www.ceeol.com/
EBSCO Publishing, Inc. Central & Eastern European Academic Source https://www.ebscohost.com/titleLists/e5h-coverage.htm

http://www.mab.lt/lt/istekliai-internete/mokslo-zurnalai/282

Editorial cannot review all of the researches, therefore we encourage familiarizing with them in the Journal, which currently is under the indexing process with Scopus.

Every paper is revised by two reviewers.

Leidinio pavadinimas: **Vadyba** (ISSN: 1648-7974)
Leidimas: Volume 30/ Number 1/2017
Periodiškumas: Leidžiamas dukart per metus
Straipsnių kalba: Anglų
Leidėjo adresas: Klaipėdos universiteto leidykla
Herkaus Manto g. 84
LT-922294, Klaipėda

Redakcijos adresas: doc. dr. Jurgita Martinkienė
Mokslo-taikomųjų tyrimų skyrius
Viešoji įstaiga Lietuvos verslo kolegija
Turgaus g. 21, LT-91429
Klaipėda

Telefonas +370 46 311 311099
Faksas +370 46 314 320
Elektroninis paštas: jurgita.martinkiene@ltvk.lt

Žurnalo internetinio puslapio adresas: https://www.ltvk.lt/VADYBA

Žurnalas referuojamas:
Index Copernicus (IC) database http://www.indexcopernicus.com, http://jml2012.indexcopernicus.com/VADYBA,p24783103,3.html
Central and Eastern European online Library (CEEOL) database http://www.ceeol.com/
EBSCO Publishing, Inc. Central & Eastern European Academic Source https://www.ebscohost.com/titleLists/e5h-coverage.htm

http://www.mab.lt/lt/istekliai-internete/mokslo-zurnalai/282

Kiekvienas straipsnis yra peržiūrimas dviejų recenzentų.

Vadyba
Journal of Management
2017, Vol. 30, No. 1
ISSN 1648-7974

Turinys / Contents

EDITORIAL

"Journal of Management" is periodically published applied sciences journal by Lithuanian Business University of Applied Sciences. Journal is periodically published since 2002 and has gained a lot of experience and international recognition. It has been positively evaluated by foreign scientists and number of international scholars publishing is constantly increasing. Articles in the journal can only be published in English. Currently, 30th number of the journal is released to readers. Only those articles that meet thorough requirements set by the Editorial Board are being published. Authors of these articles represent various Lithuanian and foreign countries science, education and business institutions, such as Szent István University (Hungary), Baltic International Academy (Latvia), Budapest Business School, University of Applied Sciences (Hungary), Alexander Dubček University of Trenčin (Slovakia), Dubnica Institute of Technology in Dubnica nad Váhom (Slovakia), University of Tirana (Albania), University of Economics in Bratislava (Slovakia), Warsaw Management School - Graduate and Postgraduate School (Poland) and other institutions.

The journal provides opportunity for academics and professionals to interact and communicate in international forum. Applied research journal „Journal of Management" Editorial Board seeks that all published articles would include foreign countries economical, business and technological environment analysis, which would benefit international audience. Articles are evaluated according to these criterion before publishing. Thus, we expect that readers will benefit from material published in the Journal and will improve their knowledge about specific areas under analysis.

Multiple articles in the journal are presented by foreign scientists. It is worth mentioning the article by scientists B. Aliev, Y. Kochetkov & K. Nedelev, where scientists thoroughly describe how innovative processes effect particular industries in Latvia.

For analysis authors choose shipbuilding and ship repair industry in Latvia and performs an interactive mathematical model of innovations, as well as including risks to their analysis. The main groups of risks are distinguished as separate vertices of the digraph as they play an important role in the system of operative factors: risks and negative relations violate the balance of the system. These ideas about risks in innovation and innovative processes themselves are furtherly described in an article.

Another distinctive research in the journal is made by Slovak author A. Schultzová, where she analyses tax revenues, state budget and public debt and how these variables interact in-between. Analysis undertakes Slovak Republic case and its' challenges in aforementioned areas.

Journal also presents variables researches by international scientists such as team of Polish and Slovak scientists W. Gajdal and E. Koišová, who review what determines decision-making processes while managing innovative areas and activities.

However, Editorial cannot review all of the researches, therefore we encourage familiarizing with them in the Journal, which currently is under the indexing process with Scopus.

We invite scientists to actively publish in the Journal, share their research results and methodological insights. We expect for close cooperation.

Prof. Dr. (HP) Valentinas Navickas
Editor-in-Chief

Vadyba
Journal of Management
2017, № 1 (30)
ISSN 1648-7974

APPLICATION OF INNOVATIVE METHODS FOR STUDENTS' LEADERSHIP DEVELOPMENT

Aelita Skarbalienė[1,2], Inga Minelgaitė-Snaebjornsson[3]
[1]Klaipėda University, [2]Lithuania Business University of Applied Sciences
[3]University of Iceland

Abstract
Leadership is one of the most researched fields in social science, however, our knowledge about leadership process is still limited. With increasingly changing environment, more focus is being put on the innovative ways for leadership development, particularly self-leadership, as means to prepare for future challenges, where leadership will be only skill needed for certain in uncertainty defined environment. This is way leadership development is essential in leadership emergence which has particular importance for the participants of future job market which will require people management, emotional intelligence and other leadership related skills. Leadership development refers to the experiences, training, and growth opportunities that help a leader mature and gain the knowledge and skills necessary for success in leadership positions. In order of more young people to take the role of leaders the systematic attitude to this question is necessary and one of the aspects is that it is needed to begin preparing professionals for the leadership already at a higher school. Although there are many facts that universities play an extremely significant role in creating and developing the quality of leadership in the contemporary society and about the importance of developing of leadership competences at higher schools, there is a lack of research on the subjects (1) how innovative study methods could be applied for more effective development of leadership competences of students and (2) what is students' opinion about using these methods. That is why the research considering these issues is relevant practically and quite new scientifically. The aims of the study are (1) to reveal the possibilities of using innovative study methods at the university for leadership development and (2) to reveal students' opinion about using these study methods. Research has shown the high demand of students to develop their leadership competences during the studies at the university. Applying innovative study methods for leadership development can be seen as a student - centered approach. There are plenty of possibilities to use innovative study methods at the university for leadership development. Playing many games do not require any additional place or space, only the regular classroom. It needs to be said that students did not need to be forced to get into playful activities. They enjoyed them very much. First of all, games helped to break down the barriers and helped to communicate better. Playing games as practical activities during the "Leadership" classes helps to create good environment for understanding oneself and others better, for acceleration of creative thinking, for developing fruitful discussions and finding different sides of leadership. These results show the effectiveness of innovative activities for leadership development and display the need for large study finding and describing innovative and non-traditional practices.
KEY WORDS: leadership, leadership development, innovative teaching methods

Introduction

Leadership is one of the most researched fields in social science, however, our knowledge about leadership process is still limited (Steers, et al., 2012, Barker, 1997). Nonetheless, leadership continues to maintain importance in research considering its established recognition as crucial to human well-being and achievement (Gill, 2011). Furthermore, leadership is important due to the significant overall effects it has on societies (O'Reilly et al., 2010). One of the main forces behind popularity of leadership research is the never ending search for leadership effectiveness as means to improve organizational performance and outcomes (Uhl-Bien, Riggio, Lowe, Carsten, 2014). However, with increasingly changing environment, more focus is being put on the innovative ways for leadership development, particularly self-leadership, as means to prepare for future challenges, where leadership will be only skill needed for certain in uncertainty defined environment (Breakwell, 2016). This is way leadership development is essential in leadership emergence (Hernez-Broome, Hughes, 2004) which has particular importance for the participants of future job market which will require people management, emotional intelligence and other leadership related skills (World Economic Forum, 2016).

Previous researches revealed that the demand of students to develop leadership competences at the institution of higher education is high (Skarbalienė, 2017), but the application of different teaching methods is not discussed widely. Using different teachning methods (depending on circumstances: age of the students, number of students in the group, previous experiences of the students, class environment, etc.) could make leadership education and development more student - centered and more efficient. Due to practical relevance, taking into account the lack of scientific research the issue of application of innovative methods for leadership development at the university has been chosen for this research. The object of the research is the development of leadership competencies at the university.

Leadership emergence

There are about 60 leadership theories found in the literature (Dinh et al, 2014) which illustrates the efforts to research this complex phenomenon from various

perspectives. Moreover, this plethora of theories exercises its effect upon leadership researchers resulting in difficulties when making research decisions (Snaebjornsson, 2016). Due to the latter, it is important to define and contextualise leadership considered in the research. In regard to the research presented in this paper, it is relevant to describe leadership in terms of assigned *versus* emergent leadership. Assigned leadership implies position that was formally assigned to the person in an organization (e.g. director, head of department, managers), whereas emergent leadership implies the rise of a leader based on how members of the group responded to the person (Northouse, 2013). Emergent leadership can be considered more influential type of leadership due to affect emergent leaders have on the groups, e.g. emergent leaders without assignation of formal power will have stronger influence on group members and hence, will be able to achieve needed goal or organizational outcomes. Research suggest that communication, particularly communication behaviours (e.g. seeking others' ideas, being verbally involved, being firm but rigid, initiating new ideas) and exhibiting certain personality traits (e.g. dominance, intelligence, self-efficacy) are two factors that are highly related with emergent leadership (Smith, Foti, 1998, Fisher, 1974). Emergent leadership is also one of the most sought skills when hiring talents. Illustrating latter, are the words of Laszlo Bock, the senior vice president of people operations for Google one of the world's most successful companies - explaining the characteristics of successful job candidate at Google, and naming leadership as second most important characteristics: "is leadership - in particular emergent leadership is opposed to traditional leadership. Traditional leadership is, were you president of the chess club? Were you vice president of sales? How quickly did you get there? We don't care. What we care about is, when faced with a problem and you're a member of a team, do you, at the appropriate time, step in and lead. And just as critically, do you step back and stop leading, do you let someone else? Because what's critical to be an effective leader in this environment is you have to be willing to relinquish power" (Friedman, 2014, n.d.). Hence, development of emergent leadership - knowing oneself, being effective communicator, being reflective and engaging, is considered one of most desired features of employees of today and tomorrow at the most successful companies across the globe.

Leadership development and methods

Leadership development refers to the experiences, training, and growth opportunities that help a leader mature and gain the knowledge and skills necessary for success in leadership positions (Norris, 2017). Leadership development typically focuses on assigned formal leaders and existing models that purport to help these individuals become better at leading. However, this sort of leader development (as opposed to leadership development) is questionable with regard to efficiency and effectiveness (Schyns et al., 2013). There is a fairly short history of rigorous scholarly theory and research on the topics of leader and leadership development (Day et al., 2014). The distinction between developing leaders and developing leadership is possibly an important one, as leader development focuses on developing individual leaders whereas leadership development focuses on a process of development (Day, 2000).

Therefore, question arises: considering the importance of leadership, particularly emergent and self-leadership, how does one find the most effective ways to develop leadership competence despite fragmentation, academic de ja vú and uncertainty about the future that leadership is facing (Hunt & Dodge, 2001, Breakwell, 2016)?

Complicating the answer to the question is implicit assumption noticed in leadership literature, even though misleading one, that if "correct" leadership theory is found, then the development would inevitably follow (Day et al., 2014). However, human development is complex and involves set of processes that need to be understood, making leadership development a challenging task. Considering that individual leader development occurs in the context of ongoing adult development (Day, Harrison, & Halpin, 2009), we need to focus on development as much as leadership to shed light on how this process unfolds (Day et al., 2014). Hence, leadership development should take into account the complexity and transformation of an individual, as well as the stage of life one is in leadership development process.

Answering this question requires understanding, that apart from increasing competition and pressure to perform and pragmatic underpinnings (Boin, 2005), leadership field maintains its popularity due to its appeal based on psychological satisfaction it provides to those engaged in leadership process (Stelmokienė, Endriulaitiene, 2015). Taking part in leadership training and development process provides the means to one's self discovery and improvement. The motivation to lead and engage in leadership development is enhanced when a person has strong engage in positive thought self-leadership. Leadership development initiatives designed to strengthen efficacy beliefs and encourage the development of thought self-leadership among emerging leaders are worthwhile strategic management techniques useful for enhancing overall leader effectiveness (Norris, 2017). However, finding the ways of such leadership development, particularly within younger participants is difficult task, as many of such participants lack experience and skills in effective in-group communication skills and self-analysis (Wright et al., 2013). Leadership development programs are described as an 'identity workspace' (Petriglieri, 2011) that is 'ultimately about facilitating an identity transition' to create new leadership options (Ibarra et al., 2010: 673). Considering above mentioned and the importance and relative underrepresentation in leadership development field (as opposed to development of leadership of assigned leaders) of emergent and self-leadership, requires innovative attitude in method construction and epistemological move from heroic-centric and leader-centric approach in leadership (Nicholson, Carroll, 2013).

Methodology

Cohen and Bradford (2005) argue that an ability to positively influence others regardless of title or position

is a fundamental principle of leadership. Nevertheless, most of the students imagine that only a person who holds a formal leader's position can influence others (Skarbalienė, 2015).

In order of changing this image and more young people to take the role of leaders the systematic attitude to this question is necessary and one of the aspects is that it is needed to begin preparing professionals for the leadership already at a higher school. Although there are many facts that universities play an extremely significant role in creating and developing the quality of leadership in the contemporary society and about the importance of developing of leadership competences at higher schools, there is a lack of research on the subjects (1) how innovative study methods could be applied for more effective development of leadership competences of students and (2) what is students' opinion about using these methods. That is why the research considering these issues is relevant practically and quite new scientifically. The aims of the research are (1) to reveal the possibilities of using innovative study methods at the university for leadership development and (2) to reveal students' opinion about using these study methods.

For this purpose, in the year 2016 the qualitative research involving last year graduated students from Klaipeda University was fulfilled. 2 groups of students attended weekly "Leadership" class. The instructor used integrated strategy, i.e. included some theoretical knowledge on different leadership competences and many innovative practical activities as well. Leadership classes contained both leadership and some management competences to prepare students for leading in social, personal and professional life without a formal leadership title or position. After the class students had to write feedback essays. In the essays students were asked to write their own reflections (and opinions) how they feel about the lecture, new knowledge, practical activities, does this knowledge change their attitudes, how they could use new knowledge in professional and personal life.

Researcher carried out the observation of the activities. While observing the researcher took the notes about students' involvement and interest in the activities and discussion. Special requirements needed for the activities (size of the class, tables, board, tools, special readiness, etc.) were noted as well. This information was analyzed and categorized. After getting feedback essays from the students, narrative analysis were carried out and several categories distinguished.

And here are the examples of the class activities used for the reseaarch. One of the objectives of the "Leadership" course was to emphasize that effective communication and collaboration enables team members to demonstrate and use their knowledge, skills and competences for the achievement of team goals and that effective collaboration entails maximizing the abilities of the team members to complete different projects, thus requiring the building of awareness and trust in each other's abilities (Bennett, Gadlin, 2012). After providing students with the theory of communication in the team and the roles of the team members, a puzzle building activity as described by Reed et al. (2016) was used to promote interpersonal communication and collaborative work skills.

Instructions given by Reed et al. (2016) for this activity were followed. Each team of students is given a box of puzzle pieces. Each puzzle has the majority of its own puzzle pieces but also has puzzle pieces from other puzzles. The following task goal is written on the board: "Put the puzzles together as quickly as possible." As the activity unfolds, the instructor monitors verbal and non-verbal communication within and between teams, behavior of the team members and roles taken. For example, does a collaborative strategy emerge in a team or does each individual act alone? Does a leader emerge in any team? It typically takes 5-10 minutes before students realize that there are extra or missing pieces. Students may begin to exchange pieces with other teams and when the first team finds their missing pieces and completes the puzzle, they typically declare victory. By 15 minutes, several teams may finish, and the instructor reiterates the goal. Depending on the group of students, the finished teams may or may not help the other teams finish. The activity ends when all teams finish. The activity is debriefed with a discussion of the types of verbal and nonverbal communication observed collaboration versus competition, and the importance of a clear understanding of task goals. The discussion is framed within the context of the instructor's goals for the teams and the project (Reed et al., 2016).

Another example of innovative practice activity is "Poster session". After getting some new theoretical knowledge, students had to develop posters for presenting their ideas about the topic learned. Posters were used to accelerate the discussion.

One more example is the game "The 5 Whys". It helps to see the bigger picture of the problem analyzed in wider context. The 5 Whys game mirrors the motive to move beyond the surface of a problem and discover the root cause, because problems are tackled more sustainably when they are addressed at the source. This game is bout reading more between the lines - about understanding the root cause of a problem so that people can get the greatest leverage out of solving it (Gray, Brown, Macanufo, 2010).

Students also made their own leadership SWOT analysis and other non-traditional tasks.

After every class for their homework, students were asked to write the feedback essay. As it was mentioned before, students were asked to write their own reflections (and opinions) how they feel about the lecture, new knowledge, practical activities, does this knowledge change their attitudes, how they could use new knowledge in professional and personal life.

After the semester the discussion with the students groups was held to learn their thoughts about using non-traditional activities and writing the reflections for their leadership development. Both the feedback essays and recorded discussion served as a source for narrative analysis.

Results

Though that was not the aim of the study, but it needs to be mentioned that research has shown the high demand

of students to develop their leadership competences during the studies at the university. Students kept saying: "If only I knew this before". They welcome the opportunity to have special leadership subject.

Games for understanding theoretical knowledge better. Applying innovative study methods for leadership development can be seen as a student - centered approach. It was quite difficult to develop discussion with the students after giving them only theoretical knowledge. For example, even after explaining the idea that every person takes different role in the team and describing the roles, it was difficult for them to decide what role they play personally. But after playing the puzzle game (that is kind of childish and do not ask thinking about leadership) in a group student understand their behavior easier. Discussing their feelings and behavior after the game helped to reveal their roles in a team and understand specification of different roles better. It is also important that puzzle and other games played during the semester helped students to know each other better. Students relaxed while playing and discussions were also much more interesting, young people expressed their opinions and questions better.

Games for developing the creative environment. Discussions after playing "5 Whys" were full of energy. After students were asked to be honest in thinking the questions, after they were asked to write the first thing that comes to their mind each time they think "Why?" and after they learned to ask "Why" until they feel that it really takes to some meaningful insights, they learned to identify problem's root cause and find the way toward the solution. All the games played for development of leadership competences helped to create very creative environment and helped students to understand their feelings about the topic better.

Games for understanding oneself better. Self - evaluation of own leadership skills and self - recognizing of own strengths and weaknesses are very important issues when developing leadership. Different tests are used for this usually. So SWOT analysis of oneself was unexpected for students. But this practice was called interesting and useful after all.

Reflection for leadership development. Another strategy of innovative study method was rethinking the class experience and writing the feedback essays. The reflective learning was new for students; they said that never experienced it before. Students admitted that first feedback essays were really difficult to write. But after they were reminded to write down their feelings after the class and new topic, try to reason the feelings and understand strengths and weaknesses and describe new knowledge and new skills, writing got much easier.

What is common for many students, that having trust and faith in the class was difficult at first. They did not want to say that out loud in the classroom, but some of them were too shy, some of them were afraid to get negative response to their opinion or thought that others may have more interesting ideas. But atmosphere got lighter and more playful during non-traditional activities and students realized that everyone has different ideas to contribute. That brought important understanding that there are many different people with their roles ideas and only communication and collaboration can bring the best results and outcomes.

Overall, it was agreed that reflecting the class experience is not only very interesting, but also effective method for development of different leadership competences, for example: setting own leadership values, defining the model of moral authority, developing emotional intelligence, understand the nature of conflict and overcome it, improving communication and collaboration skills, promoting understanding of roles in a team, etc. Students enjoyed the process of rethinking the class experience and purposefully thinking how new knowledge could help in the future life. It helped them to develop new understanding about leadership and create new models for own interpersonal relations.

Conclusions

Though leadership is one of the most researched fields in social science, it continues to maintain importance in research considering its established recognition as crucial to human well-being and achievement. That is the reason why leadership development - knowing oneself, being effective communicator, being reflective and engaging, is considered one of most desired features of employees of today and tomorrow at the most successful companies across the globe. But the changing of the environment and moving from heroic-centric and leader-centric approach in leadership to relation-centric approach requires innovative attitude in method construction for effective leadership development in contemporary society.

Whereas there are many facts that universities play an extremely significant role in creating and developing the quality of leadership in the contemporary society, the research has been carried out using innovative methods for leadership development at the university.

Research has shown the high demand of students to develop their leadership competences during the studies at the university. Applying innovative study methods (playing games during the class and reflecting the experience while writing feedback essays) for leadership development can be seen as a student - centered approach.

There are plenty of possibilities to use innovative study methods at the university for leadership development. Playing many games do not require any additional place or space, only the regular classroom. As it takes approximately 30 minutes to 1 hour to play, regular class time is enough for providing students with theoretical knowledge, doing activity and developing the discussion. And another important thing - many games that could be used for leadership development need 5 - 10 players. So they can be played in the groups. And many different groups can be formed during the semester. It gives the possibility for students to try different strategies for effective communication and collaboration within one group and between several groups.

It needs to be said that students did not need to be forced to get into playful activities. They enjoyed them very much. First of all, games helped to break down the barriers and helped to communicate better. Playing games as practical activities during the "Leadership" classes helps to create good environment for understanding oneself and others better, for acceleration of creative thinking, for developing fruitful discussions and finding different sides of leadership. Some students admitted that they wrote down those innovative activities to their notebook and will use them as a tool at work or in social life.

These results show the effectiveness of innovative activities for leadership development and display the need for large study finding and describing innovative and non-traditional practices.

References

Barker, R. A. (1997). How can we train leaders if we do not know what leadership is? *Human relations*, 50(4), 343-362.

Bennett, L. M., & Gadlin, H. (2012). Collaboration and team science: From theory to practice. *Journal of Investigative Medicine*, 60, 768–775.

Boin, A. (2005). *The politics of crisis management: Public leadership under pressure*. Cambridge University Press: UK.

Breakwell, G. (2016). The Future Leadership of Higher Education. In *Higher Education as a Bridge to the Future: Proceedings of the 50th Anniversary Meeting of the International Association of University Presidents, with Reflections on the Future of Higher Education* by Dr. J. Michael Adams (p. 115). Rowman & Littlefield.

Cohen, A.R., Bradford, D.L. (2005). *Influence without autority* (2nd ed.) Hoboken, NJ: Wiley & Sons.

Day, D. V., Fleenor, J. W., Atwater, L. E., Sturm, R. E., & McKee, R. A. (2014). Advances in leader and leadership development: A review of 25years of research and theory. *The Leadership Quarterly*, 25(1), 63-82.

Day, D.V. (2000). Leadership development: A review in context. *The Leadership Quarterly*, 11 (4), 581–613

Day, D.V., Harrison, M.M., Halpin, S.M. (2009). *An integrative theory of leadership development: Connecting adult development, identity, and expertise*. Psychology Press, New York

Dinh, J. E., Lord, R. G., Gardner, W. L., Meuser, J. D., Liden, R. C., & Hu, J. (2014). Leadership theory and research in the new millennium: Current theoretical trends and changing perspectives. *The Leadership Quarterly*, 25(1), 36-62.

Fisher, B.A. (1974). *Small group decision making: communication and the group process*. New York: McGraw-Hill.

Friedman, T. L. (2014). *How to get a job at Google*. The New York Times, 22.

Gill, R. (2011). *Theory and practice of leadership*. USA: Sage.

Gray, A. (2016). *The 10 skills you need to thrive in the Fourth industrial revolution*. Accessed at https://www.weforum.org/agenda/2016/01/the-10-skills-you-need-to-thrive-in-the-fourth-industrial-revolution/ on 2nd April, 2017.

Gray, D., Brown, S., Macanufo, J. (2010). *Game storming.* Sebastopol, CA: O'Reilly.

Hernez-Broome, G., & Hughes, R. L. (2004). Leadership development: Past, present, and future. *People and Strategy*, 27(1), 24.

Hunt, J. G., & Dodge, G. E. (2001). Leadership déjà vu all over again. The Leadership *Quarterly*, 11(4), 435-458.

Ibarra, H., Snook, S., Guillen-Ramo, L. (2010). Identity-based leader development. In: Nohria N and Khurana R (eds) *Handbook of Leadership Theory and Practice*. Cambridge, MA: Harvard University Press, 657–678.

Nicholson, H., & Carroll, B. (2013). Identity undoing and power relations in leadership development. *Human Relations*, 66(9), 1225-1248.

Norris, S. E. (2017). What Motivates an Individual to Lead and Engage in Leadership Development?. In *Encyclopedia of Strategic Leadership and Management* (pp. 696-706). IGI Global.

O'Reilly, C. A., Caldwell, D. F., Chatman, J. A., Lapiz, M., & Self, W. (2010). How leadership matters: The effects of leaders' alignment on strategy implementation. *The Leadership Quarterly*, 21(1), 104-113.

Petriglieri, G. (2011) Identity workspaces for leadership development. In: Snook S, Nohria N and Khurana R (eds) *The Handbook for Teaching Leadership: Knowing, Doing and Being*. Thousand Oaks, CA: SAGE, 295–312.

Reed K.E., Aiello D.P, Barton L.F., Gould S.L., McCain K.S., Richardson J.M. (2016). Integrating leadership development throughout the undergraduate science curriculum. *Journal of College Science Teaching*. 45(5), 51-59.

Schyns, B., Tymon, A., Kiefer, T., & Kerschreiter, R. (2013). New ways to leadership development: A picture paints a thousand words. *Management Learning*, 44(1), 11-24.

Skarbalienė A. (2015). *The Leadership Competencies of Teachers Mentors as a Factor of Education of Leadership Competencies in Students* [dissertation]. Klaipėda: Klaipėda University.

Skarbalienė, A. (2017). Development of leadership competencies during studies at an institution of higher education. Students' opinion. In A.Alvinius (editor) *Contemporary Leadership Challenges*. Rijeka: IntechOpen.

Smith, J.A., & Foti, R.J. (1998). A pattern approach to the study of leader emergence. *Leadership Quarterly*, 9(2), 147-160.

Snaebjornsson, I. M. (2016). *Leadership in Iceland and Lithuania: A followercentric perspective* (PhD dissertation). Iceland: Haskolaprent.

Steers, R. M., Sanchez-Runde, C., & Nardon, L. (2012). Leadership in a global context: New directions in research and theory development. *Journal of World Business*, 47(4), 479-482.

Stelmokienė, A., Endriulaitiene, A. (2015). *Vadovavimo efektyvumo vertinimas: psichologiniai aspektai*. Vilnius: Versus aureus.

Uhl-Bien, M., Riggio, R. E., Lowe, K. B., & Carsten, M. K. (2014). Followership theory: A review and research agenda. *The Leadership Quarterly*, 25(1), 83-104.

Wright, K. B., Rosenberg, J., Egbert, N., Ploeger, N. A., Bernard, D. R., & King, S. (2013). Communication competence, social support, and depression among college students: a model of facebook and face-to-face support network influence. *Journal of Health Communication*, 18(1), 41-57.

RECEIVED: 1 January 2017 **ACCEPTED: 10 May 2017**

Aelita Skarbalienė. An associate proffesor and a research fellow at Klaipėda University. She specializes in management quality issues and psychosocial aspects. Aelita has worked in many national and international projects with a particular focus upon leadership issues. She has great experience in coordinating and managing projects and is currently involved in few EU projects. Aelita has a PhD in Social Sciences and her researches have been published in academic peer-review journals and presented at international conferences. Her experience aslo includes development and implementation of training programs aimed to increase competencies to better address psychosocial dimensions and enhanced abilities to apply skills for behavioral change communication. Address H. Manto 84, Klaipėda, Lithuania. E-mail aelita.skarbaliene@gmail.com

Inga Minelgaitė Snaebjornsson. A researcher and lecture at University of Iceland, School of Business. Her main research focus is on leadership, cross-cultural leadership and gender. She is also interested in new and emerging fields of leadership such as neuroscience of leadership and followership. Inga has 15 years experience working in management positions in various sectors of business and in multiple countries. Inga holds PhD in business administration from University of Iceland. Email: inm@hi.is

Vadyba
Journal of Management
2017, Nr. 1 (30)
ISSN 1648-7974

OUTLINE OF THE COMPLEX VIEW AT THE STATUS OF A MANAGER IN THE SPACE OF MATERIAL LAW STATE

Daniel Lajčin, Gabriela Gabrhelová, Ferdinand Korn
DTI University in Dubnica nad Váhom

Abstract
The constitutional principle of preservation of the social and environmental values in the economic system of the state portrays and in some sense cultivates the functional operation of a free market economy. The enterprises in service areas of substantive law are subjects, respectively are formed and managed by individuals, applying the economic and social rights to carry out business or other economic activity in the space of market, ecological and social oriented economy of the country which constitutionally promotes and protects competition.
KEY WORKS: manager, law, law, economy, individual, fundamental rights and freedoms.

Introduction

Position of the control managers in the economy of the country is distinctive, starting from the particularities of the roles and responsibilities of the managers on their fulfillment. Since social intelligence is foreseen as a social managerial capacity, it allows conclusions about the possibility of action in social intelligence in the actions of the managers in terms of its neutral charge in relation to morality. The reason is that for achieving of concrete economic outcomes is need to achieve the aim of promotion over the value of the things which means to achieve the objective (profit) used. For the solution of difficult life situations by managers, whether in terms of defining their social intelligence as insitutes a possible neutral charge to the ethics and morality, then the position of general manager for morality accepted as an autonomous morality with anthropocentric tinge, with a priority to achieve the concrete objective regardless of heteronomous norms of legal normative system standed on natural law basis in conection with law and morality (Lajčin, Korn, 2016). On the ipso facto and ipso jure complex phenomenon is affected by the two major historical objective factors as legal, economic and social unification of the European Union and the economic globalization of the world economic space. This would lead to a conflict and overlap of civilization sources and different economies with different social views on interpersonal relations in the economic and subordinate process in the connection with the status of the manager. Status of the manager in economic area of Slova Republic is thus created by significant social turbulance which stem in the transition of the state economy to a market economy after 1989, in the establishment of the independent Slovak Republic in 1993, which is the material law state guaranteeing to each upatňovanie his fundamental rights and freedoms as well as the constitutional definition of independant economy of the state, in Slovakia accession to European Union in 2004 with the free movement of capital, people, goods and services and thus constitutionally voluntarily waiving the exercise of the rights of the State in the area of independent economic policy of the state in favor of the EU and in the process of global world economy, with the necessary civilization influence of different economies, with different social, ideological, philosophical, historical, economic, legal, religious, sociological and psychological opinions on interpersonal relations in a subordinate process in connection with the status of manager, whereas the relationship is not mechanical between individual and civilization environment. (Gáborová, Porubčanová, 2016). Sources indicated, however objectively present comprehensive system that they actually has a mutual causality as many transformation, where omission of the importance and awareness of even just one of those sources may cause the resultant distortion in social and economic relations, capable of inducing undesirable social outcomes in exposure of people in manager positions (Gabrhel, Hrazdilová Bočková, 2016).

Government's approach to its interference in the sphere of economy

During the current development according to J. Husára, there were formed two approaches of states to interference in the sphere of economy:

a.) liberal economic policy,
b.) interventionist policy.

The liberal concept of economic policy is based on the assumption that the market economic system is heading toward the balance and is able to absorb external impulses mainly through the price mechanism. The market system has the capability of continuous adaptation to changing economic conditions, as a result, are not required intervention by the state, therefore economic state

intervention is not necessary. In this concept there is only small space for concrete economic-political decision and the actions. According to this conception, market system is stable, providing a fair distribution of income and harmonious development of economy. State intervention in the economy are considered in place just in the case of market failure. The interventionist policy is kind of an antithesis of the liberal concept and it is based on the assumption that the private sector is not inherently stable, that is characterized by a tendency for non-equilibrium state, with consequent to market failures, from which then derives the need for complementary functioning market system about public sector in which there undertakes state, respectively, broad terms of interventionism of public authorities now. State or public authorities with their interventionist interventions try to restore its macro-economic balance and promote fairer distribution of the income.

In the term of time, the concept of a liberal economic policy was practically applied till a period of great economic crisis at the turn of the 20's and 30's of the 20th century and after that time until the mid 70s of the 20th century, concept of interventionist economic policy was dominated. In the transforming countries of Central and Eastern Europe, in the early 90s of the 20th century the need of theoretical elaboration of transition from administrative and directive system of the economy into the market economy was created, so the need of elaboration of economic policy transformation of the economic system. The economic political conception of economic transformation were original and social practice unverified in that time. These economic and political concepts were based on the need for macroeconomic stabilization, trade liberalization and privatization. Although the results of realisation of economic policy transformation in the Czech Republic and Slovakia significantly differ from the original ideas and intentions, yet through these concepts achieved of transformation of the economic system in a relatively short period and market system can now be considered to be stabilized. (Husár,2013). J. Prusák as a lawyer considered in formulating the position of the State in relation to the economy in the model identified as "intervening and social state" about the country which intervenes in the economy, particularly in areas that have a social impact, for example. in the construction of motorways, railways, channels, nuclear energy, space research, to prevent economic recession and crises, in currency stabilization, conservation measures, promotion of banking and other areas that secure its economic and defensive position in the international political broadcasts from the geopolitical and global view (Prusák, 1995).

Four categories of economists approach to defining the role of the state in the economy

Economists approaches to defining the role of the state in the economy according to J. Husára and they can be divided into four categories:

1. Liberal approach, which is based on the fact that the State should be only minimally involved in the economic sphere. This approach is based on strict rules of bankruptcy law as a result of which there is relatively rapid elimination of ineligible entities in the economic sphere. Minimization of government or other public subsidies, minimalization of redistribution processes and transformation of the state-owned enterprises to corporations in which the state has not the only or decisive factor. In applying of this liberal approach in recent times, it stresses the change of relations between the public and private sectors, while considered optimal for the development of partnerships between the private and public sectors. The need for transparency and openness in decision-making processes in economic sphere, which should guarantee the mutual confidence of economic subjects.

2. The approach is based on that the state should primarily fulfill social functions, starting from the idea that economical development allows the social security became available to everybody in some degree. This approach of the state to the economic sphere, is however criticized in the recent period mainly by the following arguments: staff who have lower incomes are not stimulated enough for improving their performance because they relies on generous welfare system, social policy and its components, mainly social insurance or benefits of unemployment depletes large source of social resources because of that they limit economic growth, a high proportion of social spending to gross domestic product negatively affects productivity of work and competitiveness in world markets. Together with the other factors for example low natural population growth, prolonging of the life expectancy, these facts lead to the need for correcting this policy.

3. Another approach is characterized by a strong developing stimul of economic, not only the market or coherent action of the state. In addition to these factors act as a development factor and powerful corporations seems as developing factors which create an extensive network.

4. An approach based on the belief that the state has only a certain capacity of options to operate in the economic sphere (Husar, 2013).

The analysis of mentioned economic opinion in prism of existence of fundamental rights and freedoms of a social character of economy

The first approach

Liberal economic approach, denoted in the previous chapter in Section 1, with minimalist effect of state in its economical space is excluded ipso jure by existence of cataloging of basic economic, social and acultural rights and freedoms that are guaranteed to every individual by international agreements and principles of national law of substantive law state. Bearer of fundamental rights and freedoms is every individual and their guarantor and recipient is the State (Bröstl, A., Dobrovičová, G., canaries, I, 2007). Starting from that premise we can conclude that the state as guarantor and recipient of fundamental rights and freedoms is required by its mechanisms of power (adoption of social laws, etc.) to be a counterweight against the liberal efforts of the economy for achieving economic results, regardless of their impact on basic space of the rights and freedoms of individuals,

not only in management subordination, but in terms of overall social impact on all individuals:
- either financial supporting of political parties in the state in the context of political competition, or
- personification of economic oligarchs in the political system of the state, who establish their own political grouping,

trying to promote their own economic interests and the drafting and adoption of laws to the State against individuals in the economic, social and cultural rights are gradually losing its guarantee role in protecting the fundamental rights and freedoms of every individual and become an instrument of economic oligarchy in achieving its economic goals regardless of the constitutionally guaranteed status of the individual in society. Political parties latently becomes the means of eliminating at least two constitutional institutions and it is the status of the individual in society as a bearer of fundamental rights and freedoms while eliminating social and environmental fixed characterof economy of materially law state.

So if R. Dworkin defines the objective law as a system of legal principles and legal norms of political morality (Dworkin, 2001), perhaps the above teleological establish that if political morality in the state is shaped by the economic oligarchy and its Machiavellian morality then the general position of political morality in the objective law of the state is important, it can cause both disregard of the principle of objective law and also receiving these legal rules which are in contrary to the concept of protection of fundamental rights and freedoms of individuals and with the nature of the economy of the state. With liberalism in the economy closely relate ideological liberalism too. The basis of its political philosophy is an individual, a citizen who has the greatest possible freedom. According to liberal conviction the freedom is the basis of society. Classical liberalism is a right-wing ideology, fighting for maximum freedom such as personal, economic, religious and political freedom (Kmetóny Gazdová, 2016).

Political morality as primarily individual substrate of personality, in connection with liberal economic approach, which is based on the fact, that the State should be only minimally involved in the economic sphere and in conjunction with ideological liberalism are the source of the fact that the actions of the individual in today objective reality in achieving the expected goals of the activities of an individual is significantly marked "required" attributes of individuals with specific anticipated features, the opportunistic attitude toward morality and justice, self-anthropocentric view of the objective reality and psychological factors of social intelligence, marked neutral charge for ethics, morality and law as a whole IK subjective natural rights of others. Psychological and sociological highlighting of the autonomy of the individual, his freedom and the searching of moral reality in the very existence of the individual as a subject in the relation to morality and objective law, it finds its reflection and possible justification in the actual ideas of anthropocentric jurisprudence. Postulates of anthropocentric jurisprudence overlap with the ideas of metaetic subjectivism and moral nonrealism of Richard Doublet on which to illustrate metaetic subjectivism and metacultural nature of anthropocentric legal philosophy. (The action of individual can be morally correct, even though the majority of individuals think otherwise.) According to R. Doublet we will not strive for theoretical consistency, but about the true nature of fidelity (subjective, their own) moral attitudes and they are inconsistent. T. Sobek critically concludes to those thesis: *"Moral attitudes are indeed only subjective attitudes, but these are attitudes that objectively exist as a part of reality"* (Sobek, 2009).

The above there is highlighted is that liberal approach in correlation state and the economy are excluded ipso jure by existence of basic economic, social and cultural rights, the rights and freedoms that are guaranteed to every individual by international treaty agreements and by the principles of national law of material law state. State power by creating a liberal space in economy of the country, with a minimum ingerency of the state, denies a role of uncompromising guarantor of protection of economic, social and cultural rights of the individual.

It is true that the bearer of natural rights and freedoms is the individual - an individual entity. *In the objective reality never did not operate and will not affect only one subject of natural rights and freedoms, but always each individual in correlation with quantitative indefinite number of individuals of the same natural law quality of subjective rights and freedoms.* This fact establishes ipso facto the existence of mutual regulatory action of all individuals in the society, regardless of the quality of subjective selfperception their individual autonomy. The subsequent existence of regulatory action ipso jure by objective standards of law is a manifestation of respect "the individual and the state", where the state guarantees the possibility of the fundamental rights and freedoms of *every individual*, regardless of the quality of individual subjective autonomy of each individual.

The second approach

The second economic approach, which is based on the fact, that the state should primarily fulfill the social functions, can comment on the following: It is verified output of economy that the small and middle enterprises tied in the state the dominant amount of employment, but their economic and legal life is dominated by a few years. In contrast, the state expect the administration of relatively sustained employment binding from the large enterprises. The state can not fulfill its social functions without reliable filling of the revenue component of the state budget, which mainly includes taxes and levies. If the state, in respect of attracting large investors in their economic space, allows these investors „taxes holidays“, it discards of significant regular income to the state budget over a long period, which could redevelop its social functions, nota bene, when the expiration of tax holidays investor leaves, its action is in service areas of law relevant only by virtue of maintaining of employment after some time. The illustration of that fact is the current case of departure of US Steel from Slovakia. From large investors, that its presence in economic area of the state state connect only to the tax holiday period, can not be expected to be involved as an employer to the Social

Agenda as its employees for example as the title of the long-term projected operation carried out in the past in the former Czechoslovakia for example Bata company (construction of housing for employees, education of its employees, loans, cultural and social activities, etc.). Participation of the employer for social programs is in fact constitutionally necessary and state must clearly reflects against the employer from the title of the constitutional status of an individual as a bearer of economic, social and cultural fundamental rights and freedoms and social characteristic of its economy. Legislative activities, relating to dual education in Slovakia, may be the evidence, that the dual training system can use and require only from those employers where are likely long-term presence in economy area of the state, a priori from managers of large enterprises. The real view on social policy already mentioned US Steel Kosice, which is leaving the economic area of Slovakia is such that even though the State Labour Code, whose creator is state itself, limits for a given employer collective redundancies by number of thirty employees per month, the company US Steel Kosice circumvented this law dismissal of 29 employees per month, thus avoiding the obligations imposed on the employer in respect of collective redundancies and secondly to employees in management subordination and also to the state. The law of its positivistic interpretation was not corrupted, but the status of managers was scientifically defined as an autonomous morality of anthropocentric tinge, with a priority to achieve the concrete aim, regardless of the existent heteronomous standards of the legal law normative system standed on natural law base in connection of law and morality. (Natural law concept of substantive law define sucha n action as circumvention of the law, law enforcement in fraudem legis which have no legal protection.). The existence of cataloging basic economic, social and cultural rights and freedoms which are guaranteed to every individual intergovernmental agreements and principles of international law of substantive law state and the existence of the constitutional concept of a socially and ecologically oriented market economy of the state, it is impossible to strictly separate the social aspect of national economic policy on the one hand and economic goals of a particular business on the other hand, without requiring of participation in positive social impacts in social environment as well as from employers, ergo managers of enterprises.

The third approach

The third economic approach is characterized by a stron developing stimul of economy, it is not only the market or coherent action of the state. In addition to these factors as a development factor act also the powerful corporations which have an extensive network. With the facticity of economic globalization, which is a content of that constallation, can be economically agreed from the economic point of view. It should be highlighted the legal dimension of the economic approach. The legal protection of economic, social and cultural rights has in fact its supranational dimension (Cisko, 2012) and is unified by adopting interstate documents such as the Universal Declaration of Human Rights, Charter of Fundamental Rights and Freedoms and the like, that is not tied only to the territory of a particular state and thus to the territorial scope of the legal standard (Ćič, 2012). It can therefore to be concluded that the existence of cataloging of basic economic, social and cultural rights, the rights and freedoms in the international treaty can not absolute globalization process only from an economic point of view of a strong multinational corporations, because it is true, that the protection of fundamental rights and freedoms of the individual is in the economic area controlled at interstate (supranational) level.

The fourth approach and conclusion

The fourth economic approach, based on the belief, that the state has only a certain capacity options to operate in the economic sphere, placed in that formulation of few issues from which we can ariculateone: "It means, besides other things, that the state has no personal substrate, from which the capacity of the quality and quantity could not grow managers of the state-owned enterprises in the economic area?" Neoliberal economic policy served the thesis for many years, that the state is a bad owner, ergo, that the state is not able to generate fund of managerswho are able to manage companies which are important in terms of national interest or the stability and protection of the public good. The state has also the capacity to affect in its economy space, which are declared in the constitution, respectively as politically decided constitutionally established principles to respect and guarantee (level and quality of political culture of a particular political force, which has become the holder of the state power). The Constitution establishes the State implicit, but clear obligation to influence and participate in the broadest sense of the word, the strategic decisions of the management of major companies, in order to guarantee the fundamental freedoms of the citizens, and with the aim to maintain the social and ecological character of the state economy. In the following set of constitutional limits for the state neoliberal hand of the market, has no place and its advocacy on background of material law state of XXI. century is a misunderstanding of the constitutional law realities of correlation "the individual and the state" even in the economic, social and cultural rights of each individual (citizen) and in the area of socially and ecologically oriented economy of the state.

References

Bröstl, A. 1999. Dejiny právneho a politického myslenia. Iura Edition 1999. ISBN 80-88715-39-3.

Bröstl, A. a kol. 2013. Ústavné právo Slovenskej republiky. Vydavtalstvíá nakladatelstvíá Aleš Čenek. Plzeň 2013. ISBN 987-80-7380-433-6.

Bröstl, A., Dobrovičová, G., Kanárik, I. 2007. Teória práva. Košice 2007, ISBN 978-80-7097-680-7

Bröstl, A., Dobrovičová, G., Kanárik, I. 2007. Základy štátovedy. Košice 2007, ISBN 978-80-7097-679-1, p. 160.

Cisko, L. Právna povaha obchodných zvyklostí v kontexte medzinárodného práva obchodného. Cofola 2012, The Conference Proceedings, Brno 2012. ISBN 978-80-210-5929-0, p.788.

ČIČ, M. a kol. 2012. Komentár k Ústave Slovenskej republiky, Eurokódex 2012, ISBN 978-80-89447-93-0, p. 27.

Dworkin, R. 2001. Když se práva berou vážne. Praha 2001. ISBN 80-7298-022-X, p. 43.

Gáborová, Ľ., Porubčanová, D. 2016. Vybrané kapitoly z vývinovej psychológie. Tribun EU, s.r.o., Cejl 892/32 Brno. ISBN 987-80-263-1088-4, p. 44.

Gabrhel, J., Hrazdilová Bočková, K. 2015. Innovation Manager and His Position in the Company. *International Business Management. Medwell Journals.* 9 (5): s. 685-693. 2015. ISSN 1993-5250, p. 685.

GABRHELOVÁ, G., KORN, F. 2016. Emotional Inteligence, Manager, Law. Ste-Con, GmbH, Karlsruhe, Deutschland, ISBN 978-3-945862-03-2.

Hollander, P. 2012. Filosofie práva, II.rozšířené vydání. Vydavatelství a nakladatelství Aleš Čenek, s.r.o. Plzeň 2012. ISBN 987-80-7380-366-7.

HUSÁR, J. 2013. Hospodárska politika a hospodárske právo, 2016. STUDIA IURIDICA *Cassoviensia* ISSN 1339-3995, ročník 1.2013, číslo 1, p. 69.

https://www.webnoviny.sk/v-spolocnosti-u-s-steel-kosice-pokracuje-prepustanie/

Kmetóny Gazdová, V. 2016. Demokracia kontra partokracia v sociálnom kontexte, Filozofická fakulta Prešovskej univerzity v Prešove, Grafotlač Prešov, s.r.o., 2016. ISBN 978-80-555-1548-9, p. 51.

LAJČIN, D., Korn, F. 2016. Personality of a Manager in the Context Morality and Law. Ste-Con, GmbH, Karlsruhe, Deutschland, ISBN 978-3-945862-02-5

Palúš, I. 2002. Štátne právo porovnávacie. Právnická fakulta UPJŠ Košice 2002. ISBN 80-7097-483-4.

PALÚŠ, I., Somorová, Ľ. 2011. Štátne právo Slovenskej republiky. Právnická fakulta UPJŠ Košice 2011. ISBN 987-80-7097-787-3.

Prusák, J. 1995. Teória práva, Vydavateľské oddelenie Právnickej fakulty UK, Bratislava 1995, p. 45.

Sobek, T.:http://teorieprava.blogspot.sk2009/06richard-double-je-metaeticky.htlm

RECEIVED: 23 March 2017 **ACCEPTED: 10 May 2017**

Daniel Lajčin (1962) Associate professor Mgr., PhD. terminated his PhD studies and successfully completed the habitation at the University of Prešov in Prešov. Currently he is CEO of the international holding company focused on education and information technologies. He is a chairman of the Management Board of Dubnica Institute of Technology in Dubnica nad Váhom and a member of Scientific Council of Dubnica Institute of Technology in Dubnica nad Váhom. He is a university lecturer in the field of management and economics. At the same field he exhibits very rich publication activity in his pedagogical, scientific and research publication issues he is involved in management and economics with an emphasis on coping.

Gabriela Gabrhelová (1978) Ass. Prof., PhD., is the director of Dubnica Technology Institute. Studied management at the Prešov University. Institut is oriented on producing and spreading knowledge and innovations in the field of applied study programs and scientific disciplines, and focuses on training professionals needed in the labor market with the aim to contribute to the development of a knowledge-based and sustainably competitive economy in Slovakia. To realize this mission it cooperates with Slovak and foreign colleges and universities, institutions in private and public sectors, non-governmental organizations, and takes part in international projects. He scientific research is primarily oriented on His scientific research is primarily oriented Emotional intelligence of managers and manažérok in relation to coping with stress managers.

Ferdinand Korn (1961) He studied law at the Law Faculty of Pavol Jozef Šafarik University in Košice. He gained the doctorate in Political Science at the Phylosophical Faculty of Prešov University, doctorate in Theology at the Faculty of Orthodox Theology of Prešov University and after completing doctoral studies at the Faculty of Law UPJŠ, he gained his PhD. in Theory of State and Law. He is the author of monographs, co-author of monographs, author of articles in scientific and professional journals and member of the editorial board and scientific trade journal. He is currently an assistant at the DTI University in Dubnica nad Váhom.

Vadyba
Journal of Management
2017, № 1 (30)
ISSN 1648-7974

COMPARISON OF THE QUALITY OF THE BUSINESS ENVIRONMENT IN THE SLOVAK REPUBLIC AND POLAND

Eva Ivanová [1], Anna Lemańska-Majdzik[2]
[1]Alexander Dubček University of Trenčín, Slovakia, [2]Czestochowa University of Technology, Poland

Abstract
The enterprises belonging to the SME sector are characterized by flexibility, dynamic approach to the economic environment, they respond quickly to the changing needs and preferences of potential customers and adapt to them. In this way, they significantly contribute to increasing efficiency of the functioning of the entire economy and constitute an important part of the regional development.
The SME sector, as the key one for the world economy, encounters, however, many barriers to development on the business envienvironment, such as, including legal regulations, restrictive labor laws, amount of tax, limited access to sources of financing, low innovative performance and other.
The propose of this atricle is examine, analyses and assess the current situation and trends related to the development of entrepreneurial environment in Poland and Slovak Republic in light of the macroeconomic environment development in both countries. The conditions for the development of the SME sector on the basic of the empirical research refers to the identification of the conditions of the business environment and its impact on small and medium enterprises conducting their activity in Poland and in the Slovak Republic. Analysis of the results of empirical research indicated the multidimensionality of the discussed problem and the great similarity in the barriers to the development of the SME sector. The main method used in the research was the questionnaire survey method and the method of comparison of the results obtained.
KEY WORDS: Small and medium-sized enterprises, business environment, barriers to the business environment

Introduction and theoretical background

Economic environment and factors that most directly affect the quality of the entrepreneurial environment and its synergistic effects affect the functioning of the corporate sector, which is reflected in the development of economy-wide macroeconomic indicators. For small and medium-sized enterprises that operate in the economic and political environment of the state are important the following factors:

- funding opportunities for business development and innovation
- access to capital, investment opportunities,
- market position,
- quality and structure of human resources,
- risk pertaining to entrepreneurial activity, possibilities of its elimination,
- stability of political environment.

Micro, small and medium enterprises have in national economies, but also in the EU economy significant attention. The importance of this business segment is growing particularly in transition economies, therefore for its development it is necessary to create suitable business environment by using the tools of state and EU economic policy. (Koišová et al.2016) Of the total number of businesses in Slovakia micro, small and medium-sized enterprises create a 99% share, they constitute 73.6% of employment and 52.8% of the total value added being created.

In 2015, based on data of the Slovak Statistical Office, the total number of active SMEs in Slovakia was 531,063. Of that number the individuals - entrepreneurs were represented by 64% and SMEs - legal entities by 36%. Of the total number of active SMEs, micro enterprises had the largest representation of 96.9% (in count 515 236), small enterprises 2.4% (12,984) and medium-sized enterprises 0.5 % (2843).

In 2015, according to the Statistical Office of SR, the gross domestic product in current prices was 78 070.8 million EUR. In year-to-year comparison it increased increase by 3.6%. Gross output and value added have a significant impact on the GDP formation.

Gross production created by SMEs (legal entities) in non-financial sector in current prices increased in 2015 year-to-year by 6.3%. In absolute terms it was 53 638,7 mil. EUR. The gross production of micro-enterprises increased by 0.6% to 12 892.3 million. EUR. The gross production of small businesses increased by 2.1% to 15 515.8 million. EUR and gross production of medium-sized enterprises increased by 12.4% to 25 230,5 mil. EUR.

The share of SMEs (legal entities) on value added formation in non-financial corporate sector in 2015 reached 52.3%, representing a year-to-year decrease by 0.5 p.p. In absolute terms it is 19 141.7 mil. EUR.

Besides large enterprises the sector of SMEs plays a key role in export performance and import intensity of Slovak economy. In 2015 export performance reached 93.8% and import intensity reached 91.4%. Export of SMEs in 2015 increased by 5.7%, which represents 18 170.5%. In 2015 compared with 2014 year-to-year the share of SMEs on total export remained unchanged, it was 29.3%. In terms of size structure the share of micro enterprises on total export in 2015 reached 10.5%, small enterprises in total export reached 6.0%, exports of medium-sized enterprises was 12.8%. The share of large enterprises reached 70.7%.

The share of the micro, small and medium-sized enterprises, generally of the SME sector, in the total number of enterprises has not changed and, for years, amounted to 99.82% of the total number of the companies operating in Poland. The absolute majority (96%) in this group is microenterprises employing up to 9 employees. This is more than the average for the European Union, where microenterprises amount to 92.5% of all the enterprises (Starczewska-Krzysztoszek, 2014).

In 2014, in Poland, there operated more than 1.84 million non-financial enterprises, described as active enterprises. Small and medium enterprises constitute as much as 99.8% of these entities (Figure 1.2). The data for years 2010-2014 indicate that the number of active enterprises has been increasing. In 2010 it amounted to about 1.73 million and in 2013 – to more than 1.77 million. However, in 2013, compared to the previous year, the value of this index decreased by 1.3%. The largest growth of enterprises was recorded in 2014, compared to 1 771 thousand in 2013; this increase amounted to 4.0%.

In 2014 there operated 1 839 thousand non-financial enterprises belonging to the SME sector and they amounted to 99.8% of the total number of enterprises.

Due to the basic legal form 91.1% of SMEs belonged to natural persons. Legal persons and entities without legal personality constituted 8.9% of the SME sector. The enterprises from the SME sector most frequently conducted commercial activity (27.0% of the total number of this group of enterprises) and professional, scientific and technical activity (12.7%), and subsequently building and industrial activity (respectively: 12.5% and 10.3%).

In 2014 the sector of enterprises has a significant share in generating gross domestic product (GDP). Polish enterprises generate 73% of GDP, and the companies belonging to SME generate 48.5% of GDP, i.e. every other zloty of this value. From among all the groups of enterprises, microenterprises have the largest share in creating GDP − about 30% (Report PARP, 2015).

Between 2010 and 2014 small and medium enterprises grew on average at a similar rate as the entire Polish economy and their share in GDP remained at a similar level. However, their condition was more susceptible to economic fluctuations than in the case of large companies, particularly to the dynamics of the domestic demand. As a result, the volume of production of this group of enterprises exceeded the pre-crisis level until in 2014. In turn, at the beginning of the analyzed period, medium enterprises had a low share in creating GDP in Poland, compared to the previous years, however, in 2013 there was recorded an increase, compared to the year of 2012, by 3.9%, and in 2014 another increase, by 3.3%, compared to the previous year. (Report PARP, 2015).

In years 2010-2014 the employment in the enterprises of the SME sector was at a relatively similar level. In microenterprises, with up to 9 employees (including selfemployment companies), it amounted to about 38.5%. In small enterprises, with 10 to 49 employees, in the analyzed period, there were employed about 13% of all the employees in Poland; in medium enterprises, with 50 to 249 employees, there were employed on average 18% of all the employees in Poland.

Two of the five employees working in enterprises in Poland are the people working in the entities run by natural persons (amounting to 91.2% of enterprises in Poland). The vast majority (93.5%) of natural persons working in the companies are the ones employed in micro and small enterprises (3.2 million people), of whom 79.3% work in microenterprises. Medium enterprises run by natural persons in 2014 provided jobs to every twentieth employee and large enterprises – to every hundredth. (Report PARP, 2015).

Theoretical background

The world scientific and economic literature embraces many publications that analyse the role, position and importance of small and mediumsized enterprises for the social and economic development of countries. Publications on SMEs also analyse their impact on the development of various areas in the economy, and ways and forms of financing the development of small and mediumsized enterprises. Moreover, there are publications presenting research findings on SMEs issue in individual countries. In this section of the scientific article, a brief overview of world technical literature dealing with the subject matter according to selected areas is provided.

Gupta et al. (2013) write growth-oriented firms are a significant contributor in a nation's economic gain, but the concept of growth is different for different entrepreneurs. Growth can be defined in terms of revenue generation, value addition, and expansion in terms of volume of the business. It can also be measured in the form of qualitative features like market position, quality of product, and goodwill of the customers. Spangenberg, (2004) states „ An economic imperative is not mentioned, nor is one of the challenges an economic one (if distributional issues are not – in a more classical sense – regarded as economic issues). Instead, the economy is perceived as a basic headed: its current way of working is a driving force behind most of the problems, but it could also be a force for the better, contributing to the solutions of problems by creating enough wealth to solve them. Although a vibrant economy is no end in itself, it is considered essential for the long term satisfaction of material needs by providing jobs, income, social security and consumption opportunities.” Love and Roper (2015) emphasise the contribution of local business eco-systems and partnering to both SME innovation and export performance. This creates the potential for localised policy initiatives which can help form or strengthen local partnerships to boost SME competitiveness. Enterprise upgrading aims to analyse the performance of firms over time. A firm’s performance is contingent on the interaction of a number of internal and external forces at different times of the business cycle. This idiosyncratic complexity has made it difficult to develop a universal model or a comprehensive theory of firm development. Brunswicker and Vanhaverbeke (2014) identified five strategies that SMEs adopt for searching: minimal searchers, supply-chain searchers, technology-oriented searchers, application-oriented searchers, and full-scope searchers. They also identified that each strategy entails a

mix of interactions with external sources of innovation such as customers, suppliers, universities/research organizations, IPR experts, and network partners. Going beyond technology road mapping methods (TRMs) to adopt the market pull strategy of technology-product integration. Reeg (2013) dealt with the enterprise upgrade in his "concept of enterprise upgrading" in terms of its impact on enterprise performance growth and work productivity growth in modern enterprises. In this relation, he also elaborated the influence of clusters on SMEs development. Enterprise upgrading aims to analyse the performance of firms over time. A firm's performance is contingent on the interaction of a number of internal and external forces at different times of the business cycle.

Entrepreneurs require external finance, both formal and informal, for a variety of purposes including business start-ups, working capital needs, fixed capital formation, and possibly even for debt financing. However, formal credit institutions such as banks mostly provide loans to well-established SMEs for specific working capital and investment purposes Ruziev, K., and Midmore, P. (2015):

According De Moor et al. (2016) [8]. These autors found that the SME debt finance gap in Poland is decreasing in contrast to the EU, and that the Polish SMEs have better access to debt finance. This result is relevant for the evaluation of the current and future support measures of the Polish and EU government for stimulating and attracting domestic and foreign investments.

Another criterion showing the role of the sector of small and medium enterprises is their impact on the level of innovativeness of the country's economy. The level of innovativeness, which undoubtedly affects the process of entrepreneurship refers both to new companies and the ones already existing on the market (Okręglicka, 2015). While reviewing the subject literature one may also come across the statements that innovations affect the survival of companies and often determine their establishment.

According to E. Stawasz (2011), 'innovation' is an ambiguous term, filled with multiple content. It is usually believed that it includes both impulses, reasons and places (institutions, groups of people) of creating new technical knowledge and factors conditioning this process.

In theory the issue of financing innovation of the SMEs is often discussed. According Madrid-Guijarro, Garcia-Perez-de-Lema, Van Auken, (2016) to reduce financing constraints on their innovation, SMEs should establish long relationships and low debt concentration with their main bank. The more banks a firm works with, the greater its financing constraints. Lee, Sameen, Cowling, (2015) write the worsening in general credit conditions has been more pronounced for non-innovative firms with the exception of absolute credit rationing which still remains more severe for innovative firms.

Wynarczyk, P. (2013) emphasize the importance of relationships with external stakeholders, especially with customers, as a main basis of small firms' competitiveness. Web technologies evolution and social media diffusion have offered businesses a new tool, with new and partially unexplored potentialities. These tools can enhance small firms' ability to manage relationships with customers and other stakeholders. Fear that this technological innovation could be harmful precisely to small businesses. The latter, in fact, have so far taken advantage of their ability to treat and manage customer relationships with a very personal approach, in which entrepreneur is often personally involved. Also confirm that small firms are worried for the risk of losing personal contact with key customers, as small entrepreneurs generally wish to engage with them on a face- to-face basis.

The issue of SMEs development barriers in their own countries is discussed by the following authors. Samitowska (2011) claim: In the case of the developed economies, economic success to a large extent depends on effectively functioning SME. The firms under discussion have been competing with companies from the developed countries particularly since Poland joined the European Union. Barriers they encounter, e.g. lack of adequate support from the state, limited support from business environment institutions, or ineffective management of financial resources might widen competitive gap between Polish and foreign firms.

Risk is inherent in all business functions and in every kind of activity. Knowing how to identify risksof the enterpreneural, attribute them a value and a priority scale, design actions and mechanisms to minimize risks, and continuously monitor them, are essential to guarantee companies' survival and create sustainable value. This is especially true for small- and medium-sized businesses that are most exposed to the harmful effects of the risks, due to limited resources and structural features and bariers of the development.(Havierniková et al.,2016)

SME sector must simultaneously absorb resources and workers from the large enterprise sector and at the same time help to create a labour market situation in which the process of reorientation and fundamental reorganization of the large enterprise sector can be carried through without threatening social peace. In addition to slowing down the restructuring process, the failure to develop the SME may increase the volume of required transfer payments for unemployment, early retirement and other programmes and (under certain fiscal policy assumptions) crowd-out investment and other employment creating expenditures (Cook, Nixson, 2000).

The goal and description of the research

The review of the subject literature in the field of the conditions for enterprise development and determinants affecting the development contributed to the formulation of the scientific problem of the article, which is based on the assumptions concerning the functioning of the contemporary micro-, small and medium enterprise in the business environment. The selection of the research problem was determined by the disturbances observed in the development of enterprises of the SME sector in the turbulent environment and the changes resulting from the quality level of the business environment.

The main objective of the conducted research was to compare the conditions for the development of small and medium enterprises (the SME sector) in different countries, whereas the specific objectives were:

- to determine the opportunities for gaining external sources of financing for the
- development of small and medium enterprises,
- to examine the conditions for innovation development in the SME sector,
- to identify the risk of small and medium enterprises

Methods and methodology of the scientific article

The research was conducted in Poland and the Republic of Slovakia in 2016. A total of 390 enterprises, classified as SMEs by the size class of employment, took part in the research, including 197 Polish and 193 Slovakian enterprises.

The research tool used for the study was the own questionnaire consisting of 38 questions and the demographics. The structure of the questionnaire allowed the authors to identify the group of questions concerning the most important conditions for the development of the examined sector referring to the business environment. The questions included in the questionnaire were closed-ended and semi-open questions. The questionnaire was completed by the owners or managers of enterprises in paper form. The questionnaire was anonymous, which, in the authors opinion, encouraged the respondents to express opinions on the development of their enterprises.

The conducted quantitative research allowed for using statistical methods. During the research analysis there were used descriptive statistics and correlation measures (Szajt, 2014). Test probability value at the level of $p<0.05$ was found significant, whereas $p<0.01$ was found highly significant. While recording the questions concerning the impact of the business environment on the development of enterprises of the SME sector, there was used a five-point Likert scale, which allowed to obtain more detailed opinions of the respondents. When analyzing the collected data there was used the statistical software – Statistica 12.5. Therefore, the authors do not provide the procedure of the calculation of individual relationships or correlations but only present the obtained results along with the interpretation and the conclusions.

The analysis of Polish enterprises

The analysis of the population of the surveyed enterprises conducting their business activity in Poland, carried out by the size class of the company, allowed for the conclusion that the largest group was micro-enterprises (47.7%) employing up to 9 employees, followed by small companies (38.1%) with 10 to 49 employees. Moreover, among the surveyed population, there were identified 28 medium enterprises (14.2%) conducting business in the area of Poland, employing 50 to 249 employees (Table 1).

Table 1. The structure of Polish enterprises by their size class (n=197)

Size classification	Number of indications	% of indications
micro-enterprise	94	47.7
small enterprise	75	38.1
medium enterprise	28	14.2
Total	197	100.0

Source: Own work based on the survey

The analysis of the surveyed enterprises in terms of the type of the conducted activity allowed to identify the following areas: production, agriculture, trade, construction and transport. It occurs that among the surveyed population the most numerous group was the entities of the trade industry (32.5%), followed by the companies dealing with production (nearly 20%). Moreover, 29 respondents (nearly 15%) declared that they ran their business activity in other industries than the listed ones. A fairly large group stated that they conducted a mixed activity (16.7%), and most frequently these indications referred to production and trade as well as trade and transport. (Table 2).

Table 2. Types of the conducted activity of Polish enterprises by sectors (n=197)

Sectors of the activity of the company	Number of indication	% of indications
production	39	19.8
agriculture	3	1.5
Trade	64	32.5
construction	21	10.7
transport	8	4.1
other areas	29	14.7
mixed activity	33	16.7
Total	197	100.0

Source: Own work based on the survey

Among the surveyed population the largest group was enterprises declaring sole proprietorship.

Table 3. Legal form of the conducted activity of Polish enterprises (n=197)

Legal form of the company	Number of indications	% of indications
sole proprietorship	122	62.0
general partnership	16	8.1
civil law partnership	14	7.1
limited liability company	33	16.7
joint stock company	5	2.5
cooperative	7	3.6
Total	197	100.0

Source: Own work based on the survey

It occurs that the most popular form of business in Poland was declared by as much as 62% of all the respondents. Another group of enterprises was limited liability companies (16.7% of all the responses). Moreover, among the declarations concerning the legal form of enterprises belonging to the SME sector, there were identified: general partnership (8.1%), civil law partnership (7.1%), cooperative and joint stock company (Table 3).

The analysis of Slovakian enterprises

The analysis of the population of the surveyed companies conducting their business activity in the

Republic of Slovakia carried out by the size class of the company allows for the conclusion that the largest group was micro-enterprises employing up to 9 employees amounting to 46.1% of the surveyed companies. Another group, in terms of the size, was small enterprises with 10 to 49 employees (34.2%), followed by medium enterprises, employing 50 to 249 employees, whose number was 38, amounting to 19.7% of all the surveyed companies (Table 4).

Table 4. The structure of Slovakian enterprises by their size class (n=193)

Size classification	Number of indications	% of indications
micro-enterprise	89	46.1
small enterprise	66	34.2
medium enterprise	38	19.7
Total	193	100.0

Source: Own work based on the survey

While analyzing the surveyed population in Slovakia in terms of the industry, it occurs that the most numerous group was enterprises from the agricultural industry amounting to nearly 30% of the respondents (57 indications).

Table 5. Types of the conducted activity of enterprises in the Republic of Slovakia by sectors (n=193)

Sectors of the activity of the company	Number of indication	% of indications
production	40	20.7
agriculture	57	29.6
trade	19	9.8
construction	20	10.4
transport	11	5.7
other areas	40	20.7
Mixed-activity	6	3.1
Total	193	100.0

Source: Own work based on the survey

Another group, in terms of the number, was manufacturing companies amounting to nearly 21% of the respondents and the ones declaring a different area of the activity from the identified ones, also amounting to nearly 21% of the surveyed population. Trading companies amounted to nearly 10% of the population and transport companies – to 5.7% of all the respondents. Mixed-activity, i.e. the indication of more than one industry, referred only to 6 respondents (Table 5).

Table 6. Legal form of enterprises in the Republic of Slovakia (n=193)

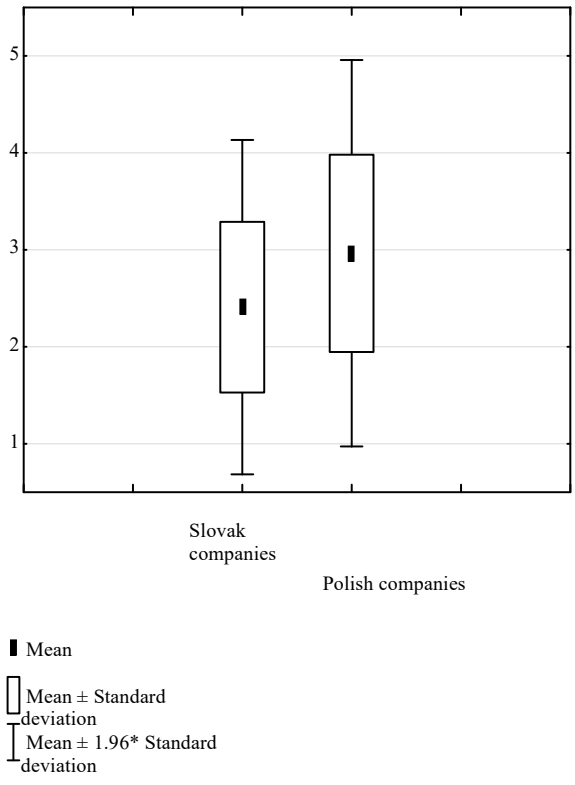
Legal form of the company	Number of indications	% of indications
sole proprietorship	50	25.9
limited liability company	121	62.7
joint stock company	18	9.3
other forms	4	2.1
Total	193	100.0

Source: Own work based on the survey

Financing the activities of small and medium enterprises

The opportunities for financing the activities of enterprises of the SME sector are completely differently perceived by entrepreneurs in Poland and the Slovak Republic. This perception, among others, depends on the type of the conducted activity, size of the company, implemented innovations or time of the operation on the market, which is often associated with the experience of an entrepreneur.

Figure 1. The assessment of the access to external sources of financing a business activity in Poland and the Slovak Republic



Source: Own work based on the survey.

The research indicates that 72 enterprises of the SME sector in Poland and as many as 148 enterprises of the SME sector in

Slovakia declare that they have difficult access to external sources of financing and this refers both to the access to the European Union funds, grants, bank loans and other instruments of the financial market. The access

to external sources of funding was assessed by the surveyed enterprises in Poland at the level of 2.96 whereas, in Slovakia, even lower, at the level of 2.41 on a 5-point Likert scale, where 1 amounted to definitely difficult access and 5 to definitely easy access (Figure 1).

The further analysis of the research results indicates that the variable of the accessibility to external sources of financing is positively statistically important at a rather low level with the development of innovative projects by the enterprises of the SME sector in Poland. Therefore, it can be concluded that the easier access to external sources of financing business the enterprise has the more regularly it implements innovative projects in Poland. At the same time, there was not found statistical correlation between the accessibility to external sources of funding and the implementation of innovative projects by the companies of the SME sector in the Slovak Republic (Table 1).

Table 7. Gamma rank correlation between the size and age of enterprises and the level of burdens of the SME sector in Poland and Slovakia

	Regular implementation of innovative projects in the enterprise
	***Gamma rank correlation (p-value<0.05)**
Accessibility to external sources of financing business activities in Poland	0.178*
Accessibility to external sources of financing business activities in Slovakia	0.113

Source: Own work based on the survey.

Interestingly, the research indicates that, in Slovakia, the smaller the enterprise, i.e. the fewer employees it hires, the easier the access to external sources of financing (Gamma rank correlation=-0.178; p-value<0.05). Such a statistically significant relationship was not found in the case of small and medium enterprises conducting their business activity in Poland. (Table 7).

Innovations and opportunities for the development of small and medium enterprises

The conducted research of the SME sector indicates that, in Poland and the Slovak Republic, innovations are most frequently financed from the profits of enterprises. Such declarations were made by 47% of the Polish entrepreneurs (93 indications) and more than 50% of the Slovak ones (97 indications).

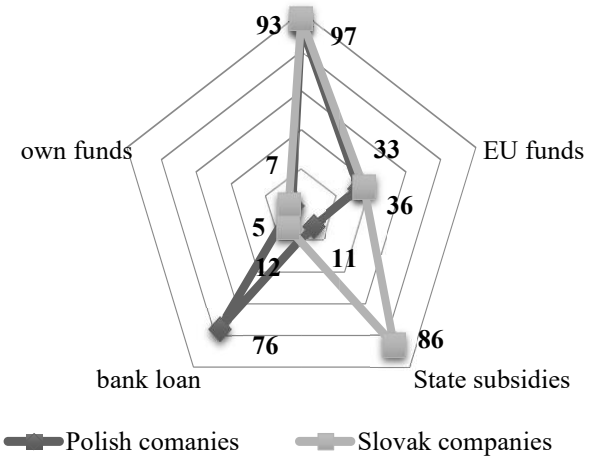


Fig.2. Basic sources of financing innovations in small and medium enterprises in Poland and the Slovak Republic

In the case of Polish enterprises of the SME sector, another source of financing innovations was the bank loan (76 indications) and EU funds (33 indications) - 16.7% of all the responses. It occurs that own funds of entrepreneurs are most rarely the source of financing innovations. In the case of the Polish enterprises, this situation refers to only 2.5% of the respondents. In the case of the Slovak enterprises of the SME sector, the second most frequently indicated source of financing the implemented innovations is State subsidies (86 indications) and the EU funds (36 indications). The same as in the case of the Polish enterprises, the implemented innovations are most rarely financed with own funds of entrepreneurs (6.2% indications) (Figure 2). Simultaneously, it should be pinpointed that the surveyed entrepreneurs, both in Poland and the Slovak Republic, identify a few sources of innovations in their enterprises. There are often two or three sources which, according to the declarations by the respondents, occur simultaneously.

For the significant part of the surveyed population, both in Poland and Slovakia, the implementation of a different type of innovations in the process of a business activity is an important tool of the competitive struggle on the market. It occurs that as many as 120 Polish enterprises of the SME sector (60.9% of indications) declare that the implemented innovations are the basic tool of fighting against competition, and 35 companies firmly declare this fact (Figure 3).

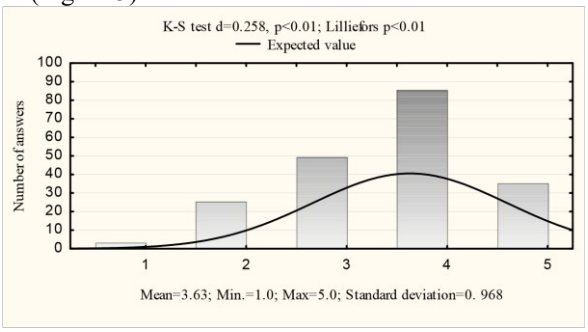


Fig. 3. The implemented innovations are the basic tool of the competitive struggle in Poland (n=197)

Source: Own work based on the survey

In the case of the Slovak enterprises of the SME sector, the implemented innovations are the basic tool of the

competitive struggle on the market for as many as 134 companies (72.4% indications), including 26 respondents for whom it is definitely the basic fighting tool which brings about an increase in competitiveness of the analyzed enterprises (Figure 10).

In Figures 3 and 4 there are presented the answers of the respondents, where 1 amounts to 'the implemented innovations are definitely not the basic tool of the competitive struggle', and 5 amounts to 'definitely yes', i.e. the implemented innovations are definitely the basic tool of the competitive struggle on the market on a 5-point Likert scale.

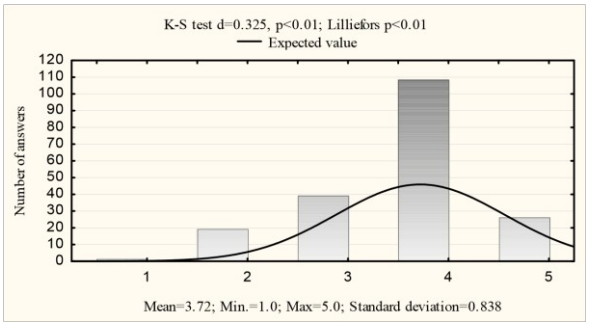


Figure 4. The implemented innovations are the basic tool of the competitive struggle in the Slovak Republic (n=193)

Source: Own work based on the survey.

Interestingly, the further analysis of the research indicates that the variable of 'the implemented innovations are the basic tool of the competitive struggle' is negatively statistically significant with the age of the company of the SME sector in Poland. Therefore, it can be concluded that the younger the enterprise, i.e. the shorter it operates on the market, the more often the implemented innovations affect an increase in competitiveness of the analyzed company (Table 8).

Table 8. Gamma rank correlation between the age of the company and 'innovations are the basic tool of the competitive struggle for the SME sector in Poland' (n=197)

	Age of the company
	***Gamma rank correlation (p-value<0,05)**
Implemented innovations are the basic tool of the competitive struggle	**-0.181***

Source: Own work based on the survey.

The research indicates that the variable of 'the implemented innovations are the basic tool of the competitive struggle' is positively statistically significant with the size of the company of the SME sector in Slovakia. Therefore, it can be concluded that the more employees the company hires the more often the implemented innovations increase competitiveness of the analyzed company (Table 9).

Table 9. Gamma rank correlation between the size of the company and 'innovations are the basic tool of the competitive struggle for the SME sector in the Slovak Republic (n=193)

	Size of the company
	***Gamma rank correlation (p-value<0,05)**
Implemented innovations are the basic tool of the competitive struggle	0.257*

Source: Own work based on the survey.

The surveyed enterprises, both in Poland and the Slovak Republic, declared that, while implementing a different type of innovations, they aim at increasing their level of competitiveness on the market. Among the Polish enterprises of the SME sector there were most often implemented marketing innovations (97 indications of the respondents), followed by process innovations (59 indications). For comparison, among the Slovak enterprises of the SME sector, there were most frequently product innovations (66 indications) and organizational ones (47 indications) (Figure 11). Moreover, the respondents declared that, when conducting business, there are often implemented various innovations and, simultaneously, in many areas of activity, however, during the research, the focus of attention was the most often implemented innovations when conducting a business activity.

Innovative projects in the surveyed populations are launched respectively by 81 Polish entrepreneurs (41.1% of indications) and as many as 134 Slovak companies (69.4% of indications), belonging to the SME sector. It also occurs that the projects in question are launched regularly in a 5-year cycle, according to the declarations of the respondents from both countries.

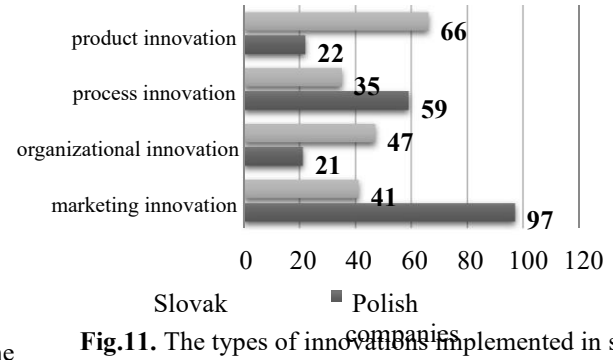


Fig.11. The types of innovations implemented in small and medium enterprises in Poland and the Slovak Republic

Source: Own work based on the survey

The variable of 'regular implementation of innovative projects in the company' (a 5-year cycle) is positively statistically significant with the variable of the size of the company in both surveyed populations. Therefore, the larger the company the more regularly it implements

innovative projects. It also occurs that this correlation in the case of the Slovak enterprises is stronger (gamma=0.430) compared to the Polish companies (gamma=0.289) (Table 10).

At the same time, the conducted analysis indicates that the variable of 'regular implementation of innovative projects in the company' (a 5-year cycle) is positively statistically significant with the variable of 'the implemented innovations are the basic tool of the competitive struggle', i.e. along with the more systematic (regular) implementation of innovative projects in the surveyed small and medium enterprises, both in Poland and the Slovak Republic, the adopted strategy becomes the basic tool of the competitive struggle.

Table 10. Gamma rank correlation between the size of the company and 'regular implementation of innovative projects by small and medium enterprises in Poland and Slovakia'

	Size of the company
	***Gamma rank correlation (p-value < 0,05)**
Regular implementation of innovative projects in the company in Poland	0.289*
Regular implementation of innovative projects in the company in Slovakia	0.430*

Source: Own work based on the survey.

Table 11. Gamma rank correlation between 'regular implementation of innovative projects in companies' and 'innovations are the basic tool of the competitive struggle for the SME sector'

	Regular implementation of innovative projects in the company
	***Gamma rank correlation (p-value < 0,05)**
Implemented innovations are the basic tool of the competitive struggle on the Polish market	0.433*
Implemented innovations are the basic tool of the competitive struggle on the Slovak market	0.281*

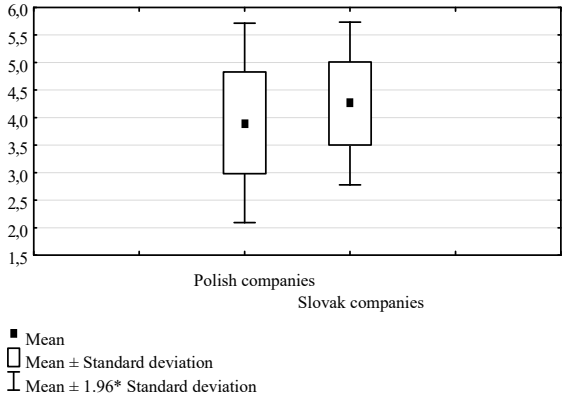
Source: Own work based on the survey.

The surveyed companies, both in Poland and Slovakia, assessed the selected aspects concerning the innovation policy of the State. This assessment included the issues associated with the appropriate amount of information on the applied innovation policy respectively in both countries and whether the State encourages the companies of the SME sector to implement innovations.

Risk in the business activity of the SME sector

The risk of conducting a business activity refers to all entrepreneurs, it is an indispensable element of the operation of organizations on the market. The level of business risk was another aspect assessed by the surveyed Polish and Slovak small and medium enterprises. The research results indicate that the level of risk is high in the opinion of the surveyed Polish population and it amounts to 3.99 on a 5-point Likert scale. The respondents conducting business in the area of Slovakia acknowledged that the level of business risk is higher and amounts to 4.25 on a 5-point Likert scale (Figure 12).

Fig. 12. The level of business risk in the sector of small and medium enterprises in Poland and the Slovak Republic



Source: Own work based on the survey.

Polish enterprises declare that the business activity conducted by them is most often exposed to market risk which is usually associated with the sales price of goods and services, types of concluded contracts and high level of competition (102 indications, which amounts to more than 51% of the surveyed population). In the opinion of the Polish respondents, the risk in a business activity is also quite often associated with economic conditions, among others, the prices of energy, fuels, materials necessary for production, high personnel costs of the staff as well as foreign exchange rate risk and the amount of duty or inflation level (100 indications). Political risk, resulting from the changes within the ruling parties, changing legal regulations and new tax proposals was indicated by 44 respondents (22% of indications). On the other hand, financial risk, which is closely related to the accessibility to external sources of financing for the sector of small and medium enterprises, financial burdens and payment liabilities of entrepreneurs, was indicated by nearly 21% of the respondents (41 indications). Interestingly, a very small number of Polish entrepreneurs declare that, when conducting business, their company is exposed to technical risk, resulting from the implementation of new technologies or innovations and production risk, associated with the availability of production factors (Figure 13).

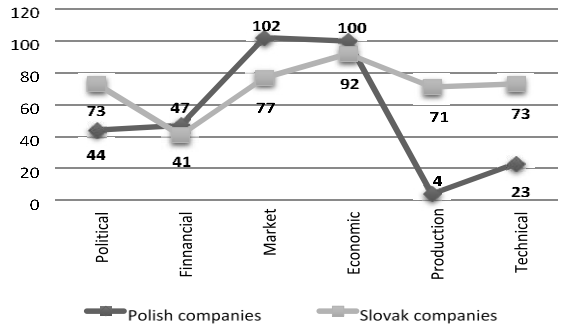


Fig. 13. Types of risk in the activity of small and medium enterprises in Poland and the Slovak Republic (the possibility of selection of more than one response)

Source: Own work based on the survey.

In the Slovak Republic, the enterprises declare that their business activity is most frequently exposed to economic risk (47.6% of indications) and market risk (39.9% of indications), resulting from the same determinants as the ones listed in the case of the Polish companies. However, what is interesting and different, political risk and technical risk were indicated in the second position, by respectively 37.8% of the Slovak respondents (73 indications), and the risk associated with the availability of production factors was indicated by 71 respondents, which amounts to 36.8% of the Slovak enterprises. The lowest level of risk threatening the business activity of the Slovak companies, in the opinion of 41 respondents, referred to financial risk. This risk was associated with the accessibility to external sources of financing for the SME sector, financial burdens and payment liabilities of entrepreneurs etc. (Figure 13).

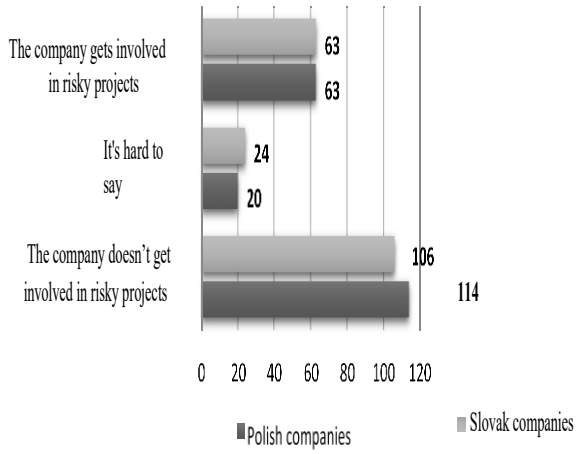


Fig. 14. The share of small and medium enterprises in projects with a high level of risk in Poland and the Slovak Republic

Source: Own work based on the survey.

The conducted research indicates that the Polish and Slovak enterprises of the SME sector rather do not get involved in risky projects. As many as 114 Polish enterprises and 106 Slovak enterprises do not take actions in the area of risky projects. The enterprises which take risky projects (the same number of enterprises in both analyzed countries - 63 indications) declare that the projects launched by them allow them to gain competitive advantage (Figure 14). The value of Chi squared test (p-value $p>0.05$) indicates that the null hypothesis is supported, i.e. there is no statistically significant correlation between the variables.

At the same time, the research shows that the variable of 'the level of business risk is statistically significant with the variable of 'the implemented innovations are the basic tool of the competitive struggle for the population of the surveyed companies in Poland and the Slovak Republic'. Positive correlation is slightly stronger in the case of the Polish enterprises, however, in both surveyed groups, it can be concluded that along with the use of innovation in order to fight on the competitive market there is an increase in the risk of conducting business, i.e. the more innovations the company implements the more risky its activity is (Table 15).

Table 15. Gamma rank correlation between 'the level of business risk' and 'innovations are the basic tool of the competitive struggle for the SME sector'

	The level of business risk
	***Gamma rank correlation (p-value<0,05)**
Implemented innovations are the basic tool of the competitive struggle on the Polish market	0.204*
Implemented innovations are the basic tool of the competitive struggle on the Slovak market	0.172*

Source: Own work based on the survey.

The surveyed population of enterprises in most cases notice that the level of risk associated with conducting business changes depending on the business cycle in the market economy. Such awareness of the entrepreneurs may result e.g. from many years of experience in conducting own business which, in the case of the analyzed group, refers to more than 70% of the population.

The research also indicates that 166 Polish enterprises, i.e. nearly 84% of the respondents and 164 Slovak companies, i.e. 85% of those questioned specify that, in times of crisis, the level of risk associated with conducting business increased for the sector of small and medium enterprises (Figure 15).

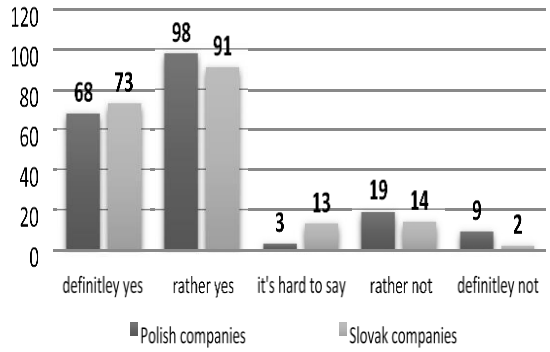


Fig. 15. In times of crisis business risk of the SME sector increased

Source: Own work based on the survey.

At the same time, statistically significant positive correlation between the variables shows that the larger the company the higher the business risk in times of crisis in Slovakia (gamma=0.173). Therefore, this risk increases in the case of the enterprises that employ a larger number of people while still belonging to the SME sector (Table 16). Similar statistically significant correlation (p-value<0.05) was not found in the case of the Polish enterprises from the SME sector.

Table 16. Gamma rank correlation between the size of the company and 'in times of crisis business risk of enterprises of the SME sector increased' in Slovakia (n=193)

	Size of the company
In times of crisis business risk of the SME sector increased	***Gamma rank correlation (p-value<0,05)**
	0.173*

Source: Own work based on the survey.

The opinions of the surveyed Polish enterprises indicate that there is an increase in financial risk when conducting a business activity. Among the determinants affecting an increase in the level of business risk, among others, there were identified high credit burdens of enterprises from the SME sector (the rating of 3.92) and poor legal protection of enterprises (the rating of 3.91 on a 5-point Likert scale) (Table 17).

Table 17. The selected factors of business risk in the opinion of Polish entrepreneurs of the SME sector (n=197)

	Mean	**Min**	**Max**	**Standard deviation**
Under the present conditions, in the business environment, there is an increase in financial risk due to high credit burdens	3.92	1.0	5.0	0.907
Due to poor legal protection of enterprises, there is an increase in financial risk when conducting business	3.91	1.0	5.0	0.789

Source: Own work based on the survey.

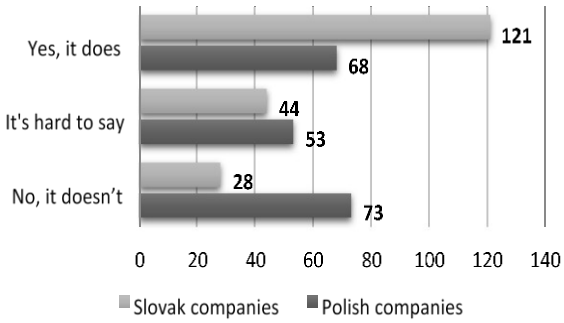
In the opinion of the surveyed Slovak enterprises, 'financial risk, when conducting business, increases due to high credit burdens of the SME sector' was assessed at the level of 3.54, and 'poor legal protection of enterprises' respectively at the level of 3.99 on a 5-point Likert scale (Table 18).

Table 18. Selected factors of business risk in the opinion of Slovak entrepreneurs of the SME sector (n=193)

	Mean	**Min**	**Max**	**Standard deviation**
Under the present conditions, in the business environment, there is an increase in financial risk due to high credit burdens	3.54	1.0	5.0	0.984
Due to poor legal protection of enterprises, there is an increase in financial risk when conducting business	3.99	1.0	5.0	0.777

Source: Own work based on the survey.

This indicates that, in both countries, entrepreneurs notice that the risk of conducting a business activity is affected by the listed factors at a similar level.



Chi squared test=35.745; p-value=0.000001

Fig. 16. The number of enterprises of the SME sector using commercial insurances in Poland and the Slovak Republic

Source: Own work based on the survey.

One of the methods of decreasing the level of risk when conducting business is the use of commercial insurances. However, it occurs that this situation is slightly differently perceived by the surveyed populations of small and medium enterprises in both countries. The activities of this type are much more frequently taken by Slovak entrepreneurs since such declarations refer to as many as 121 respondents (nearly 63% of indications), who declare that they use commercial insurances whereas, in Poland, the decisions of this type are taken

much more rarely and by a significantly smaller group of enterprises. The declarations of the purchase of insurances for business are made only by 35% of the respondents, therefore, nearly by every third entrepreneur. However, the value of Chi squared test (p-value $p<0.05$) indicates the necessity to reject the null hypothesis and to accept the alternative hypothesis, therefore, there is statistically significant correlation between the variables, i.e. there is noticeable a specific tendency in the responses of both countries (Figure 16).

Interestingly, in the case of the Polish enterprises, there is positive statistically significant correlation between the variable of the size of the company and 'the use of commercial insurances to reduce the risk of conducting businesses. Therefore, it can be concluded that the larger the company, i.e. the more employees it hires, the more often it purchases insurance policies to reduce the level of risk of the conducted activity in Poland (Table 19).

Table 19. Gamma rank correlation between the size of the company and 'SMEs use commercial insurances in Poland'

	Size of the company
SMEs using commercial insurances	***Gamma rank correlation (p-value<0,05)**
	0.204*

Source: Own work based on the survey.

However, such correlation was not found in the case of the Slovak enterprises in spite of the fact that the purchase of insurance policies for business activities conducted there is a more frequent practice.

Conclusions

The sector of small and medium enterprises has a great development potential. The opportunities for the development of the SME sector also occur in the case of the already existing enterprises and the support for the growth of the discussed sector is only possible by removing the barriers. The barriers impede the development of entrepreneurship and negatively affect the operation of enterprises on the market. Most barriers of the analysed sector result from the business environment, therefore it is worth attempting to assess the impact of the business environment and the conditions for the development of small and medium enterprises from the aspect of business risks.

On the basis of the conducted research aimed at the comparison of the conditions for the development of small and medium enterprises (the SME sector) in Poland and the Slovak Republic there have been identified the areas of the business environment that may determine the development.

On the basis of the conducted research of the sector of small and medium enterprises running their business activities in Poland and operating in Slovakia, it can be concluded that a large group of companies have difficult access to external sources of financing and this refers both to the access to the European Union funds, grants, bank loans and other instruments of the financial market. However, it occurs that:

- In Slovakia, the smaller the enterprise, i.e. the fewer employees it hires, the easier the access to external sources of financing,
- The easier access to external sources of financing business the enterprise has the more regularly it implements innovative projects in Poland,

For the significant part of the surveyed population, both in Poland and Slovakia, the implementation of a different type of innovations in the process of a business activity is an important tool of the competitive struggle on the market. It occurs that as many as 61% Polish and 72% Slovak enterprises of the SME sector declare that the implemented innovations are the basic tool of fighting against competition. Moreover, one can conclude that:

- the younger the enterprise, the more often the implemented innovations affect an increase in competitiveness of the analyzed company in Poland,
- the more employees the company hires the more often the implemented innovations increase competitiveness of the analyzed company in Slovakia.

It also occurs that this correlation in the case of the Slovak enterprises is stronger compared to the Polish companies, moreover:

- the analysis of the research results indicates that the Polish enterprises assess the amount of information on the innovation policy of the State, addressed to the SME sector, better than the Slovak companies.
- problems in Poland and in Slovakia in accessing external funds due to the complexity of the process of approval of applications and documents and strict criteria for the assessment of financial capacity, the result of which is reducing funds for a business activity.

As many as 73% of the Slovak enterprises and 46% of the companies of the Polish SME sector indicate that the forms of financial aid in the country are not properly designed and configured.

From the point of view of business risk The surveyed population of enterprises in most cases notice that the level of risk associated with conducting business changes depending on the business cycle in the market economy and this risk increases in the case of the enterprises that employ a larger number of people in Slovakia.

The opinions of the surveyed Polish and Slovak enterprises indicate that there is an increase in financial risk when conducting a business activity. Among the determinants affecting an increase in the level of business risk, among others, there were identified high credit burdens of enterprises from the SME sector and poor legal protection of enterprises.

One of the methods of decreasing the level of risk when conducting business is the use of commercial insurances. The practice indicates that Slovak enterprises much more

frequently make use of this type of insurances, compared to Polish enterprises. However, the results show that the actions taken and the cooperation with insurance companies in the business environment may contribute to the improvement in the operation of enterprises on the market.

The research indicates that the most frequent barrier to the development resulting from the business environment of enterprises in Poland is:

- political instability,
- instability and ambiguity of tax regulations,
- burdens associated with obtained revenues of companies.

The factors influencing the improvement in the quality of the business environment of the enterprises conducting business in Poland and the companies running their business activities in the Slovak Republic were found very similar.

Acknowledgements

This article was created within the project VEGA no. 1/0918/16 title: Risk management of SMEs in the context of clusters´ involvement activities in the Slovak Republic.

References

Brunswicker,S., W. Vanhaverbeke,W., (2014), Open innovation in small and medium-sized enterprises (SMEs): External knowledge sourcing strategies and internal organizational facilitators, *Journal of Small Business Management*, Vol.53(4), pp. 1241-1263.

Cook, P., Nixson, F., (2000), Finance and Small and Medium-Sized Enterprise Development, Available online: www.gdrc.org/icm/micro/finsme.html.

De Moor, L., Wieczorek-Kosmala, M., & Joanna Blach, J. (2016). SME Debt Financing Gap: The Case of Poland. Transformation in Business and Economics, 15 (3) pp. 274-291.

Gupta, P., Seetharaman, A., & Raj, J. R. (2013). The usage and adoption of cloud computing by small and medium businesses. *International Journal of Information Management*, 33(5), pp. 861-874. http://dx.doi.org/10.1016/j.ijinfomgt.2013.07.001

Havierniková, K.,Okręglicka, Lemańska-Majdzik,A.(2016) Cluster cooperation and risk level in small and medium. sized enterprises. *Polish Journal of Management Studies*, 14(2),pp.82-92.

Koišová, E., Masárová, J., Krajčo,K.(2016). Trends in economic performance development of the EU, 2016. *Actual Problems of Economics*, 185, (11) pp.42-52.

Lee, Neil, Sameen, Hiba and Cowling, Marc (2015) Access to finance for innovative SMEs since the financial crisis. Research Policy, 44 (2). pp. 370-380. DOI: https://doi.org/10.1016/j.respol.2014.09.008

Love, J., Roper, S., (2015), SME innovation, exporting and growth: A review of existing evidence, *International Small Business Journal*, Vol. 33(1), pp. 28-48.

Madrid-Guijarro, A., Garcia-Perez-de-Lema, D., Van Auken, H. (2016). Financing constraints and SME innovation during economic crises. Academia-Revista Latinoamericana de Administracion,

Okręglicka, M., (2016), Internal Innovativeness and Management of Current Finances of Enterprises in Poland, [in:] Bilgin, M. H., Danis, H., Demir, E., Can U. (eds.), Business Challenges in the Changing Economic Landscape, Springer International Publishing, Vol. 1, pp. 225-237.

Raport o stanie sektora małych i średnich przedsiębiorstw w Polsce w latach 2013–2014, PARP, Warszawa 2015, p. 19.

Reeg, C., (2013), Micro, Small and Medium Enterprise Upgrading in Low- and Middle-Income Countries, Bonn, Discussion Paper 15/2013, Deutsches Institut für Entwicklungspolitik.

Report Małe i średnie firmy w Polsce – bariery i rozwój, Polityka Insight, 2016.

Report on the State of Small and Medium Enterprises in the Slovak Republic in 2014, (2015), Available online: http://www.sbagency.sk/sites/default/files/sprava_o_stave_msp2014.pdf, [9.09.2016].

Report on the State of Small and Medium Enterprises in the Slovak Republic in 2014 (2015), Slovak Business Agency, Available online: http://www.sbagency.sk/sites/default/files/sprava_o_stave_msp2014. pdf [10.04.2017].

Ruziev, K., and Midmore, P. (2015).Connectedness and SME Financing in Post-Communist Economies:Evidence from Uzbekistan. *The Journal of Development Studies*, 51 (5), pp.586-602

Samitowska,W. (2011). Barriers to the development of entrepreneurship demonstrated by micro, small and medium enterprises in Poland, Economics & Sociology, Vol. 4(2), pp.42-49.

Stawasz, E. (2011). Źródła innowacji, [in:] K.B., Matusiak (red.), *Innowacje i transfer technologii Słownik pojęć,* PARP, Warszawa, pp. 341-342.

Szajt M., (2014), Przestrzeń w badaniach ekonomicznych, Sekcja Wydawnictwa Wydziału Zarządzania Politechniki Częstochowskiej, Częstochowa 2014.

Wynarczyk, P. (2013). Open innovation in SMEs: A dynamic approach to modern entrepreneurship in the twenty-first century. *Journal of Small Business and Enterprise Development*, 20(2), 258–278. DOI: http://dx.doi.org/10.1108/14626001311326725

RECEIVED: 16 January 2017 **ACCEPTED: 10 May 2017**

Ing. Eva Ivanová, CSc. is the Head of the Department of Economy and Economics at the Faculty of Social and Economic Relations, Alexander Dubček University of Trenčín. Her teaching fields are Microeconomics, General Economic Theory, Business Economy and Economy of SMEs. Her research fields include competitiveness of business and economies, innovation performance of enterprises and economy and regional economy. She has published over 100 publications: monographs, textbooks and scientific and research papers.

Ing. Anna Lemańska – Majdzik, Ph.D. – Ph.D. in economics in the field of management studies. She has been working as Assistant Professor at the Faculty of Management of the Czestochowa University of Technology. The author´s scientific interest focuses around issues connected with management of small and medium-sized enterprises, their development as well as success determinants of SMEs on the market. She is as author/co-author of over 110 research papers in domestic and international journals, monographs and textbooks.

Vadyba
Journal of Management
2017, № 1 (30)
ISSN 1648-7974

POSSIBILITIES TO EVALUATE EMPLOYEE KNOWLEDGE AS A COMPONENT OF KNOWLEDGE SYNERGY AT ORGANISATION

Ilona Skačkauskienė, Aušra Katinienė[1]
[1]*Vilnius Gediminas Technical University*

Abstract
Knowledge evaluation and management is one of the key tasks in any organisation aiming to improve the efficiency of its activities, create an environment in which employees are unconditionally willing and are able to share their knowledge and generate new knowledge, thus creating a higher added value and a modern, synergy processes-based and sustainable organisation. Employee knowledge – a component of organisational knowledge synergy – is multifaceted and consists of different content factors with quantitative and qualitative expressions. A comprehensive evaluation of this object requires multi-criteria evaluation methods to transform data, build a hierarchy of indicators and get an aggregated estimate. The article analyses the employee knowledge evaluation process and characteristics of multi-criteria evaluation methods, explaining why they are used in employee knowledge evaluation.
KEY WORDS: knowledge, employee knowledge, evaluation, multi-criteria evaluation methods.

Introduction

With advancing information technology and knowledge as a key economic resource, humanity has entered into a complex and diverse world of knowledge society. When dealing with today's problems and socio-cultural situations, the emphasis is put on the concept of a harmonious man. Management theories actualise a systematic approach and focus on professionalism, where knowledge is an integral part (Katinienė, Skačkauskienė 2014). Environmental uncertainty and technological developments make every organisation to focus on the management of employee's basic and exclusive competence, create an environment favourable to sharing knowledge and promote new knowledge creation processes.

By sharing their knowledge employees create preconditions for synergy, the components of which are explicit and tacit employee knowledge and relations among employees (Skačkauskienė et al. 2017). Evaluation of knowledge synergy and its components is an essential prerequisite in organisational knowledge management. The object of this research is one of the knowledge synergy components – employee knowledge. According to Giroux, Taylor (2002), Peters, Maruster, Jorna (2010, 2011), employee knowledge evaluation allows us to measure the input of knowledge in added value creation as well as the scope of and need for knowledge in an organisation. Employee knowledge is not evaluated by universally recognised methods. Some researchers (Dave, Dave, Shishodia 2012, Moradmand, Datta, Oakley 2013) evaluate employee knowledge by competence analysis, others (Fink 2005, Park, Lee, Kwon 2010) by expert evaluation.

Evaluation of employee knowledge as a component of organisational knowledge synergy should take into account many complex factors and consolidate them. Multiple methods have been proposed to combine partial indicators of a complex phenomenon into a single aggregated indicator. Many different multi-criteria methods have been created to evaluate complex processes from a simple sum of positions (ranks) to methods based on complex mathematical calculations. These methods evaluate alternatives according to their characteristics and common goals. Many socio-economic phenomena and complex processes are evaluated by multi-criteria evaluation methods. They are increasingly popular among foreign researchers (Li et al. 2011, Liu et al. 2013, Oztaysi 2014, Rajesh, Ravi 2015, Şengül, Eren, Eslamian Shiraz, Gezder, Şengül 2015, Lupo 2015, Bouyssou, Marchant 2015, Mir et al. 2016) as well as Lithuanian researchers (Zavadskas, Turskis 2010, Beleţentis, Beleţentis 2011, Slavinskaitė 2012, Poškas et al. 2012, Zavadskas, Turskis, Kildienė 2014, Simanavičienė, Cibulskaitė 2015). In the article about the application of multi-criteria methods, Mardani et al. (2015) mentions 393 articles published between 2000 and 2014 in 19 fields. Limited research of knowledge evaluation is revealed by the fact that only five (or 1.27%) articles apply multi-criteria methods to analyse knowledge management problems. No cases have been found where knowledge synergy and employee knowledge as its component are evaluated using multi-criteria evaluation methods. Thus, the aim of this research is to analyse multi-criteria evaluation methods, identify employee knowledge evaluation methods and, if possible, propose a set of relevant methods. To achieve this aim the following objectives have been set: analysing the evaluation process, providing an employee knowledge evaluation technique for a complex employee knowledge evaluation, examining the methodological potential of multi-criteria methods and justifying the use of these methods in employee knowledge evaluation. The article

applies comparative and critical analysis, synthesis and modelling.

Modelling an employee knowledge evaluation model

Alkin (2004) claims that evaluation should be understood as a process of determining the value of a certain object. To ensure a smooth evaluation of all or certain organisational activities, this process is structured. For example, Patton, Sawicki, Clark (2012) suggest that evaluation should be conducted consistently and provide a six-step evaluation cycle (Fig. 1).

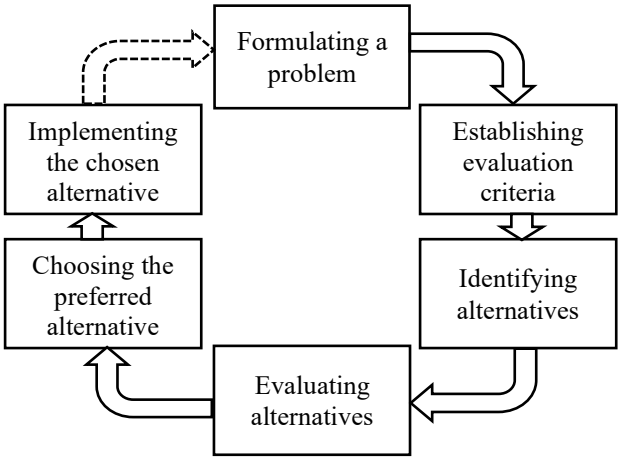


Fig. 1 Classical evaluation cycle (Patton, Sawicki, Clark, 2012)

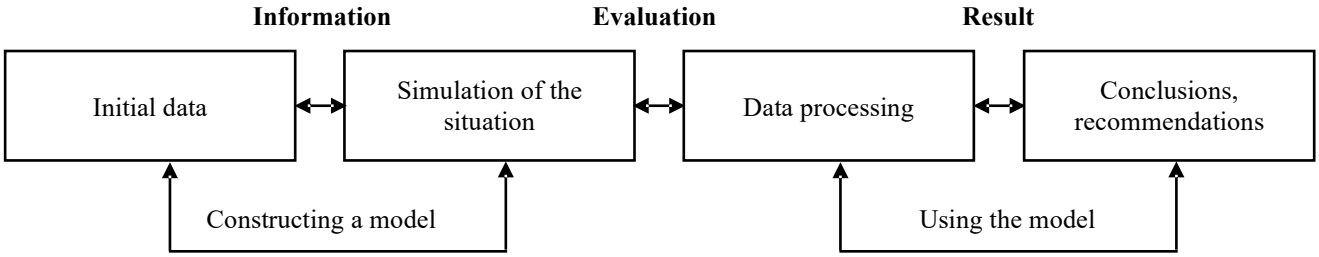


Fig. 2 Multi-criteria evaluation scheme (Guitouni, Martel 1998)

The classical evaluation cycle provided by Patton, Sawicki, Clark (2012) is suitable for the evaluation of different objects. However, Beleţentis and Beleţentis (2011) identify original steps in multi-criteria evaluation methods applied to complex tasks: (1) developing a system of goals and related indicators, determining their weight; (2) developing a response matrix and normalising it using multi-criteria decision-making methods; (3) interpreting the findings and making decisions. The application of multi-criteria evaluation methods has been systematised by Guitouni, Martel (1998): using the available data for simulating the situation, processing data and getting the evaluation result (Fig. 2).

Andriušaitienė et al. (2008) proposes to start multi-criteria evaluations with the identification of the research object and end them with decision-making to improve the phenomenon at issue (Fig. 3). Slavinskaitė (2012) agrees with this order, but merges the first stage and the second stage into one. Sarraf, Mohaghar, Bazargani (2012) use four steps in multi-criteria evaluation: (1) formulating the object and problems; (2) identifying alternatives and evaluation criteria; (3) applying the model and (4) choosing the best solution.

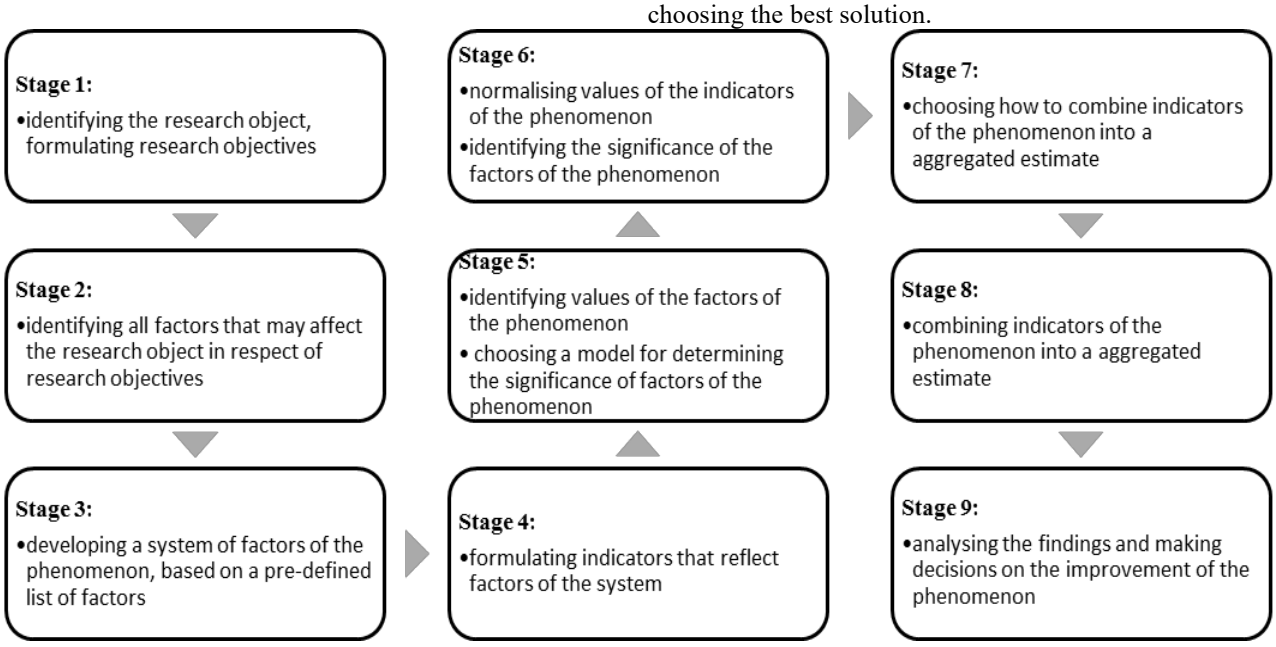


Fig. 3 Stages of multi-criteria evaluation according to Andriušaitienė (made by the authors)

Podzvesko (2008) claims that irrespective of the task subject to multi-criteria methods, the researcher examines the following key stages of a complex task (not necessarily all of them):

- developing a system of partial indicators with complex quantities;
- preparing evaluations of statistical data of the indicators applied or expert evaluations;
- transforming and normalising data;
- determining the significance of indicators – calculating their weight;
- analysing the characteristics and limitations of different multi-criteria methods, choosing specific relevant multi-criteria evaluation methods, analysing the compatibility of individual results;
- establishing a hierarchy of complex quantities and carrying out qualitative evaluation of the hierarchical structure;
- conducting a complex evaluation of indicators of the main hierarchical level;
- measuring the effect of data uncertainty on multi-criteria methods, establishing intervals for changing model parameters.

Comprehensive evaluation of complex objects consists of certain stages of evaluation. As a rule, it starts with the formulation of the research problem, the development of a system of partial indicators and a hierarchical structuring of components and ends with the determination of the aggregated estimate of the phenomenon at issue and the verification of the stability of the models applied. To summarise stages of multi-criteria evaluation distinguished by many researchers, the authors of this article used a linear algorithm and developed an employee knowledge evaluation technique (Fig. 4). The article further analyses stages 1 and 2 in more detail.

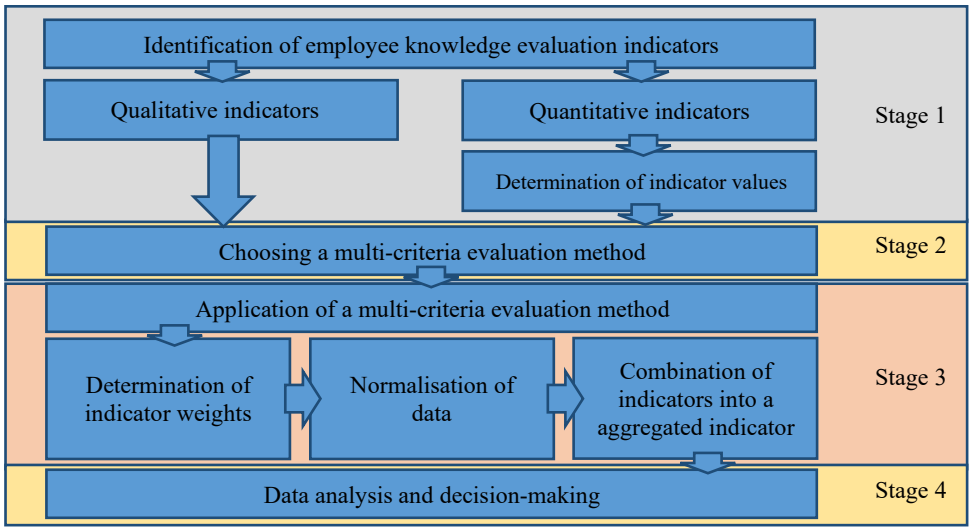


Fig. 4 Employee knowledge evaluation algorithm (made by the authors)

The system of employee knowledge evaluation indicators consists of two subsystems. Employee knowledge is divided into two blocks: explicit knowledge and tacit knowledge (Skačkauskienė et al. 2017), and these consist of relevant factors (Fig. 5).

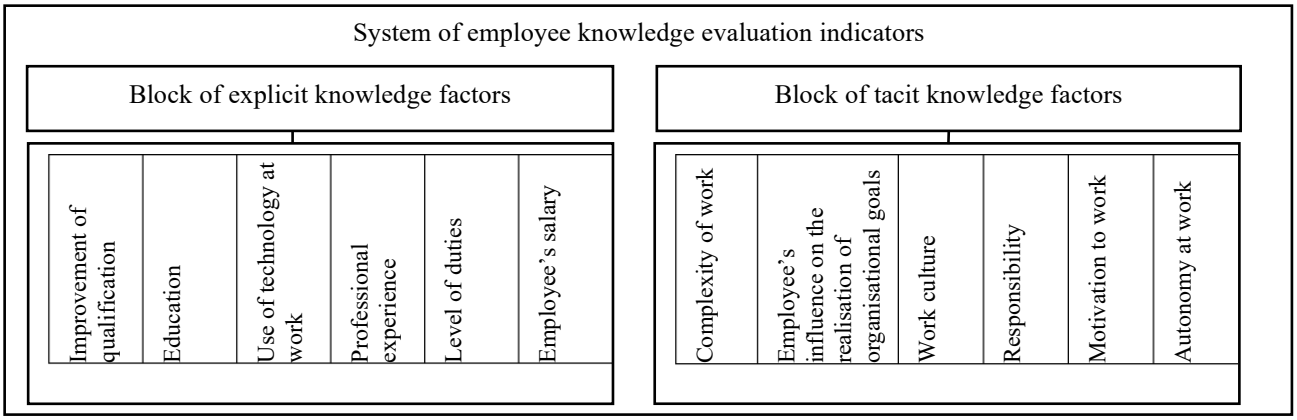


Fig. 5 System of employee knowledge evaluation indicators (made by the authors)

Factors of the explicit knowledge block have both quantitative and qualitative expressions. Their content is specified in Table 1.

Table 1. Quantitative and qualitative factors of the explicit knowledge block (made by the authors)

Factors		Components of the factor	Unit of Measurement
Type	**Name**		
Quantitative	Improvement of qualification	*Number of courses:* Per year. Computer literacy certificate (ECDL) Language certificates	 hour unit unit
	Professional experience	*Work experience:* (1) all work experience (2) work experience by profession	 year year
	Employee's salary	Post Hourly wages (before tax) or Monthly salary (before tax)	unit currency currency
Qualitative	Education	*Level of education:* primary	 1 point
		progymnasium (basic)	2 points
		gymnasium (secondary)	3 points
		professional education or secondary special	4 points
		higher education or higher non-university education (professional BA)	5 points
		higher university education (BA)	6 points
		higher university education (MA)	7 points
		doctoral degree	8 points
	Use of technology at work	Neither technology nor computer is used	0 points
		Only computer is used at work	3 points
		Operating machinery that requires technological knowledge	7 points
		Work includes using a computer and developing technology	10 points
	Level of duties	Level 1: manager, deputy, head of unit	3 points
		Level 2: foreman, brigade leader	5 points
		Level 3: administration, employee, civil servant	8 points
		Level 4: auxiliary worker, janitor, cleaner, security guard	10 points

Factors of the tacit knowledge block are of a qualitative nature. They should be evaluated using components describing their content (Table 2). Components of qualitative employee knowledge factors are measured in points. The number of components that describe factors varies, therefore evaluation points also vary. For example, if the employee does not deal with any strategic objectives and does not have any influence on the realisation of organisational goals, he/she gets 0 points, but if the employee participates in various working groups, performs various complex tasks and finds partners, i.e. influences the realisation of organisational goals, he/she gets 10 points.

Table 2. Tacit knowledge factors (made by the authors)

Factors		Components of the factor	Points
Type	**Name**		
Qualitative	Complexity of work	Easy physical work	3
		Physical work that sometimes causes stress	5
		Work related with constant mental activity	8
		Work causing much metal and nervous tension, related to constant concern for all activities in the organisation	10
	Employee's influence on the realisation of organisational goals	No influence	0
		Weak influence	3
		Average influence	5
		Strong influence	8
		Very strong influence	10
	Work culture	Does not listen to other opinions, often engages in conflicts	0
		Has his/her own opinion, but engages in conflicts	3
		Acknowledges opinions of their own and others	5
		Willingly shares data, information, knowledge and experience	8
		Creates a positive micro-climate in the organisation	10
	Responsibility	Does not make any decisions	0
		Makes decisions when problems are identified	3

		Makes individual decisions when problems are not identified, but the result is under control	5
		Makes individual decisions when problems are not identified; decisions determine the performance of the whole division	8
		Leads a collective management body when dealing with issues related to key strategic issues	10
	Motivation to work	No motivation to work	0
		Average motivation to work	5
		Strong motivation to work	10
	Autonomy at work	Routine work defined by rules	3
		Tasks are defined, but require external information	7
		Individual tasks for creativity, innovation, intuition, higher education, internal and external communication	10

Standard employee survey data are sufficient for determining values of all qualitative factors. Weights of factors are determined by expert survey. Data of qualitative factors are usually stored in the organisation's information system. The key factors affecting employee knowledge and expressed in quantitative and qualitative terms are combined into one indicator (D_i). It helps to calculate the sum of components of explicit (m_i) and tacit (n_j) employee knowledge factors and the sum of factors of explicit (I_i) and tacit (N_j) employee knowledge (formulas 1, 2 and 3).

$I_i = \sum_{i=1}^{6} \gamma_i m_i$ (1)

$N_i = \sum_{i=1}^{6} \delta_i n_i$ (2)

$D_i = I_i + N_i$ (3)

where I_i is a sum of explicit employee knowledge factors; γ_i is weights of components of explicit employee knowledge factors; m_i is estimates of components of explicit employee knowledge factors; N_j is a sum of tacit employee knowledge factors; δ_i is weights of components of tacit employee knowledge factors; n_i *is* estimates of components of tacit employee knowledge factors; i is a number of the indicator; D_i is employee knowledge index.

Another step after developing a system of knowledge evaluation indicators and identifying key factors that affect the formation of employee knowledge is choosing a proper multi-criteria evaluation method.

Characteristics of multi-criteria evaluation methods

Scientific literature offers many multi-criteria evaluation methods for complex tasks: from a simple sum of positions (ranks) to methods based on complex mathematical calculations (Ginevičius, Krivka 2009). They all evaluate alternatives according to their characteristics and common goals and help to make the best decisions (Table 3).

Table 3. Classification of multi-criteria methods (made by the authors according to Ustinovichius et al. 2007, Brauers et al. 2008, Keršulienė et al. 2010)

Method group	Name of the method	Description	Author, year	Application
Rank correlations	Rank correlation	Based on rank generalisation. Calculates a coefficient to verify the compatibility of expert results (Kendall).	Spearman 1904; Kendall 1970	Dealing with issues of contingency
Comparison of ranks	ELECTRE	Eliminates alternatives with less favourable characteristics. Alternatives are prioritised in accordance with concordance and discordance indicators.	Roy 1968; Ulubeyli 2009	Selecting indicators
	PROME-THEE	Uses indicators characterising the objects being compared, statistical data (or expert evaluation) matrix and weights of indicators. Indicators are evaluated by experts. Requires participation of the decision-maker. Possible partial, full, continuous and interval classification.	Brans 1982; Behzadian et al. 2009; Podvezko 2009, 2012	Comparing alternatives
Qualitative evaluations replaced by quantitative evaluations	AHP	Hierarchical data breakdown based on a pairwise comparison matrix. Experts compare all indicators.	Saaty 1980	Qualitative methods are transformed into quantitative methods, thus solving a wide range of tasks
	Methods based on the theory of	The theory of fuzzy numbers is focused on the rationalisation of uncertainty. Experts evaluate indicators in external and internal	Liang 1999; Chou 2008; Stein et al. 2013	Tasks with the indefinite

	fuzzy numbers	interval points. Qualitative criteria are converted into fuzzy numbers, i.e. calculations use triangular fuzzy numbers, trapezoidal fuzzy numbers and Gaussian membership functions.		number of possibilities
Methods based on the measurement of distances from the reference point	TOPSIS	Technique for order performance by similarity to ideal solution. Uses vector data normalisation. The final step determines the relative distance between each alternative to the "ideally best (worst)" alternative. Experts evaluate criteria weights. Maximising (minimising) indicator values do not need minimisation (maximisation).	Hwang, Yoon 1981; Lin 2008; Antuchevičienė et al. 2010	Finding how to distance alternatives from the ideal solution
	COPRAS	Multi-criteria complex proportional assessment. Alternatives are compared in a relative way (positive and negative characteristics).	Zavadskas, 1996, 2008; Kaklauskas 1996	Comparing alternatives
	VIKOR	Linear normalisation and measurement of distances from the hypothetical best alternative. No expert evaluation.	Opricovic, Tzeng 2002, 2004	Comparing alternatives
	MOORA	The ratio system helps to normalise data and harmonise different indicator measurement systems, therefore requires an external normalisation mechanism. The reference point theory uses ratios calculated by the ratio system method The principle of the method of calculation: the sum of criteria evaluations of maximising normalised alternatives minus the sum of minimising normalised criteria values. Indicators are divided into groups with the same weights. No expert evaluation is required.	Brauers, Zavadskas 2006	Comparing alternatives
	MULTIM-OORA		Brauers, Zavadskas 2010	Comparing alternatives
Additive methods	SAW	The sum of products of indicator values and weights. The weights of indicators are determined by experts and these values are normalised. Alternatives are subject to ranking.	MacCrimmon 1968; Hwang, Yoon 1981	Comparing alternatives and ranking indicators
	ARAS	Additive ratio assessment, i.e. alternatives are assessed by a ratio of additive indicators. Expert evaluation is required.	Zavadskas, Turskis 2010	Comparing alternatives

Every multi-criteria evaluation method has its own peculiarities, strengths and limitations. When choosing a specific method, it is important to take into account requirements for the transformation of indicator values, normalisation and the reorganisation of negative values, the weighting effect on evaluation, the nature of evaluation criteria (maximising and minimising), etc. (Podvezko 2008).

Each of these methods has a characteristic evaluation process. When comparing SAW and COPRAS, Podvezko (2011) found that COPRAS gave a more accurate assessment of the calculation results. COPRAS and TOPSIS may be used to evaluate the same probability (Antuchevicienė, Zakarevičius, Zavadskas 2010). Simulation of the stability of multi-criteria methods, performed by Vinogradova (2015), found that the more simulations there were, the more accurate evaluation of the stability of the multi-criteria method at issue was. After one million simulations, the percentage of stability is as follows: PROMETHEE – [65.8–65.9%], TOPSIS – [58.46–58.54%], SAW, COPRAS – [53.43–53.45%], MOORA – [44–58%]. A method that is in a larger percentage range is more stable.

The ARAS method helps to measure the effectiveness of alternatives compared to the optimal alternative, parameters of which are determined by the evaluator. It shows the best alternative for the interested group. Due to outranking with a complex logic, PROMETHEE and ELECTRE are rarely used. These methods use values of specially selected functions (priorities, concordance and discordance) rather than the usual normalised criteria values. A decision-maker must participate in setting function parameters (Podvezko 2012).

The practice of many researchers (Ginevičius et al. 2006, Podvezko 2008, Ginevičius, Krivka 2008, Simanavičienė 2011, Vinogradova 2015) shows that the

subjectivity of the multi-criteria evaluation method applied has a lower impact, if the phenomenon is evaluated by several methods. The final result is an arithmetic mean of the results obtained by the multi-criteria evaluation methods.

Data of multi-criteria methods are stochastic. Their uncertainty affects the results of the methods applied. Any mathematical method may be used in practice, if it meets the stability requirement (Žukauskienė 2011). A mathematical method is considered stable when minor fluctuations of parameters correspond to minor developments of the results. Employee knowledge should be evaluated by a method which gives stable results, has low time costs and is simple and easy to apply in the organisation (Table 4).

Table 4. Criteria of evaluation methods (made by the authors)

Criteria / **Methods**	**Stability of results (Stable (2)/ Average (1)/ Unstable (0))**	**Times costs (Low (2)/Medium (1)/High(0))**	**Easy to apply (Easy (2)/Moderate(1) /Complex(0))**	**Expert survey (Not required (1)/ Required (0))**	**Total evaluation**
AHP	1	1	2	0	4
ARAS	1	1	1	0	3
COPRAS	1	1	1	0	3
ELECTRE	2	0	0	0	2
PROMETHEE	2	0	0	0	2
MOORA	1	1	1	1	4
SAW	1	2	2	0	5
TOPSIS	2	1	1	0	4
VIKOR	1	1	1	1	4
Preferred evaluation	*2*	*2*	*2*	*1*	*7*

It should be noted that all methods can evaluate alternatives expressed in quantitative and qualitative indicators, whereas criteria may be of different measurements. It is beneficial to evaluate employee knowledge by the SAW method. It has low time costs, it is easy to use and it gives moderately stable results. SAW requires expert evaluation to weigh indicators of the employee knowledge block of factors. It allows the organisation to prioritise certain factors of employee knowledge. AHP, TOPSIS, MOORA and VIKOR meet the stability requirement and their joint application could minimise the subjectivity of results. AHP allows experts to evaluate structured employee knowledge and the priority of indicators. Moreover, if the significance of the factors is regarded taking into account the specifics of the organisation's activities, i.e. if the organisation needs employees with higher education, experts will be able to give more weight to this factor than to other factors. The TOPSIS method stands out with stable results, but its methodology is rather difficult to apply in an organisation. The methodology of MOORA and VIKOR does not include expert evaluation, therefore there is no subjectivity caused by different competence, value systems and experiences of experts.

Conclusions

An employee evaluation algorithm has been created to evaluate employee knowledge. It consists of four stages: stage 1 – the identification of employee knowledge evaluation indicators; stage 2 – choosing a multi-criteria evaluation method; stage 3 – multi-criteria evaluation; stage 4 – data analysis and decision-making. A system of employee knowledge indicators has two subsystems: explicit knowledge and tacit knowledge. It is proposed to describe factors using indicators with quantitative and qualitative expressions. Standard employee survey data are sufficient for identifying components of qualitative factors. Weights of factors are determined by expert survey and components of quantitative factors by data stored in the organisation's information system.

The analysis of multi-criteria evaluation methods has showed that a lot of methods can be used for complex tasks. To summarise the results of the analysis, it may be claimed that ELECTRE and PROMETHEE are not widely used due to their complex logic, even though PROMETHEE has many modifications. AHP compares criteria in pairs, while VIKOR and MOORA do not need expert evaluation, which allows them to avoid any subjectivity. SAW gives stable results and is one of the easiest to use, therefore widely used.

For complex tasks with many parameters it is wise to use methods which meet the stability requirement, i.e. when minor fluctuations of parameters corresponds to minor developments of the results. Employee knowledge should be evaluated by a method which gives stable results, has low time costs and is simple and easy to apply in the organisation. The SAW method meets the requirements the best. AHP is also suitable for employee knowledge evaluation. It allows experts to evaluate structured employee knowledge and the priority of indicators. TOPSIS is characterised by stable results, but its methodology is rather difficult to apply in an organisation and therefore is not recommended. The methodology of MOORA and VIKOR does not include expert evaluation, therefore there is no subjectivity caused by different competence, value systems and experiences of experts. SAW, AHP, MOORA and VIKOR allow for a complex employee knowledge evaluation and evaluation results contribute to the improvement of human resources

management. If possible, SAW, AHP, MOORA and VIKOR should be used as a set, thus avoiding any subjectivity. Moreover, results of such evaluation would give additional useful information about organisation's strengths and weaknesses.

References

Alkin, M. C. (ed.). (2004). *Evaluation Roots – Tracing Theorists' Views and Influences.* Sage Publications.

Andriušaitienė, D.; Ginevičienė, V., B.; Šileika, A. (2008). Daugiakriterinis profesinio mokymo kokybės valdymo vertinimo modelis. *Verslas: Teorija ir praktika Business: Theory and Practice,* 9(2), 88–96.

Antucheviciene, J.; Zavadskas, E. K.; Zakarevicius, A. (2010). Multiple criteria construction management decisions considering relations between criteria. *Technological and Economic Development of Economy,* 16(1), 109–125.

Behzadian, M.; Kazemzadeh, R. B.; Albadvi, A.; Aghdasi, M. (2010). PROMETHEE: A comprehensive literature review on methodologies and applications. *European Journal of Operational Research,* 200(1), 198–215.

Beleţentis, A., Beleţentis, T. (2011). Kaimo darnaus vystymo strateginis valdymas: Daugiakriterinio vertinimo metodai ir integruotas Lietuvos ūkininkų ūkių veiklos efektyvumo vertinimas. *Management theory and studies for rural business and infrastructure development, 1 (25).* [revised 2017 02 10], *http://vadyba.asu.lt/25/25.pdf*

Bouyssou, D., Marchant, T. (2015). On the relations between ELECTRE TRI-B and ELECTRE TRI-C and on a new variant of ELECTRE TRI-B. *European Journal of Operational Research*, 242(1), 201–211. [revised 2017 01 23], https://biblio.ugent.be/publication/5814749

Brans, J. P. (1982). L'ingenierie de la decision; Elaboration d'instruments d'aide a la decision. La methode PROMETHEE, in Nadeau, R. and Landau, M. (Eds.). *L'aide a la decision: Nature, Instruments et Perspectives d'Avenir.* Quebec, Canada. Presses de l'Universite Laval, 183–213.

Brauers, W. K. M., Zavadskas, E. K. (2006). The MOORA method and its application to privatization in a transition economy. *Control and Cybernetics*, 35 (2), 445.

Brauers, W. K. M., Zavadskas, E. K. (2010). Project management by MULTIMOORA as an instrument for transition economies. *Technological and Economic Development of Economy*, 16 (1), 5-24.

Brauers, W. K. M.; Zavadskas, E. K.; Peldschus, F.; Turskis, Z. (2008). Multi-objective decision-making for road design. *Transport* 23(3), 183–193. [revised 2017 01 15], http://www.tandfonline.com/doi/pdf/10.846/1648-4142.2008.23.183-193.

Chou, S.–Y., Chang, Y.–H., Shen, C.–Y. (2008). A fuzzy simple additive weighting system under group decision-making for facility location selection with objective/subjective attributes. *European Journal of Operational Research*, 189(1), 132–145.

Dave, M., Dave, M., Shishodia Y. S. (2012). Knowledge Management and Organizational Competencies: A Harmonic Collaboration. *International Journal of Advanced Research in Computer Science and Software Engineering*, 2(1), 45–50.

Fink, K. (2005). Knowledge Measurement and Interviewer Bias. *Proceedings of I-KNOW '05*, 79–86.

Ginevičius, R., Krivka, A. (2009). Konkurencinės aplinkos oligopolinėje rinkoje daugiakriterinis vertinimas. *Verslas: teorija ir praktika / Business: Theory and Practice,* 10 (4), 247–258.

Giroux, H., Taylor, J. R. (2002). The Justification of Knowledge: Tracking the Translations of Quality. *Management Learning*, 33(4), 497–517.

Guitouni, A; Martel, J. M. (1998). Tentative guidelines to help choosing an appropriate MCDA method. *European Journal of Operational Research*, 109, 501–521. [revised 2017 02 18], http://www.sciencedirect.com/.

Hwang, C. L., Yoon, K. (1981). *Multiple Attribute Decision Making Methods and Applications.* – Berlin: Springer – Verlag.

Katinienė, A.; Skačkauskienė, I. (2014). Socialinio kapitalo vadybiniai aspektai. *Mokslas – Lietuvos ateitis,* 6(1), 25–32.

Kendall, M. G. (1970). *Rank Correlation Methods*. 4th ed. – London: Griffin.

Keršulienė, V., Zavadskas, E., K., Turskis, Z. (2010). Selection of rational dispute resolution method by applying new step-wise weight assessment ratio analysis (Swara). *Journal of Business Economics and Management,* 11(2), 243–258.

Li, H., Adeli, H., Sun, J., Han, J.-G. (2011). Hybridizing principles of TOPSIS with case-based reasoning for business failure prediction. *Computers & Operations Research*, 38, 409–419.

Liang, G.–S. (1999). Fuzzy MCDM based on ideal and anti-ideal concepts. *European Journal of Operational Research*, 112(1), 682–691.

Lin, Y. H., Lee, P. C., Chang, T. P., Ting, H. I. (2008). Multi-attribute group decision making model under the condition of uncertain information. *Automation in Construction,* 17(6), 792–797.

Liu, H.-C., Mao, L.-X., Zhang, Z.-Y., Li, P. 2013. Induced aggregation operators in the VIKOR method and its application in material selection. *Applied Mathematical Modelling,* 37, 6325–6338.

Lupo, T. (2015). Fuzzy ServPerf model combined with ELECTRE III to comparatively evaluate service quality of international airports in Sicily. *Journal of Air Transport Management*, 42, 249–259.

MacCrimmon, K. R. (1968). *Decision making among multiple attribute alternatives: A survey and consolidated approach.* RAND Memorandum, RM-4823-ARPA. – The RAND Corporation, Santa Monica, Calif.

Mardani, A., Jusoh, A., MD Nor, K., Khalifah, Z., Zakwan, N., Valipour, A. (2015). Multiple criteria decision-making techniques and their applications–a review of the literature from 2000 to 2014. *Economic Research-Ekonomska Istraživanja*, 28(1), 516-571.

Mir, M. A., Ghazvinei, P. T., Sulaiman, N. M. N., Basri, N. E. A., Saheri, S., Mahmood, N. Z., ... & Aghamohammadi, N. (2016). Application of TOPSIS and VIKOR improved versions in a multi criteria decision analysis to develop an optimized municipal solid waste management model. *Journal of environmental management*, 166, 109–115.

Moradmand, N., Datta, A., Oakley, G. (2014). An Interactive Multimedia Development Life Cycle Model Based on a Cognitive Theory of Multimedia Learning. In J. Viteli & M. Leikomaa (Eds.), *Proceedings of EdMedia: World Conference on Educational Media and Technology,* 2014(1), 746–761. Association for the Advancement of Computing in Education (AACE).

Opricovic, S., Tzeng, G. H. (2002). Multicriteria planning of post-earthquake sustainable reconstruction. *Computer-Aided Civil and Infrastructure Engineering*, 17 (3), 211–220.

Opricovic, S., Tzeng, G.-H. (2004). Compromise solution by MCDM methods: A comparative analysis of VIKOR and TOPSIS. *European Journal of Operational Research*, 156 (2), 445–455.

Oztaysi, B. (2014). A decision model for information technology selection using AHP integrated TOPSIS-Grey: The case of content management systems. *Knowledge-Based Systems*, 70, 44–54.

Park, M., Lee H.-S., Kwon, S. (2010). Construction knowledge evaluation using expert index. *Journal of Civil Engineering and Management,* 16(3), 401–411.

Patton, C. V., Sawicki, D. S., Clark, J. J. (2012). *Basic Methods of Policy Analysis and Planning,* 454. New York: Routledge. 3rd Edition.

Peters, K., Maruster, L., Jorna, R. J. (2010). Knowledge claim evaluation: a fundamental issue for knowledge management. *Journal of Knowledge Management*, 14 (2), 243–257.

Peters, K., Maruster, L., Jorna, R. J. (2011). The evaluation of knowledge claims in an innovation project: A case study. *Management Learning*, 42(5), 537–563.

Podvezko, V. (2008). Sudėtingų dydžių kompleksinis vertinimas. *Verslas: teorija ir praktika,* 9(3), 160–168.

Podvezko, V. (2011). The Comparative Analysis of MCDA Methods SAW and COPRAS. *Inzinerine Ekonomika-Engineering Economics*, 22(2), 134–146.

Podvezko, V. (2012). Dominuojančiųjų alternatyvų daugiakriteriniai metodai. *Lietuvos matematikos rinkinys. Lietuvos matematikų draugijos darbai,* 53, 96–101.

Poškas, G., Poškas, P., Sirvydis, A., Šimonis, A. (2012). Daugiakriterinės analizės metodo taikymas parenkant Ignalinos AE V1 pastato įrengimų išmontavimo būdą 2. Daugiakriterinės analizės metodika ir jos taikymo rezultatai. *Energetika*, 58(2), 86–96.

Rajesh, R., Ravi, V. (2015). Supplier selection in resilient supply chains: A grey relational analysis approach. *Journal of Cleaner Production*, 86, 343–359.

Roy, B. (1968). Classement et choix en présence de points de vue multiples. *Revue française d'automatique, d'informatique et de recherche opérationnelle. Recherche opérationnelle*, *2*(1), 57–75.

Saaty, T. L. (1980). *The Analytic Hierarchy Process.* New York: M.Graw-Hill. T.

Sarraf, A. Z., Mohaghar, A., Bazargani, H. (2013). Developing TOPSIS method using statistical normalization for selecting Knowledge management strategies. *Journal of Industrial Engineering and Management*, *6*(4), 860.

Şengül, Ü., Eren, M., Eslamian Shiraz, S., Gezder, V., Şengül, A. B. (2015). Fuzzy TOPSIS method for ranking renewable energy supply systems in Turkey. *Renewable Energy*, 75, 617–625.

Simanavičienė, R., Cibulskaitė, J. (2015). Sprendimo, gauto topsis metodu, patikimumo statistinė analizė. *Lietuvos statistikos darbai*, 54(1), 110–118.

Skačkauskienė, I.; Kazlauskienė, E.; Katinienė, A. (2017). Modelling Knowledge Synergy Evaluation. *Montenegrian Journal of Economic*, 13(1), 35–49.

Slavinskaitė, N. (2012). Kompleksinis pieno pramonės įmonių pagrindinės veiklos efektyvumo vertinimas. *Buhalterinės apskaitos teorija ir praktika,* 12, 82–94.

Spearman, C. (1904). The proof and measurement of association between two things. *The American journal of psychology*, *15*(1), 72-101.

Stein, M., Beer, M. Kreinovich, V. (2013). Bayesian approach for inconsistent information. *Information Sciences,* 245, 96–111.

Ulubeyli, S., Kazaz, A. (2009). A multiple criteria decision-making approach to the selection of concrete pumps. *Journal of Civil Engineering and Management*, *15*(4), 369–376.

Ustinovichius, L.; Zavadskas, E. K.; Podvezko, V. (2007). Application of a quantitative multiple criteria decision making (MCDM-1) approach to the analysis of investment in construction. *Control and Cybernetics* 36(1), 251–268.

Vinogradova, I. (2015). Nuotolinių kursų parinkimo optimizavimas. Daktaro disertacija.

Zavadskas, E. K., Kaklauskas, A. (1996). *Multicriteria Evaluation of Building (Pastatų sistemotechninis įvertinimas).* Vilnius: Technika.

Zavadskas, E. K., Turskis, Z. (2010). A new additive ratio assessment (aras) method in multicriteria decision-making. *Technological and economic development OF ECO NOM Y Baltic Journal on Sustainability,* 16(2), 159–172.

Žukauskienė, V. (2011). Neapibrėžtų aibių teorijos elementų taikymai daugiakriteriuose uždaviniuose, 14-osios Lietuvos jaunųjų mokslininkų konferencijos „Mokslas – Lietuvos ateitis“ 2011 metų teminės konferencijos straipsnių rinkinys. [revised 2017 01 20], http://dspace.vgtu.lt/bitstream/1/727/1/Zukauskiene.pdf.

RECEIVED: 16 January 2017 **ACCEPTED: 10 May 2017**

Prof Dr. Ilona Skačkauskienė. Head at Vilnius Gediminas Technical University, Faculty of Business Management, Department of Social Economics and Management. She has published over 40 publications in her scientific period and read reports in Lithuanian and international conferences. Her research interests: management theory, social and economic development, knowledge synergy, taxation, tax system evaluation. E-mail: ilona.skackauskiene@vgtu.lt

Aušra Katinienė. Lecturer at Vilnius Gediminas Technical University, Faculty of Business Management, Department of Social Economics and Management. Her research interests: management, knowledge. E-mail: ausra.katiniene@vgtu.lt

Vadyba
Journal of Management
2017, № 1 (30)
ISSN 1648-7974

NEW INNOVATIONS FOR SENIOR CARE

Martin Zsarnoczky
Szent Istvan University
Enyedi György Doctoral School of Regional Sciences

Abstract
The population of Europe is ageing. This phenomenon is a major challenge for the society, but it can also be a great opportunity for business and economy. The EU project called "Silver Economy" focuses on developing strategies related to population ageing, mainly by means of special technology services. These services generally aim to support well-being through health monitoring, robotic assistance, electric mobility or sport activities, including health tourism, green care and web-based home care solutions. Nowadays, innovation developers focus on solutions for elderly people. Economic sectors involved in innovation and development want immediate strategies and clear visions for the next decades. Health and social care, health services, self-health management and senior tourism all require ready models with smart innovations. Currently, there are two main dimensions existing parallel within the field of technologies supporting elderly people. One is focusing on homecare and independency, whilst the other is concentrating on nursing solutions in senior homes. Despite their different approach, the two trends have one thing in common: they are both facing a major innovative technological development.
KEY WORDS: silver economy, technological innovation, elderly care, village lab, matra medical, Parádsasvár.

Introduction

Research on the significance of silver economy is a current issue in the EU. According to the demographic indicators of the EU countries, it is clear that there is a huge market segment with a currently unexploited potential (EC 2015). In the case of elderly people, the right to well-being is just as significant as in case of other segments. The term "silver economy" refers to the economy of the 50+ age group, including all their economic activities, products, demands and expenditures. Up until about a decade ago, products and services targeting the 50+ age group were generally neglected, except for a few companies especially focusing on them. After 2008, the economic crisis made experts realise that one of the most stabile consumer group is that of the pensioners, who have a predictable income. By now, it is also clear that the elderly population is not a homogenous group of pensioners (Zsarnoczky 2016a). Age is a main distinctive feature: there can be decades of difference, which means that we can talk about "younger" and "older" elderly people, and these groups can be further divided into several sub-groups. It means that even within the senior demographic group, we can talk about generation differences and special characteristics, related to the age of the elderly. Further important differences come from gender, cultural background, acquired skills, life experience or health status.

International demographic forecasts (OECD 2016) show that the human population is constantly growing. Taking into account the current indicators, it is clear that the number of elderly people and women are increasing, and due to the improved life standards of developed countries, the ratio of old people within the age group of senior citizens is also expanding. As a result of this phenomenon, the developed world has to face a major challenge caused by the fact that the reproductive performance of the population is below the replacement level (i.e.: the number of deaths is higher than the number of new-borns).

In response to the challenges of the "greying century", new scientific fields have emerged. In gerontology, there are important researches going on in order to have a greater understanding of the biological processes related to ageing. These examinations aim to find solutions for the expansion of quality life of the elderly and try to find innovative technological novelties to enhance the life standard of senior people. Ageing and death are unavoidable parts of all life on Earth – however, with the development of human knowledge and science, we are the point where we can re-consider the meaning of these words.

Research method

My research focused on the increasing impact of senior economy on technological innovations and services. Within my qualitative primary research, I took surveys among senior club members in North America and in the EU and I also I interviewed managers of European health and social development companies. The questions focused on the best practices of elderly care and the experiences of the interviewees. During my quantitative secondary research, I used public databases to examine the relations between demography, economic

developments and elderly care services. My hypothesis is that senior people are open towards innovative and creative senior care solutions. As a result, I aim to define the role and weight of senior care sector in relation with new technologies, living lab projects and open services in the European Union.

My research provides a novel approach to the subject and offers further opportunities in the economic development; by examining how much senior people are willing to accept new and creative healthcare solutions, stakeholders of the sector can gain broader understanding of the field.

Technological revival for elderly people

There are thoroughly documented medical researches going on worldwide related to the elderly. The science of gerontology examines the chronological changes in human life processes and aims to define the characteristic principles of ageing. Within gerontology, geriatry experts focus on the health issues of senior people; in summary, geriatry refers to preventive, curative and rehabilitation medicine. It is of key importance to understand the chronological changes in human life processes that affect everybody equally. According to gerontologists, the ageing of the body is a normal biological process, not necessarily accompanied by pathological lesions or diseases (Czigler 2000). This means that there is a so-called "healthy ageing process", and that elderly people not necessary get sick (Halmos 2002). However, the biological processes of natural ageing increase the vulnerability to diseases and accidents. These facts are important because it means that there is a theoretical possibility to develop a model for successful ageing (Fig. 1). The ageing process and life expectancy of a person depend on several factors like hereditary factors, environmental impacts, personal lifestyles developed in younger years, behaviour, social status, emotional and cognitive development, moral and ethical values and the accessibility to quality free time. (Imre 2007).

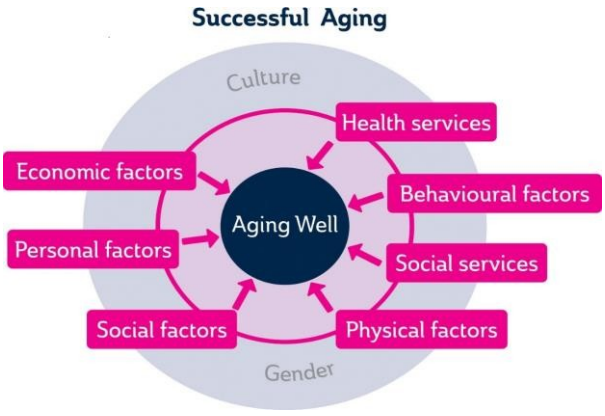


Fig. 1. Successful Aging
Source: Martin Zsarnoczky (Zsarnoczky 2016b)

The most important results of gerontology research are:

- human life expectancy can be expanded up to 150 years, of which around 30 years can be achieved by healthy lifestyle, genetic modifications and implant technologies;
- intellectual performance can be enhanced by chemical, psychological and psycho-biological methods;
- the defensive-protective operation of the immune system can be influenced and modified by targeted dietetic programmes;
- the role function of elderly age is transforming, but there is no general pattern of ageing, because diseases affect life quality.

Based on the achieved research results, elderly people are gradually starting to realise the importance of a healthy lifestyle. The willingness to live longer will motivate them to take actions, and there is a tendency among them to open up towards regular physical activity and physical-emotional-intellectual harmony, and as a result, a higher level of empathy will emerge towards them (Ángyán 1999).

For the elderly, the current economic and social processes represent a huge "smart" change of their known world. The constant changes in their environment forces senior citizens to face new challenges every day. The media is full of news about new achievements of technological innovations, the new results of the digital revolution and the speeding development of biotechnology. Thanks to the latest developments in information technology, after smart houses, the newest projects are focusing on smart cities. Of course, these developments are not only important for the elderly: they offer safe solutions that can have a positive effect on every segment of the society. For senior people, safety does not only mean personal security, but also includes the reliability of the basic necessities of life like the steady operation of utilities, food safety and reliable health services. The top priorities are social security, reliable social services and safety from helplessness and natural disasters (Zsarnoczky 2016c).

Smart solutions, Living Lab models

The improvement of social well-being is one of the top priorities of today's world. Accordingly, companies produce their products and services based on the preferences of the consumers. Involving the customers into the innovation and development processes is of key importance because it helps to explore common demands, thus enabling the creation of competitive products. In the past times of closed innovation, companies had monitored the development processes and results; know-hows and innovation technologies were developed within a closed system until the new product was released to the market. This trend started to change in the 1980's with the emerge of the personal computers, when developers realised the importance of direct and instant customer feedback in order to develop user friendly and easy-to-handle products (Bødker et al 2000).

Today, the principles of open innovation dominate the market of innovative developments. The concept of open innovation originates from companies that were able to successfully integrate their development activities with other external innovation ideas and technologies. At first, the initial goal was to achieve higher economic profit; today, the new solutions can also guarantee constant market presence (Chesbrough et al. 2006). The most important novelty of open innovation is the knowledge base it uses. In the case of the closed innovation model, the assessable knowledge of users was hardly accessible. For this reason, customer feedback was not a reliable source of information for the big companies, and thus taken into consideration as a possible risk. Open innovation, however, operates with an open knowledge platform, based on the widespread and high level knowledge of numerous stakeholders, and even the most successful R&D companies tend to rely on open external knowledge resources (Chesbrough 2003). One of the most common and popular forms of open innovation platforms is the so-called living lab, a term that refers to an open innovation ecosystem. Within this ecosystem, experiments and creative development take place in real life, with the involvement of end users. The new innovative ideas, products and services are developed with the joint collaboration of researchers, end users, funding companies, universities and public authorities (if necessary). Beyond the enhanced creativity, living labs are useful because the end users provide direct feedback for the marketing experts of the participating companies about the market reception of products, services and business solutions. Real life end users (Følstad 2008) are the best possible testing environment, offering the most trustworthy market survey results. Because the majority of product/service testers are volunteers, it is in their own interest to actively participate in the testing. Thus, their direct feedback is less biased than the previously used method of public polls. The most important advantage of such user-led-innovation is the inclusion of consumers in the company processes (Von Hippel 1978).

Several international surveys (ENOLL) have proven that the living lab concept is applicable not only in the case of large companies but also in the case of SMEs (Vanhaverbeke 2012). As of today, it has become a "fashionable" trend that beyond product development, small companies also include their end users into the process of branding, marketing strategy development and production. Experience gained through "learning by doing" has massive benefits for both sides (Voss et al 2011).

Micro-and small businesses usually operate in local communities, where the collaboration between similar companies generally has more benefits than threats to their success. Within the frameworks of an open innovation chain, local businesses can jointly develop new products and services for the global market, whilst sharing the costs and risk factors. By doing so, the first stakeholders to receive the profits will be the local communities involved in the development process.

Among the European living lab models, a Finnish example is considered to be the best practice. Prizztech Ltd is an association of non-profit organisations in Satakunta region, Finland. Their living lab project, focusing on elderly care is implemented with the participation of three Finnish regions: Satakunta, Tampere and South-Ostrobothnia. Further project partners are Pori Regional Development Agency Ltd (POSEK), South-Ostrobothnia Health Technology Development Centre (EPTEK) and Tampere University of Applied Sciences (TAMK).

The jointly established organisation aims to support the economy of the region by providing counselling and help to regional businesses, with special priority given to developments and investments in the fields of energetics and industrial technologies. Beyond the management of regional start-ups, their business model also includes a mentoring programme that provides unique opportunities for small development companies.

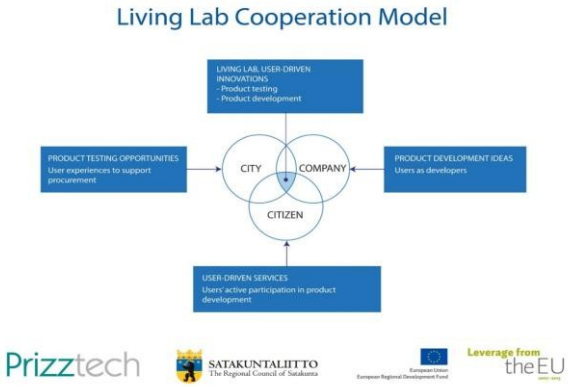


Fig. 2. Living Lab Cooperation Model
Source: Niina Holappa, Prizztech Ltd.

In Finland, special priority is given to the sector of elderly care. With the number of senior citizens increasing, the workload related to the elderly is also rapidly growing, resulting in the expansion of the workforce employed in the sector. With the number of available workforce unable to follow the increased demand, it is a reasonable choice to reach out for technological solutions. In Pori and its surrounding cities, the state-of-the art elderly care technological novelties are tested at institutional scale. The products - distributed free of charge for testing purposes – are tested for 2-6 months; after the testing period, the product is further improved based on the feedback of the elderly and the nursing staff. After the thorough analysis of the testing period, tailor-made solutions can be developed for the homecare sector and elderly care institutions. Another important advantage of the system is that the aforementioned testing method not only allows the better exploitation of human resources and enhances the quality and effectiveness of services, but also assures a higher standard of end user satisfaction by offering tested and examined products and services to the customers. Currently, the following projects are being tested within the frameworks of the Living Lab system: Stella Kotipalvelut Ltd - locating bracelet, Sportevo Ltd - Seniors service, First Link Ltd -

NetSpot Smart Hub for iPads, VideoVisit Ltd - video call service, Viasec Ltd - safety system.

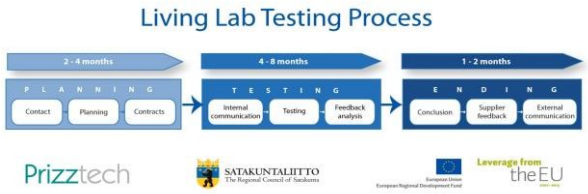


Fig. 3. Living lab testing process
Source: Niina Holappa, Prizztech Ltd.

The key to the success of the Finnish example – which received the European Union Regio Starts Award in 2013 – lies in the growing demand and stat-of-the-art innovation research. Of course, the successful process requires an open minded approach from business and private sector stakeholders equally, so that they can recognize the advantages of the developments. This development model is also cost-effective: there is basically no "waiting time" for a product to enter the market: thanks to the testing period, prototypes are available for the end users instantly. Prizztech Ltd has a key role in the model: they manage the administrative background of the whole process, i.e.: organisation and analysis of testing, preparation of contracts and assisting in the communication between the partners.

In the European Union, another state-of-the art senior care project is being implemented in Hungary that also exploits the international migration of the elderly (Illés 2013). The unique investment uses the benefits of the living lab methodology. The project is located in Parádsasvár, a settlement in the nature reserve of the Mátra mountains, 100 km from the Budapest, the capital city of Hungary. The MATRALAB program of MATRA Medical Ltd. started in 2011; within the frameworks of the project that aims to earn worldwide recognition, there is a great emphasis on the continuous dialogue between community leaders, local people, investors and local authorities. Between 1708 and 2008, the mountain settlement of Parádsasvár used to live off artisan glasswork production, but due to the global economic crisis, its main income resource was shut down after 300 years. Whilst searching for a new livelihood, the local people had started a bottom-up incentive that aims to transform the village into a complex healthcare, nursing and rehabilitation health tourism destination for senior people.

Aiming to achieve a world-class level, the spatial configuration of the settlement had been re-designed, including a new settlement centre, connected settlement sections, a new recreational park and tourism developments. It is important to note that although the village's main livelihood previously had been industrial scale glassware production, tourists were also attracted to the area by the scenic location and the vicinity of tourism routes. This tradition of tourism in the settlement played an important role in when policy makers decided to develop health tourism and medical services instead of reviving the glassware industry in the area.

At the beginning of the project, the investor group had a vision of a village lab development similar to the existing city lab projects (e.g.: the Maastricht citylab). The first step of the planning was the creation of an asset inventory, using settlement marketing tools and mind maps. As many settlements were in competition for the project, the exact location was chosen only after the analysis of the settlement asset inventories. Being a development specialising in senior health tourism, the natural surroundings of the project area was of key importance for the ROYAL PARK RESORTS project, which aims to integrate a resort-type health tourism destination into the everyday life of a village. Furthermore, great emphasis was put on the development of the local and newly settled community; another key factor was the implementation of a local food chain system. Parádsasvár and its surrounding settlements are considered as a curative medical and mineral water destination, thanks to the high quality thermal waters and more than 10 mountain springs in the area. The use of locally produced food and local water not only supports the local communities, but also contribute to the protection of the habitat by minimising environmental stress caused by transportation. The ROYAL PARK RESORTS project is planning to implement 5 separate development phases in different areas of the settlement. In total, a maximum of 250-300 apartments will be built for health tourism, elderly rehabilitation, sport rehabilitation, senior apartment home and senior home purposes. During the planning process, special emphasis was put on the factor that the new buildings would visually fit into the existing settlement structure. It was a significant challenge to bridge 10-15 m height differences on the mountainous terrain; however, state-of-the art solutions guarantee that even the mountains and creek banks can be reached easily by the guests of the resort.

The development project, based on two unique ideas is a great example of innovative and creative thinking, desperately needed in the healthcare and senior care sector. Senior care is a sector that – despite many individual differences - eventually everyone gets involved with. It is not clearly predictable whether the individual and tailor-made solutions will prevail within the homes of senior people or in special care facilities; but these novel ideas indeed are great incentives towards the improvement of the well-being and dignity of senior people.

Results

My research is based on a group breakdown of my own idea. Of course, segmentation by life stages is only one option among many grouping possibilities. Due to the fact that we spend at least one-third of our lives being senior people, there are numerous further in-depth research opportunities in the field.

Age group	Life stage	Main characteristics (statistical majority)
51-64	Mature	Married Very active social actor Large household Large income (one or multiple resources) Medium disposable income
65-74	Young-old	Married Active social actor Medium household Multiple income resources Medium disposable income
75-84	Middle-old	Married / Single Follows social processes Small household One resource of income Large disposable income
85-94	Old-old	Single* Follows social processes Independent household Large disposable income *usually female
95+	Very old	Single* Passive social actor Outsourced household One resource of income Medium disposable income *usually female

Fig. 4. Age groups of senior people by life phase
Source: Martin Zsarnoczky (Zsarnoczky 2016d)

Their health condition highly affects the life quality of senior people. Scientific fields focusing on the elderly have many different definitions of the human age. Chronological age refers to the number of calendar years lived by someone, while the biological age of a person is defined by the measure and status of their biological processes. Another aspect can be the psychological age, which is measures by one's own subjective age perception (Hidyné 1989). Taking into account all different aspects, a person's age can be defined in many ways from different perspectives. According to studies, elderly people generally feel 10-15 years younger than their actual chronological age. When comparing themselves to other people of the same age, they generally think they look better and have a more "youthful" mind-set (Rutishauser 2005). Within the senior age group, "new" pensioners are usually more careful, more responsible and more forward-thinking. They give particular attention to healthy eating, regular physical activity, preventive healthcare, and thus they tend to be healthier and less susceptible to diseases.
Data facts:

- Number of fully completed surveys: 79; 53% of the total of 150 filled questionnaires
- Gender ratio of respondents: female:67%, male: 33%

– Ranking of respondents' countries of origin (1-5): Hungary, Austria, Germany, Canada, USA. Ratio of EU countries among respondents: 76%.
– Age of respondents: the majority fell within the age group 51-64 (51%), followed by the 65-74 age group (37%). The 85-94 age group was represented by 1%, and no respondent fell into the age group of 95+. The eldest respondent was a 93 years old Canadian female of Hungarian origin.
– Level of education of respondents: 1% had a PhD, 34% of them had graduated from higher education (university or college), 41% had finished secondary education, 19% had graduated from VET education, while 3% had finished primary education, and 2% had not finished any school at all.
– Marital status of respondents: married and lives with kin:44%; divorced and single: 19%, widow(er), single: 16%, single female: 9%, unmarried and lives with partner: 5%, single male: 3% , divorced and lives with another partner: 2% separated and single: 1%, widow(er), lives with partner:1%.
– Latest job of respondents: miscellaneous intellectual activity (without higher education degree): 35%; employment related to higher education degree: 27%; skilled worker (non-agriculture): 10%; service provider: 9%, intellectual freelancer: 5%; high level management (above head of department): 3%; lower level management (below head of department): 3%; farmer (agriculture): 2%; trader:2%; mid-level management (head of department):2%, trained worker:1%; craftsman (manufacturer): 1%
– The survey also examined how many times the respondents' discretional income would allow them to travel abroad at 100EUR daily subsistence rate , based on their own preferences (A: longer than 1 week, B:minimum 1 week, C:minimum 3 days, D: less than 3 days). The answers were as follows: 51-64 age group: A: 9 B: 10 C: 4 D: 13; 65-74 age group: A: 8 B: 9 C: 12 D: 11; 75-84 age group: A: 7 B: 5 C: 7 D: 3; 85-94 age group: A: 1 B: 1 C: 0 D: 0.

Analysis of results:
According to the results of the survey, the following factors are of key importance for the elderly (listed by level of importance):

1. avoiding helplessness;
2. fear of solitude and loneliness,
3. environmental awareness,
4. conscious food consumption,
5. food safety,
6. avoiding dementia and other diseases,
7. safety, living in a protective closed system,
8. sufficient medication and healthcare,
9. digital society inclusion,
10. seeking other forms of enjoyment due to decreased sexual activity.

According to demographic forecasts, by 2050, the world population will reach 9 billion, its estimated sustainability limit. This not only calls for the need to make vegetarianism fashionable; people need to understand that there will not be enough meat for everyone. For senior people, the quality of food is of key importance: they prefer food that had been produced with higher production cost but with better resource-effectiveness. They prefer local products over imported food; eat less meat, drink less bottled beverages and water and tend to choose organic/bio food over mass production meals. Their absolute favourite is locally produced food.

According to the survey, people with higher level of education tend to worry more about environmental problems and climate change. The elderly are not willing to participate in the competition for resources. They see

today's world as a new age in which wars and economic crises follow each other. In this new era, the work of their lifetime seems to be wasted, making the elderly often feel frustrated. Clean water, healthy food, fresh air, easily accessible places and services, a reliable daily routine, pleasant natural surroundings and the vicinity of nature reserves are of key importance for almost every senior people. When asked about poverty, almost all respondents were curious about how the younger generations will share the available natural resources.

References

Ángyan, L. (1999) *The role of the body culture in the elderly lifestyle. The biological aspects of aging. (A testkultúra szerepe az időskorúak életmódjában. Az öregedés biológiai aspektusai).* Dialóg Campus Kiadó, Pécs-Budapest, 122-128 o.

Bodker, S., Ehn, P., Sjögren, D. and Y. Sundblad (2000) *Co-operative Design – perspectives on 20 years with the Scandinavian IT Design Model*, Proceedings of the first Nordic conference on Human-computer interaction, Association for Computing Machinery, Stockholm.

Czigler, I. (2000) *Beyond the youth. Túl a fiatalságon (Megismerési folyamatok időskorban)* Pszichológiai tanulmányok. XVIII. Akadémiai Kiadó, Budapest, 39-73. o.

Chesbrough, H. (2003) *Open Innovation: The New Imperative for Creating and Profiting from Technology*. Harvard Business School Press, Boston, MA.

Chesbrough, H – Vanhaverbeke, W – West, J. (2006): *Open Innovation: Researching a New Paradigm. Oxford* University Press, Oxford.

Gekeler, M. (2012) *Konsumgut Nachhaltigkeit, Zur Inszenierung neuer Leitmotive in der Produktkommunikation*, transcript Verlag, Bielefeld, 120-133 p.

ENOLL (2006) *http://www.openlivinglabs.eu/*

EUROPEAN COMMISSION (2015) *http://ec.europa.eu*

Følstad, A. (2008) *Living labs for innovation and development of information and communication technology: a literature review*. In: Electronic Journal for Virtual Organizations and Networks, vol.10 (7), p.99–131.

Halmos, T. (2002) *Aging is a physiological and social phenomena* (*Az öregedés élettani és társadalmi jelenségei*.) Magyar Tudomány, Budapest, 402. o.

Hidyné K. E. (1989*) Education in old age. (Művelődés az időskorban)*. Országos Közművelődési Központ, Budapest

Illés, S. (2013) *Senior international migration. (Időskori nemzetközi migráció)*. Tullius Kiadó, Budapest, 202-204 o.

Imre, S. (2007) *The basics of clinical gerontology (A klinikai gerontológia alapjai).* Medicina Könyvkiadó Zrt., Budapest, 27-61.

PARK ROYAL RESORTS (2013) Royal park resorts http://parkroyal.hu

Rutishauser, F. (2005) *Seniorenmarketing. Diplomica* GmbH, Hamburg, 9-10 p.

OECD (2016) http://oecd.org

MATRALAB (2016) *Matralab project*. http://matralab.hu

Matra Medical (2016) http://matramedical.hu

Vanhaverbeke, W. (2012*) Open Innovation in SMEs: How can small companies and startups benefit from open innovation strategies?* Research Report, Vlerick Leuven Gent Management School, Flanders DC, Gent.

von Hippel, E. (1978) *Successful Industrial Products from Customer Ideas.* The Journal of Marketing, 42, 1, pp. 39-49

Voss, J., and B. Bornemann (2011) *The politics of reflexive governance: challenges for designing adaptive management and transition management.* In: Ecology and Society, vol.16 (2), p.9.

Zsarnoczky, M. (2016a*) Impact of Silver Economy on Health Tourism*. Acta Carolus Robertus, Gyöngyös.

Zsarnoczky, M. (2016b) *Innovation Challenges of The Silver Economy.* Vadyba Journal of Management 2016, № 1 (28)., Klaipeda, pp 106.

Zsarnoczky, M. (2016c) *Effects of senior tourism in rural areas. (Az idősek turizmusának hatásai a falusi szálláshelyeken).* A Falu magazin. Hermann Ottó Intézet Budapest, pp. 65-70.

Zsarnoczky, M. (2016d) *Silver Tourism*. Conference book of International Scientific Days, Challenges for Naturel Resources Management and Society. Nitra.

RECEIVED: 16 October 2016 **ACCEPTED: 10 May 2017**

Martin Zsarnoczky, Szent Istvan University, Enyedi Gyorgy Doctoral School of Regional Sciences PhD Student. Medical Tourism and Silver Economy are the scientific research fields. 3242 Parádsasvár, II Rakoczi Ferenc street 17.Address. Phone number +36/709-388-874. E-mail martin@aunaturel.hu Experiencies are in developing rural areas, agro tourism, senior care and elderly homes.

Vadyba
Journal of Management
2017, № 1 (30)
ISSN 1648-7974

SEAPORT SOCIETY'S SELF-CONCEPT MANAGEMENT BY POSITIONING A MARITIME IDEA

Saulius Lileikis[1], **Magdaléna Tupá**[2]
[1]Lithuanian Maritime Academy, [2] Alexander Dubček University of Trenčin

Abstract
Problems of the mental management, in regard to personality's maritime self-concept development, are discussed in this paper because it is relevant that the maritime idea positioning in society could achieve the leading level. A scientific spectrum of the mental management is revealed. It is a meaningful scientific situation of the ideological and psycho-pedagogical management. The scientific research is methodologically based on the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, paradigm of universal upbringing, idealism, humanism, existentialism, existential phenomenology and neotomism philosophy. Scientific data of the mental management of the maritime self-concept shows an individual relationship with the sea, transcendence over everyday routine, consideration of ideological and psychological effects, valuable transformation of transcendental ideal of the humanity, spiritual development of the classic European maritime culture, and a potential of the personal self-esteem experience at ideological and psycho-pedagogical levels.
KEYWORDS: maritime self-concept, mental management, ideology, psycho-pedagogics, personality.

Introduction

Relevance and novelty of the problem. The maritime self-concept is an important field for development of the seafarer's personality. It is ideologically based on social and psychological attitudes. This self-concept mentally characterizes the maritime state, near pragmatic indicators at the economical level. The maritime self-concept is purposefully seen as perceiving of the personality's own value in relationship with the sea in this hodegetic research.

So, what are ideological and psycho-pedagogical problems that the maritime idea positioning in society could achieve the leading level?

Mechanisms of the ideological and psychological influence, that manage human consciousness, naturally promote a sense of the personality's value. It requires a minimal sense of this value at least achieving mentioned harmony and maturity.

A methodological quintessence and operationalizational essence of an application of the maritime self-concept consist of the individual, phenomenological and free conception of the sea, and effects of the humans, who are in relationship with the sea, personal self-conception in regard to own personality's value based on the subjective experience from the axiological point of view.

We can scientifically register physical and partially psychical development of a human. However, we must be more confident to ideal and phenomenological researches, trying to understand the spiritual field of the personality because his/her specificity and complexity.

A phenomenological analysis of the personality's maritime self-concept development brings closer to the truth that is non-absolute but based scientifically and is significant with reference to the praxis of educational influence at the level of scientific prerequisites.

The grade of the exploration. There are a few researches of the European maritime tradition at the ideological and mental levels.

We have found mentioned researches from the theoretical and empirical point of view of the:

- Maritime sociology,
- Maritime geography,
- Maritime vocational activity,
- Maritime education with reference to the hodegetic and psychosocial directions,
- Maritime ethnology and mythology (Beresnevičius 2002; Žaromskis 2001, 2008; Lileikis 2011; Schmid-Höhne, Bühr 2011; Astikas 2015).

The scientific problem of mental management of the maritime self-concept is manifold, involving many factors, conditions and positions. However, cognitive development of the maritime self-concept needs a psychologically suggestive ideological base firstly in regard to the hodegetics.

Psycho-pedagogical development of the maritime self-concept in European culture tradition is based on the transcendental ideal that promotes the European identity and personality's sense of the own self-esteem and dignity.

The most important condition for the personality's own self-esteem and dignity is a freedom of thought, dissociating from the overestimated determinant of the human nature. A significance of the relationship with the sea for this dissociation is natural and based scientifically (Tenzer 2007).

The most significant mental instruments for influence to the maritime self-concept consist of the national and political maritime ideology, and psycho-pedagogics that adequately applies the maritime ideology to purposeful social groups.

It is appropriate to systemize fragmented scientific data of the maritime self-concept mental management at ideological and psycho-pedagogical levels regarding to the leadership of the maritime idea positioning in society.

The object of the research is mental management of the maritime self-concept.

The aim of the research is identification of scientific problems of the maritime self-concept mental management at ideological and psycho-pedagogical levels.

The tasks of the research are as follows:

1. Revelation of a scientific spectrum of the maritime self-concept ideological management.
2. Characterization of the scientific situation of the maritime self-concept psycho-pedagogical management.

The research methodology. The research is based on epistemological attitudes in prospect of the European identity of the maritime self-concept and personality's value.

Classical and modern philosophical paradigms orient to ideological base of the European culture sustainable tradition from the point of view of the modern methodological way in conditions of the individual and experiential self-education of a free personality that are significant for the postmodern epoch.

The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers along with other principles requires a social responsibility at the maritime business, humanity and respect for human dignity (STCW Manila seafarer training <…> 2011). A valuable spirit of the convention is significant, managing and evaluating the vocational self-concept of seafarers and state of the maritime self-concept internalization.

Paradigm of universal upbringing orients to development of all powers of the personality, educationally satisfying all his/her biological, psychological and spiritual needs at the horizontal and vertical levels of the human existence. The universal development of the human maritime self-concept is based on this paradigm from the ontological point of view.

Idealism notes the human's spiritual genesis and his/her spiritual nature. A self-implementation of the personality is educationally characterized by main principles of the idealistic pedagogics. The aim of the teacher is to help reveal the spiritual powers of the personality, and universal promotion of the conscious development of them.

Enriching of the personality is based on the transcendental ideal that proposes a final sense of the human existence, promotes development of the free personality and helps promote his/her self-implementation at the axiological level of the maritime self-concept.

Humanism highlights a spiritual origin of the personality, and considers it as a natural base for personal development of his/her spiritual culture. Humanistic psychology considers a human as an integral personality that is enriched with the freedom and with creative powers, and develops his/her natural powers, and aims to freely implement them and to improve himself/herself in regard to the valuable orientations.

Orientation from the humanistic anthropocentrism to pragmatic biocentrism raises a treat to assign the environmental responsibility not to the person but to the natural self-regulation from the hodegetic point of view of the maritime ecology.

Mental management and internalization of the maritime self-concept give the possibility to perceive the human existential value with humanistic reference to the personality's freedom better.

Existentialism notes a fear of the lone human who relates to an uncertainty and a hostile world on land and at sea. The existential psychology raises hope, promotes a reserved approach to the pleasure of life, and personality's liberation and purification of his/her existence.

The mental management of the maritime self-concept promotes wider physical and intellectual horizons and can help personality to overcome a tragedy of existence, improve the emotional state, find an individual trust, joy, get a higher self-esteem and phenomenologically give a sense to own delicate existence.

Existential phenomenology raises a concern for the world and changes it into a concern for the personality. This phenomenology promotes to perceive and give a sense to the phenomena that are related to development of the individual existence, distribution and integration. The personality analyses the valuable attitudes with help of his/her existential experience, artistic creativity, development of the imagination, insights and reflections of own values.

A value of the metaphorical thinking is emphasized because an imaginational consistence of metaphors in education. All these moments of the experiential self-management are very significant in regard to the maritime effects, forming the own maritime self-concept, searching for an expression of the own personality's value and creating the authentic relationship with oneself, the nature and social reality.

Neotomism gives a priority to the personalism, highlights the human's spiritual nature and spiritual aim, raises the personality over the everyday routine and gives the base to develop a sustainable culture of the personality by improving the maritime self-concept and combining anthropocentric, sociocentric and theocentric ideals.

A mental management of the maritime self-concept in European culture tradition is based on transcendental ideal that determined a sense of the personality's own self-esteem and dignity, freedom of thinking, and a distance from the nature as an absolute determinant. Transcendental ideals that are propagated by neotomism are important for development of the European identity in long-term prospect.

Methods of analysis and retrospective, comparative, meta-, extrapolative and heuristic analysis, and systemization of scientific data of the maritime self-concept ideological and psycho-pedagogical management are used in the research.

The type of the research is theoretically descriptive.

Limits of the research. Revealed scientific problems of the maritime self-concept mental management can be applied theoretically and methodologically basing the empirical researches that are vocationally and cognitively related to individuals and their maritime affairs.

The scientific spectrum of the maritime self-concept ideological management

The scientific situation of ideological management of the maritime self-concept is analyzed with reference to European maritime tradition, axiology and scientific spectrum of mental development of the maritime self-concept, Lithuanian maritime mentality, modern didactical culture and important external factors for an improvement of the maritime self-concept.

European maritime tradition is directly related with development of the personality's spiritual horizons, especially the ideological horizons.

The most important factors of this development are Arabic genesis of the maritime navigation and astrophysics, Greek mythology and philosophy by raising the maritime symbolism, maritime mission that was promoted by Judeo-Christian European mentality; new geographic and ethnographic discoveries, function of the Judeo-Christian European mentality by developing European states, institutional culture and literacy, and rising universities from the monastic libraries (in 10-11 th centuries) and first - Portuguese - maritime schools in 15th century (Encyclopedia Britannica 1999; Kullik 2005).

A development of the European maritime self-concept in the Mediterranean civilization and in the context of Judeo-Christian cultural transformation was characterized by horizons that could be distributed at three strategic levels - maritime physical, scientific-intellectual and spiritual-transcendental.

The personality's possibility to recognize oneself and be recognized by others, and to freely make decision regarding to the transcendence, can and must be revealed from the anthropological point of view of European culture development.

These significant conditions, with reference to the ideology, helped human creatively satisfy own cognitive interests and perceive the personal value of oneself and others, and possibility for the existential liberation and improvement in regard to anthropology and European culture development.

It is natural, that the sea is a value, and not only because of the economical causes. This ontological approach accords to an a priori personality's value and its aspiration, especially when existential and psychoanalytical questions of genesis, destiny, management and education are directly related with waters and their symbolism.

The significance of the integrally valuable approach and personality is highlighted at the level of European maritime policy and ecology (Žvejyba ir akvakultūra Europoje 2006).

Politic and educational decisions that are regarding to the maritime praxis need a sustainable consensus. The personality, taking care of oneself and of environment, can create a sustainable culture when he/she perceives own culturally deep relationship to the sea at the applied level, and consciously develops it.

However, it is difficult to take care of oneself, if the personality has not had enough sustainable social environment. Perhaps it is more difficult to take care for the environment, if the personality has not had a possibility to develop his/her adequate self-esteem or lost it.

The mentioned unchangeable and psychologically influent ideal that is based on the European maritime self-concept exists always and is present in every case. Christianity came from Judaism and is not an ideology in a theological sense. However, Christianity expresses as an official neotomistic philosophy in the mechanism of the maritime self-concept internalization, especially at the cognitive level of the internalization, and takes part from this point of view as an ideology near other ideologies, and promotes the personality to the ideal that could give a sense to human life and development of the personality and his/her self-esteem.

However, we must scientifically review this conception of the ideal of the maritime self-concept development. It is a new cognition of the ideal that is important to know with reference to development of the maritime self-concept.

We must understand a mental transformation in European maritime foretime. So, we can take part in global scientific searches, trying to perceive a regular expression of the European maritime identity, and a reliable perspective of its development by integrating of an ideological factor.

General principles of the European personality's maritime education, from the managerial point of view of the positive relationship with the sea, are revealed in the scientific monograph "Methodological parameters of the cultural and psycho-social maritime education" written by author of this paper and published in 2011 (Lileikis 2011). Subsequent researches of the author led to raise more special scientific questions about the personality, sense of his/her self-esteem developing the European maritime self-concept.

Lithuanian scientific researches of mental management of the maritime self-concept are very scarce and are more related to:

- Positioning of the national maritime mentality by creating of the state,
- Maritime culture in general,
- Respect to oneself and to the sea,
- Philosophical consciousness,
- Dialectics of the personality's self-management,
- Maritime economics,
- Socially responsible environment of the maritime business,
- Vocational preparation of seafarers, their dignity, spirituality and physical and psychic health,
- Planning of the maritime students' career,
- Anthropocentric, sociocentric and theocentric needs of their self-education,
- Psychological terror of seafarers,
- Moments of a state of the maritime self-concept of future seafarers (Beresnevičius 2002; Krikštopaitis 2002; Gairės laivybos kompanijoms 2004; Žukauskienė, Viršilas 2005; Jūrininkų rengimas Lietuvoje <…> 2008; Žaromskis 2001, 2008, 2010; Lileikis 2011; Safronovas 2011; Kalvaitienė 2012; Astikas 2015).

Scientific conferences about the maritime culture, maritime heritage and maritime identity, history, geography and ecology of the maritime business, that are partially related to a search of the possibilities for the

maritime self-concept essence and its development, are more often organized in Lithuania close to some popular moments of the maritime self-concept.

Mass media highlights these moments that are usually limited by the maritime events. Fragments of the national self-esteem sense with reference to the maritime spirit, and civic pride interacting with the sea are highlighted.

Dr. Gintaras Beresnevicius (1961-2006) was a famous Lithuanian mentality researcher and scientist at the Institute of the Culture, Philosophy and Art. The scientist raised and analyzed the scientific problem very correct. He combined the data of ontology, anthropology, history of civilizations, ideologies, religions, ethnology, folklore, psychological attitudes and heuristic relationship of the personality's value by evaluating of the Lithuanian maritime mentality in a global context from the integral point of view of the world civilization development at the level of mentioned mentality regarding to the maritime self-concept. So, these researches are very close to problems of the maritime self-concept development (Beresnevičius 2002).

Nowadays official scientific debates are characterized by some limits of the local historical approach only to the maritime self-concept of the coastal population by ignoring of principle of the constitutional integrity of the all-Lithuanian state. Problems are significant. Some positions *a priori* do not let citizens of the general maritime state to be with the maritime self-concept. Maritime traditions only of the coastal population are highlighted usually. However, autochthons that represent the traditional coastal population are very little. Mentioned debates are characterized by low creativity that is natural for people with the maritime spirit.

Debates lack of expression of a deep thought and of respect to oneself and others. Scientific papers written by philosopher L. Donskis revealed historical and psychosocial tendencies of the weak personality's self-esteem, and audacity based on the fear, arrogance and contempt, victim's syndrome and moral culture in East-Europe in general (Donskis 2009).

We can see an effort to base existence of Lithuania as the maritime state (may be better - as the maritime nation) on the history of Curonians or of so-called a Little Lithuania (Germ. *Kleinlitauen*) when Lithuania as a state received an accession to the Baltic Sea in Klaipeda region only in 1923.

The need to prove creates a controversial situation because it let to perceive psychological problems of some national and civic self-esteem. These problems are less in traditional European maritime states where the maritime self-concept of the population is more natural and goes without saying also when people lives away of the sea that rinses the coast of their state. Some West-European scientists approve that at Lithuanian scientific conferences.

The epistemological base of these conferences is scientifically questionable, especial when it is aimed to approve Lithuania as the maritime state. If we agree (or do not agree) that Lithuania is a maritime state, then it is possible to ensure a false psychological peace that is characterized by passivity. Reality of life showed, that a maritime self-concept is very dynamic.

So, it is appropriate to formulate the names of the conferences orienting not so much on what maritime things Lithuania still has or requires to maintain but more to what it is purposeful to create and what is being created now from the political and socio-cultural point of view of the maritime self-concept development in nowadays life conditions.

Perhaps the closest to the truth statement is in the monograph written by V. Safronovas in 2011 regarding to scientific approach (Safronovas 2011). The monograph raises the foretime as a source for the conflicts, and analyses the contest of the identity ideologies in Klaipeda at 20th century at the level of the self-concept management.

Purposefully ideological development of the personality's maritime self-concept is based on maritime and not maritime cultural studies of his/her cultural identity genesis and development with reference to the European civilization, and of the entire state at the hodegetic and didactic levels when psychologically stronger or more romantic aspirations to go to the sea or become a seafarer can characterize the human who namely lives away from the sea. It is obvious and approved empirically.

So, it is appropriate to evaluate a situation of the national maritime mentality and especially of the personality's maritime self-concept in a broader context of the ontology, cultural anthropology, axiology and ethno-psychology that are relevant to the hodegetics.

A person makes decision about directions of his/her maritime self-development. The person can freely choose a kind of the maritime self-concept development or not, a relationship with the sea or not, an opportunity to become a seafarer or not, and to respect himself/herself or not. Human creates an individual knowledge and existential and vocational senses relating with the environment and being with reference to own unique experience from the modern point of view of the didactic culture that is based on the self-educational paradigm.

It is not an extreme pedocentrism. Individualism is applied promoting a personality's consciousness, a personal responsibility of own life, and own relationship with oneself, others and with the natural, socio-cultural and technological environment. A collective community is not defined and it does not let to take a personal responsibility.

The conception of the human as an animal that fully depends on the environmental stimuli is related to the behaviorism and characterizes the world of the manipulation in business.

However, a human mentally differs from an animal because of his/her ability to distance from the bothering stimuli of the social environment, to switch psychologically, for example ignoring psychological terror, look at one-self, consciously to choose directions and senses of own authentic life from the cognitive point of view.

The maritime environment based on the social minimalism is especially significant to the managerial self-expression of maritime self-concept processes of the mature personality.

The traditional school is characterized by mass and depends on the governmental politeconomic decisions.

The mentioned school aims to the noble ideals but often physically cannot develop the independent and prosocial personality by taking more latent and indirectly expressed objectively social mission based on the social engineering, namely discipline of children, teens and youth.

An expression of the learner's personality and individualized development need educational conditions that are close to the subjectivism and social minimalism, practical working in micro-groups, individual consultation, unlimited consciousness, learning to think, constructive originality and originality in general, and unlimited and technologically non-automatic creative freedom.

These conditions are namely found near the sea with reference to the individual self-education, recreation and natural opposition to urbanistic massification. It is relevant to apply an integral approach.

The noble and very difficult mission is to keep balance between the standard system and pedocentrism that naturally raises connection with the sea with the spirit of freedom. A development of the maritime self-concept is based more on subjective and phenomenological criteria than on objectivism at the level of the personality's value concept.

So, the sea and maritime studies at the higher school can enrich the personality with internalization of the subjectively adequate and unique maritime self-concept, and at the same time with a compensation of the objectively standard scholar development of the personality by integrating an idealistic self-expression based on the personal responsibility that gives joy in hard life.

The Lithuanian ethno-culturally historic tradition is characterized by the instinct to survive and by the continental expansion. We do not have a coherent, long-term and global political strategy of the society's maritime education. Individualism characterizes the post-modern epoch that does not let valuable violence, and is related to the free expression of the personality. Every individual approach to the sea and its significance regarding to the self-esteem can be implemented in the long-term prospect.

Lithuania has external factors that are relevant to development of the personality's maritime self-concept from the ontological point of view.

The state is characterized by 90,66 km Baltic Sea coast and 136 vessels that are registered in the maritime ships register; Lithuanian Navy and Lithuanian soldiers with the adequate maritime self-concept take part in EU anti-piracy operations and NATO peacekeeping missions; maritime business and maritime cultural events, creation of maritime mentality traditions by raising of original ideas and regarding to the experience of other maritime countries; 18 thousands seafarers who came from different ethnographical regions of Lithuania and foreign countries are registered in the Lithuanian seafarers' register, and 8 thousands of them are vocationally active (Lietuvos saugios laivybos administracija 2011).

Future seafarers who are working at seas and oceans of the world are being prepared at the Lithuanian maritime academy with reference to conventions of the European higher education and International maritime organization. Jung people from Klaipeda and other cities, towns and countries become seafarers.

Possibilities or poverty of the mental management of the society's maritime self-concept do not depend on historical evidences or so called ideological memorialization. What was in the Lithuanian maritime past is relevant but maritime activity nowadays is more important.

Present maritime activity, maritime business, sea- and maritime studies and new maritime traditions that are freely created, and respect to oneself and others reveal a possibilities to constructively develop a personally meaningful relationship with the sea at vocational, educational and recreational levels, and to create oneself as a valuable personality in a prospect of the aimed European ideal as the own identity.

So, it is appropriate to understand the state of marine-type as a self-evident positioning an idea: not Lithuania as a maritime state but directly - the maritime state Lithuania. It would give impulses to think more globally about possibilities of the Lithuanians' maritime self-concept development nowadays at the leading level.

The scientific situation of the maritime self-concept psycho-pedagogical management

The scientific spectrum of the maritime self-concept psycho-pedagogic management is discussed regarding to a paradigm of the universal upbringing, psychological conditions for self-development from the point of view of own behavior and the sea, psycho-pedagogical data, art therapy, behavioristic psychology, technocratic dictatorship and democratic education.

Paradigm of the universal upbringing raises an integral approach to the maritime development of the personality at the hodegetic level. So, we ideologically respect the vertical and horizontal lines of the human nature and existence. It is an integral approach. A significance of psychological mechanisms that are educationally relevant is very important to the maritime self-concept mental development.

The development of the personality is based on the conception of the all-human's upbringing and the improvement of all his/her powers. This conception universally revealed a personal purpose to create conditions to integrally satisfy all (physiological, psychological and spiritual) own needs.

Philosophy is considered as a managerial science of the educology, and psychology is considered as the background science for the educology. Researches of the expression and development of the maritime self-concept and personality's value at the maritime level with reference to the psycho-pedagogics are not many.

More researches are related to the purposeful maritime commercial marketing that popularly presents a benefit of the physical and psychic health, medical and psychotherapeutic development at the sea and with the sea-good that is often based scientifically.

Psycho-pedagogics investigating an educational psychology is very relevant for the revelation of the maritime self-concept regularities because orientation to psychological conditions of the adequate behavior

management from the point of view of the personality and sea.

The relationship of these factors is meaningful:

- Psychological processes of the knowledge in regard to one-self and the sea;
- Psychological, physiological and biochemical mechanisms of the maritime self-concept;
- An influence of psychic levels (consciousness, self-consciousness and sub-consciousness) by perceiving and learning to perceive the sea and one-self;
- Psychological attitudes regarding to the sea and to one-self;
- Emotional experiences in relationship with the sea and one-self;
- Reactions, attention, interests and aspirations;
- Internal and external factors of the natural, social and technological environment;
- Motives of the learning to cherish the sea, nature, own and other personalities, and changing of their motives;
- Learner's approach and teacher as a qualified specialist, and the sea as a teacher presenting an ecologically informational sense of the nature.

Psycho-pedagogical researches are related to the relevant ideological levels and include a wide spectrum of interpretations of the maritime self-concept. The maritime self-concept is usually researched with reference to the scientific questions of the maritime self-consciousness, maritime consciousness and development of the maritime consciousness.

Most scientific data of the maritime self-concept and close problematical fragments in regard to psycho-pedagogics are a social sea-image, conditions of the sea-image personal development, mental motives of the sea attraction and avoidance, psychoanalysis characterized by maritime symbols, psychological analysis of the sea perception, influence of the virtual environment, changing of epochs that is significant to the maritime self-concept, unification of the European moral maritime mentality and praxis, protestant maritime business and a sense of freedom, needs of the seafarers' self-education applying of their psycho-prophylactic tools; competence of the seafarer's stress-management, mental state of his/her organism, and maritime training of the personality by sailing (Corbin 1994; Hellpach 1950; Paul 1998; Pestana 2001; Hugo 2003; Žukauskienė, Viršilas 2005; Stadler 2007; Tenzer 2007; Naujok 2008; Rademacher, Zielke 2009; Rapolienė, Sąlyga 2012).

The maritime self-concept is often related with the coaching where the sea is a quality dimension giving sense to life. Metaphors of the sea are applying for the perceiving of the personality's self-esteem, and for the pedagogic therapy that is related with a psychological self-management of the personality (Fritz 2011).

The image of the nature can be interpreted as a significant metaphor of the essence of existence by applying the maritime art-therapy from the educational point of view. A psycho-emotional stress is less and the personality is enriched by the combination of images (archetypes) previous experience of the mankind that are in the human collective sub-consciousness, and of the personal relationship with the sea.

The use of the maritime landscape (that is mentally related to remembers of archetypical symbols of the sub-consciousness) for the perceiving of the personally and existentially important experience let originally perceive metaphors that rise in the sub-consciousness, and find an enriching relationship between archetypical images and the individual experience.

The relationship with the sea wakes human powers of the sub-consciousness and helps personality experience better his/her value and individually understand in life in a context of values that are intuitively experienced and close to the mankind.

The analysis of psycho-pedagogical conditions of the maritime self-concept mental management enriches the hodegetics but not enough. We need scientific results for a development of the personality's consciousness and for improvement of his/her self-concept.

These results are taken after the psycho-pedagogical researches and especially after diagnostic sections. It is important to base the researches on the stagnant and reliable transcendental ideals that, near the eventual negative physical conditions of physiological indicators, give a final sense of human existence, promote to develop a free personality, help improve his/her self-expression and autonomic thinking by raising of existential questions and processes of the diversified, conscious and strategic management of life.

The behavioristic psychology, denying the human consciousness and dehumanizing the personality, was rated much worse in a scientific world in second half of 20th century at the education system of European countries in democratic conditions.

The object of the behavioristic psychology is considered only external and objectively registered manifestations of the behavior. Behaviorism that recognized the biological weapon is based on I. Pavlov's medical experiments with dogs and people (children). Study of E. L. Thorndike and B. F. Skinner is very questionable from the moral point of view.

Futurologists designed scenarios of the behavioristic and totalitarian management note that global powers aim to redistribute the mankind from the discriminating and qualitative point of view by implanting of distance control microchips to every individual as a quasi-personality etc. Scientists capture and publish abundantly the manipulation features of human life, and management of the personal freedom and self-consciousness, and violation of personal privacy in France, Germany, USA, Russia etc.

Political directions of the global tracing are considered as an initial phase of them. Online social networks are used for a political influence, the technocratic dictatorship and individual's remote management (Bauman 2012). A collecting of private data of the virtual communication (under cover of the security and prevention of terrorism or of other noble motive), a continuous satellite-scan of the Earth's entire surface, promotion of bank cards or so-called discount cards in order to register a customers' information and habits, and to transform them by developing relevant product markets, to punish or eliminate people that think otherwise are problematic with reference to the

personality's dignity, privacy and conscious moral development.

However, a priority of the democratic education-policy is given to the humanistic and not manipulative direction of the cognitive psychology. Some sort of an "anti-psycho-pedagogical" campaign of the education policy, directed against the manipulative psycho-pedagogics and promoting an awareness and a conscious self-development of the personality, rised in 20 th century (Braunmühl 1990).

A human can perceive themselves in two general ways – as a research object and as a free existence that is not available for any investigation, objectless reality where the personality takes root by the authentic self-concept and understand of the source of his/her reflections and activities.

It is appropriate to combine naturally the ideological and psycho-pedagogical levels of the human maritime self-concept management based on the personality's liberation possibilities, aimed to give a more global European context for researches of the personality's value in regard to the maritime self-concept.

The noble valuable transformation related to the transcendental significance that is important to cherish and enrich the human personality with the educational spirit of the European identity development, characterizes this context.

The personality's self-esteem is most relevant to the development of the maritime self-concept, and to leading position of maritime idea in society.

So, a possibility for sense of the personality's self-esteem is naturally highlighted when we integrate scientific problems (regarding to ideological and psycho-pedagogical levels of the relationship with the sea, to individual way of the transcendence over the daily routine, to psychological factors, to valuable transformation of the transcendental ideal that rises from the experience of spiritual development of the mankind, and reveals in the classic European culture) into researches of the maritime self-concept mental management.

The revealed scientific argumentation let methodologically base the empirical researches of the maritime self-concept mental management from the applied point of view.

Conclusions

The scientific spectrum of the maritime self-concept ideological management at the level of the exploration is characterized by European maritime culture tradition; Greek, Arabic and Judeo-Christian mentality of researches; *a priori* personality's value when questions of life genesis and destiny, existential and psychoanalytical management and education are related with waters and their symbolism; positioning of the Lithuanian national maritime mentality creating the state; maritime philosophical consciousness, dialectics of the personality's self-management, maritime economics, socially responsible environment of the maritime business, vocational training of seafarers, their dignity, spirituality, physical and psychical health, and psychological terror of seafarers; respect to multi-disciplinal researches of the maritime self-concept, self-esteem and tolerance.

The scientific situation of the maritime self-concept psycho-pedagogical management is characterized by researches of the medical and psycho-therapeutic health development near the sea and with the maritime good, social maritime image, conditions of the personal maritime image development, mental motives of the sea attraction and avoidance, psychoanalysis based on the maritime symbols, psychological analysis of the maritime self-concept, influence of the virtual sea, changing of epochs that is significant for the maritime self-concept, unification of the moral maritime mentality and praxis, protestant maritime business and sense of freedom, needs of seafarers' self-education applying of their psycho-prophylactic tools, competence of the seafarer's stress-management, mental state of seafarer's organism, maritime training of the personality by sailing, maritime art-therapy and invulnerable personal freedom in general.

Revealed scientific problems of the maritime self-concept mental management, with reference to the leading level of the maritime idea positioning in society, can be applied theoretically and methodologically basing the empirical researches that are especially related to the vocational level of the human's maritime existence.

References

Astikas, E. (2015). *Jūrų kapitono užrašai.* Klaipėda: Lietuvos aukštoji jūreivystės mokykla.

Bauman, Z. (2012). Do Facebook and Twitter help spread Democracy and Human Rights? *Social Europe Journal*. Retrieved from http://www.social-europe.eu

Beresnevičius, G. (2002). *Ant laiko ašmenų*. Vilnius: Aidai.

Braunmühl, E. (1990). *Zum Vernunft kommen. Eine „Antipsychopädagogik"*. Weinheim: Beltz Verlagsgruppe.

Corbin, A. (1994). *Meereslust. Das Abendland und die Entdeckung der Küste.* Frankfurt am Main: Fischer Taschenbuch.

Donskis, L. (2009). *Neapykantos formos: įaudrinta vaizduotė modernioje filosofijoje ir literatūroje*. Vilnius: Versus aureus.

Encyclopedia Britannica. (1999). Retrieved from http://www.britannica.com

Fritz, S. (2011). *Meer-Wert durch psychologische Beratung*. Retrieved from http://www.meer-wert.com

Gairės laivybos kompanijoms. Lygios galimybės ir įvairovė Europos laivybos bendrovėse. Priekabiavimo ir grasinimų darbo vietoje panaikinimas. (2004). Briuselis: EBLSA Europos transporto darbuotojų federacija.

Hellpach, W. (1950). *Geopsyche. Die Menschenseele unter dem Einfluss von Wetter und Klima, Boden und Landschaft*. Stuttgart: Ferdinand Enke.

Hugo, V. (2003). *Die Arbeiter des Meeres*. Hamburg: Achilla Presse.

Jūrininkų rengimas Lietuvoje jūreivystės istorijos retrospektyvoje. (2008). Klaipėda: Libra Memelensis.

Kalvaitienė, G. (2012). *Jūreivystės studentų profesinės karjeros planavimo mokėjimų ugdymo modelis*. Kaunas: Vytauto Didžiojo universiteto leidykla.

Krikštopaitis, J. A. (2002). Įsižiebusi ir greit išblėsusi jūrinės valstybės idėja. *Mokslas ir gyvenimas*, 12. Retrieved from http://www.ausis.gf.vu.lt

Kullik, G. (2005). *Mythos Kap Bojador. Gil Eannes und Portugals Vorstoß nach Afrika*. Norderstedt: Books on Demand GmbH.

Lietuvos saugios laivybos administracija. (2011). Retrieved from http://www.msa.lt

Lileikis, S. (2011). *Kultūrinės ir psichosocialinės jūrinės edukacijos metodologiniai metmenys*. Klaipėda: Klaipėdos universiteto leidykla.

Naujok, M. (2008). *Sicher segeln ohne Stress*. Bielefeld: Delius Klasing.

Paul, A. T. (1998). Überschreitung und Schwellenangst. Über die nautische Phantasie und die Küste. *Ästhetik & Kommunikation*, *102:* 59-66.

Pestana, C. G. (2001). The ideological Origins of the British Empire by David Armitage. *The William and Mary Quarterly*, *58:* 542-545.

Rademacher, T., Zielke, M. (2009). *Traumatischer Stress in der Handelsschifffahrt – Curriculum für nautisches Führungspersonal zur Krisenintervention nach Extrembelastungen*. Lengerich: Pabst Science Publishers.

Rapolienė, L., Sąlyga, J. (2012). Psichoemocinis stresas jūrininko darbe ir jo mažinimo galimybės. *Sveikatos mokslai*, *22:* 83-87.

Safronovas, V. (2011). *Praeitis kaip konflikto šaltinis. Tapatybės ideologijų konkurencija XX amžiaus Klaipėdoje*. Vilnius: Lietuvos istorijos instituto leidykla.

Schmid-Höhne, F., Bühr, F. (2011). *Ihre Veränderung beginnt am Meer*. Retrieved from http://www.swellness.de

Stadler, M. (2007). *Psychologie an Bord*. Bielefeld: Delius Klasing.

STCW Manila seafarer training amendments enter into force on 1 January 2012. (2011). *International Maritime Organization*. Retrieved from http://www.imo.org

Tenzer, E. (2007). *Einfach schweben. Wie das Meer den Menschen glücklich macht.* Hamburg: Marebuchverlag.

Žaromskis, R. (2001). Jūrinis mentalitetas kaip visuomenės geografinio ugdymo dalis. *Geografija Lietuvoje*. Vilnius: Geografijos institutas, 52-61.

Žaromskis, R. (2008). *Baltijos jūros uostai*. Vilnius: Vilniaus universiteto leidykla.

Žaromskis, R. (2010). *Lietuvos jūriniai interesai kaip jūrinės savimonės atspindys*. Retrieved from http://www.slideshare.net

Žukauskienė, L., Viršilas, V. (2005). Lietuvos jūrininkų saviugdos poreikiai XXI a. pradžioje: vertybinis aspektas. *Pedagogika*, *80:* 57-62.

Žvejyba ir akvakultūra Europoje. *Integruotos jūrinės politikos vizija Europoje.* (2006). Briuselis: Europos Komisija.

RECEIVED: 16 January 2017 **ACCEPTED: 10 May 2017**

Saulius Lileikis is a doctor of social sciences, associate professor at the Lithuanian Maritime Academy. Direction of scientific interests is a cultural and psychosocial dimension of maritime affairs. The last scientific monograph: *The Outline of the Maritime Self-concept Development: Direction of the Personality Value* (2015). Address: I. Kanto str. 7, LT-92123 Klaipėda. Phone: 8 652 08 106. E-mail: s.lileikis@lajm.lt

Magdaléna Tupá, Ing. PhD. Faculty of Social and Economic Relations, Alexander Dubček University of Trenčin, Študentská 2, Trencin, 91150, Slovakia. E-mail: magdalena.tupa@tnuni.sk
Research interests: regional development and regional policy.

Vadyba
Journal of Management
2017, № 1 (30)
ISSN 1648-7974

THE IMPACT OF MANAGERIAL COMPETENCIES ON BUSINESS PERFORMANCE: SME's IN KOSOVO

Liridon Veliu[1], Mimoza Manxhari[2]
[1]University of Prishtina "Hasan Prishtina", Faculty of Economics, [2]University of Tirana, Faculty of Economics

Abstract
One of the most important criteria for having effective managers is competency. Managers are required to ensure that organizations achieve their objectives. Today, when measuring organization's performance, its better results more and more are referred not to material recourses of an organization, but to human resources and their competencies; development of competencies has become one of the key priorities of the organization. This study investigates the connections between managerial competency and performance of SME's. Data collection was made through questionnaires, and the constructs used were adapted from prior research and already tested for reliability. For the study we used a structured questionaries' and the data analyses where made through statistical package for social sciences (SPSS). Results indicated support for the theoretical model that was considered. The findings suggest that managerial competency is associated with performance.
KEY WORDS: managerial competencies, managers, performance, sme's.

Introduction

Research on competencies went to analyze, understand and explain the importance of managerial competencies in the organizations. Many studies showed that competencies is a cluster of the related knowledge, skills characteristics and attitudes that correlates with effective performance and are able to be measured evaluated, and strength through training and development programs it is consider as a common term for employees to assert their working and show the real activities (Berge et al., 2002). Every business organization need effective managers to be successful in today's highly competitive and dynamic business environment. It is very important for a business organization to identify, develop, and retain talented people. Every successful and effective manager possesses several competencies that enabled him to perform efficiently and effectively at different managerial levels. Management occurs within any type of organizational context where human and physical resources are combined to achieve certain objectives. Managerial competencies play today an important role in different types of organizations. The Competencies can detect the differences between average and excellent managers. The relationship between managerial competences and business success still remains an important issue within organizational literature (Crook et al., 2011). Competencies can give companies their competitive advantage over their competitors. This can be achieved through companies developing competencies that are not easily transferable from one business to another. Competencies can also be called maturing when they are no longer relevant to the firm's strategic positioning. Some core competencies that are difficult to duplicate can be developed through the firm's reputation, service, traditions and image (Lado et. al, 1994). Managerial competencies refer to knowledge, abilities, skills and behaviors required for effective job performance in managerial occupations.

In addition to executing each function effectively, each level of manager should demonstrate managerial skills with regard to performing job-related tasks and responsibilities because management skills developed order and consistency through management functions (Bateman & Snell, 2002). Competencies vary depending on the type of business and manager competencies, similar to company core competencies, which can change with variables such as time, location of business or size of business. The precise definition of managerial competencies is heavily contested. In the context of SMEs, managerial competencies are defined as sets of knowledge, skills, behaviors and attitudes that can contribute to personal effectiveness of managers (Hellriegel, Jackson, Solcum and Staude, 2008). Contemporary business companies need management professionals with managerial competences that would enable an employee to success-fully perform in ever changing business and economic environment.

This paper determines the impact of managerial competencies on business performance.

The following questions were raised up for the purpose of this research:

Which are the managerial competencies that can help in the process of business performance?

What are professional competencies?

What are social competencies?

What are personal competencies?

Which managerial competencies – professional, social or personal are more important for business performance?

Literature Review

Managerial Competencies

Managerial Competences are important because they are forward looking, describe the skills and attitudes the staffs need to meet future challenges, help clarify expectations and provide a sound basis for consistent and objective performance standards by creating a shared language about what is needed and expected in an organization (United Nation's Report, 2004). Organizations applying several managerial competencies which drowse attention to the need to understand how different these competencies are working in organizations, this require to highlight the most effective competency in order to enhance it for a better performance. Competencies are measured in terms of importance and frequency. By measuring how important a competency is, managers can show how critical these competencies can be within a particular profession. It is also important to see how often competencies are used in a particular job. Building on McClelland's (1973) view, Competency term that was defined by Boyatzis (1982) as underlying characteristics that the person possess lead to achieve outstanding performance. Competence has been defined as the ability and willingness to perform a task (Brown, 1993). Competencies have been defined by Boyatzis (1982), as "an underlying characteristic of a person in that it may be a motive, trait, skill, aspect of one's self-image or social role, or body of knowledge which he or she uses (Boyatzis, 1982). Drucker (1985) defined competence at individual level as an ability of employees to offer superior performance in tasks. Competency is used as an umbrella term to cover almost anything that might directly or indirectly affect the job performance (Woodruffe, 1992). Managerial competencies are a cluster of similar knowledge, skills and attributes that are essential to effective job performance (Karns, 1998). Henderson (2000) defines competency as a combination of knowledge and skills required to successfully perform an assignment. Its attainment is evidenced by the ability of an individual to gather data, process it into useful information, access it and arrive at an appropriate and useful decision in order to initiate the actions necessary to accomplish the assignment in an acceptable manner. Boyatzis (2000) describes managerial competencies as underlying characteristics of a person that he or she uses to solve problems that arise at a work place. According to Kayes et al (2005), managerial competencies involve internally and externally managing the host people and other expatriates in the organization. This internal management skill serves to resolve conflicts between local employees and expatriates and maintain a close relationship between them. Draganidis & Gregoris, (2006) defined competency as a combination of tacit and explicit knowledge, behaviour and skills that gives someone the potential for effectiveness in task performance.

Spencer and Spencer (2008) posited that competences refer to the range of skills which helps in satisfactory performance and competencies refer to the behaviour adopted in a competent performance. Managerial competencies were developed because of current and emerging business requirements (Meyer & Semark, 1996).

Managerial competencies can affect organizational performance. Heffernan and Flood (2000) surveyed 114 human resource managers to determine the usage of competency frameworks in Irish industry. The relationship between the adoption of a competency model and other variables was investigated. The results confirmed that use of a competency framework was linked to improved organizational characteristics and was reflected in better organizational performance, such as reduced turnover and growth of the industry. A managerial competency has been used and is recommended regularly by several authors constructed initially on the basis of (Boyatzis and Goleman 2007; Boyatzis 1982) work. It is as follows.

Table 1. Contents of managerial competencies

Blocks of Managerial Competencies	Managerial Competencies
Professional competencies	Planning, problem solving, information gathering, analytical thinking, abstract thinking, strategic thinking, learning from one's own and others' experience, striving for results, initiative, business-like orientation, generation of ideas, diligence, resolution, global perspective, organizational skills, team-work, negotiation skills, leadership, conflict handling, communication, organizational awareness, systemic logics, written communication, creativeness and ability to implement innovations, modern knowledge, time management, risk assessment, risk-taking, defining the circle of personal interests.
Social competencies	Communication and influencing others, verbal communication, convincing communication, effective relations, orientation to customer, goal-setting, delegation of authorities, change management, performance management,fairness, responsibility, flexibility, cultural awareness, qualification, group-building and development skills.
Personal competencies	Self-confidence, stress management, personal reliability, loyalty, self-control, self-confidence, self-management, listening skills, system of personal values, personal goals, continuous personal self-development, personal responsibility for taken decisions, awareness of ethics relevance in business.

Source: I. Bakanauskienė and J. Martinkienė (2011)

Business performance

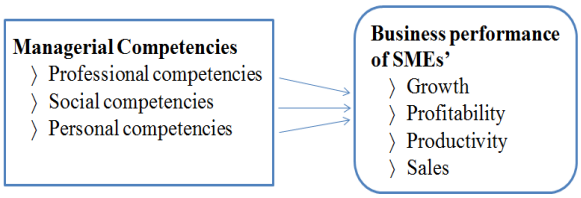
Since the beginning of competency management, nearly all authors have stated a positive relationship between management competencies and success. Business performance is addressed to organizational effectiveness, in a broader concept, there are two

indicators explaining business performance including financial performance (sales growth, profitability, earning per share) and operational performance (market share, new product, product quality, marketing effectiveness and value added) (Venkatraman & Ramanujam, 1986). Timmons (1999) asserts that as you achieve business success, it is sometimes measurable and sometimes not. Accumulating a certain volume in sales is certainly one way to measure success, but it is not the only way; earning a prestigious award, earning the respect of your peers, or providing livelihood to your employees may be far more meaningful to you. Boyatzis (1982) argued in his seminal book on competency and performance, that the competency clusters "Goal and Action Management", "Leadership", and "Human Resource Management" are the most important ones. Prahalad and Hamel (1990) distinguished between technological and management competencies and only the fit of both will lead to entrepreneurial success. Companies gain and sustain competitive advantage due to the ability to renew, integrate and expand their existing competencies which enable the firm to transform resources into value offerings leading to sustain and increase firm's performance (Doole et al., 2006). Castelli (2006) defines Business success as a subject to individual interpretation based on upbringing, past experiences, role models, competitive forces, personal motivations and goals. For some, merely staying in business can be considered success, while for others it could be achieving a certain level of sales or an IPO thus core values of the business (Castelli, 2006). Another study explored business performance indicators as sales growth, customer growth, profit growth and working capital growth (Ismail, 2012). While performance would be divided onto financial and non-financial performance where financial performance is financial efficiency, profit measures, non-financial performance includes customer satisfaction, sales growth, employee's growth and market share, SMEs often investigate their growth via turnover growth and employment growth (Sidik, 2012).

In a study performed on firm performance, perceived performance is defined as an indicator including growth, firm profitability and market share in which firm growth and profitability are the essential parts of a firm's performance and those are measured to evaluate the competitiveness of the firm (Soininen, Martikainen, Puumalainen, & Kyläheiko, 2012). The researcher developed a conceptual framework drawn from the works Berger (2002) where business success was described in terms of sales, profitability and survival.

Conceptual Framework

The following Conceptual framework was developed after review of existing literature to investigate the research questions at hand. The framework shows Managerial competencies (professional, social and personal) as the independent variables used to explain business performance as the dependent variable.



Source: own processing

Methodology

This research is designed to check the relationship between managerial competencies and business performance. A self-administered survey questionnaire was used to collect primary data from the targeted samples of Kosovo managerial employees. Questionnaire was designed based on the paper "Determining managerial competencies of management professionals: Business companies managers' approach in Western Lithuania region", authors: Irena BAKANAUSKIENĖ, Jurgita MARTINKIENĖ, published in the ORGANIZACIJŲ VADYBA: SISTEMINIAI TYRIMAI: 2011.60, ISSN 1392-1142.

Business performance was measured using the Questionnaire of Entrepreneurial Success (Wiklund and Shepard, 2005).The scale items refer to the assessment of one's own Business's growth evaluation during the last three years.

Questionnaire was designed to take the required data about managerial competencies and their impact on business performance. Data analysis is taken through descriptive statistical method. It includes Mean, Standard deviation and Linear multiple regression. The population for the study was all the managers of small and medium enterprises (SMEs, Kosovo), distinguishing between small companies that employ from 10 to 50 staff and medium-sized companies that employ from 50 to 250 employees. The respondents were asked to complete a self-administered questionnaire which was collected immediately after completion. The sample was drawn on 195 managers from small and medium enterprises in Kosovo. While 195 questionnaires only 110 of them met the conditions for analysis. A convenient sampling technique was used to select the managers. Descriptive statistical method was used to assess perceptions of managerial competencies. Statistical Package for the Social Sciences (SPSS, version 24.0) was used to analyse the data. Principal components analysis and varimax rotation methods were used to managerial competencies analyse. Linear multiple regressions were used to assess the relative importance in predicting the business performance.

The Cronbach's alphas for all the scales are at an acceptable level of reliability, averaging 0.85

The relative importance of the business performance dimensions was based on their Beta (i) weight in the following hypothesized linear regression model:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots. + \beta_n X_n + \varepsilon$$

Y: dependent variable – business performance
0: regression of coefficient of intercept
i: partial correlation coefficient of latent independent variables

Xi: latent independent variables
e: random error.

The research results of the mentioned profiles characteristics are given in Table 2. and describe demographic characteristics of the respondents in this study including gender, age groups, education level, Size of SME's, management level.

Table 2. Profile of managers at SME's

General information		Response	
Item		n	%
Gender			
Male		92	83.64
Female		18	16.36
Age groups (years)			
20 - 30		14	12.73
31 - 40		21	19.09
41 - 50		39	35.45
51 - 60		24	21.82
>= 61		12	10.91
Highest education level			
Bachelor's		44	40
Master		60	54.55
Phd		3	2.73
Other		3	2.73
Size of SME's			
Small		18	16.36
Medium		92	83.64
Management Level			
Top		56	50.91
Middle		30	27.27
First		24	21.82

Source: own processing

The distributions of the respondents according to their gender: 83.64 % of respondent are male; according to their age group: 35. 45% of respondent are between 41 - 50 years old; 21.82% of respondents are between 51-60 years old; 19. 09% of respondents are between 31-40 years old; 12. 73% of respondent are below 30 years and 10.91% of respondents are above 61 years old. Distribution of respondents according to highest education qualification: table shows that majority of the respondents, 54.55% have obtained master degree, 40% have bachelor degree, 2.73% have PhD and the least 2.73% of respondents have other degree. Distribution of respondents according to size of SME's: 83.64% of respondents are in medium size, 16.36% in small size, most of the respondents 50.91 work in top level.

Descriptive statistics for respondents' answers related to managerial competencies and the business performance are shown in table 3.

Table 3. Descriptive statistics of managerial competencies and performance measures

#	Scale Items	Mean	Std. Dev.			Mean	Std. Dev.
Professional competencies				#	**Social competencies**		
1	Global perspective	4.09	1.04	1	Cultural awareness	3.41	1.18
2	Strategic thinking	4.14	0.73	2	Empowerment	3.69	1.26
3	Leadership	4.27	0.81	3	Empathy	3.73	1.09
4	Written communication	4.61	0.95	4	Goal-setting	3.80	0.98
5	Creativeness	4.58	0.87	5	Change management	4.25	0.84
6	Planning	4.78	0.89	6	Flexibility	4.32	0.57
7	Negotiations	4.65	0.95	7	Effective relations	4.50	0.72
8	Risk-taking	4.62	0.92	8	Qualification	4.78	0.54
9	Risk assessment	4.81	1.17	9	Orientation to customer	4.81	0.45
10	Abstract thinking	4.15	0.84	10	Fairness	4.87	0.48
11	Organizational awareness	4.01	0.81	11	Responsibility	4.65	0.42
12	Modern knowledge	4.28	0.72	#	**Personal competencies**		
13	Generation of ideas	4.25	0.78	1	Personal goals	3.95	0.85
14	Problem-solving	4.43	0.59	2	Achievements	4.06	0.73
15	Organizational skills	4.03	0.68	3	Self-management	4.16	0.55
16	Team-work	4.32	0.71	4	Personal reliability	4.13	0.62
17	Conflict handling	4.68	0.54	5	Stress management	4.22	0.59
18	Information gathering	4.72	0.61	6	Self-development	4.45	0.51
19	Analytic thinking	4.84	0.63	7	Awareness of ethics in business	4.36	0.75
20	Time management	4.89	0.54				

21	Communication	4.48	0.61		
#	**Business performance**				
1	Nature of the Capital Investment for the last 3 years			3.68	0.82
2	What is the trend of your customers for the last 3 years?			3.74	0.75
3	To what degree has your business achieved its most important goals?			3.68	0.83
4	The volume of sales the business has made for the last 3 years			3.65	0.91
5	The volume of assets the business has attained for the last 3 years			3.81	0.85
6	The level of profits the business has raised for the last 3 years			3.76	0.72
7	Have other outlets been opened up since they began this business?			3.58	0.94
8	The growth rate the business has registered overtime			4.21	0.77
9	Business rewards to its customers at their due date			4.11	0.85
10	Degree of expansion of the business from its earlier initial size			4.08	0.51
11	In the last 3 years, has the business introduced products or services that were new or improved to the market?			4.26	0.45
12	The extent of the business' market share for the last 3 years			4.16	0.48

Source: own processing

Results for the importance rating are displayed in Table 3. Mean scores were plotted to check the "Normal Distribution" Competencies with a mean score 4.50 to 5.00 were classified as essential competencies to achieve business performance, competencies with a mean score of 3.50 to 4.49 were classified as considerably important competencies and competencies with a mean score of 3.00 to 3.49 were classified as moderately important competencies. Based on the distribution the managerial competencies identified under mean score below 3.00 in this study are not analysed. Managers at SMEs' in Kosovo perceive themselves reasonably competent in all facets of their managerial competencies. They did however feel relatively more competent in their ability to time management (4.89), analytic thinking (4.87), orientation to customer and risk assessment (4.81), planning and qualification (4.78), information gathering (4.72), conflict handling (4.68), responsibility and negotiations (4.65), risk-taking (4.62), written communication (4.61), self-development (4.45), problem-solving (4.43) and the last cultural awareness (3.41).

Table 4. Regression analysis for managerial competencies and business performance

Model	**β**	**t**	**Sig.**	**F**	**r2**	**Sig.**
constant		-0.343	.633			
Professional competencies	.576	5.767	.000*			
Social competencies	.247	2.102	.003*	14.10	.536	.000
Personal competencies	.347	3.149	.001*			

Note: *indicate significance at 5 percent level; N=110 ; dependent variable: business performance (five – point scale, 1=Far Below Target, 2=Slightly Below Target, 3=Mid Target, 4=Slightly Above Target, 5= Far Above Target); independent variables: Professional competencies; Social competencies; Personal competencies

Source: own processing

Table 4 shows that there was a significant positive relationship between managerial competencies and business performance ($r = .536$, $p < .01$). This implies that existence of managerial competencies in the business will result into business success and lack of managerial competencies results into failure of the business. The partial correlation coefficients of the three independent variables showed that professional competencies ($\beta = 0.576$), followed by personal competencies ($\beta = 0.347$), emerged as the most important factor in predicting the business performance in Small and medium-sized enterprises, followed by social competencies ($\beta = 0.247$) in order of influence.

This indicates that there is a significant impact of the managerial competencies on business performance measures and professional competencies have the most impact on the business performance. Regression analysis showed that professional competencies and personal competencies have the most significant statistical impact on business performance and explains (53.6%) of the variation in performance.

Conclusions

The successful activity of SMEs has a significant impact on economic development (e.g. Bosma et al., 2008). Therefore it is important to identify factors which consolidate the success of these businesses. The study aimed to contribute to our understanding of how managerial competencies of Managers affect SME

performance measured as subjective assessment of economic growth indicators against competitors on the market.

The results of this study generally corroborate the theoretical model assuming that more managerial competencies characteristics are mediators between professional and personal characteristics and business performance. The linkages between independence managerial competencies were observed to be positively significant to business performance. The study showed the aspects that influencing the managerial competencies for good organizations performance. These current studies focus on the managerial competencies and they are applied in the SME's by the managers, but future research could also study and determine the managerial competency only the one level management. As McClelland showed, it is important to look beyond person's basic skills. When organizations work seriously to apply the required managerial competencies, set the tasks they avoid the recruiting costs, dissatisfied customers, missed opportunities and create their own position in the market and drive successful to organizations. In general, the study looked at Managerial competencies and performance of the small and medium size enterprises. It is therefore evident that the combinations of managerial competencies (professional, social and personal) have an Impact on the Performance of SMEs in Kosovo.

Managerial competencies are not fixed and should correspond to the needs of the organization.

References

Bateman, T. & Snell, S. (2002). Management (5th ed.). New York: McGraw-Hill Companies.

Berger, A., and Udell, G. (2002). "Relationship Lending and Lines of Credit in Small Firm Finance." Journal of Business, 68 (3), 351–381.

Boyatzis, R. E., Goleman, D., & Acquisition, H. (2007). Emotional and social competency inventory. Boston: Hay Group.

Boyatzis, R. E., Goleman, D., & Rhee, K. S. (2000). Clustering competence in emotional intelligence, Insights from the emotional competence inventory.

Boyatzis, R.E. (1982). The competent manager: a model for effective performance. New York: John Wiley and Sons.

Bosma, N., Acs, Z. J., Autio, E., Coduras, A. and Levie, J. (2008). Global Entrepreneurship Monitor. 2008 Executive Report, (accessed April 10, 2011), [available at http:// www.gemconsortium.org/].

Brown, R. B. (1993). Meta-competence: A recipe for reframing the competence debate. Personnel Review, 22(6), 25-36.

Castelli, A., Dwyer, G. and Hasan, I. (2006). "Bank Relationships and Small Firms' Financial Performance," Working Paper 2006-05, Federal Reserve Bank of Atlanta.

Crook, T. R., Todd, S. Y., Combs, J. G., Woehr, D. J. And Ketchen, D. J. (2011). Does human capital matter? A meta-analysis of the relationship between human capital and firm performance. Journal of Applied Psychology, 96: 443-456.

Doole, I., Grimes, T., & Demack, S. (2006). An exploration of the management practices and processes most closely associated with high levels of export capability in SMEs. Marketing Intelligence and Planning, 24(6), 632-647. http://dx.doi.org/10.1108/02634500610701690

Draganidis, Fotis and Gregoris, Mentzas, (2006), "Competency Based Management: A Review of Systems and Approaches", Information Management & Computer Security, Vol. 14, No. 1, pp. 51-64.

Drucker, P. F. (1985). Innovation and entrepreneurship: Practice and principles. New York: Harper & Row.

Goleman, D., & Boyatzis, R. (2008). Social Intelligence and the Biology of Leadership.. Harvard Business Review, 86(9), 74-81.

Heffernan, F., and Flood, P. (2000), 'An Exploration of the Relationships between the Adoption of Managerial Competencies, Organisational Characteristics, Human Resource Sophistication and Performance in Irish Organisations,' Journal of European Industrial Training, 24, 2/3/4, 128– 136.

Hellriegel, D., Jackson, S.E., Slocum, J., Staude, G., Amos, T., Klopper, H.B., Louw, L., & Oosthuizen, T. (2008). Management. Third South African Edition, Cape Town: Oxford University Press, 2008.

Henderson, R. (2000). Compensation Management in Knowledge – Based World, Prentice – Hall Englewood Cliff, NJ.

I. Bakanauskienė and J. Martinkienė (2011): Determining managerial competencies of management professionals: Business companies managers' approach in Western Lithuania region; https://eltalpykla.vdu.lt/bitstream/handle/1/941/ISSN2335-8750_2011_N_60.PG_29-43.pdf?sequence=1&isAllowed=y

Ismail, T (2012). The development of entrepreneurial social competence and business network to improve competitive advantage and business performance of small medium sized enterprises: a case study of batik industry in Indonesia. Procedia-Social and Behavioral Sciences, 65, 46–51.

Karns, L.A. and Mena, M.A. (1998). "Sharpening the performance management focus using core management competencies; a pilot study," Academy of Business and Administrative sciences, Emerging Economies International Conference Proceedings, Budapest.

Kayes, C. et al (2005). Essential competencies for cross cultural knowledge absorption. Journal of Managerial Psychology. Vol. 20 No. 7 pp. 578 – 589

Lado, A. A., & Wilson, M. C. (1994). Human resource systems and sustained competitive advantage: A competency-based perspective. Academy of Management Review, 19(4), 699-727.

McClelland, D. (1973). Testing for competence rather than for "intelligence". American Psychologist, 28: 1-14.

Meyer, T., & Semark, P. (1996). A framework for the use of competencies for achieving competitive advantage. South African Journal of Business Management, 27(4), 96-103.

Prahalad, C.K., Hamel, G., (1990): The Core Competence of the Corporation, Harvard Business Review, Vol. 68, No. 3, pp. 79-91.

Sidik, IG (2012). Conceptual framework of factors affecting SME development: mediating factors on the relationship of entrepreneur traits and SME performance. Procedia Economics and Finance, 4, 373–383.

Soininen, J, Martikainen, M, Puumalainen, K, & Kyläheiko, K (2012). Entrepreneurial orientation: growth and profitability of Finnish small-and medium-sized enterprises. International Journal of Production Economics, 140(2), 614–621.

Spencer, L. M., & Spencer, P. S. M. (2008). Competence at Work models for superior performance. John Wiley & Sons

Timmons. (1999). Personal factors associated with leadership as a way to firm success. A survey of the literature – Journal of psychology 25: 35 – 71.

Venkatraman, N. and Ramanujam, V. (1986), 'Measurement of business performance in strategy research: A comparison of approaches'. Academy of Management Review, vol. 11, no. 4, pp.801-814.

Wiklund, J. and Shepherd, D. A. (2005). Entrepreneurial Orientation and Small Firm Performance: A Confi gurational Approach. Journal of Business Venturing, 20: 71-91.

Woodruffe, C. (1991): Competent by any other name, in Personnel Management, September, 30-31.

Woodruffe, C. 1992. "What is meant by a competency?", in Designing and achieving competency, Boam, R. and Sparrow, P. (Eds.), McGraw-Hill, London.

RECEIVED: 1 January 2017 **ACCEPTED: 10 May 2017**

Liridon Veliu - A teaching assistant at Faculty of Economics at the University of Prishtina in Kosovo. The head of teaching include: management and human resource management. Doctoral Researcher at Faculty of Economics at the University of Tirana in Albania. Scientific interest include: management. Tel.: +381(0)38 228 966; e-mail: liridon.veliu@uni-pr.edu

Mimoza Manxhari - Prof. Assoc. Dr., University of Tirana, Faculty of Economics. Field of scientific research: Organizational Behavior, Management. E-mail: mimozamanxhari@feut.edu.al

Vadyba
Journal of Management
2017, № 1 (30)
ISSN 1648-7974

COMPARATIVE APPROACH APPLICATION IN VALUE ASSESSMENT OF LAND AREAS IN LITHUANIA

Valentinas Navickas[1], Audrius Šaudys[2], Rusnė Jegelavičiūtė[3]
[1]Kaunas University of Technology, [23]Lituka and Ko, Ltd

Abstract
Real estate industry is of great importance in development of economy of a country. Real estate value determination, including land areas, is one of the problematic fields. Correct valuation of real estate value is relevant in the financial services sector, insurance and lease companies as well as construction sector, agencies that sell properties, institutions that manage the Real Estate Register, it is also important for citizens who purchase and sell their real estate. Current valuation methods solely specifies requirements for application of the comparative approach – to evaluate time, place and other conditions expressing differences between the valued property and analogous or similar properties. This definition does not reflect the totality of criteria to be evaluated when estimating the value of the property. It should be noted that one of the most important factors of value substantiation is selection of totality of criteria applied in object value calculation, evaluation of the criteria (sub criteria) and interpretation of obtained results. In absence of exhaustive, reliable and continuous research identifying the criteria and importance thereof in calculation of the value, appraiser refer to expert valuation that is acceptable and applicable in calculation of real estate value, but has both advantages and disadvantages. The research carried out by the authors discloses that current data collected by the State Enterprise Centre of Registers are not sufficient and suitable for formation of methodology based on a data base. Lack of data about market transactions, quality and exhaustiveness thereof prevents reliable application of methods based on analysis of factual data. For this reason expert valuation remains as priority method for calculation of real estate value using the comparative approach. Therefore application of continuous research identifying criteria influencing the market value of real estate is recommended in the future, as well as preparation of valuation methodology for real estate valuation in consideration of analysis of data located at data bases of the Real Estate Register.
KEY WORDS: real estate, value of land areas, market value, assessment methodology, comparative approach.
JEL: L85, C51

Introduction

The global financial crisis of 2008 - 2009 and the confusion in markets stimulated a strong interest in the impact of property valuation on financial markets as well as the large regulation of this area.

Regardless of whether it is performed for tax, loan or any other purpose, property valuation is a complex process, which requires not only to identify and evaluate the key market factors and criteria but also to determine how they affect the value of the property at the time of its valuation. It is a process, which requires the appraiser's knowledge not only in the valuation methods, the real estate market analysis, but also in legislation governing the property valuation (Walacik, Grover, Adamuscin, 2013).

The process of valuation can be described as a thoroughly considered estimation of value based on the appraiser's experience and opinion in identifying and evaluating specific criteria, which influence the value of the property (Yomralioglu, 2003). Possible differences in value, determined applying different valuation methods as well as different skills, knowledge and appraiser's experience, influence the regulation of the valuation process. This regulation is also indirectly influenced by appraisers themselves (Walacik, Grover, Adamuscin, 2013).

In many countries, valuation of real estate has been and still is based on the intuition and accumulated experience of real estate appraisers. Nowadays, when more and more attention is paid to the securitization of real estate in the markets, simultaneously more effort is put to ensure the most logical, quantifiable and accurate selection of the real estate valuation technique (Yomralioglu, 2003). One of the greatest issues in the contemporary practice of valuation is the determination of correction criteria and their justification applying the method of comparative value. Such countries as USA apply the value estimation method based on the data analysis of market transactions, which may constitute an alternative method for expert valuation. However, foreign methods are not suitable for Lithuanian market. According to Raginis (2015), the Slovenian experience in mass valuation and dissemination of data on market transactions presented in the international conference held in Vilnius revealed a much more transparent application (in some cases, free of charge) of the database of market transactions.

The analysis of scientific literature leads to the lack of information on both the determination of criteria themselves and the impact of these criteria on the valuation of real estate in Lithuania. This situation leads to the issue of determining the methods required to justify the application of corrections in assessing the value of land plots by a comparative approach. The determination and justification of these methods must ensure the impartial and accurate valuation of the property value.

Authors studying valuation of real estate, namely A. Tumelionis (2013); S. Raslanas; Zavadskas; Kaklauskas; Zabulėnas (2010); A. Aleknavičius (2008); R. Raslanas, J. Šliogerienė (2012), examine individual criteria affecting real estate and methods of identification of effects of such criteria, including both expert and mathematical, however, no clearly identified and distinguished criteria as well as

their influences are found in the literature dealing with the valuation of real estate in Lithuania. As a result, the appraiser has to take into account many unknowns using the comparative approach (Schulz, 2003). Most commonly, these values of corrections are determined through expert surveys. In this sense, the traditional technique of comparative approach is not very accurate and the results depend on the appraiser's talent to find probable and reliable correction criteria (Schulz, 2003).

Real estate market value assessment is an important segment also to a number of investment projects focused on the market economy. The need to create approaches for property valuation and to include them in legislation clearly defining valuation models and parameters is a mandatory factor for the valuation of real estate to be reasonable, unique and acceptable to all participants of the market. This approach applying different methods of data processing and corrections could reduce uncertainties, in determinacies, manipulation of documentary evidence and could enhance the transparency of the valuation process (V. Zujo, D. Car - Pusic, V. Zileska - Pancovska, 2014).

The present article aims at determining, through data stored in the database of the Real Estate Register operating in Lithuania, criteria influencing the value of land plots as a type of real estate, as well as at revealing the impact of these criteria on the value estimation.

Relevancy of the research. The development of application techniques of the comparative approach through access to the database of real estate transactions.

Research tasks:

1. To examine application techniques of the comparative approach.
2. To present the existing methodology of analysis of criteria influencing the property value.
3. To conduct the differential analysis of the dependence of value of land plots on the area.

Application techniques of the comparative approach

Analyzing Lithuanian real estate valuation market, it should be noted that the county applies three valuation methods also governed by the law. This include the income approach, costs and comparative approach.

The most popular and widely used method to assess land plots market value is the comparative approach. (Yomralioglu, 2003). The comparative approach is the most commonly applied and well-known method of valuation. Applying this approach, the value of assessed property is determined referring to sales prices of similar objects (Walacik, Grover, Adamuscin, 2013). In the comparative approach, the sales prices of very similar and recently sold estate are used to estimate the market value of the assessed property. In order to apply this method of assessment, the appraiser must have several comparable objects and adjust prices of comparable objects taking into account their differences from the assessed object (Schulz, 2003). The appraisor shall have sufficient knowledge in prices of comparable objects and factors affecting the property (Trojanek, 2010). This method requires a sufficient amount of transaction data, however, assessors are often unable to collect sufficient information about comparable objects due to commercial secrecy, insufficient amount of data, the system of taxation of real estate and the correspondent dissemination of information (Yomralioglu, 2003). One of the main drawbacks of the comparative approach is its limitations in the market, which fails to provide adequate information on transactions (Raslanas; Zavadskas; Kaklauskas; Zabulėnas, 2010). In addition, it must be noted that assessors face not only with the lack of data but also with the quality of reported data. The existing database provides only the defined number of criteria identifying the real estate and its individual features.

In the comparative approach, the sales prices of very similar and recently sold estate are used to estimate the market value of the assessed property. In order to apply this valuation method, the appraiser must have several comparable objects and adjust prices of comparable objects (Schulz, 2003). While assessing land plots through comparative approach, the assessor selects several similar recently sold objects; since there are no two identical objects in the market, the appraiser has to adjust the price of each selected object taking into account differences between comparable objects and the assessed property (Walacik, Grover, Adamuscin, 2013). All of these criteria must be clearly identified and specified in the valuation report.

In practice, corrections of criteria differences may be determined as follows (Tumelionis, 2013):

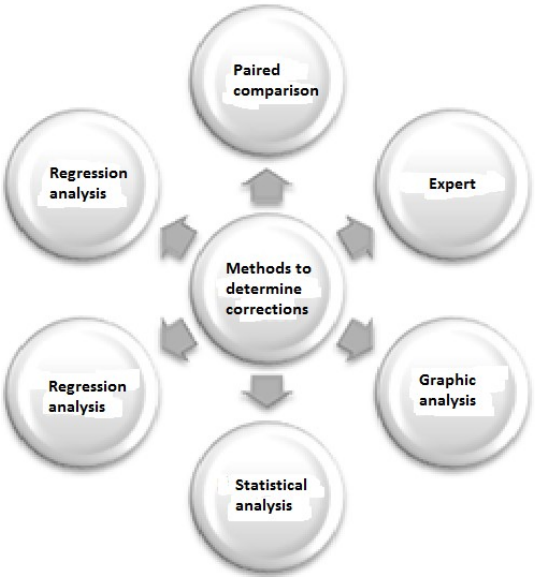


Fig. 1. Methods of determination of corrections

However, the attention should be drawn to the fact that all techniques, except for the expert one, require not only a sufficient amount of actual data but also the identification of criteria, which have affected the transaction price. The amount of data displayed in the database does not suffice to estimate the value taking into account the fact that the amount referred to in the literature is considerably larger. There is no sufficient analysis revealing the impact of these criteria on the property value.

In addition, it should be noted that the legal acts, namely the Law of the Republic of Lithuania on Amendment of the Law on Bases of Property and Business Valuation (2011) and the Methodology and Assessment of Property and Business (2012), require, however, provides no methods, formulas, calculation sequences, patterns or

samples of calculation of corrections; the calculation of corrections is not elaborated. Neither the European Standards of Assessment (2016) nor the International Standards of Property Assessment (2013) provide the same.

The existing analysis methodology of criteria influencing property value

Applying the comparative approach and adjusting the sale prices of comparable objects, corrections of the compared object are made focusing on the assessed object, therefore the market value of the assessed object is estimated adding the sale price of the compared object and the value of adjustments. If the value element of the compared object is better than of the assessed one, corrections are made downward, and vice versa, i. e. if the characteristics of the assessed object are better, the price of the compared object is raised (Raslanas, Šliogerienė, 2012). In other words, the more differences the compared object has, the more corrections are to be made. The amount of corrections may determine the accuracy in the value of the assessed object as the less corrections the comparable objects need, the more similar they are to the assessed object and the more accurate the established value will be (A. Aleknavičius, 2008).

According to Yomralioglu (2003), land valuation depends on physical and economic factors affecting the assessed property. These factors and their number must be taken into account performing the valuation of land plots. Some of these factors are characteristic to specific land plots, others include external or environmental factors. These factors can be objectively determined, however, there is always a certain degree of subjectivity, which is difficult to substantiate in the process of valuation (Yomralioglu, 2003). As Cupal (2014) points out, all variable factors, except for the price, include technical characteristics, location, conditions for development, spaces for the disabled, the entirety of social and legal restrictions, etc. The appraiser should have competence and opportunities for quantifiable evaluation of these variables. Only then the property can be compared with each other.

A considerable number of factors influencing the value of a land plot may be distinguished (Aleknavičius, 2008):

Table 1.Factors affecting the value

Factor description
Configuration of the land plot and its convenience in respect of agricultural works;
Land use, management and disposal restrictions;
Land easements;
Territorial distribution of the land plot in respect of the acquisition of production necessary for farming as well as the realization points and social, cultural and public service facilities necessary for the landowner;
Engineering infrastructure of the land plot, fittings and improvements, landowner's buildings and structures on the land plot;
Availability to use the land plot for other activities (for instance, construction or recreation) taking into account the fact that the change of the main targeted land utilization purpose is associated with the compensation of respective losses;
Productivity of agricultural land or relative fertility;
Territorial distribution of land in respect of cities and other objects corresponding the nature of its use;
Influence of a residential house or a farm building situated on the land plot;
Networks of engineering infrastructure or possibility to install them;
Configuration of the land plot taking into account the land unsuitable for construction, possibilities to form a larger piece of land (by connecting the whole or a part of an adjacent plot) or to split it if necessary, i. e. to form a separate land plot for sale or lease;
Possibility to use a piece of land for recreation;
Land use, management and disposal restrictions;

The main parameters of assessed objects and their effect may be divided into two main groups: commercial and parametric. Commercial factors include transferable rights, financial terms and sale conditions, commercial attractiveness. Parametric factors include the object's location, area, the ratio of the built-up and total land area as well as other parameters (Novickis, 2015).

In the process of valuation, the appraiser must refer to the market and economic logics, criteria based on the observation of market and economic conditions, as well as study results (methodology). However, it should be noted that there are neither specialized studies assessing the impact of these and other unidentified factors on the property value, nor opportunities to evaluate the significance of these criteria using the existing database of the Real Estate Register. As academics analyzing the real estate valuation issues note, a simple polynomial correlation-regression analysis can be applied to determine the factors affecting the value of land plots (Raslanas; Zavadskas; Kaklauskas; Zabulenas, 2010).

Statistical mathematical analysis may be applied to estimate the object value, however, the amount of data must be large enough in order to apply a specific method of determination of statistical data (Walacik, Grover, Adamuscin, 2013).

The conclusion can be drawn that statistical methods based on the analysis of transaction data are not common in the Lithuanian practice, therefore it is natural that the appraiser's experience, which determines valuation quality, plays a significant role applying the comparative approach (Raslanas; Zavadskas; Kaklauskas; Zabulenas, 2010). In other words, most commonly these criteria depend on the appraiser's experience and the expert appraiser's decision (Schulz, 2003).

This is why, in their practice Lithuanian appraisers apply expert valuation methods, with the help of which experts determine assessment coefficients, rates and standards (comparative indicators) referring to the valuation experience and analysis of individual items of property. This method is usually applied in cases where there are insufficient market data for the comparative approach or income method to apply (Robert J. Glaudemans, Richard R. Almy, 1997).

The inclusion of methods of analysis of statistical transaction data in the process of valuation would allow to deal with the main issue associated with the subjectivity of expert opinion in the process of valuation. Expert, statistical methods, based on the analysis of transaction data, as well as combinations of these methods would allow to compare values applying different methods of processing and evaluation of data and factors. The entirety of approaches and techniques may improve the quality of valuation reports (Cupal, 2014).

In order to avoid valuation discrepancies, following the experience of USA and other foreign states Raslanas (2005) suggests in the Lithuanian methodology of property valuation to establish the required number of comparable objects, which should be taken into account by appraisers, as well as limits of discrepancies between values of the valued object and comparable objects. In her article, Galinienė (2001) states that all participants of the real estate market (buyers, sellers and financial intermediaries, including banks) should also be constantly and adequately informed of peculiarities and change tendencies of the real estate market. However, it should be noted that, according to the author, such information is still lacking.

Differential analysis of the dependence of value of land plots on the area

The research involved bank data on real estate transactions from the State Enterprise Centre of Registers, including land transactions in the Republic of Lithuania over the period from 2008 to 2016.

Before performing the analysis of the data from the State Enterprise Centre of Registers, the impact of the area on the estimation of value common in the practice of valuation was also taken into account. The models used by appraisers in their practice and the analysis of available data revealed that after conducting the expert research, appraisers devote from 21,74 % to 25,33% of importance to the area of land plot, depending on the intended purpose (Jegelavičiūtė, 2016).

Our analysis involved purchase-sale transaction data of residential, other industrial/warehousing and commercial land. Analyzing the mass valuation in Lithuania, Almy (2015) said that various methods of mass valuation may be applied. According to the author, the Centre of Registers chose to develop mixed statistical models with sufficient sales, however, the author also points out that the appraiser's decision complements the data analysis, where there is a lack of direct evidence in the market. In order to identify exact application possibilities of analytical methods for the valuation of land value, it is necessary to perform the statistical analysis.

In order to determine the impact of analytical valuation approach on the assessment of land value, the data from the State Enterprise Centre of Registers on the sale of land plots over the period from 2008 - to 2016 will be employed. First of all, exclusions are analyzed and eliminated (Multivariate Approach). The analysis involved cooks distance, which measures the effect of deleting a given observation. In total, the analysis eliminated 21 observations. For instance, in 2008, in Elektrėnai region, an industrial land plot exceeding 5 hectares was acquired, as well as the commercial land plot of 16 hectares was purchased in Klaipėda region in 2011, etc. These observations were eliminated since cooks distance coefficient exceeded the existing average of values four times.

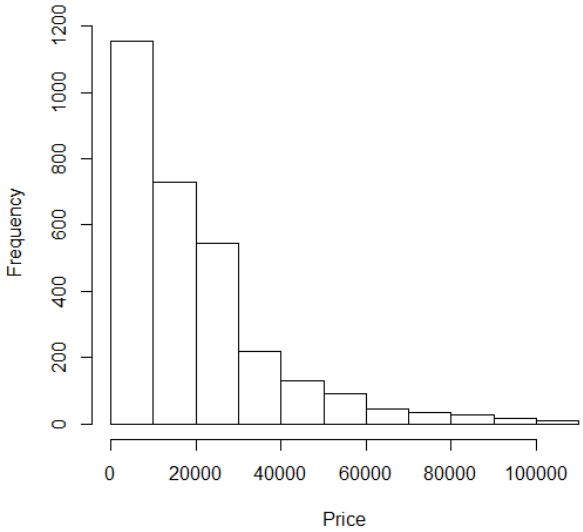


Fig. 2. Distribution of prices for residential transactions in Kaunas region in 2008

The chart (see fig. 2) reveals that the dependence of the price on the purchased land area is decreasing, therefore the composed regression model may also predict a negative price, which would be biased. It also shows that the model is more in line with the exponential distribution than normal. In order to solve this issue, the data are transformed through logarithming.

In the first stage, the regression analysis is applied only on the land area and price.

Table 2. Summary of the regression analysis of the land plot and the price

Coefficients	Estimate	Std. Error	t value	Pr(>|t|)
Intercept	4.6	0.02	273.25	<2e-16 ***
Land area	0.62	0.02	42.09	<2e-16 ***

The composed regression model revealed that the land area is statistically significant in determining the land price (P value< 0.05). However, R-squared received only 0.16, which means that the land area explains only 16% of the land price movement on average (see table 2).

Table 3. Land distribution by criteria

Criteria	Category	Value
Cities category	Kaunas	1
	Vilnius	1
	Klaipėda	1
	Other	2
Type	Municipality	1
	County	2

Use	Residential	1
	Commercial	2
	Industrial	3
Year	2008-2016	

In the next stage, the analysis was repeated employing more variables. The data were differentiated according to the intended purpose of the purchased land, the locality was divided into big cities and small towns, cities and towns or district territories (see Table 3).

Table 4. Dependence of the land price on several variables

Coefficients	Estimate	Std. Error	t value	Pr(>|t|)
Intercept	-27.776	8.052	-0.87	0.000564 ***
Land size	0.967	0.016	56.7	< 2e-16 ***
Use	0.045	0.029	-2.7	0.0069 *
Type	-0.208	0.014	-21.2	< 2e-16 ***
Cities category	-0.431	0.014	-34.2	< 2e-16 ***
Year	0.017	0.004	1.65	3e-05 **

$$y = 10^{(-27.776+\log_{10} x_1 * 0.967 + x_2 * (-0.045) + x_3 * (-0.208) + x_4 * (-0.431) + x_5 * 0.017)} \quad (1)$$

where y – land price, x_1 – purchased area, x_2 –intended purpose, x_3 - type, x_4 –city category and x_5 – year.

The repeated regression analysis revealed that all variables are statistically significant (see table 4). Multicollinearity diagnosis demonstrated that coefficients of all variables are close to unit, therefore there is not multicollinearity problem in the composed regression model (see table. 5).

Table 5. Multicollinearity analysis of independent variables

Land size	Type	Cities category	Purpose	Year
1.19	1.2	1.19	1.15	1.07

The prediction test with the composed regression model revealed that the prediction errors vary from 0.02% to 19118%. Such a result is determined by the fact that the composed module explains only 34.27% of variation (R-squared = 0.3427).

Conclusions

The models used by appraisers in their practice and the analysis of available data revealed that after conducting the expert research, appraisers devote from 21,74 % to 25,33% of importance to the area of land plot, depending on the intended purpose. (Jegelavičiūtė, 2016). The conducted research of data registered in the database of the State Enterprise Centre of Registers on the sale of land plots over the period from 2008 to 2016 revealed that the land area affects only 16% of changes in the price dependence. After the inclusion of additional variables in the model, 34, 27% of the price change was explained. Therefore, it can be concluded that there is a number of variables, which are not captured in the existing system, however, have a significant impact on transaction prices.

The composed analytical equation demonstrates that land prices may be analytically assessed, however, it requires large quantities of data of different categories, which were minimally applied in the present study. In the future, it is advisable to expand the land value valuation methodology through analytical approach. This requires to identify appropriate criteria and broaden analytical module in order to adequately determine the land value. Before the formation of an appropriate module, it is advisable to assess the land value applying the principle of expert valuation as the analytical approach requires valuation corrections, which are indefinite.

In order to create the adequate approach for analytical valuation, it is necessary to analyze the approaches conducted abroad, to repeat a similar research in Lithuania and on the basis of research results to compose the land valuation methodology of analytical approach. This process must be conducted taking into account the largest possible diversity of land plots and the appropriate criteria to explain transactions. It is also important to emphasize that the available data on the land area were comprehensive without distinguishing the land price itself. The land price may be determined not only by its area but also terrain, communication places, etc. One of the possible analytical valuation methods were performed in America. Ames, Iowa analyzed Boston housing data and applied an advanced regression model to predict housing prices. The model consisted of 80 different variables, of which: 23 nominal, 23 ordinal, 14 discrete, and 20 continuous. The variables varied from price, building class to location from public transport, house heights, pluming, etc. (http://ww2.amstat.org/publications/jse/v19n3/decock.pdf).

It is advisable to perform further broader studies, which would allow to assess the factors affecting the land value and to reduce land valuation corrections through a more regular analytical expression.

References

Aleknavičius, A. (2008). Nekilnojamo turto vertinimas. Vadovėlis. Kaunas, p. 103.

Almy, R. (2015). Property Valuation and Taxation for Improving Local Governance in Europe and Central Asia: Lithuania Case Study. Elektroninis leidinys „Turto vertinimo teorijos ir praktikos apybraižos“. Vilnius, p. 6-29. Prieiga per internetą http://www.ltva.lt/wp-content/uploads/2015/12/Turto_vert_teorija_praktika2015.pdf

Cupal, M. (2013). The Comparative Approach theory for real estate valuation, Procedia - Social and Behavioral Sciences 109 (2014), p. 19 – 23.

Eckert J. K., Glaudemans R. J., Almy R. R. (1997). Property Appraisal and Assessment Administration. Chicago: The International Association of Assessing Officers, p. 860.

Galinienė, B., Statkevičienė, L., (2001). Nekilnojamojo turto vertinimas ir įkeitimas. Pinigų studijos: Ekonomikos teorija ir praktika. p. 37.

Jegelavičiūtė, R. (2016). Pataisos kriterijų įtaka žemės ūkio, pramonės/komercinės bei gyvenamosios paskirčių žemės sklypų vertei. Tyrimo ataskaita. Elektroninis leidinys. Prieiga per internetą http://lituka.com/wp-content/uploads/2016/11/ISSN-2538-6492.pdf

Lietuvos Respublikos Seimas. (2011). Lietuvos Respublikos turto ir verslo vertinimo pagrindų įstatymo pakeitimo įstatymas (2011 − 06 − 22 Nr. XI-1497).

Prieiga per internetą https://www.e-tar.lt/portal/lt/legalAct/TAR.278D4FD8E838/zJkKDKQkJY

Lietuvos Respublikos finansų ministerija. (2012). Turto ir verslo vertinimo metodika (2012 m. balandžio 27 d. Nr. 1K-159. Prieiga per internetą https://www.e-tar.lt/portal/lt/legalAct/TAR.14FE4917B8E1

Novickis, I., Dorofejevas, A., Golovanovas, V., Pavlova, S., Fadejeva, S. (2015). Cenoobrazujuscyje parametry rinka zemelnych ucastkov i komerceskoj nedvizimosti. Internet-zurnal „Naukovedenije“. T. 7, Nr. 5. Prieiga per internetą http://naukovedenie.ru/PDF/131EVN515.pdf

Raginis, T. (2015). Didysis Registrų centro nenoras ir jo pasėkmės. Elektroninis leidinys „Turto vertinimo teorijos ir praktikos apybraižos“. Vilnius, p.73. Prieiga per internetą http://www.ltva.lt/wp-content/uploads/2015/12/Turto_vert_teorija_praktika2015.pdf

Raslanas, S., Tupėnaitė, L. (2001). Individualių namų vertinimo ypatumai, taikant lyginamosios vertės metodą. Ūkio technologinis ir ekonominis vystymasis, 9(4), p. 233-241.

Raslanas, S., Šliogerienė, J. (2012). Nekilnojamo turto vertinimas. Mokomoji knyga. Vilnius: Technika, p. 99.

Raslanas, S., Zavadskas, E. K., Kaklauskas, A., Zabulenas, A. R. (2010), Land value tax in the context of sustainable urban development and assessment. Part II - analysis of land valuation techniques: The case of Vilnius', International Journal of Strategic Property Management, 14:2, 173 — 190.

Schulz, R. (2003). Valuation of Properties and Economic Models of Real Estate Markets. Dissertation. Berlynas, p. 11.

Tumelionis, A. (2013). Lyginamojo metodo pataisų apskaičiavimo aktualijos. Turto vertinimo teorijos ir praktikos apybraižos. Vilnius, p. 38–54.

Walacik, M., Grover, R., Adamuscin, A. (2013). Valuation systems in Poland, Slovakia and the United Kingdom – comparative study, 21(4), p. 75-85.

Yomralioglu, T., Parker, D. (1993). LU, T., A GIS-Based Land Readjustment System for Urban Development, Fourth European Conference on Geographical Information Systems in Genoa, EGIS'93 Conference Proceedings, V. I p.372-379.

Trojanek M. (2010). Methodic of Estate Valuation in Poland - Actual Status, Economics & Sociology, Vol. 3, No 1, 2010, p. 66-75.

Zujo V., Car – Pusic D., Zileska – Pancovska V. (2014). Cost and Experience Based Real Estate Estimation Model. Procedia – Social and Behavioral Sciences 119 (2014) 672-681.

RECEIVED: 27 January 2017 **ACCEPTED: 10 May 2017**

Valentinas Navickas, Doctor of social sciences (economics), professor at Kaunas University of Technology (Lithuania), the School of Economics and Business, the Department of Economics. E-mail: valna@ktu.lt Author of more than 300 scientific publications (including monography published in Czech Republic, 2013) and scientific articles, published in Lithuania and abroad. Author of four experimental development projects. Prepared 5 doctors of social (economics) science; now he is research adviser of 2 persons maintaining a doctor's thesis of social (economics) science. Fields of scientific interest: international economics, tourism economics, clusterization, competitiveness, customer satisfaction, corporate social responsibility.

Audrius Šaudys, Degree: Master of business economics. Real estate appraiser, Lituka ir ko, Ltd; e-mail: kaunas@lituka.com.

Rusnė Jegelavičiūtė, Degree: Master of finance. Real estate/business appraiser-assistant, Lituka ir ko, Ltd; e-mail: rusnejegelaviciute@gmail.com.

Vadyba
Journal of Management
2017, № 1 (30)
ISSN 1648-7974

DETERMINANTS OF DECISION-MAKING PROCESSES IN MANAGING INNOVATIVE ACTIVITY

Waldemar Gajda[1], Košová Eva[2]
[1] *Warsaw Management School - Graduate and Postgraduate School, Poland*
[2] *A. Dubček University of Trenčín*

Abstract
This article concerns conditionality of decision-making processes in management of innovative activity. Basing on description of chosen aspects of decisions included in the literature on management sciences as well as selection of models and tools supporting these decisions an attempt was made to indicate determinants of decision-making process in management of innovative activity. Innovation diamond concept was used here. It is one of the latest systemic solutions concerning management of innovative activity. It is considered by many scientists as one of the most significant discoveries in the field of management of innovation process. Strategy, resources, tactics and human factor are fields determining presently success of innovative activity. Nevertheless, decisions are the most important element of each of these fields and it was attempted to highlight it in a final part of the article.
KEY WORDS: decision process; models; innovation diamond.

Introduction

Innovations have been driving force of progress, development and competitiveness since the beginning of our civilisation and the execution of the concept of economic choice. Wide spectre of innovative activity determines possible field of considerations concerning management of the process of innovations which leads from concept to its final implementation. Similarly to differences between innovations on the grounds of degree of novelty, area of implementation or relation with applied solutions also differences between decision processes in management of innovations may be considered (Jurczyk-Bunkowska, 2016).

Deliberations on theoretical and practical aspects of use of decision-making process aim at seeking new concepts of their construction useful for practitioners. Krupa states (on line) that seeking for creative solutions, creating heuristics and invariants as well as models which are easy to use which may be algorithmized very easily may effectively improve effectiveness of work of teams executing innovative undertakings. It requires substantial effort and it does not surrender to any rules.

Search for the fields where decision-making process determines effective management of innovative activity is a leitmotif of this article. The article includes an attempt to indicate determinants of decision-making processes in management of innovative activity basing on the description of chosen aspects of decisions included in the literature of management sciences as well as selection of models and tools used to support decisions. Innovation diamond concept was used here. It is one of the latest systemic studies concerning management of innovative activity. It is considered as one of the most important discoveries from the field of management of the process of innovation. Strategy, resources, Stage-Gate model as well as climate for innovations constitute the fields determining nowadays success of innovative activity and decisions executed within decision-making process are the most crucial factor of each field.

Decisions in management sciences

Making decision has been present in all fields of human activity since its beginning. The word “decision” etymologically comes from the Latin word “decision” which means order, settling or resolution. It is claimed that making decisions is one of the most important elements of management and in fact, its essence. Management is a decision-making process executed on many levels of an organisation, which mainly has to provide use of evolving chances, effective completion of all functions necessary to pursue adopted objectives as well as elimination of identified or potential threats. In management sciences it is not disputed that decision-making process is the essence of management and effective management means appropriate decisions in this process.

In a classical theory of decision, decision-making process determines a group of thought or calculation operations logically connected with each other which lead to the solution of a decision-making problem through selection of one of possible variants of operation (decision). Decision-making process itself looks in a classical depiction as following:

1. Identification of a decision-making situation.
2. Specification of a decision-making problem.
3. Generation of a decision-making model.
4. Creation of permissible, sufficient or optimal decisions.
5. Making final decision.

Considering decision-making process, it is possible to find various types of decisions in the literature on the subject. There are different criteria according to which

their division is made. Kieżun (1997, pp. 228-229) suggests the following typology of this process:

In case of "hierarchical" criterion there are following types of decisions:

- strategic decisions – great decisions specifying the most important goals and strategic concepts,
- tactical decisions – the decisions including methods of execution of strategic decisions within shorter period of time,
- operational decisions – decisions concerning execution of particular tasks, for example decisions on spending particular financial resources,
- implementation decisions – execution of a task, for example delivery of purchased lot of materials.

Whereas "form of making decision" criterion includes the following types of decisions:

- decisions made by a manager on his/her own,
- approving decisions which approve proposals of subordinates, supervisors or suggestions from the surrounding of the organisation,
- collective decisions which are made by a group of workers,
- decisions made by one person separately or with support of advisors.

As it was mentioned above, in management sciences making a conscious choice of one of variants of action among at least two which are considered as possible to perform constitutes a prevailing part of the process of management of a contemporary organisation. Czermiński and Czapiewski (1995, pp. 14-15) call such an action an act of choice or an act of conscious refrain from choice which should also be perceived as a decision in management. There are some differences in the literature on the subject concerning definition of a decision in management in comparison with other fields of science. In management practice a model of making a decision by a single person is common. Deciding means there formulation of a decision-making problem, description of all possible variants of action, assessment of these variants and implementation of the decision. Processes of making independent decisions are based on heuristic methods, logical reasoning, common sense, imagination, intuition and experience enabling at the same time good understanding of a problem as well as the whole process at the same time generating new knowledge and experience. Science has developed also decision-making processes with determined particular steps of operation. They are called algorithmic processes. The procedure of their execution corresponds to functioning of an algorithm, i.e. basing on a set of principles of conduct specifying ways of resolving an undertaken problem with clearly specified number of taken steps. In situations when it is not possible to solve a problem with the use of an algorithm, heuristic methods are used (Sałek, 2014, p. 244).

In decision-making process it is crucial not only to follow specified algorithms but also provide conditions of effectiveness of decision-making processes. Kieżun (1994, p. 238) indicates three phases providing effectiveness of decision-making process.

The first is preparation phase which includes the following steps:

- defining a problem where the conditions of effectiveness include: completeness, speed, credibility of information,
- determining possible causes where the conditions of effectiveness include: maximal number, convergence with initial information, logicality of possible reasons,
- confirmation of the most probable causes where the conditions of effectiveness include: logicality, accuracy of assessment of probability of case-and-effect relation,
- specifying possible variants of a decision where the conditions of effectiveness include: defining: needs, values, system of assessments, realism in assessment, quantitative research,
- specifying acceptable variants where the conditions of effectiveness include: quantitative research, realism in assessment of implementation capability.

The second phase is a choice. The phase includes two elements:

- initial choice of a decision where the conditions of effectiveness include: quantitative research, defining professional ethics, social values, lifestyle, risk assessment,
- making a final decision where the conditions of effectiveness include: ability of prospective assessment.

The third implementation phase is:

- implementing a final decision where the conditions of effectiveness include: using principles of efficient organisation in systemic depiction,
- effect analysis where the conditions of effectiveness include: control procedures, updating system of assessments,
- adjustment where the conditions of effectiveness include: repetition of procedure of a decision.

Models and tools supporting decision-making processes

Development of science has caused that a contemporary manager has been equipped with a huge set of decision-making models and tools supporting making decisions. Their description is included in specialist monographs as well as in handbooks concerning management. A decision-making model is described there as synthetic, analytical reproduction of a decision-making problem in a form of mathematical, statistical, economical, information, psychological model, etc. Regardless of an accepted decision-making model an optimal decision should be made in a decision-making process. This decision is one of permissible decisions and fulfils the most proper criteria of assessment. A permissible decision is a choice which meets all limiting conditions. Whereas decision-making criterion means allocation of quantitative or qualitative benefit measure, usability, costs and profits of a given decision (Rebizant, 2016). This article includes characteristics of chosen models and tools which are the most useful for support of a decision-making process from the practical point of view. These tools are of quantitative,

qualitative as well as hybrid nature and they mostly constitute achievement of quantitative-system school. The methods and tools are as following (Kisielnicki, 2016):

1. Optimisation models derive from a mathematical decision theory and operational research and they are aimed at searching for a variant of solution with an optimal decision. An optimal decision is a decision which maximises or minimalizes particular objective function on the basis of a chosen criterion, i.e. getting the greatest benefits or the smallest losses. Depending on a form of a model and usages we have here linear, non-linear, single-criterion, multicriteria etc. When a problem is solved with a use of an optimisation model, we use the most often methods of mathematical programming and, for instance when a linear model in a mathematical sense is used, a presented solution is called optimisation solution when we determine extreme of function (objective) with adopted limitations.
2. Simulation models. A great number of decision-making problems in management may be solved with the use of these models but they are mostly used in case of complex situations when optimisation methods fail. Simulation process is when a manager seeks to describe reality as closely as it is possible and creates a model, and then due to the use of computer system he/she may make decisions of a different kind in a situation created in a model way. Hence, simulation models allow the managers to experiment on the model before it will be implemented in a real enterprise. In practice, it leads to a great decrease of costs as well as elimination of mistakes especially during implementation of new projects or in creation of business plans.
3. Forecasting models constitute similarly to the above-mentioned methods a wide range of possibilities to prepare decisions. This type of models is unique in that they are used to make future decisions. Determination whether a given value will be formed beneficially or adversely for an enterprise is a basis of these decisions. In latter situation we will have so called warning forecast. Forecasting models are used mainly to make planning decisions and both long-term and short-term strategic plans. Time series analysis is a tool which is often used to forecast formation of economic values interesting for managers.
4. Econometric models. They are system of equations or equation which presents in an approximate way quantitative link occurring between analysed economic phenomena. They are used to consider the most difficult economic problems when relations between economic phenomena are very complex and multidirectional. Process of learning mechanism of decision-making problem means creation of the so called model of estimation of parameters and as a result drawing conclusions on its basis. A model supporting decisions is a formalised description of a studied fragment of reality taking into consideration only its crucial elements (excluding less important ones). Cause and effect models are useful in the process of making decisions in which between a clarifying variable and a variable clarified there is a cause and effect relationship.
5. Decision games are a tool which allows to conduct an analysis and predict rational conduct of people in competitive situations. The essence and assumption is that almost each situation may be presented as a game. The simplest situation with a decision game may be described with the use of the so called two player game with no winners. The game is completely competitive and there are no negotiations between the players, the one who wins takes what the other loses.
6. Decision trees constitute a decision model in which hierarchical sequences of actions (fully depending on a decision-maker) and events (independent from a decision-maker, sometimes with random character) are presented in an ordered manner. Graphic presentation in a form of a decision tree makes analysis of all elements of situations crucial while making decisions. As a result, it is possible to determine decision variants and their consequences. In this model, in a non-confidential form, there are no rigorous and flexible conditions, they are taken into account during creation of the tree. Additional information on probabilities and costs of particular decision variants leads to increase of optimisation rationality through maximisation of function of usability. The aim of use of a model in a form of a decision tree is to make assessment of a decision-making situation easier, the model allows to analyse many variants and criteria of their assessment at the same time. Multivariant analysis may be conducted with the use of decision trees and it is possible to use this model in a computer systems of supporting decisions through program implementation (Rebizant, 2016).

Determinants of decision-making processes in management of innovative activity

A perennial desire to satisfy needs, improve living conditions, facilitate and improve work as well as, due to curiosity, innovativeness and decision-making processes related to it have been accompanying humankind since the dawn of time. When we are thinking about innovations our imagination leads us to material artefacts. Nevertheless, innovations in contemporary business do not have only material dimension such as progress, development and gaining competitive advantage. It is mainly appropriate decision-making process which is the most crucial creative and productive factor determining economic output. Innovations are driving force of a lofty aim, i.e. embodiment of values which enables leaders (managers) to unite people in a joint action to create modern enterprises based on knowledge, innovativeness and entrepreneurship (Gajda, 2016, p. 76).

Baruk (2010) writes that effective management of innovative activity, its proper understanding and control are of crucial meaning for economic growth, development of economies at the same time increasing prosperity and level of life of the society. Creative thinking and appropriate decision-making process without which there is no concept (idea) which may be implemented are basics for the above-mentioned effects to appear in an innovative process (Webber, 1990).

Two keys to success determined with correct decisions exist in management of innovations and implementation of new products, namely good selection of projects and adequate execution of projects. According to R. Cooper (Jankowski, 2016) "… it sounds very simply but it is not easy to implement these rules in practice. The research shows that many project teams do not execute correctly some key tasks of the process and as a result the projects fail … Together with my colleagues from Scandinavia and Germany we have conducted huge research in Europe and the United States and it has turned out that the success rate connected with the launch of new products into the markets is from 30% to 80%. When we look at the most effective companies it turns out that they use systemic solutions. Whereas the ones which are unsuccessful do not apply any solutions and in such a case coincidence rules."

Innovation diamond concept is one of the latest systemic studies concerning management of innovative activity. The concept is considered by many scientists as one of the most important discoveries in the field of management of innovation process. Innovation diamond concept is a visual representation of the four fields (Cooper, 2016):

1. Strategy of innovation.
2. Resources, management of portfolio of initiatives.
3. Tactics with use of Stage-Gate model.
4. Climate, culture, human element.

Decisions are the most important in all of the above-mentioned elements and they determine effective management of innovative activity of contemporary enterprises.

Strategy refers to decisions regarding selection of aims of a company in scope of innovations, decisions concerning sale volume and markets, technologies and products on which a company wants to concentrate its efforts. It should be remembered that decisions in management of innovations do not only mean operational solutions. It mainly means creativity in the field of new products and services offered to its clients. It is innovativeness which, when it is integrated with strategy, allows to gain long-term competitive advantage. Strategic decisions must allow a company to fully use chances which it faces due to its innovative activity. It is necessary to implement overall innovative strategy and then execute its assumptions consistently through every day decisions and actions (Siwińska, 2016).

Resources and management of portfolio of initiatives. It is another field in which decision-making process determines success of innovative activity. Majority of companies allocate too less resources for the projects. In order to achieve innovative success, managers have to make difficult decisions, e.g. that they will spend more money, devote more time and designate more people to work on innovations. Finally, they also have to make decisions concerning targeting resources to appropriate projects. Moreover, they have to make appropriate investment decisions connected with investment portfolio in such a way to know when to continue particular innovative project and when to resign from it. Using resources especially human ones may be compared with a layout of football players on the football pitch in such configuration and with such players to win the match.

Stage-Gate model plays a tactical role in process of innovations. Decisions on each stage of execution of an innovative project "from concept to implementation" constitute its base. Stage-Gate model is nowadays the most popular decision tool in creation of effective innovative strategies, 80% of American and Western European companies including Procter & Gamble, Nestle, HP, BMW, Bank of America, Lego, Johnson & Johnson or IBM use it (Siwińska, 2016). This model constitutes a conceptional and operational map where stages mean concrete actions of a project team from research through project works, tests, etc. Gates, in turn, mean in this system moments where difficult decisions are made whether investment will be continued or whether it will be stopped on a given stage. According to Cooper Stage-Gate process increases speed and effectiveness of innovativeness of a product and it multiplies its results.

Climate, culture is the fourth element of innovation diamond which should be taken into consideration by managers especially in case of decisions concerning personnel. Decisions building adequate atmosphere for innovative activity, appropriate remuneration, giving recognition for innovativeness are significant here. All decisions should be made in such a way to create pro-innovative attitudes and values in a company. Managers and leaders of teams should promote, stimulate and support each innovative activity. Research indicates that in western companies succeeding in the field of innovations there is completely different climate and culture than in majority of the remaining enterprises.

Conclusions

Both in theory of decisions and in management sciences efforts of scientists focus on strive for prediction of conduct of systems consisting of people, objects and procedures. The scene is dominated by the two approaches which because of virtue of their complexity are intertwining with each other in reality repeatedly and invariably. The former is normative depiction, determined as collection of rules and recommendations which should be followed to make decisions reasonably and in an aware way. The latter is described as behavioural depiction which presents real conduct of people who make decisions which are not always perfect and do not coincide with recommendations of normative models (Sałek, 2014, pp. 247-248).

However, in order to make appropriate decisions in a contemporary and highly competitive and uncertain surrounding a normative approach with knowledge of theoretical aspects connected with decision process is more justified. Knowledge of particular stages of the process and their importance. It is also necessary to use models and tools which constitute an array of a manager and which support making decisions through optimisation, simulation models or more advanced econometric models.

Nevertheless, decisions made in the fields which are the essence of management of innovative activity are the most important. These fields were indicated in this article basing on the latest studies and practice of the most innovative western countries. These are the fields from the so called innovation diamond, i.e. innovation strategy, resources, tactics and climate, culture and human factor.

Companies which will be able to manage them with appropriate decisions should not worry about executed innovative projects and at the same time their current and perspective functioning on dynamic, highly-competitive and globalising market. They may look at the future optimistically and gain newer solutions in the scope of product, process, organisational and marketing innovativeness.

References

Baruk, J. (2010). Czy *polskie przedsiębiorstwa są innowacyjne?* in: A. Stabryła, *Koncepcje zarządzania współczesnym przedsiębiorstwem*. Mifiles pl, Kraków.

Cooper, R. (2016). *The Innovation Diamond.* Harvard Business Review Poland. [Retrieved September 18, 2016], <https://www.youtube.com/watch?v=x-vvilwj13o>

Czermiński, A., Czapiewski, M. (1995). *Organizacja procesów decyzyjnych.* Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk.

Gajda, W. (2016). *Innovativeness of the Polish service sector as well as of the whole economy in comparison with chosen countries of Central and Eastern Europe,* in: K. Łobos et al., (eds). *Between crisis and innovation. European Policies throught National and Transnational Perspectives.* CeDeWe, Warsaw.

Jankowski, W.B. (2016). *Jak uniknąć porażek przy wprowadzaniu innowacji.* Harvard Business Review Poland. [Retrieved September 17, 2016], <https://www.hbrp.pl/b/jak-uniknac-porazek-przy-wdrazaniu-innowacji/ukn07tCd>

Jurczyk-Bunkowska M. (2016). *Niepewność jako kryterium klasyfikacji decyzji w planowaniu procesów innowacji.* [Retrieved September 17, 2016], <http://www.ptzp.org.pl/files/konferencje/kzz/artyk_pdf_2013/p009.pdf>

Kieżun, W. (1997). *Sprawne zarządzanie organizacją. Podręcznik akademicki.* Wydawnictwo SGH, Warszawa.

Kisielnicki, J. (2016). *Decyzje menedżerskie i narzędzia do ich podejmowania. Typy decyzji i stosowane narzędzia.* [Retrieved September 19, 2016], <http://edu.pjwstk.edu.pl/wyklady/poz/scb/index37.html>

Rebizant, W. (2016). *Metody Podejmowania Decyzji.* Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław.

Sałek, R. (2014). *Algorytmizacja działań innowacyjnych na podstawie modeli decyzyjnych*. Zeszyty Naukowe Politechniki Śląskiej, Seria: Organizacja i Zarządzanie nr 68.

Webber, R.A. (1990). *Zasady zarządzania organizacjami*. PWE, Warszawa.

RECEIVED: 16 October 2016 **ACCEPTED: 10 May 2017**

Waldemar Gajda – doctor of economics – Rector of Warsaw Management School - Graduate and Postgraduate School. Member of the Polish Economic Society, the Association of Scientific Organisation and Leadership. Member of the Society of Polish Economists. He focuses his main interests and scientific efforts on the issues referring to the operation of business entities, especially management taking into consideration identification and proper usage of the instruments which determine operation and development of enterprises, creation of models of development based on the endogenic and exogenic instruments appearing in the market economy.

Ing. Eva Koišová, PhD., Department of Economy and Economics, Faculty of Social and Economic Relations, Alexander Dubcek University of Trencin, Studentská 3, 915 50 Trenčín, Slovakia. Position: Assistant Professor. Mail: eva.koisova@tnuni.sk. She is an authoress of many scientific publications and papers issued domestically and abroad (Czech Republic, Lithuania, Turkey, Bulgaria, Poland, UK and Canada). The area of scientific interest is Regional economy and development, finance and enterprise financing and Finance and currency.

Vadyba
Journal of Management
2017, № 1(30)
ISSN 1648-7974

TAX REVENUES, STATE BUDGET AND PUBLIC DEBT OF SLOVAK REPUBLIC IN RELATION TO EACH OTHER

Anna Schultzová
University of Economics in Bratislava, Slovakia

Abstract
Slovakia is currently one of the countries that generate one of the lowest tax revenues in relation to GDP. On the other hand, subjects pay one of the highest taxes in the form of specific contributions to the social and health system.
The lower tax collection was influenced by a gradual reduction of tax rates, especially in personal income tax and VAT, but mainly declining tax collection, in particular VAT. Collection of taxes, but also effective tax mix support the government's efforts aimed at increasing tax revenues to the state budget as well as eliminating the deficit of public finance and government debt.
Methods of analysis, comparison and graphical methods were used to monitor relations between the state budget and tax revenues of SR.
KEY WORDS: Tax revenues; Balance of the State budget; State budget deficit; Public debt; Direct taxes; Indirect taxes.

Introduction

Balance of the state budget and public debt is still affected by changes caused by the global crisis and its consequences. In general, it was confirmed that high budget deficits are causing the unsustainable public debt.

In spite of the government's efforts to reduce the deficit and debt measures that reduce the expenditure side of the state budget, tax revenues of the state budget are playing an increasingly important role. Tax revenues, not only in Slovakia but also in the EU Member States, represent the most important source of income.

Despite the fact that usage of the Maastricht criteria and the Stability and Growth Pact has led to a certain recovery of public finances, in the EU has been a slowdown in economic growth, the consequence was the creation of budget deficits. States have created sufficient reserves for a period of recession during the economic boom, there has been a reduction of public revenues.

In order to consolidate public finances and economic recovery, the Slovak government proposed measures to reduce government debt and increased resources serving for financing and covering the state debt. This led to the adoption of a lower VAT rate, higher rates were used for taxation of excisable goods, etc. Tax measures were naturally respected by economic policy of the state, especially with regard to the business environment support policy and employment policy.

The intensity of state interference in the functioning of the economy deal with several representatives of economic science (eg. J.B. Say, Keynes, J.F. et al.). Their views, however, are constantly developing and the measures of countries respond to current economic realities. The absolute efficiency of the government's decisions, however, is hardly foreseeable with respect to the unpredictability of possible economic development of the state, respectively most developed countries and the existence of economic cycles.

Material and methods

The consolidation of public finance is closely related to the effective tax collection. There are created many tax bases with sufficient reliable information on tax subjects. There are created many tax bases with sufficient reliable information on tax subjects. Key challenges are focused not only on the “rating” of tax subjects, but also on other measures of counties that will be implemented in coordination with the EU. Some of these are mentioned in this article. Also methods of analysis, comparison and graphical methods were used to monitor relations between the state budget and tax revenues of SR.

Results and Discussion

For the chosen period 2005-2015, total amount of expenditures has exceeded the total amount of revenues in the Slovak state budget. Slovak Republic has reported a budget deficit in this period that had an unstable character.

Fig. 1. Revenues, expenditures and the deficit of the state budget in billions EUR (2005– 2015) (Source: own collaboration of the data, 2014. http://www.finance.gov.sk/Documents/Adresare/FinanceSK/Default.aspx-CatID=4103.htm.)

In terms of a ratio of total revenues and expenditures of a state budget, the most common type of the Slovak state budget is its deficit.

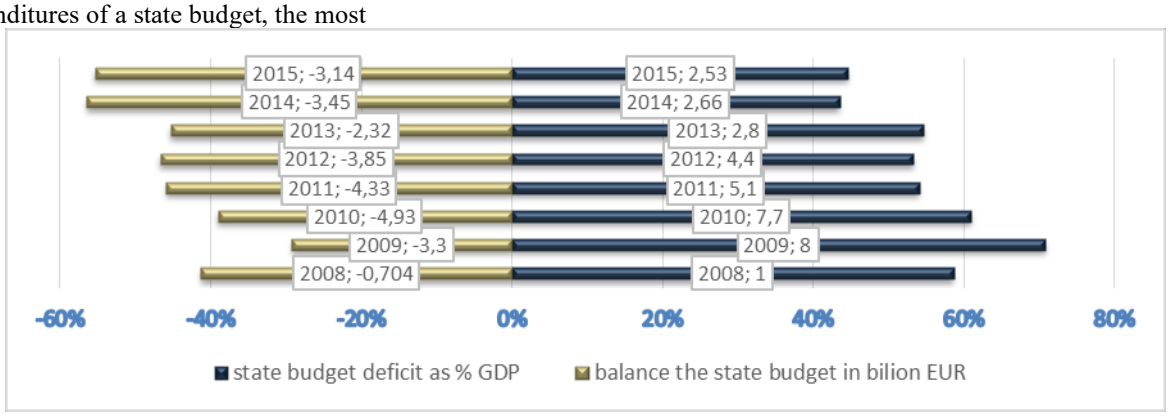


Fig. 2. State budget deficit as % GDP and balance the state budget in bilion EUR in SR (2008 – 2015) (Source: own collaboration of the data http://www.rozpoctovarada.sk/svk/rozpocet)

In the period of the global crisis (except the year 2006), the deficit of the state budget of the Slovak Republic was below the 3% of GDP, which was one of the basic requirements for membership in the European Union. This period is linked with an effort of the Slovak Republic to achieve and fulfill the convergence criteria necessary for accession to the EMU.

We can briefly summarize the development of the budget deficit in SR from year 2008 to the present in the following conclusions:

In 2008, the deficit of the state budget reached the level of 1 % of GDP. The level of revenues was fulfilled up to the level of 98% of a plan. The best collection was achieved in relation to the income tax (this area was fulfilled up to the level of 110%) and expenses were fulfilled to the level of 96%.

The year 2009 represents the year with the highest state budget deficit since 2004. In comparison to the previous year it has increased by 4,6% and has reached the level of 8 % of GDP. Simultaneously, one of convergence criteria was broken (the deficit has exceeded the threshold of 3% of GDP). Following this fact, the European Council has started to apply an excessive deficit procedure towards Slovak republic.

In 2010, the Slovak Republic has failed to fulfil the aim of initiating budgetary consolidation of public finances due to the fact that the deficit has reached the level of 7,7% of GDP. The budget plans that were set on the level of 5% were repeatedly exceeded.

The year 2011 was represented by the growth of the Slovak economy by 3,3%. Due to this fact the Slovak Republic was one of the most fast growing economies within the Eurozone area. In this year, the budget deficit has increased by 5,1% of GDP. This situation was partially reached due to the better tax collection.

In year 2012, the deficit of the state budget was represented by 4,48% of GDP.

In 2013, the government of Slovak Republic has achieved the goal of reducing the government deficit below 3% of GDP to the level of 2,8%. Consequently, the European Commission has stopped to apply the excessive deficit procedure towards Slovakia.

For the year 2014, the deficit was set in amount of 2,66% of GDP, but according to the estimations of the European Commission, the deficit has reached the level of 2,93% of the economy performance. In any case it was kept below the level of 3%.

In 2015, the Slovak government has set its objective in achievement of a deficit of 2,53 % of GDP.

For the following two years, they have even more optimistic view, as there is a forecast for the year 2016 to reach the deficit on the level of 1,43% of GDP. In 2017, there should be the deficit in the level of only 0,39% of GDP. The Slovak government plans to reach the higher level of tax collection that would contribute to the reduction of the deficit.

Growing deficit of the public finance contribute very significantly to the deepening of the public debt of

the relevant country. In the conditions of Slovakia, for the chosen decade, the debt of the public administration did not exceed the level of 60% of GDP – none of the Maastricht criteria has not been exceeded.

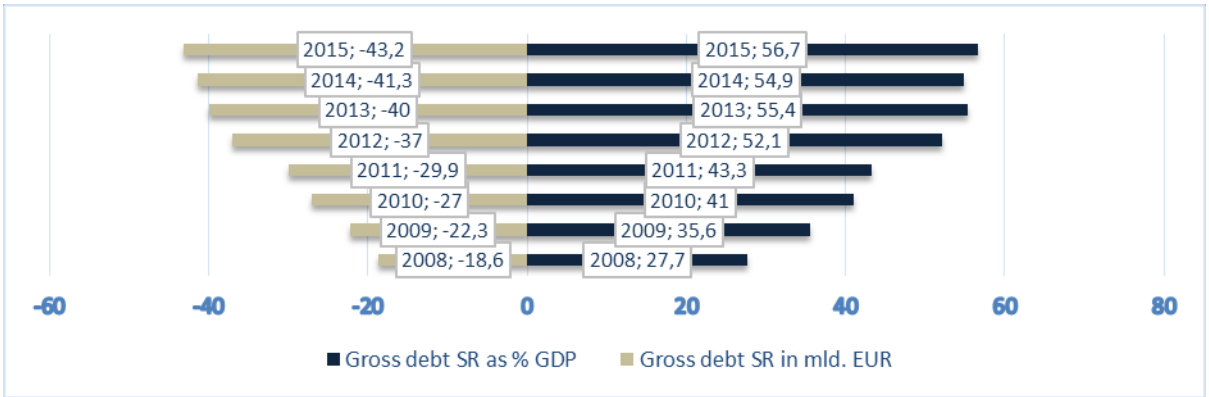


Fig. 3. Gross public debt of SR as a percentage of GDP, in EUR mld. (2008 – 2015)
(Source: own collaboration of the data http://ec.europa.eu/eurostat/web/government-finance statistics/data/main-tables)

The year 2009, in a comparison with the year 2008, represents the period of a sharper rise of public debt up to the level of 35,6% of GDP. This level is represented by nearly 23 billion EUR. The main factor affecting the increase of the public debt was the financial and economic crisis, that had significantly reflected into the government deficit in the form of lower tax revenues and social contributions, the applied expansionary fiscal policy and an outflow of resources used for financing and covering the state debt. In the following years, there was an increase of government debt up to the level of 54,9 % in 2014.

Public debt of the Slovak Republic from 2012 to the present is located in the sanction zone of 53-55 % of GDP. This means that the government submits to the National Council document concerning proposals for measures to reduce the public debt and to reduce the salaries of members of the government to the level of the previous year.

Despite to the relatively high level of the government debt, Slovak Republic is one of the countries that have relatively low debt and keep the level of their debt below the average level of the debt within the all EU countries and the countries of the Eurozone area. However, one of the negative sides is the rate of the economic growth of a public debt for the last six years. In relation to the performance of the economy, the debt had an increasing tendency by the sixth fastest rate among all EU Member States. A faster rate than in our country was only in countries such as Greece, Ireland, Spain, Portugal and Cyprus.

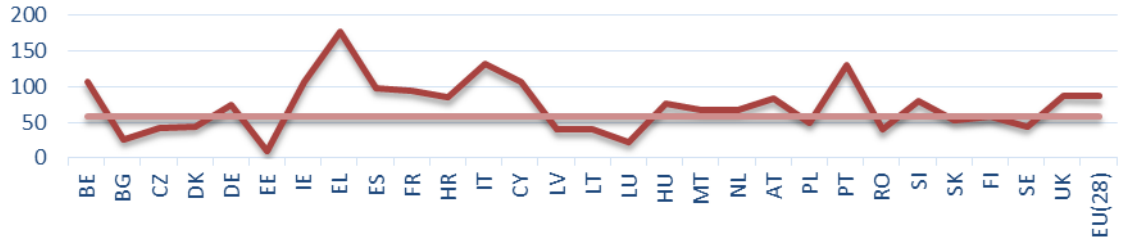


Fig. 4. Debt of the public finance in countries of EU for the year 2014 in %
(Source: own collaboration of the data http://ec.europa.eu/eurostat/web/government-finance statistics/data/main-tables)

In 2014 the tax burden of the Slovak Republic reached the value of 31% of GDP, while the average tax burden of the EU was for that period at 40%. Based on the above it can be concluded that the tax revenues of the Slovak Republic were the fifth lowest in the EU (as % of GDP). Among the V4 countries, in 2014, the highest tax burden was achieved in Hungary (39 % of GDP), followed by Czech Republic (34 % of GDP), Poland (33 % of GDP) and Slovakia (31% of GDP).

The largest and the most important component of the Slovak state budget revenues is represented by the tax revenues. Non-tax revenues have only negligible impact on the state budget revenues (fines, penalties, court fees, administrative fees, etc.). Grants and transfers represent the significant proportions of state budget revenues, especially those that flow from the EU budget. Tax revenues thus represent the most important source of government revenue, which is used to finance public goods and services provided. The

Slovak tax system consists of tax revenues of four fifths of total revenue.

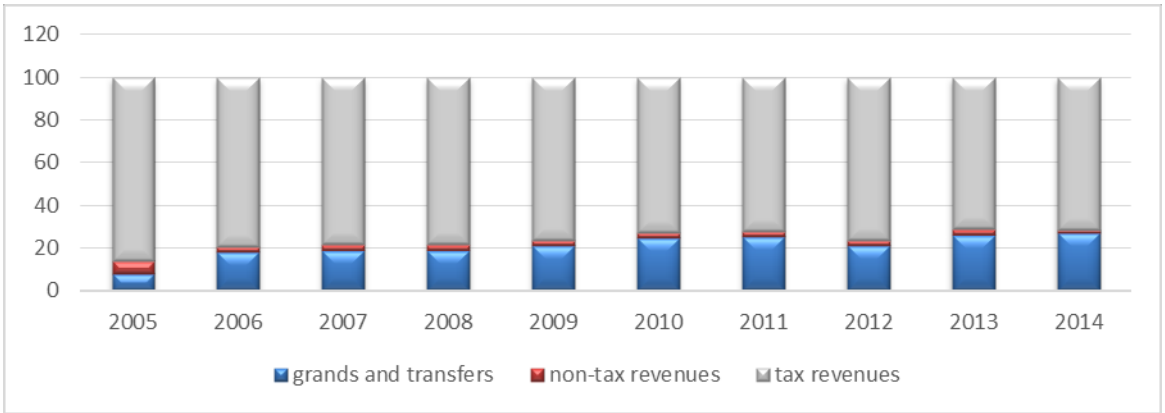


Fig. 5. The ratio of tax revenues, non-tax revenues, grants and transfers on the total amount of the state budget revenues in Slovakia (2005 – 2014)
(Source: own collaboration of the data http://www.finance.gov.sk/Documents/Adresare/FinanceSK/Default.aspx-CatID=4104.htm)

Fig. 6. The ratio of direct taxes, indirect taxes and other tax revenues on the total amount of revenues of Slovak state budget (2005 – 2014)
(Source: own collaboration of the data http://www.finance.gov.sk/Documents/Adresare/FinanceSK/Default.aspx-CatID=4104.htm)

The other tax revenues represent only a negligible part of the total state budget revenues (withholding tax, taxes on the international trade and transactions - such as import duties, import additional charges, customs penalties, etc., as well as the fines resulting from the tax audit). In the Slovak Republic, the indirect taxes represent the largest amount of the revenues of the state budget. Their volume is represented by more than 60%.

Fig. 7. The ratio of direct taxes on the total amount of tax revenues of the Slovak state budget (2005 – 2014)
(Source: own collaboration of the data http://www.finance.gov.sk/Documents/Adresare/FinanceSK/Default.aspx-CatID=4104.htm)

Corporate tax forms the majority of state budget revenues from direct taxes. In the monitoring of the income from the personal income tax to the state budget we must take into account the fact that the tax is proportionate tax in Slovakia and most of its income goes to the budgets of municipalities and higher territorial units. For example, in 2014, the tax revenues were distributed in proportion 67 % (village, town), 21,9 % (higher territorial units) and 11,1 % (state budget).

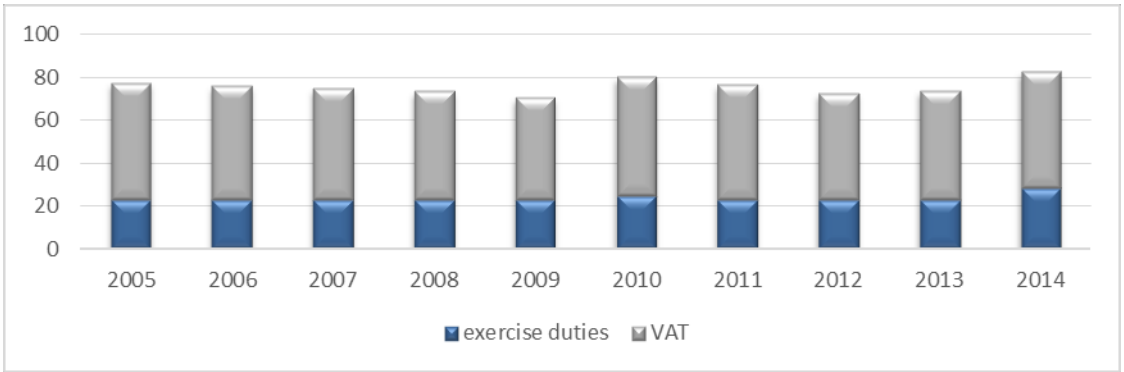


Fig. 8. The ratio of indirect taxes on the total amount of tax revenues of the Slovak state budget (2005-2014) (Source: own collaboration of the data http://www.finance.gov.sk/Documents/Adresare/FinanceSK/Default.aspx-CatID=4104.htm)

In the case of indirect taxes, we can see a relatively balanced process of tax revenues. From the excise duties, the largest proportion of the collected tax was represented by the tax income from mineral oil and from tobacco products.

Conclusions

Despite the fact that during the global crisis SR experienced decreased government revenues and increased spendings, the state keep public debt below the EU average. Slovakia and other EU countries, to consolidate public finances, adopted more than sixty measures, some of which still takes place. It can be concluded that these measures have influenced very significantly the revenue side of the state budget as well as the elimination of the government debt. Despite to this fact, the state still persists in its effort and is still adopting additional measures in the area of taxation aimed to combat tax fraud and tax evasions. Especially, a maximum effort is needed to eliminate VAT tax loopholes which in 2014 amounted to 29,5 % of potential VAT in Slovakia (representing 2,8% of GDP). It should also be noted that the government plans, for the years 2015 and 2016, to increase tax revenues of the state budget with additional almost 900 million euro package as a result of better condition of the economy and increased efforts in detecting tax evasion.

During the chosen period of the last ten years (2004-2013), the most significant government deficit was reached in Ireland in 2010 (32,4%). Conversely, the lowest government deficit for this period was reached within the EU countries in Denmark, Estonia and Latvia. In most cases, these countries have applied the restrictive policy as well as the adjustments in taxation area (increase in rates of VAT and of the rates of certain excise duties, especially on alcohol and tobacco).

In 2013, the compliance of one (from five) convergence criteria – to keep the state budget deficit at the level of 3% of GDP have fulfilled 18 Member States, including the Slovak Republic. This standard did not fulfil 10 EU countries (Slovenia, Greece, France, Ireland, Spain, Croatia, Cyprus, Poland, Portugal and the United Kingdom).

The debt of the public administration in EU countries has started to increase notably since 2009, as a result of the global crisis. Since 2006, Greece is making very bad results in this way. From the mentioned year, the relevant amounts are exceeding the level of 60% of GDP, the total public debt of the public finance is above 100%. In 2013, the mentioned criterion was met in 12 Member States, including the Slovak Republic.

For the respective chosen period in all EU countries the tax revenues represent the most important source of the state budget revenues. The highest share of tax revenues (over 70%) is reported by Denmark, Ireland, Sweden and the United Kingdom. Conversely, the lowest share of tax (less than 50%) is recorded in the Czech Republic, Slovakia and Lithuania. In the structure of total tax revenues of EU countries, the direct tax revenues (65,6%) significantly outweigh revenues derived from the indirect taxes (35,4%). The most significant representation of the indirect taxes from the total amount of the state budget revenues is in a tax system of Lithuania, Bulgaria, Estonia, Croatia, Romania, Poland and Slovakia
(over 60%).

References

Gayer, T., Harvey S. Rosen (2010). Public Finance . McGraw-Hill, ISBN 800-7126-7885.

Kušnírová, J. (2014). Challenges to a corporate taxation in selected countries, In: Proceedings of the 16th International Scientific Conference Finance and Risk 2014 Vol 1, University of Economics. Bratislava:

Publishing House EKONÓM, pages 129-137, ISBN 978-80-225-3991-3.
Lehuta, M. (2009). The budget deficit for 2008 was so far the lowest. 9.1.2009. Internet: <http://ekonomika.etrend.sk/ekonomika-slovensko/rozpoctovy-deficit-za-rok-2008-bol-zatial-najnizsi.html>.
Rabatinová, M. (2014). Application of vat rates in the EU. In Finance and risk 2014 : proceedings of the 16th international scientific conference : Bratislava, Slovak Republic, 24. - 25. november 2014 : vol. 1. Bratislava : Publishing house EKONÓM, 2014. - ISBN 978-80-225-3991-3. - S. 198-202.
Schultzová, A. a kol. (2015). Tax Theory and Policy I. Bratislava: Wolters Kluwer, 2015. ISBN 978-80-7478-867-3.
Schultzová, Anna - Rabatinová, Marcela. Public finances vs. tax policy of the state during financial crisis. In How does the central and eastern Europe cope up with the global financial crisis? : conference proceedings : 7th international conference on currency, banking and international finance : 27 and 28 September 2012 in Bratislava, Slovak Republic [elektronický zdroj]. - Bratislava : Vydavateľstvo EKONÓM, 2012. ISBN 978-80-225-3494-9, [S. 1-14]. VEGA 1/0008/11, ITMS 26240120032.
Válek J. - Zubaľová, A. (2014). The Impact of Excise Taxes on Alcohol on Selected Macroeconomic Indicators in the Slovak Republic - VEGA 1/0008/11. In Ekonomický časopis = journal for economic theory, economic policy, social and economic forecasting = Journal of economics : journal for economic theory, economic policy, social
and economic forecasting. Bratislava: Ekonomický ústav SAV.
Ardal (2012). Annual report on the activities of ARDAL for 2011. Retrieved from: <https://www.ardal.sk/_img/Documents/O%20n%C3%A1s/Vyrocna%20sprava/V%C3%BDro%C4%8Dn%C3%A1%20spr%C3%A1va%20za%20rok%202011.pdf>.
MF SR (2014). Fulfillment of state budget revenues for 2013. Retrieved from:
<http://www.finance.gov.sk/Documents/Adresare/FinanceSK/10.1.10.3/Default.aspx-CatID=4103.htm>.
Eurostat (2014) <http://ec.europa.eu/eurostat/web/government-finance statistics/data/ main-tables>.
MF SR (2014). Fulfillment of state budget revenues for 2014. Retrieved from: <http://www.finance.gov.sk/Documents/Adresare/FinanceSK/Default.aspx-CatID=4104.htm>.
Finančná správa (2014). Fulfillment of state budget revenues for 1993 – 2013. <https://www.financnasprava.sk/sk/infoservis/statistiky/plnenie-statneho-rozpoctu/plnenie-príjmov-sr-v-1993-2012#Rok2013>.
National Bank of Slovakia. (2010). Financial Stability Report 2009. Bratislava: National Bank of Slovakia. ISBN 978-80-8043-155-6. Internet: <http://www.nbs.sk/_img/Documents/ZAKLNBS/PUBLIK/SFS/SFS2009.pdf>.
National Bank of Slovakia. (2011). Financial Stability Report 2010. Bratislava: National Bank of Slovakia. ISBN 978-80-8043-171-6. Internet: <http://www.nbs.sk/_img/Documents/ZAKLNBS/PUBLIK/SFS/SFS2009.pdf>.

Acknowledgement

„This work was supported by the Slovak Research and Development Agency under the contract No. APVV-15-0322.“

RECEIVED: 17 February 2017 **ACCEPTED: 10 May 2017**

Anna Schultzová, Professor, University of Economics in Bratislava, Faculty of National Economics, Department of Finance, Field of scientific research: tax theory and policy, EU state tax systems, e-mail: anna.schultzova@euba.sk

Vadyba
Journal of Management
2016 № 1 (30)
ISSN 1648-7974

FIXED ASSETS OPERATION MANAGEMENT IN ENTERPRISE IN CONDITIONS OF THE XXI CENTURY ECONOMY

Krzysztof Szewczak
Warsaw Management School Graduate and Postgraduate School, Poland

Abstract
In the paper there are presented on the basis of literature and author's own researches the changes that have occurred in the management of enterprise's fixed assets due to changes in management of enterprise as a complex system located in a turbulent environment. Achieving the objectives of the enterprise is more and more difficult due to increased risk of activity in fast moving and difficult to predict changes in the global economy. In such conditions of enterprises functioning a special role is played by knowledge of a staff and ability to using it.
KEY WORDS: management; operation; knowledge; risk.

Introduction

Enterprise is an organization in material sense, therefore the most universal is its overall model of organization by HJ Leavitt, according to which the organization is a structured system, that is ordered in a certain way system (entirety) consisting of four basic elements (subsystems):

- objectives being realized by organization and resulting of it specific tasks,
- people with their individual and collective strivings and patterns of behavior,
- material and technical as well as technological equipment and specific rules of handling,
- formal structure, that is accepted principles of distribution tasks and responsibilities as well as information.

Enterprise as organized entity (system) must determine a purpose or purposes of its activity, simultaneously taking into account both closer and further changes in the environment and also must take into account and adapt itself to internal conditions.

The internal conditions are first of all human resources (including intellectual capital), financial resources and physical resources (including fixed assets).

All elements of the entity called enterprise are integrated by the objectives for which the enterprise was created and functions.

Purpose of enterprise

Traditionally, a model of private enterprise is based on assumption that the purpose of its business is maximizing a profit.

A. D. Chandler's definition defining a strategy as „... determination of long-term goals and tasks of the enterprise, the choice of courses of action and the allocation of resources necessary to achieve these goals" (Moszkowicz, 2005, p. 47), is a tool for highlighting setting goals in the analysis of the key elements of the strategy.

Depending on accepted strategy of the enterprise, one can notice a dominance of specific goals in a bundle of goals.

Analyzing relations „strategy - goals" one must answer the question who sets the objectives of the enterprise, since they can be determined by the owners (shareholders), but also by managers.

The owners realizing themselves the situations in which it may be a conflict between preferred by them objectives, and the objectives of managers, often strive to co-ownership of managers. This causes blurring the differences of both groups in the approach to the formulation of the strategic goals of the enterprise.

A bundle of goals one can build striving to basic objectives - survival and growth (Koźmiński, Piotrowski, 1998, p. 130) – with objectives arising from different partial criteria being realized on the base of strategic, tactical and operational plans of the enterprise.

In strategic management there are presented different base patterns, out of which result the different ways to achieve the primary objectives, which is „survival".

In most of concepts of enterprise's objectives a survival and development is absolute condition. There are situations when one needs withdraw from realization the „survival and development" goal, that is when it is not possible to improve the very poor situation of the enterprise, regardless of a phase of branch life cycle and then one should proceed to controlled liquidation or curtailment of activity.

The twenty-first century challenges for managers of enterprises

The twenty-first century is a post-industrial era, frequently called civilization of information, in which the primary resource creating competitive advantage is to have the knowledge and ability to use it.

Managers of an enterprise must take into account the characteristic changes in the world economy, such as:

- Turbulent environment,
- Increasing globalization,
- Competition between mega political and economic systems,
- Searching for a more flexible system.
- New vision of an enterprise.

In discussions over the requirements, what a new organization of enterprise should be, one can mention the most often occurring features:

- Flexibility,
- Dynamism,
- Multitasking - economic, political, social, moral, ethical goals,
- Orientation on science,
- Ability to manage a knowledge,
- Serving customers,
- Openness and ability to changes (ability to using opportunities and avoiding threats).

Flexible adaptation to continuous and turbulent changes in environment and ability to functioning in conditions of chaos and crisis – this is a concept of tomorrow enterprise - „sustainable enterprises". For those sustainable enterprises one can accept defined targets of control systems and supervision of the corporation, whose expression are principles of organizational culture of „corporate governance":

- harmonizing interests of entities that are involved in functioning of the corporation,
- providing owners and stakeholders effective procedures and institutions of monitoring the management and correcting its mistakes,
- gradual increasing a goodwill from viewpoint of owners and other stakeholders,
- creating an investment attractiveness and ensuring an inflow of financial funds necessary for development of the enterprise (Grudzewski, 2010, pp. 17, 199, 300).

In concepts of business management at the end of the twentieth century and early twenty-first century, in new economic situation in the world one is looking for help in new approaches such as:

- Situational approach, system approach,
- Customer orientation,
- Orientation on quality, orientation on innovation and know – how,
- Orientation on financial result, orientation on goodwill,
- Orientation on knowledge, orientation on human, resource approach,
- Concepts of learning, intelligent, virtual and network organizations,
- Process oriented paradigms, flexibility and changes in management concepts,
- Lean Management, clever organization.

Those concepts relate to enterprise management as a whole, but also influence the management of individual subsystems, including assets subsystem.

Fixed assets management

Assets of enterprise is identified with capital because financial capital invested in the enterprise is converted into assets of the enterprise, which consist of fixed and current assets. Depending on the purpose of capital for the financing the type of property we can distinguish fixed or current capital. A size and structure of material and financial capital decides on formation of enterprise, its operations and development. Rational using resources (capital) of the enterprise allows to its growth and development.

In process of business management the ability of making decisions in all areas of enterprise determines results. Synergy effect in decision-making processes is achieved if coherence of decision-making system is ensured, while lack of coherence in decision-making processes accelerates entropy of the system.

Subsystem of fixed assets is the most important in the tangible fixed assets.

Relations between a subsystem of fixed assets economy, and the goal of the enterprise (goodwill) are related to two areas: reproduction and widely understood exploitation.

Choosing a fixed assets economy subsystem for the analysis, results from the importance of this subsystem in a modern knowledge-based economy.

The increase in value is a goal of enterprise's activity, because „the goodwill is the appropriate criterion for any decision whose consequences are of a financial nature." (Czekaj, Dresler, 2005, p. 20). The goodwill, as opposed to the criterion of the amount of profit, takes into account the time factor and the risk factor, which is particularly important in conditions of turbulent changes in the economy.

An enterprise that exists (lasts) can increase its value and for the purpose of duration the enterprise must renew its fixed and current capitals and use of owned property.

Renewing can also be simultaneously a factor of development (broadened reproduction), only a maintenance of production capacity in the existing sizes (simple reproduction) or a reduction of production capacity (constricted reproduction).

Owned assets and its fixed assets, require implementation of the operation processes, which include sub-processes: maintenance, waiting and using, as well as liquidation. Operational processes have an impact on goodwill through optimal implementation of those sub-processes.

The process of use actively influences on increase of goodwill, because that sub-process determines the added value in manufacturing processes. The maintenance sub-process, as a typical secondary process, has a significant impact on possibility of using and enterprise's costs in the form of indirect costs despite the fact that it itself does not bring a new value.

Reproduction, especially broadened, increases potential capabilities of increasing the goodwill, however for the goodwill any kind of reproduction will have a positive significance, provided that the adjustment of fixed assets to the changing needs of the production program will be an effect of the reproduction. An increase

in value of fixed assets without an increase in productivity of fixed assets will not increase the goodwill.

Means of work including fixed assets (tangible fixed assets) as one of the components of the business assets should affect an increase of goodwill and should be a factor of boosting the enterprise development.

Means of work is also accumulated work of society in the past years (national property), constituting objectified expenditure of human labor (physical and mental). For efficiency of means of work, except the production fixed assets, the use of intellectual capital has special significance.

Means of work improvement is one of the basic elements of technological progress, which have an impact on the growth of labor productivity.

However, in many cases one can observe a phenomenon, that the fixed assets becomes a ballast aggravating costs without multiplying the added value.

Fixed assets operation management

In English language literature an operation as „maintenance" comes down to the issue of handling or exploitation (Gulati, 2009, p. 18, Levitt, 2009, p. 9). Functions of exploitation or maintenance are treated by practitioners of enterprise management as functions of ensuring the continuity of work process of technical equipment at the lowest possible cost.

The best proof of it is the fact that popular *Maintenance Management* term equated with the process of management of handling the machinery and technical equipment is more and more often equated with an integrated system of fixed assets management and manufacturing process in the concepts of *Total Productive Maintenance* (TPM).

Analysis of the systems of fixed assets operation management should be preceded by an analysis of paradigm shifts in operation management.

The paradigm shift in operation management by J. Moulbray (Moulbray, 2009) is based on the analysis of processes of fixed assets maintenance, mainly of machinery and technical equipment in connection with the general objectives of the enterprise, rather than focusing only on autonomous goal of maintenance, what often was only ensuring a suitability for using.

According to the old paradigm, development of the concept of *Preventive Maintenance* was based on the belief that maintenance has to entirely preserve reliability or built-in utility potential of each fixed asset. According to the new paradigm based on a deeper understanding the role of fixed assets in building the goodwill (business role) it is important, what the asset makes it possible to realize according to the required standards, and not, what that asset is.

L. Fedele notes that the term of maintenance is identified with the policy and strategy. The policy of maintenance indicates that established by the firm the general attitude to the problems of maintenance may be in practice related to the subjects: organizational units, work stations (organizational level 0), as well as to a single technical object (eg. machines) in different strategies (Fedele, 2011, p 33).

In the literature on maintenance some authors define three basic strategies of maintenance (Wireman, 2008, Levitt, 2009, pp. 219-258):

- *Breakdown Maintenance,*
- *Preventive Maintenance,*
- *Predictive Maintenance*.

Also appears extended understanding of the predictive strategy: *Proactive Maintenance* (Fefele, 2011, p. 41).

In the publications and in practice one can note mixing of concepts and interchangeably use of policies, strategies and methods of maintenance.

Simply put, most generally one can divide the strategies into two opposing strategies:

- *Breakdown Maintenance*,
- *Preventive Maintenance*.

In the *Preventive Maintenance* we can use different methods, whose common feature is the action of preventing accidents.

R. Gulati does not include the *Breakdown Maintenance* to the strategy, treating this type of maintenance as a case not resulting of the choice of decision-maker.

In practice, a strategy of *Breakdown Maintenance* is used with respect to some objects for economic reasons. In every case one must make an account what is more profitable: so called individual *Breakdown Maintenance* or group maintenance of some cheap elements as a preventive replacement. When it is necessary to maintain a group of objects in an up state it can be more profitable to replace the entire group, even if some elements continue to work properly, than replace individual objects after diagnosis their damage.

Regardless of the classification, an objective of maintenance services activity is to reduce reactive breakdowns and adapt or increase respectively works of *Preventive Maintenance* (PM) and *Condition Based Maintenance* (CBM).

Preventive Maintenance (PM)

Preventive Maintenance refers to a series of actions that are taken on the resources in accordance with the schedule. This schedule can be based on both the time and the machine running time or the number of machine cycles. These actions are designed to discover, prevent or mitigate the degradation of the system and its components.

Preventive Maintenance carried out at predetermined intervals, based on the number of operations (for example mileage, number of made details, etc.), based on the using of data on reliability (MTBF, Rate of Failure, mean time between failures, the rate of damages, etc.) (Wireman, 2008b, pp. 11-15).

PM is a scheduled conservation of resources, designed to enhance life of resources and to avoid unplanned conservation activities. PM includes cleaning, adjustment, lubrication, and smaller replacement of spare parts, in order to extend the life of resources and expand its capabilities.

The aim of PM is minimizing the failures. One should not be allowed to reach a critical point both by property and equipment, unless strategy *run-to-failure* (action until

the failure) is accepted for specific parts of resources. In its simplest form, *Preventive Maintenance* can be compared to a car service schedule. The scope of the necessary procedures undertaken within the PM is very different. It can include a range from visiting of property and equipment to measuring the backlashes, checking settings of pumps and engines, simultaneously noticing other deficiencies for later improvement.

According to L. Fedele, *Preventive Maintenance* was often used as dogmatic as planned revisions at fixed intervals regardless of the possible comparison with the data obtained in the previous experiments. At the beginning of the 60s of the twentieth century, when it was decided to carry out deep researches on the effectiveness, *Preventive Maintenance*, and on other hand development of RCM (*Reliability Centered Maintenance* – maintenance focused on reliability) method aimed at combination the reliability of the project with complex analyzes, which required a number of significant activities (staff training, information gathering, identification and distribution the system, strategy, cost effectiveness, etc.) led to fully defining a new strategy *Predictive Maintenance* (predictive - *Predictive Maintenance* as a logical evolution of *Preventive Maintenance*).

The rationale for the use of predictive methods (CBM) is the fact that 82% of the components does not exhibit wearing-up (frequency of failures does not increase over time), and 72% show an increased frequency of failure immediately after installation.

In economic practice one can find cases, where badly (failure) fixed assets operate, and production services put pressure on increasing purchases of new resources to ensure the timely completion of production tasks.

Increasing state of assets ownership can lead to its excess, which is justified by high rate of failure. It may turn out, that if the maintained system would increase the reliability of existing fixed assets, additional purchases would be superfluous and thereby the effectiveness of the invested fixed capital would be higher, and thus ROI (Return on Investment) indicator would increase.

In natural way the next step after PM based on the time, is carrying out a maintenance based on work cycles or on the time course. Resources do not need to be checked repeatedly, if they were not used. Generally, the actual operation of resource exhausts them, so it makes sense to check them after a certain time of work, in which they could be partially worn out.

Condition Based Maintenance (CBM)

Condition Based Maintenance (CBM), also known as *Predictive Maintenance* (PdM), attempts to assess the state of resources by periodically or continuously monitoring them. The ultimate goal of CBM is to carry out the maintenance in the scheduled time point, when the action is costly the most effective and simultaneously at the time before the failure. „Predictive" component is derived from the goal, which is prediction of future trends regarding the state of resources. This approach uses principles of statistical process control and trend analysis to determine, at which point in the future the carrying out the maintenance will be appropriate and most effective in terms of cost reduction.

CBM inspections are usually carried out during servicing, so that a break in normal operation of the system are minimized. The results of the acceptance of CBM/PdM are significant cost savings and higher system reliability.

Advantage of *Condition Based Maintenance* by R. Gulati (Gulati, 2009, p. 56) is that the proceeding can:

- warn on time against the majority of mechanical problems to minimize unexpected damages, risk and consequences of additional damages and adverse influence on safety, operation and environment. This will reduce a quantity of forestall corrective actions,
- increase the use and lifetime of equipment, minimize disruptions in fulfilling their mission and schedule. It will reduce periods of exclusion of resources and processes, which will result in increased availability,
- reduce maintenance costs - both spare parts and labor,
- reduce significant number of inspections and *Preventive Maintenance* inspections based on calendar/mileage,
- minimize the costs and threats relating to resources, which are the result of necessary carried out inspections, dismantling and PM inspections,
- increase the probability of optimal lifetime of operating components.

Operator Based Maintenance (OBM)

An operator is actually the most important member of the maintenance team. Well informed, trained and responsible operators are guarantors of maintaining the resources in the functional efficiency.

The operators are on the first line of defense carried out against the periods of excluding the fixed asset from operation. OBM assumes that operators, who are in daily contact with the resources, can use their knowledge and skills to predict and prevent the accidents and other losses.

The main objective of the program *Operator's Maintenance* also called *Autonomous Maintenance Program* is to provide operators with the following skills related to resources:

1. The ability to detect abnormalities;
2. The ability to correct - as far as possible - smaller abnormalities and restoring function;
3. Ability to determine the optimum conditions of resources;
4. The ability to maintain optimal conditions of the equipment.

Autonomous maintenance is one of the basic pillars of *Total Productive Maintenance* (TPM). TPM is a Japanese philosophy of maintenance, which involves operators performing some basic maintenance activities. The operators acquire maintenance skills through a training program. In some cases in the processes running in automated lines, due to the nature of these processes the positions of operators do not occur, and only maintenance posts, which perform only one operator function, i.e. initiating the process.

Corrective Maintenance (CM)

CM, sometimes called a repair, is carried out to improve the deficiencies found in the evaluation of PM and CBM; it restores good conditions of the resource after their breakdown or work stopping. CM is an activity initiated as a result of observed or measured conditions of resources before or after functional failure. CM action can then be classified in three categories:

Scheduled CM

CM – Scheduled is a corrective action being performed in order to ease potential failures of resources or to improve the deficiencies found during PM and CBM tasks. It leads the resources to capability, what were designed for them, or to level, which is expected to be acceptable.

CM – Major Repairs/Projects (Planned & scheduled**)**

In many organizations all major repairs or improving works which are valued above a certain threshold - eg. general reviews and major projects, are treated as taxable capital projects. If those projects are to bring the resources back to the abilities that were designed for them, without adding additional capabilities, they should be seen as C*orrective Maintenance*. In this case, they should be planned and schedules.

CM - Reactive (Unscheduled), also known as Breakdowns/Emergency (reactive unscheduled).

Corrective Maintenance - Reactive (Unscheduled) first of all is repairing of resources after being damaged. This action is also known as an emergency or failure repairing action. In most of cases the implementation of this activity is mixed with the realization of the regular weekly planned activities. The activities outside the schedule cost much more than planned and included in the schedule.

A lot of researches/studies presented at the *International Maintenance Conferences*, at the annual *Society for Maintenance & Reliability Professionals' Conferences* and on *Reliabilityweb* indicate, that *Reactive Maintenance* is still the most widely used method of maintenance. The average results of the researches on the methods so far used in enterprises in the United States are as follows (Gulati, 2009, p.61):

- 55% reactive - (CM unscheduled),
- 30% preventive - calendar and running time,
- 15% CBM/PdM.

Note that those studies indicate, that 55% of maintenance of resources and activity is still reactive nature

- maintenance prevents failures of resources or their parts and repairs them in the case of occurring.

However, a new paradigm of maintenance is capacity assurance, what means that maintenance assurances the resource capacities on planned or acceptable level.

Costs of maintenance and resource availability can be improved by optimizing the operating tasks and through the effective execution of tasks using available tools. Tasks of maintenance, such as operating instructions of PM, CBM and repair plans must cover everything, what requires performing. These tasks can be optimized by the use of tools and techniques such as RCM, FMA, predictive technologies and *Six Sigma*. These tools and techniques help optimizing range of operating tasks, which are to be realized. Execution of maintenance tasks can also be optimized by the use of other tools and techniques, such as planning and scheduling. These tools and techniques can help you effectively use resources use.

The selection of appropriate indicators to measure the performance of maintenance tasks is an important element in the implementation of best practices. Indicators should encourage appropriate behavior; they should be difficult to handle, leading to results that allow „feel good". And finally, it should be easy to collect and make up reports.

The evolution of operating techniques (maintenance) is a result of growing expectations of management, increasing the efficiency of the whole system - an enterprise - as synergistic effect resulting from co-contribution of the individual subsystems, including maintenance subsystem to achieve the strategic goals of the enterprise.

Each maintenance causes unavailability of equipment for the processes of using in time of residence the device in handling.

Ensuring continuity of exploitation of the devices requires, that a number of operating devices is greater by average number of devices residing in handling in relation to number of operating devices with full load of production or service processes. This additional equipment is called the repair fund, and applies only to homogeneous or devices, that are not homogeneous, but can replace each other. This fund is used to fill up the group of devices being used in the case, that any devices must be taken out of service to perform maintenance.

Exploitation politics

L. Fedele at policy level distinguishes (Fedele, 2011, p. 14):

TPM - *Total Productive Maintenance* - comprehensive maintaining the productivity,

RCM - *Reliability Centered Maintenance* – the maintenance focused on reliability,

Total Productive Maintenance (TPM) is a method (Masaki, 2007, p. 178) of management the resources, which puts pressure on cooperation between divisions: operational and maintenance, aimed at zero defect, zero failures, zero accidents at work (effective workplace) (Gulati, 2009, p. 167).

„The method of achieving these objectives is, among others, stimulating the initiatives of the operational staff, who can submit proposals of improvements, group solving the problems." (Urbaniak, 2004, p. 200).

TPM aims to activation of all employees at various levels of the organization with their different functions, in order to unite efforts to maximize the overall efficiency of production resources.

TPM (Gulati, 2009, pp.169-176) is based on the following principles:

- improving the efficiency of resources and equipment,
- *Autonomous Maintenance* carried out by the operators,
- serviceability, adjustment and minor repairs,

- planning the handling by exploitation division,
- training of improvement the operations and skills in a scope of maintenance,
- better designing of workplaces, including taking into account the standardization of procedures.

According to R. Gulati, TPM consists of eight pillars of activities, that affect all areas of the organization, with three basics, that are immutable and always should take effect:

1. The involvement of all employees;
2. Teamwork;
3. 5 "S" (Japanese version: seiri - selection, seiton - systematics, seiso - cleaning, seiketsu - maintaining cleanliness, shitsuke – selfdiscipline).

J. Levitt believes that pillars are specific strategies of transforming the *Lean Maintenance* and can be changed and accept TPM as a building with 4 plinths, which are the bases and can not be changed (Levitt, 2010, pp.61-62):

1. Safety, health and environment,
2. Training,
3. 5 „S" (a modified version compared to the Japanese version - separate, organize, clean the place of work, standardize, self-discipline)
4. TPM office,

and 6-columns:

1. Autonomous Maintenance,
2. Synchronized Maintenance,
3. Proactive Maintenance,
4. Quality of a product,
5. Continuous improvement of both equipment and processes,
6. Management of a new equipment.

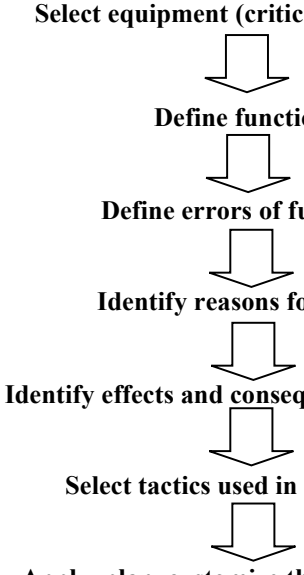


Fig. 1. Steps of RCM by J. Moubray (Campbell, 2001, p. 45)

Reliability Centered Maintenance (RCM) - maintenance focused on reliability is a historical process that led to the development of reliability issue of dependability (reliability).

RCM was created as an attempt to find answers to questions, that were partially ignored:

- What does equipment do?
- What type of functional failure are possible?
- What are possible consequences?
- What can be done to prevent them?

Implementation of RCM by J. Moubray should be in accordance with diagram shown in Figure No.1.

RCM is a set of rules, methods and procedures for management of maintenance and their rules aim to rapidly increase and sustain growth of availability and safety in the enterprise. RCM uses the theory of reliability as its basis.

J. Moubray draws attention to the use of RCM in *Proactive Maintenance*, because of the study of „P-F" interval (potential failure - functional failure) (Moubray, 2002, pp.144-168).

Model of analysis the causes of damages, which allows the personnel to determine plans and procedures for management of interventions, is achieved by incorporating the principles of RCM on three levels:

- assessment of the consequences of damages to the decision-making process, which takes into account the criteria of safety, economic parameters and maintenance costs;
- developing the researches over models of complex systems damages, to determine a new approach in choosing the most appropriate policies of preventive or alternative actions;
- binding of these activities in a process which guarantees making optimal choices.

RCM must be implemented throughout entire facility's life cycle, if it is to achieve maximum efficiency (Gulati, 2009, p. 214)

R. Gulati believes that decision of introducing RCM in relation to the technical facility, including monitoring the conditions under which the facility will be used, will have a greater impact on cost of life cycle of the object. This decision is best to take during planning and designing phase. Since decisions about RCM are often made later in the life cycle, it becomes more difficult to achieve the maximum possible benefit from RCM program.

However maintenance absorbs a relatively small part of total life cycle costs, the program of balanced RCM is still available to achieve 10-30% savings in annual maintenance budget of the facility during phase O & M (Operations and Maintenance.).

Currently the most popular variant of this method (policy) is version RCM II developed by J. Moubray and constantly improved.

RCM II is a process used to meet expectations of users, enabling determination the functional interdependence of groups, which are composed by the users and employees, to design programs enabling reliability of technical objects.

It was assumed in the concept of RCM II, that new production technologies require new solutions in the scope of handling.

Business approach to managing the operation

In the theories of operation management, in the West limited to Maintenance Management, it appears the concept of thinking about maintenance in business terms. In this approach, it is analyzed the impact of maintenance on the profitability of the enterprise.

Maintenance should be managed just like any business organization. T. Wireman notes that „if manager of maintenance makes one or two bad decisions in any business part, the profitability of the entire plant can be threatened", and also believes that for maintenance organizations „it is important the setting business goals, objects, policies and procedures for maintenance and dependability departments, as far as one really establishes the business " (Wireman, 2008a, p.1).

Business approach requires determination the measures of achieving the objectives, and it is important the adoption of acceptable deviations from the accepted indicators. Such a measurement system known as KPI (*key performance indicators*) should constantly make measurements of these indicators and study deviations and in case of deviations not falling within the limits set as acceptable, causes of their occurrence must be established.

As soon as the causes are identified, one must determine the appropriate corrective actions to fix the problem. Along with the determination of corrective actions, it is important to plan how to implement this action; it often requires communication with other units or internally with individual employees of exploitation unit.

Corrective actions should be included in schedule; before the beginning of implementation, the schedule should be known and understood by all participants of corrective actions implementation. After finishing implementation of corrective action one should periodically evaluate the effect of this action and answer the question whether the correction has solved the problem; if the problem has not been solved, further corrective actions are necessary until the problem is corrected. Corrective actions may take a form of a loop of continuous improvement, where KPI are constantly monitored, to ensure focus on business of maintenance and dependability.

By T. Wireman such system of business control ensures that maintenance and dependability unit is managed in efficient way and it ensures generating a profit.

The author of the trilogy on *Maintenance Strategy Management*, Terry Wireman believes, that business approach to maintenance requires the successive implementations of strategies.

Adopted by the author's philosophy of development of fixed assets maintenance systems is based on the assumption: as long as *Preventive Maintenance* is not effective, every consecutive strategy will be more costly and inefficient. It is a starting point to improvement handling systems and it is necessary to master this strategy before implementation the next-generation maintenance strategy. Similarly Nakajima Seiichi believes that the PM (*Preventive Maintenance*) is a core of handling processes strategies (Nakajima, 2008, pp.12-29).

The second series of „maintenance" strategies is a continuation of the first series, but under condition of effective functioning the first series modules.

The second series of „maintenance" strategies improvement begins from the module of planning and scheduling of handling processes through the module CMMS/EAM (Computerized Maintenance Management Systems / Enterprise Asset Management), until training employees in a scope of acquisition the „maintenance" skills.

Planning and scheduling „maintenance" processes aims to optimize the cost of service life, assuming minimizing interruptions of operation of the device.

Criterion of choosing the optimal variant of projects implementation in the scope of operation, especially in the field of maintenance, is often minimizing of time of device exclusion; however not always is so, because in some cases it can be efficient use of operated technical means, under the given constraints, eg. financial. Therefore there is a need of building mathematical model, which would be a base for formulating, appropriate to the situation, tasks of optimization.

Computerized Maintenance Management Systems

Computerized Maintenance Management Systems is an essential tool for all maintenance units. It helps maintenance divisions to improve efficiency and effectiveness, and - ultimately - to gain more of the fixed assets by improvement of critical „work streams", planning, scheduling and reporting. Two types of systems are available. One type is regarding the entire enterprise set of modular applications, such as fixed asset management, material resource planning, finance and human resources. These applications can work effectively in many places and plants. Most of these systems, developed in the mid-90s and at the beginning of this decade, is known as *Enterprise Asset Management* (EAM). Their installation is costly.

Another type of systems are autonomous applications of maintenance management. They can have an area of joint action with other enterprise systems such as systems for Finance and Human Resources. These systems are called *Computerized Maintenance Management Systems* (CMMS). The name CMMS was introduced in the 70s and 80s, when programs PM (*Preventive Maintenance*) were automated using computers. Basically, at present there are no major differences between the methods of functioning the systems of both types, so the notions CMMS and EAM are often used interchangeably.

The third series of maintenance strategies T. Wireman closes with the issue of implementation the training programs of operation and operators. He draws attention, that the issue of skills and increasing a scope of knowledge on operation (here understood as operator and handling personnel) is a critical point for the next steps to enter the higher levels of fixed assets management strategy.

The next step in improving the quality of maintenance processes is to go to *Predictive Maintenance* (PdM)

strategy. The basis of PdM is using the diagnostic techniques for evaluation state of fitness of equipment.

Business approach to operation management requires financial optimization through total costs of operation management. The following data are necessary to analyze the total costs:

- MTBF - medium time between failures,
- MTTR - mean time to repair,
- downtime costs and costs of lost production,
- ABC Pareto distribution of causes of equipment failure,
- the initial value of the equipment,
- costs of regeneration,
- history of operating the device.

It is necessary the continuous improvement of enterprise management system including the system of fixed assets operation management.

The last strategy of maintenance on the development path of management methods is a continuation of improving all aspects of operation management. This strategy is often called „Best Practices".

„Best Practices" is an idea that ensures that the technique, method or process that is more effective in supplying the desired results than any other technique, method or process.

It is usually documented practice being used by most of respected, competitive and able to generate profit organizations.

Best Practice, if properly implemented, should improve efficiency and effectiveness in specific area. Best Practice is a relative term, because some may be a routine or standard practice, but for others it may be the Best Practice, since the current practice or method is less effective than the practice of other organizations.

According to the American Productivity and Quality Center the three main barriers to the acceptance of Best Practice is lack of (Gulati, 2009, p.21):

- knowledge about current Best Practices,
- motivation to enforce the changes needed for its acceptance,
- knowledge and skills required for its acceptance.

„There is no single Best Practice, since what is considered as the best, is not the best for everyone. Each organization is different in its own way, when taking into account its mission, culture, environment and technology. By „the best" one should understand those practices, which showed, that they achieve the best results" (Gulati, 2009, p. 248).

The evolution of the strategy of exploitation process management is largely due to changes in approach to the role of resources, especially of fixed assets, in the creation of enterprise value.

Conclusion

Management of cycle of operating the fixed assets processes is a causing to that operational processes are carried out in accordance with a will of managing of the process. In different models of management of operation processes, it is important, regardless of the using the universal principles, also determination of specific methods in the operation management, which however must be subordinated to goals of business management.

If the enterprise accepted as the primary goal an increasing its goodwill, then all subsystems realizing their goals should get close the enterprise to increasing its goodwill.

The development of economic volume of activity of enterprises has led to ever deeper division of labor, increased specialization of work stations and organizational units of higher levels, and thus to the disintegration of the individual subsystems. In contrast, the development of technical and organizational progress manifests itself in the automation of manufacturing processes and the use of information technology to automate processes of information and decision-making, resulting in a closer integration of auxiliary activities, information and decision-making, the latter can be both a centralized, involving the entire system of manufacturing, and decentralized referring to the individual system components.

Turbulent changes in the environment of enterprise make it necessary to increase the flexibility of the organization, or the ability to adapt to the rapidly changing environment. This causes that both in production processes and service processes, withdrawing from deep specialization, one looks for an optimum of specialization.

According to the old paradigm, the development of the concept of *Preventive Maintenance* was based on the belief that maintenance is to a wholly behave the reliability or built-in utility potential of each fixed asset. According to the new paradigm, based on a deeper understanding the role of fixed assets in building a goodwill (business role) it is important, what the fixed asset enables to realize in accordance with required standards, and not, what this asset is.

In the process of improving asset management the strategy of *Preventive Maintenance* should eliminate the failures in order to eliminate unplanned downtime.

Increasing a state of fixed assets ownership may not be necessary, because if handling system increased dependability of existing fixed assets, it would be superfluous additional purchases, and thus the effectiveness of the invested fixed capital would be higher and it would be an increase of indicator ROI (Return On Investment).

The development of systems of maintenance processes management should proceed evolutionary through a shift away from reactive to preventive model, and then seek to „Best Practices" in the conditions of specific enterprise.

References

Campbell J., Jardine A, Mc Glynn J. (2001). *Asset Management Excellence*, Taylor & Francis Group, Boca Raton.

Czekaj J., Dresler Zb. (2005). *Zarządzanie finansami przedsiębiorstw. Podstawy teorii*, wyd. III PWN, Warszawa.

Fedele L. (2011). *Methodologies and Techniques for Advanced Maintenance*, Springer - Verlag London Limited.

Grudzewski M. W., Hejduk K. I., Sankowska A., Wańtuchowicz M. (2010). *Sustainability w biznesie czyli przedsiębiorstwo przyszłości. Zmiany paradygmatów i koncepcji zarządzania*, Wydawnictwo MT BIZNES, Warszawa.

Gulati R. (2009). *Maintenance and Reliability Best Practices*, Industrial; Press Inc. New York.
Koźmiński K. A., Piotrowski Wł. (ed.) (1998). *Zarządzanie. Teoria i praktyka*, PWN, Warszawa.
Levitt J. (2009). *The Handbook of Maintenance Management*, second edition, Industrial Press Inc., New York.
Levitt J. (2010). *TPM Reloaded*, Industrial Press Inc., New York.
Masaaki Imai (2007) *Kajzen Klucz do konkurencyjnego sukcesu Japonii*, Kaizen Institute Polska s. c. and MT Biznes Sp. z o. o. Warszawa.
Moszkowicz M. (ed.) (2006). *Zarządzanie strategiczne. Systemowa koncepcja biznesu*, UE Wrocław.
Moubray J.(2002). *RCM II Reliability-Centered Maintenance*, Industrial Press, Inc. New York.
Moubray J.(2009). *New Paradigma*, *http://www.aladon.com/PDF/parUS.pdf* of 21.12.2009.
Nakajima Seiichi (2008). *Introduction to TPM*, Cambridge Mass Productivity Press. Cambridge.
Wireman T. (2008a). *Maintenance Work Management Processes*, Industrial Press, Inc. New York.
Wireman T. (2008b). *Preventive Maintenance*, Industrial Press, Inc., New York.
Wireman T. (2008c). *MRO Inventory and Purchasing*, Industrial Press, Inc., New York.

RECEIVED: 11 October 2016 **ACCEPTED: 10 May 2017**

Krzysztof Szewczak. PhD in Economics, Warsaw Management School - Graduate and Postgraduate School, Poland. Research interest: theory and practice of management, fixed assets operation management. E-mail: krzysztof.szewczak@gazeta.pl

Vadyba
Journal of Management
2017, № 1 (30)
ISSN 1648-7974

THE EUROZONE CRISIS AND THE EFFECT OF BREXIT

Paulína Srovnalikova[1], Juste Razinskaite[2]
[1]Alexander Dubček University of Trenčin, Slovakia, [2]London Middlesex University, United Kingdom

Abstract

Eurozone debt crisis continues for more than five years. It is important to understand the causes of the crisis, it is possible for the future development scenarios, and how it will affect individual country companies and individuals finances. Over last five years the euro area shocked two major crisis. Greek decision to leave EU (Grexit) and now UK (Brexit). Greek stayed in the EU after all, but UK looks made the last solution to leave EU. There are important to look what will happen with the EU citizens resident in the United Kingdom, and United Kingdom nationals residing in the EU. If there will be any changes for the immigration and emigration to the UK after Brexit. How the Brexit will impact the foreign direct investments, economy in all European Union after UK withdraw. This situation in Europe is likely to reduce lending and economic growth is not or it would be very slow for a number of years. That is why Europe (and other countries) politicians are ready to do everything to prevent such a scenario. After Brexit, United Kingdom, will not be able to reach for excellent deals with non-EU countries in order to reduce trading costs and that this would encourage foreign direct investment. Although the UK would no longer have to compromise with other EU countries in the negotiations. If the UK were to leave the EU but wanted to remain a member of the European Free Trade Area or the European Economic Area, it may have to accept unrestricted EU immigration.

KEY WORDS: Eurozone, Crisis, Brexit, Immigration, Foreign Direct Investment.

Introduction

Eurozone debt crisis continues for more than five years. Although these are the political and institutional decisions suggest that the worst is behind us, the consequences of the crisis will be felt for many years. European Central Bank's liquidity loans, fiscal discipline, contracts and other agreements lead Europe in the right direction, but a huge debt burdens weigh heavily on the shoulders of many years. It is important to understand the causes of the crisis, it is possible for the future development scenarios, and how it will affect individual country companies and individuals finances.

The euro zone crisis has many aspects, starting for a variety of the crisis in the global economy and the implications of Europe as well as in Sweden and the Baltic countries.

The purpose of this article is to discuss what means a number of euro zone crises of uncertainty, to indicate two biggest crises in Eurozone in past 5 years.

There are two main euro zone crisis objectives. Such as the breakup of the monetary union and the Greek default and exit from the euro zone in 2012. After the Greek crisis became a bit of a stable situation in the euro zone, but then suddenly comes out United Kingdom's Brexit referendum to leave the EU in 2016. It is not clear what the UK's future will look outside the European Union (EU), which allows Brexit leap into the unknown. This report gives an overview of the pros and cons of the most likely possibilities. After Brexit, the EU continues to be the world's largest market and the UK's the largest trading partner. But one of the main question is what will happen with the EU citizens resident in the United Kingdom, and United Kingdom nationals residing in the EU? How the Brexit will impact the foreign direct investments, economy in all European Union after UK withdraw?

In May of 1998 11 European countries met the convergence criteria and were the first to adopt the euro. Those countries are: Germany, Belgium, France, Spain, Italy, Ireland, the Netherlands, Luxembourg, Portugal, Finland and Austria. At that time, the United Kingdom and Denmark have completed the first two stages of readiness to adopt the euro currency, used the so-called "opt-out" reform of the third stage of EMU, meantime at the same time, Sweden and Greece failed to meet the necessary requirements. Sweden has decided not to join the Exchange Rate Mechanism on the outstanding criteria despite the opt-out form. In 2001, Greece adopted the EMU in 2007 - Slovenia, in 2008 - Malta and Cyprus in 2009 – Slovakia, in 2011 - Estonia, in 2014 - Latvia, in 2015 - Lithuania.

The rest of Europe countries are planning to adopt the euro in 2018 - Bulgaria, in 2019 - Romania and in 2020 - Hungary, Poland, Croatia and Czech Republic. Also, there are few EU countries which are not going to adopt the euro are Denmark, Sweden and United Kingdom. (This country actually is leaving EU.)
The beginning of the Euro Zone crisis and recession and the sovereign debt crisis. The euro zone crisis is more than 5-year debt crisis, what have been started in the European Union since 2009.

The euro zone debt crisis is not a direct global financial crisis and the consequent global recession, its direct consequence, but the events have highlighted the structural problems in the euro zone and increased the tension in it. “Falling global demand has forced central banks to cut interest rates and increase liquidity, and the government, in accordance with "good old" Keynesian economic policy of attempting to promote their economies by increasing by spending and budget deficits.” (Nerijus Mačiulis, 2011 [R.1.1]) At the same time, the economy was in recession and tax revenues. Due to just mentioned reasons, the budget deficit of Portugal, Ireland, Greece and Spain in 2009. Exceeded 10 percent's GDP and gave rise to the contempt acronym "pIGS". These countries together with Italy remain the euro area debt crisis epicentre.

While imbalances in the euro zone (because of cheap credits and uneven competitiveness) formation of the main unit cohesion in the euro area and its "foundations" loss was caused by chronic problems of the Greek economy. Throughout 2009 year, the confidence in the euro zone countries remained high despite retreating euro area economies and frenzied world financial crisis. The difference between Greek and German 10-year government bond yield was 1 percentage point. However, at the end of 2009, investors began to doubt whether that Greece would not be able to give back their debt and EMU countries will want to save it, so one way or another to take over part of Greece debt. During a few months’ time the Greek government bond yields jumped above 10 percent. Borrowing on financial markets as the price lost its meaning.

When the crisis has greatly increased tensions in the banking sector and the weakening of market confidence, it lays deep distrust of governments and their ability to repay a huge debt. In part, this lack of confidence stems from the fact that the individual euro-zone members cannot print money and inflation help to reduce their real debt burden. Sovereign debt crisis in the beginning with no institutions that could help countries solve their liquidity problems.

In 2009 deteriorating economic situation in Greece, the country's GDP contracted by 3.3 per cent, (2008 - 0.2 percent). Along negatively markets approach to the stability of Greece's debt - in 2009 Greek debt jumped from a year ago, the former 113 percent by 129.3 per cent. Although the debt level itself is not a very big problem (for example, Japan's public debt exceeded 200 percent Their GDP), but the retreating Greek economy and the government's inability and unwillingness to reduce the budget deficit, also the other to initiate much needed reforms showed that the debt is out of control, i.e., Greece it will never be able to repay.

In 2010 other euro area members continued to perform very expansionary fiscal policy - neither one of them (except Finland and Luxembourg) has not fulfilled the Maastricht Treaty's less than 3 percent GDP budget deficit criterion. In 2010 May the beneficiary Greece was the only country - in the same year to the IMF and the EU turned and Ireland, which received 67.5 billion million loan. In 2011 May of these two institutions in Portugal received 78 billion EUR formal loans. A few months after the granting of the aid, began to decline in capital confidence in the euro zone countries - Spain and Italy. The ECB has updated the Securities Markets Programme (SMP), which he bought government bonds on the secondary market. While official aid has been designed from the SMP update to 2011. The end of the ECB bought more than 130 billion euro Italian and Spanish bonds. Meanwhile, the Italian public debt, which for many years has exceeded 100 percent Of GDP in 2011, was already more than 120 percent GDP. This is the second highest debt level in the EU, which is lower only for the Greek public debt level (160 percent). The main reason for lack of confidence in Italy was too small for its competitiveness, slow growth and government inaction.

Ireland is an exception in the sense that the country their knees at the irresponsible behaviour of public finances - the debt before the crisis was only 24.7 percent GDP - but the government's decision to guarantee the six Irish banks, reckless financing of the huge real estate bubble commitments. In a sense, the Irish Government, in order to avoid a banking crisis, part of the debt from the private sector moved to the public sector.

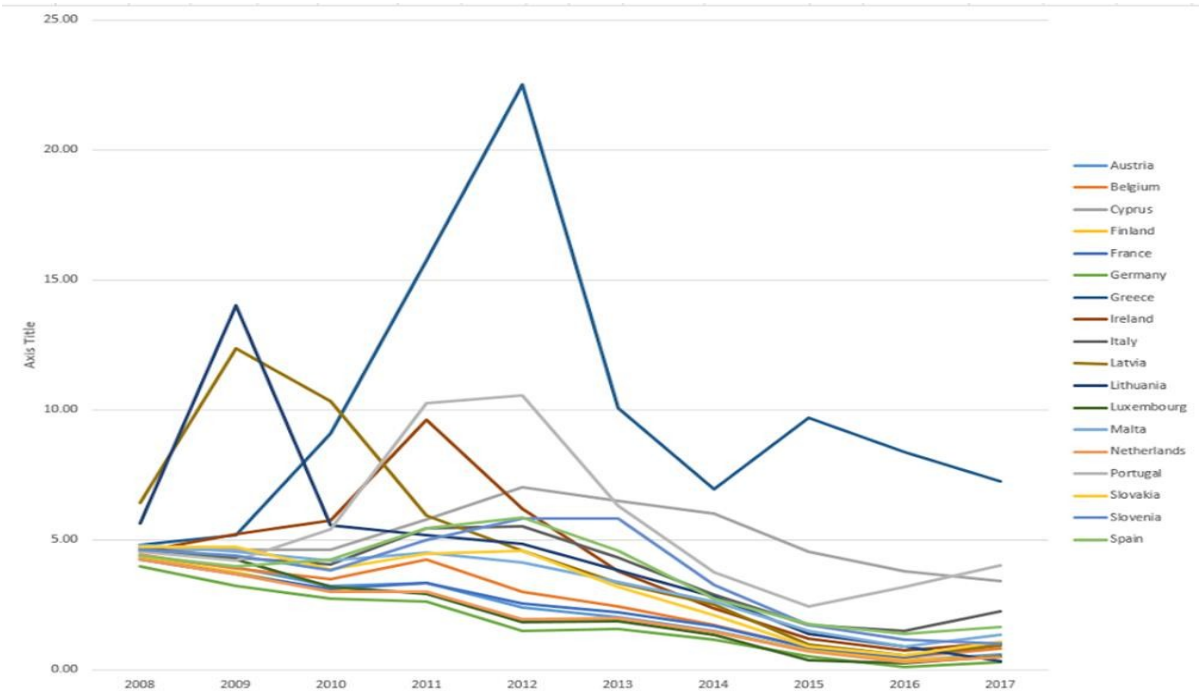


Fig 1. Long-term interest rates
[Statistical Data Warehouse]

Crisis and trust policy are related

Although the U.S. and UK debt and budget deficit figures are worse, these countries can borrow much lower interest rate than most European countries. This indicates that the structure of the euro area is fundamentally flawed, and investors have questioned whether politicians and the ECB will want to avoid the bankruptcy of the country's states. Germany's initial claim that the ESM, which if necessary will be able to lend euro-area Member States should include private sector participation in the elements, prompting investors generally avoided the euro zone sovereign bonds. Only later, this idea was abandoned, and European politicians began to argue that the Greek debt restructuring was a unique event, which will never happen again in any other euro zone state.

Politicians' actions during this crisis can be described as a "foot-dragging" - reluctance (or inability) to take urgent measures to stop the crisis from spreading further. Initial response - the European Financial Stability Facility (EFSF) was an obviously inadequate and only a temporary measure. Most likely, the policy not in a hurry to build a "firewall" to stop contagion and restore confidence about the moral hazard risks - quickly solved the problems of Greece, Italy and other countries have never had to end on a far-reaching reforms, they could be initiated only when the market began to "breathe them in the back of the head."

The situation worsens and sometimes seen in the differences between Member States as to why, when and how they should save each other. Because of the many important decisions had to vote in national parliaments, and the process was not smooth - for example, in Slovakia because of disagreement on this issue the government fell. Almost all the problems in countries with policies cannot explain to the public that fiscal austerity and structural reform path is the least painful way out of the crisis. Upcoming elections that will be held this year in Greece and France, and in the 2013 was - in Italy, creates a lot of uncertainty and further complicates the situation. There is a risk that populist politicians will decide who, although not unpopular among their constituents (for example, refuse to extend a helping hand and to withdraw from the euro zone), but it can have tragic long-term consequences.

The Growth and Stability Pact Compliance

"Strict Maastricht convergence criteria are designed to ensure that all countries in the euro zone, to maintain stable prices and exchange rates, low budget deficits and debt, and that they have confidence in the financial markets. The Stability and Growth Pact (SGP) was to ensure sustainable growth in the euro area members, demanding that their budget deficit below and not exceed 3 percent. GDP and public debt - 60 percent of GDP. Initially, the SGP had set much stricter limits than those provided for in the Maastricht Treaty, for example. Reducing the budget deficit to 1 percent GDP and the use of automatic financial sanctions." (Nerijus Mačiulis, 2011 [R.1.1])

However, before signing the pact, the requirements were relaxed, for example, The imposition of sanctions was to accept a two-thirds majority of finance ministers violators automatic financial penalties for violation of the requirements have not been applied in many countries, including France and Germany, they will continue to be violated The pact was violated more than 60 times. Peer pressure was weak, while sinners were allowed to decide whether to punish or not. Because violators there were so many, the system never failed.

In 2012 year March signed a new fiscal agreement which one helped address the root problems. The aim of this agreement is to adjust the structural budget deficit

(adjusted, taking into account the economic cycle), and for violations of this requirement is subject to a semi-automatic financial sanctions unless the vast majority of countries (85 percent). Would vote against it. The avoidance of sanctions remains, because of large budget deficits and may occur due to objective reasons, such as natural disasters.

Relevance of these days in the Eurozone

There are signs that the euro area economy is recovering, but it is far from back to normal**.**

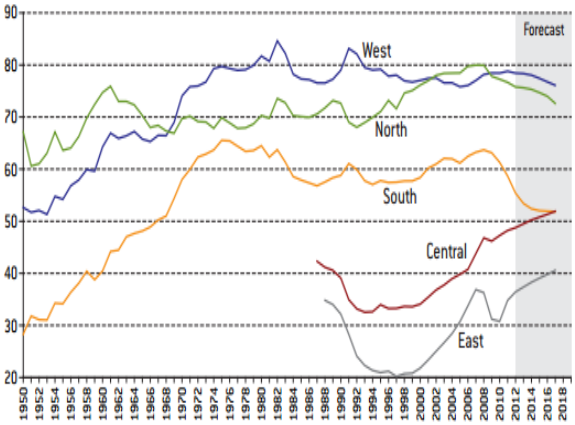


Fig. 2. GDP per capita in major geographical regions of the EU (USA = 100), 1950-2017
[Article: The euro crisis: Ten roots, a fewer solutions, 2017]

When the Eurozone crisis started one Professor of International Economics in Geneva said: "The Eurozone is levitating on the hope that European leaders will find a way to end crisis and take steps to avoid future ones. Unless more is done, however, this levitation magic will wear off and the Eurozone crisis will resume its destructive, unpredictable path." [Charles Wyplosz, 2010]

Right now, after more than five years, this prophecy proved to be accurate. The situation was getting worse and worse until taken determined steps to stabilize the financial markets. However, many shortcomings and imbalances that caused the crisis in the EZ are still without demonstrated arguments:

- non-performing loans
- growing interest rates very fast
- unsuccessful investment

Nowadays, when the all situation about Greece (Grexit) left behind and we can see a bit better times for Eurozone. Suddenly, other very strong country decided to Leave EU, it is United Kingdom. This decision is called Brexit.

What is Brexit?

The United Kingdom European Union membership referendum, also known as the Brexit referendum is the term of United Kingdom`s planned withdrawal from the European Union.

UK membership of the EU has been a quite big topic of debate in the United Kingdom for a while. In 2015, Conservative Party desired to hold referendum for a leaving the EU membership was established by the UK Parliament through the European Union Referendum Act. This determination was mostly corroborated by the Prime Minister David Cameron and Chancellor George Osborne.

This term means, that UK population had to vote to support for the country either remaining member of, or leaving, the European Union.

The first vote took place on 23 June in UK. And the result was a bit shocking for the remaining EU countries, because 51, 9% of voters voted in favor of leaving the EU. United Kingdom citizens have been voted that they want United Kingdom to leave the European Union, but UK citizens and the rest EU counties population don't know quite yet what this will mean for the future of Britain's economy, its policies, and its relations with other European countries.

The British government has initiated a formal withdrawal from the European Union on March 29 in 2017 and until March 30 in 2019 supposed to leave the EU properly. Basically, UK have two-years period to filled up all the necessary documents, to solve all issues what will become with export/import from foreign countries, emigration problem and others important parts of leaving EU; unless EU parties will not agree with these negotiations, and offer to do otherwise.

There are lots of reasons why such a strong country as United Kingdom decided to leave European Union. All of these problems appear out of all over the world corners. UK government believe that this big change as the Brexit will be useful in the UK. "We are absolutely going to have to provide fiscal security to people, in other words we are going to have to show the country and the world that the country can live within its means." [The chancellor George Osborne, 2016 06 28]

The most important reasons for UK decision to leave EU:

- The EU threatens British sovereignty
- The EU is strangling the UK in burdensome regulations
- The EU entrenches corporate interests and prevents radical reforms
- The EU was a good idea, but the euro is a disaster
- The EU allows too many immigrants
- The UK could have a more rational immigration system outside the EU
- The UK could keep the money it currently sends to the EU

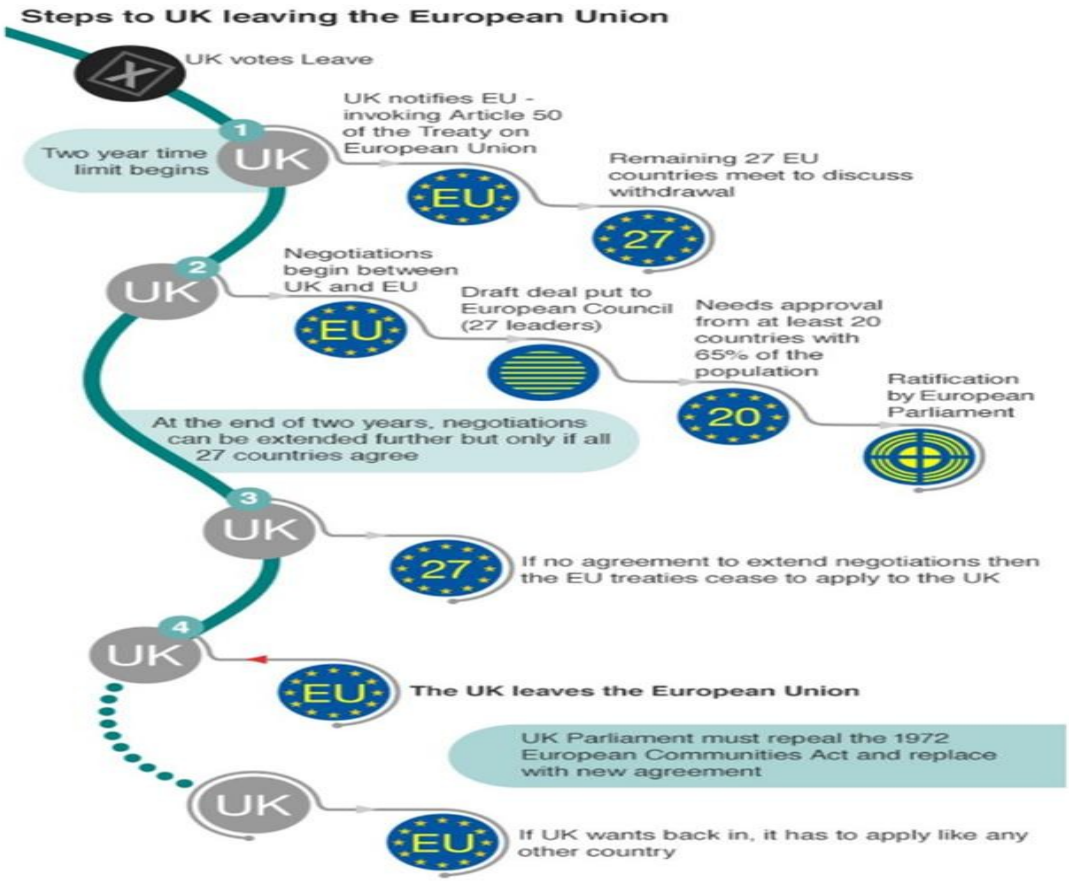


Fig. 3. UK leaving plan
[Article: "Brexit: George Osborne says tax rises and spending cuts needed", 2016]

Brexit effect for the United Kingdom and the world

Much of economists argue that withdrawal from the EU negative repercussions for the UK economy. More recent estimates from different sources, such a decision of the United Kingdom GDP level in the long term could change from -20% to 2% (range 20% decrease to 2% increase compared to the level of GDP, which would be if the UK continues to be an EU member).

The UK solution to leave the EU, a significant increase in uncertainty regarding the economic future. As a result, a possible depreciation in the UK financial assets (e.g., Shares, bonds, pound sterling) would increase borrowing costs. Pound sterling effective exchange rate since November, 2015 within six months period fell by 9%. While in the last month, offsetting only a small part of its lost value. If the pound sterling devalued even stronger, obtain a presumption of goods and services prices rising in the UK, and the positive impact of export growth is expected to be short-lived.

Due to the resulting uncertainty in the business is expected to reduce the volume of investments could be relieved of the employees. This is a slowdown in the UK economic growth or even lead to recession.

It is estimated that the UK foreign trade and foreign direct investment volumes in the long term is also reduced. This has a negative impact on UK productivity growth prospects.

It is estimated that the UK government's budget also reduced. On the one hand, the UK savings, because not pay direct contributions to the EU budget (currently paid about 1% of the tax collected in the UK). On the other hand, due to the above reasons, the UK economy shrinks, leading to automatic tax collection would fall.

However, a small part of economists predicts that the withdrawal from the EU slightly increase the level of GDP in the United Kingdom. These analysts base their estimates on the assumption that in this case the UK very quickly and successfully carry out negotiations with foreign countries for freer trade and significantly liberalized business environment. But hardly UK talks on freer trade to take place as smoothly as, for example, much greater economic weight with the EU negotiations on the trade agreement with Canada took seven years. In addition, business conditions in the United Kingdom is already one of the most liberal among the developed countries of the world.

Withdrawal from the EU the United Kingdom affected not only economically, but also politically. In particular, the British regain more autonomy in shaping the economic and social environment in their own country. However, how much autonomy to recover from being subject to a new agreement with the EU on trade relations. In addition, there is a chance that the UK's withdrawal from the EU, pro-European Scotland initiate another referendum on secession from the UK to again become part of the EU.

If UK citizens to speak up for a stay in the EU, would disappear uncertainty regarding the future of the UK economy. It is believed that the pound sterling recovered from the end of last year and the loss of value of investments start to grow rapidly. In addition, to avoid the debate on a possible new referendum on the secession of Scotland from the UK. On the other hand, the UK economic and political life and continues to be closely aligned to common EU rules.

Referendum debates about UK membership of the European Union (EU), the main argument for Leave campaign is that Brexit allow more control over the flow of immigrants to Britain from the rest of the EU. Many people are concerned that high levels of immigration could undermine their work, wages and quality of life.

Immigration has increased a lot over the past 20 years and a big part this growth came from other EU countries, especially after the 2004 when eight Eastern European countries joined the EU. Between the 1995 and 2016 immigrants from other EU countries, in the United Kingdom has tripled from 0.9 million to 3.5 million. Increased immigration has increased gross national income (more employees will create more GDP) and has benefited from immigrants who come to the UK, although a small difference, but here they are better than their native country.

Another argument in favor of the Brexit is that the large increase in the minimum wage (national living wage) is planned over the next four years, will attract a large number of EU immigrants. It is not clear how big it will be a draw, because it depends in part on what other countries do, that their own wages and the relative cost of living in each country.

Looking from the world side when the British withdraw from the EU, financial markets around the world there will be more uncertainty and volatility. Their size is difficult to assess, because similar events have not occurred. In addition, there is a chance that will begin enhance considered safer world currencies - the US dollar, Swiss franc, Japanese yen.

The negative impact on the EU economy should be relatively small. Direct effects on exports should not be significant, because the UK is sold only 7% of all EU exported goods. Potentially increased EU financial market volatility increased risk for countries with high debt levels. Investment growth can be slow, but foreign direct investment in the EU - particularly in Ireland - flow could even increase if the company decides to move from the UK to the capital of the EU.

The political consequences of the EU could be more significant than economic. At present, EU enlargement critics rank the UK decision to withdraw from the EU would be an additional challenge for the European integration. Therefore, the European Union's economic and political role in the world will become smaller.

If the British decided to stay in the EU, it will avoid the increased volatility of the world, including the EU's financial markets. EU countries with a high level of debt, to avoid the risks of borrowing cost growth. Increased stability of the EU could have a positive impact on investment growth. In addition, if UK citizens overwhelmingly speak for future membership in the EU, it would be a serious Support strengthening of European integration.

It is very important to have a look how it will affect the Lithuania as well, cause more than 140,000 of Lithuania citizens are emigrated to United Kingdom right now.

Lithuanian economic growth in case of Brexit should not significantly slow down. Lithuania UK sells only 5% of total exports of goods and services. However, goods of Lithuanian origin exports to the UK accounted for slightly higher proportion - 7%. It feels more damage unless the individual sectors, such as leather processing industry: in the UK it sells a fifth of its production is exported.

On the other hand, since the UK is the most popular emigration from Lithuania direction (from 2010. About half of the emigrants reside precisely in the UK), the United Kingdom withdrew from the EU, could alter migration: in the UK schedule the leave Lithuanians or stay live the homeland, or more often choose emigration other countries (Germany, Ireland, Norway, and so on.). This would affect the remittances from abroad to Lithuania: last year the total amounted to 1.1 billion euros, while orders from the UK - the largest share.

Lithuania, and the remaining countries of the EU, the political consequences could be more significant than economic. However, if the unity in the future to further weaken, Lithuania - a small open economy - in the long run could feel and greater economic losses.

Conclusions

Although the euro zone, while at the same time, the euro collapse risk is sufficiently low. The main reason for this low risk - high level of uncertainty associated with the potential costs of such a decomposition. They are mainly related to capital flows and trade decline, the dominant uncertainty in the financial sector and the banks. This situation in Europe is likely to reduce lending and economic growth is not or it would be very slow for a number of years. That is why Europe (and other countries) politicians are ready to do everything to prevent such a scenario.

There's another option - the monetary union may decide to leave and some "hard core" countries (Finland, Germany or the Netherlands). However, and in this case would be the inevitable problems - they are mostly related to giving up the value of the currencies of countries appreciation. Though these countries are richer, they would be much more difficult to compete in the global market, and their growth rates are likely to reduce the unemployment rate - have risen.

In point of fact that the Brexit may have a negative impact on inward foreign direct investment. This analysis shows that leaving the EU will reduce foreign direct investments in UK. Such losses will damage the UK investment and productivity would reduce real incomes. Case studies of finance also suggest that Brexit would reduce EU production-related goods and services, and disrupt the UK's ability to negotiate concessions with the EU regulations on related transactions.

After Brexit, United Kingdom, will not be able to reach for excellent deals with non-EU countries in order to reduce trading costs and that this would encourage foreign direct investment. Although the UK would no longer have to compromise with other EU countries in the negotiations. Moreover, would not get automatic access to new deals struck with the EU, such as currently being negotiated with Japan and the United States of America.

If the UK were to leave the EU but wanted to remain a member of the European Free Trade Area or the European Economic Area, it may have to accept unrestricted EU immigration just as all other countries like Norway or Switzerland do. Only a looser trading agreement with higher trade costs would potentially enable the UK to restrict work-related EU immigration in much the same way as non-EU immigration is restricted.

There is no possibility to be precise about the size of the losses from restricting immigration following a Brexit. But we can confidently say that the empirical evidence shows that EU immigration has not had significantly negative effects on average employment, wages, inequality or public services at the local level for the UK-born. Nor, it should be said, are there large positive effects.

At the national level, immigration falls within the EU may fall in living standards in the UK born. This is partly because immigrants are helping to reduce the deficit: they are more likely to work and pay taxes, and less likely to use public services because they are younger and more educated than the UK born. It is also partly due to the positive impact of EU immigrant's productivity.

The previous report reflects the broad consensus that trade and foreign investment will also fall under Brexit, both of which would reduce the UK revenue. Looking at the point of immigration, the result of this investigation shows that lower immigration will push the UK living standards even lower.

As the euro zone break-up probability is low, used article`s authors has established results, that there is no reason to reduce savings in euro (who saves money), but investors should be noted in the estate of the issuer (deposit-taking banks, etc.). The quality and potential exchange rate fluctuations.

References

Arnorsson A. & Zoega G., On the Causes of Brexit, London, 2016. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2851396 (Access on: 2017 03 20)

Albert A., Home care bosses call Brexit result "disappointing", Homecare website. Available at: www.homecare.co.uk/news/article.cfm/id/1576802/Brexit-prompts-home-care-leaders-to-voice-concern-about-impact (Accessed on :2017 04 03).

BBC News, Brexit: George Osborne says tax rises and spending cuts needed, 2016. Available at: http://www.bbc.com/news/uk-politics-eu-referendum-36647006 (Accessed on: 2017 04 02)

Baldwin R., Gros D., What caused the eurozone crisis?, Centre for European Policy Studies, Brussels, 2015. Available at: https://www.ceps.eu/system/files/What%20caused%20the%20EZ%20Crisis%20RB%20DG%20CEPS%20Commentary.pdf (Access on: 2017 04 02)

Darvas Z., The Euro crisis: Ten roots, but fewer solutions, Bruegel Policy Contribution, Brussels, 2012/17. Availablet at: https://www.econstor.eu/bitstream/10419/72112/1/728332493.pdf (Access on: 2017 04 25)

European Central Bank, Long-term interest rates Statistical Data Warehouse, Available at: http://sdw.ecb.europa.eu/ (Access on: 2017 04 28)

Grauwe P.D., Self-fulfilling crises in the Eurozone: An empirical test, Journal of International Money and Finance, 2013. Available at: http://www.sciencedirect.com/science/article/pii/S0261560612001829 (Accessed on: 2017 04 02)

M. Gartner, B. Griesbach & F. Jung, The European Sovereign Debt Crisis and The Role of Rating Agencies, International Advance in Economic Journal,2013. Availabale at: http://www.ingentaconnect.com/content/aea/jep/2012/00000026/00000003/art00003 (Accessed on: 2017 03 20)

Lane P.R., The European Sovereign Debt Crisis, The Journal of Economic Perspective, 2012. Available at: http://www.ingentaconnect.com/content/aea/jep/2012/00000026/00000003/art00003(Accessed on: 2017 03 20)

Rooney B., Europe strengthens fiscal ties, CNN Money, 2012. Available at: http://money.cnn.com/2012/03/02/markets/european_union_fiscal_pact/index.htm (Accessed on: 02017 03 28)

Smart R. D., Blum M. & Wesseler J, Trends in Approval Times for Genetically Engineered Crops in the United States and the European Union, Journal of Agricultural Economics (JAE), 2016. Available at: http://onlinelibrary.wiley.com/doi/10.1111/1477-9552.12171/full (Access on: 2017 04 03)

The commission of Europe, Economic governance. Available at: http://ec.europa.eu/europe2020/europe-2020-in-a-nutshell/priorities/economic-governance/index_lt.htm (Access on: 2017 03 30)

Vasilopoulu S. & Halikiopoulou D., In the Shadow of Grexit: The Greek Election of 17 June 2012, Journal South European Society and Politics, 2013. Available at: http://www.tandfonline.com/doi/abs/10.1080/13608746.2013.779784 (Access on: 2017 03 28)

Wadsworth J., Dhingra s., Ottaviano G. & J.V. Reenen, Centre for Economic Performance, London, Brexit, 2016. Available at: http://cep.lse.ac.uk/pubs/download/brexit08_book.pdf#page=50 (Accessed on: 2017 03 28)

Wodak R., & Angoouri J., From Grexit to Grecovery: Euro/crisis discourses, Discourse & Society (SAGE journals), 2014. Available at: http://www.tandfonline.com/doi/abs/10.1080/13608746.2013.779784 (Accessed on: 2017 03 31)

RECEIVED: 16 January 2017 **ACCEPTED: 10 May 2017**

Paulína Srovnalíková. Ing. MBA. Faculty of Social and Economic Relations, Alexander Dubček University of Trenčin, Študentská 2, Trencin, 91150, Slovakia. E-mail: paulina.srovnalikova@tnuni.sk
Field of scientific interest: finances, competitiveness, competitive advantage.

Juste Razinskaite a graduate of Bachelor Degree in Banking and Finance at London Middlesex University in United Kingdom. Accountant at USA Logistic company „Unlimited Carrier". E-mail: juste.razins@gmail.com
Field of scientific interest: finances, government policy, competitiveness.

Vadyba
Journal of Management
2017, № 1(30)
ISSN 1648-7974

EDUCATION STRATEGY AS ONE OF THE MACROECONOMIC INDICATORS OF THE STRATEGY LEVEL OF THE DEVELOPMENT OF A STATE

Zuzana Horváthová[1], Marián Hosťovecký[2]
[1]Metropolitan University Prague, Czech Republic, [2]University of Ss. Cyril and Methodius, Slovak Republic

Annotation
The main goal of bachelor study is provide quality of education to its student during three years. The better the studies, the better employment chances of the graduates. The competitive ability of today's youth is a very important social and economic factor in every developed state. Since its foundation, the European Union went from its initial documents founding European Coal and Steel Community, to the Lisbon Treaty founding the European Union, through changes in priorities and goals to a very ambitious strategy that is supposed to bring the EU to a leading place in the world market. The EU is supposed to gain a position as the most competitive economy based on a knowledge and skills-oriented economy.
The paper aims at analysing and assessing of educational programme of applied informatics. It describes the assessment quality of bachelor curriculum in half of the academic year (after one semester) by third year students (last year of the bachelor study) of the Department of Applied Informatics and Math at University of Ss. Cyril and Methodius, Slovak Republic. Data was obtained by electronic questionnaire and anonymously from students. The results are presented by graphical output and describes it.
KEY WORDS: social policy, competitiveness, employment, quality of education, data analysing, curriculum, assessment of quality, students, online survey.

Introduction

What does quality mean in the context of education? Many definitions of quality in education exist, testifying to the complexity and multifaceted nature of the concept. The terms efficiency, effectiveness, equity and quality have often been used synonymously (Adams, 1993). Definitions of quality must be open to change and evolution based on information, changing contexts, and new understandings of the nature of education's challenges. New research - ranging from multinational research to action research at the classroom level - contributes to this redefinition.

The goal of the contribution is to show how a quality study program is capable of positively influencing the overall increase of education of the population on both a national and regional level. Education is one of the long-term economic indicators of each state and the states should therefore approach the increase of quality of study programs in a precise and highly specific manner. The key role in the system remains on the part of the state. Given that this is a classic case of non-market goods, the features and benefits of which (known as positive externalities) are crucial for the society, financing of education is predetermined to be primarily from public funding. The EU finances only specific selected programs through subsidy titles for schools, as well as scientific and research facilities.

The world transformative processes influence seriously education systems in all countries and at all levels. First of all, it appears in transformation of the main educational model specifically from the model of knowledge to the model of competency which we can over watch in the most of countries (Gerkushenko et al.,2014). This transform for model of competency is very useful for young generation. That is the reason why education is one of the most important part of national economy for every society, every region and country. Quality of education should be supported by every government in country. If the persons responsible for education realized important of education, try to improve it by variety ways. One of the way, how can we improve or increase quality of education system in every elementary or secondary school, college or university is to provide the opportunity to students comment the content of the educational curriculum (or study program), (Ölvecký - Gabriška, 2014; Toman - Michalík, 2013; Mišútová, 2009, Mišútová - Mišút, 2012; Mišút - Pribilová, 2013)

Education invariably aims at developing competencies, technical as well as non-technical ones. As a consequence, there is also a need for methods that can be used to assess the quality of education faithfully. One possible approach is an assessment of whether intended learning outcomes are achieved, i.e. an investigation if the target audience possesses the desired competencies. Assessment of competencies, however, is tricky since competencies are often only vaguely defined. An approach to assess competencies, and particularly those needed for proper software engineering. To that end, SECAT builds on Rauner's approach for competency assessment in vocational education. Rauner's approach uses nine competency criteria, which are further refined by suitable issues that indicate to which extent a competency is, or should be, present. The main contribution of this paper lies in the adaptation and

enhancement of this framework in order to make it useable in software engineering education. Adaptation and enhancements encompass issues such as team and individual assessments, integration of multiple perspectives from various groups of stakeholders, and product- and process-orientation. The paper also presents first insights from using SECAT in a pilot university course in software engineering (Sedelmaier - Landes, 2015).

Strategic goals for education

What does quality mean in the context of education? Many definitions of quality in education exist, testifying to the complexity and multifaceted nature of the concept. The terms efficiency, effectiveness, equity and quality have often been used synonymously (Adams, 1993)

Upon reaching the basic goals of the EU (becoming most competitive and most productive knowledge-based economy in the world), four new strategic goals were established in the ET 2020 program for education:

- *To put into action a life-long education and mobility in learning program.* Advanced changes in technology and increases in information transfer speeds pose ever increasing demands on life-long education. Important factors influencing employment and other social issues are both the ability and the necessity of life-long education and thus better employability in the job market. The European population is aging and it will become necessary to maintain qualified workers to a later age. The introduction of new methods of education are necessary within the globalized market and an ever increasing overlap of the individual fields, including e-learning courses, webinars and other forms of education using information and communication technologies. The internal market, understood as a whole within the entire EU, requires workforce mobility. Workforce mobility is an essential element for employment in the job market. Preparation for travel to follow jobs should therefore become an integral part of education, both for students and for teachers and training educators. Support of exchange study programs also became a partial priority within the first of the four strategic educational goals.
- *To increase the quality and effectiveness of education and professional training.* Quality systems of education and professional training are essential for Europe's success. The education system is moving away from the classic understanding of mechanical learning - memorization. Through the use of repeated word-to-word definitions, memorizing leads to learning without understanding the content, without logical systemization. The new direction is toward a systematic ability of cross-profession overlap of processing of information and knowledge. The most important goal will be to ensure that everyone gains key competencies. To have a competency means that we are capable of performing suitable activities and get appropriately oriented in a certain natural situation in a manner bringing a beneficial approach.
- *To support justice, social cohesion and active citizenship.* This goal is also accentuated by the international character of the European Union. Emphasis on fair education for all EU citizens is necessary in order to sustain economic growth and social systems. The key interest groups in this case are pupils and students from disadvantaged environments, students with special needs, migrants, etc. The goal is to ensure that they do not end their schooling prematurely, regarding all students between 18-24 years of age in Europe. Their education should also promote multicultural competencies and democratic values without discrimination. Also important are communication skills among peers from different environments.
- *To improve creativity and innovation, including entrepreneurial skills, on all levels of education and professional training.* This part of the strategy is divided into two main goals. The first is the support of key competencies in the area of digital technologies. The second is to endure a fully functional knowledge triangle: education – research - innovation. It is necessary to ensure a collaboration of all stakeholders that influence the future success of graduates in the job market. Collaboration between schools, scientific and research institutions and companies is a key factor for aligning professional and social needs with the personal satisfaction of individuals. Through quality education individuals gain a chance to succeed in the job market and obtain sufficient financial means to satisfy their needs without burdening the social-care system and thus improve the position of the European Union in the worldwide market.

Universities as the centres of knowledge play an important role in education and application of the concept of corporate social responsibility (CSR). They are not just institutions of higher education and research granting titles but they together educate responsible people with excellent knowledge able to solve questions and problems globally and share their knowledge that the wider community can benefit from. The aim is to show which teaching methods could be used to educate students of the study program Informatics (Tokarčíková - Kucharčíková - Ďurišová, 2015). The assessment of academic advising practices is far from satisfactory. Major academic advising approaches and key characteristics of quality assessment practices. We propose the consideration of integrating both the logic model and mixed methods design in academic advising assessment framework. Adapting the Appreciative Education (AE) framework to guide the assessment process, we specify a 6-step model to assess the initiation, interaction, and impact of academic advising practices (He - Hutson, 2016).

When assessing the quality of education should be considered an area involved in the assessment, which takes place. There is a difference, and we will assess the quality of the education system, the quality of schools and the quality of teaching, although all three levels of the pyramid are interrelated and interdependent (Nucem,).

The ability to predict what university course a student may select has important quality assurance and economic imperatives. The capacity to determine future course load and student interests provides for increased accuracy in the allocation of resources including curriculum and learning support and career counselling services. Prior research in data mining has identified several models that can be applied to predict course selection based on the data residing in institutional information systems. However, these models only aim to predict the total number of students that may potentially enrol in a course.. This association with student identity is not always feasible due to government regulations (e.g.; student evaluations of teaching and courses. The results demonstrate that the accuracy of the student course predictions was high and equivalent to that of previous data mining approaches using fully identifiable data. The findings suggest that a students' grade point average relative to the grades of the courses they are considering for enrolment was the most important factor in determining future course selections. This finding is consistent with theories of modern counselling psychology that acknowledges self-efficacy as a critical factor in career planning (Ognjanovic at al., 2016).

Applied Informatics may have an important role in the strategies for attracting and retaining talent in Computer Science (CS) studies and careers. Contrary to the continuing growth of the informatics industry in Europe the number of CS experts (students, graduates, teachers, etc.) is declining. This decline is producing negative consequences in the technology field that affect other sectors like business and education. The purpose of this PhD study is to determine if the strategic implementation is an effective means to counteract the declining trend. The research will: Identify the negative consequences of a declining interest in CS studies in Europe; determine the factors which motivate young Europeans to pursue or reject CS studies and careers; analyse CS curricula and how technology can enhance teaching and learning of the unique skills required to become a computer scientist, thus increasing the interest in CS studies and careers amongst young Europeans (Porta, 2010). Students graduating from this programme develop the ability to work on applied problems. Graduates after finish study at the university will use their knowledges in variety areas. They can offer high theoretical, practical and analytical skills.

Accreditation can be referred to as the procedure followed for official recognition or quality assurance. It provides the opportunity of promoting excellence in the field of education. It can be stated as the process in which the quality of an educational institution or a particular educational programme is evaluated so as to formally recognize it if it meets certain standards. As per the exponential growth in the number of engineering colleges in India, the process of accreditation is becoming a necessity in order to maintain the standard of education in the engineering institutes (Kohli, 2014). According to the continuous changes in technology there is a need for continuous changes in rising area of higher education like engineering for the development and evolution of nation in world. For this, there is a need of educational accreditation. Educational accreditation is classified into different categories like primary educational accreditation, secondary educational accreditation and higher educational accreditation. Accreditation of an educational program is a continuous process which should meet specific standard of quality required for education. There are many points has to be consider for accreditation process (Gonge - Ghatol, 2014).

Modularity is one of the most important quality attributes during system development. Its concepts are commonly used in disciplines of information technology courses, mainly in subjects as software project, software architecture, and others. However, it is notable among certain groups of students that this issue is not fully absorbed in a practical way. Although some researchers and practitioners have approach themes like this, there is still a lack of research about how modularity can be approached in IT courses. This paper presents a systematic mapping study about how the modularity is addressed in education. The main objective is to understand what the main areas in this field are and find more interesting points of research to improve the practice of modularity during IT disciplines (Lima at al., 2015).

Educational policy

The University of Ss. Cyril and Methodius has developed its own basic document Quality Policy titled: *internal system of quality policy at UCM.* Policy, strategy and quality assurance procedures are official and are publicly available. The principles of quality UCM:

- The system has a complex character and is uniform for the whole university;
- The system supports the achievement of strategic objectives of the University;
- The system is elaborated in accordance to national and international Quality Assessment Framework universities;
- The system is open, flexible and focused on continuous quality improvement;
- The system is aimed at strengthening the ongoing feedback from stakeholders and visibility objectives and results of the faculty;
- The system includes the participation of students, employers and other interested parties in the evaluation of quality.

Internal directive regulates cyclic monitoring and assessment of study programs at the University of Ss. Cyril and Methodius in Trnava (further 'UCM'). It is focused on rules, organizational charts and structure evaluation of programs in accordance with internationally accepted evaluation scheme designed for higher education institutions. The cycle of evaluation of programs was processed according to standards and guidelines for quality assurance in the European Higher Education Area, processed organization European Association for Quality Assurance in Higher Education (ENQA) and the monitoring of good practice in the implementation of evaluation systems of European universities. Internal guidelines governing the procedures and framework in which the UCM committed to develop and monitor the effectiveness of the quality system. The

Directive contains binding rules of quality assurance in various fields and at various levels and to various stakeholders. Basic quality policy processed in the internal:

- Linking education and research.
- Quality assurance of teaching staff.
- Monitoring and evaluation of programs.
- Monitoring and evaluation items.
- Control and monitoring of educational process through classroom visits.
- Surveys of relevant target groups in education.
- Assessment of students.
- Evaluation of teachers.
- Monitoring and evaluation of quality in science and research.
- Monitoring and evaluation in the field of international relations and cooperation.
- Student support and involvement of students in internal quality system.
- Public information and information systems.
- Provision of material, technical and information resources to support student learning needs appropriate learning programs.

Education as an economic indicator

The definition of competition-ability of the European Union emphasizes the needs of citizens. Competitiveness enables a country to offer its citizens a growing quality of life and employment for all who want to work.

The EU continues to increase its emphasis on the quality of education in the individual member states, however it fully respects the sovereignty of states in the organization of their educational systems. The responsibility for content and systems of education is fully within the competencies of the governments of the EU member states. Quality school is understood to be a basic prerequisite for the quality development of education of children and students. It is understood in all its aspects, from technical equipment to professional composition of the educational staff. Preparedness and motivation of teachers is seen as a key prerequisite of education of pupils and students in the strategy. Tools and implementation methodologies are ready for school educational systems to achieve all goals of the Strategy 2020 document. All three key aspects are covered: regulative tools, economic tools and information tools. Priority subjects were also established.

Education became one of the key subjects of the Lisbon strategy, defining educational goals intended to help achieve the overall objectives of the strategy. A system of introducing new technologies into education was prepared due to the fast development of information technologies, defining the needs for life-long education. Given the globalized environment of Europe, there is an emphasis on teaching foreign languages and digital literacy.

The aim of our research was to determine quality of study of bachelor programme. An anonymous questionnaire was used in the research that we carried out to determine how students evaluate the quality of this program. The questionnaire was divided into sections:

- *In the first section* a short introductory text about the intent of the questionnaire was presented followed by demographic data about a student: age, sex, student's current grade etc.
- *In the second section* was implemented database of questions about the quality of study programme (curriculum). We were examining differences in content, subjects composition, which subjects are at least beneficial and the most useful for market needs or if students consider useful theoretical knowledges obtained from lectures during their seminars. The questionnaire was anonymous and used electronically. Electronic questionnaire was created using Google Docs and distributed via an electronic link sent to students.

Participants were 76 bachelor students (60 males and 16 females) with the mean age of 21.6 years (range: 19 - 23 years). The research sample consisted of university students in third level of education. Students participated in the research on a voluntary basis, i.e. they could decide for themselves whether they will take part or not.

Research evaluation and practice recommendations

After obtaining specific data we have them evaluated and graphically illustrated. Of the more than 25 items in the test, we selected those that we think in terms of interpretation to the topic the most important.

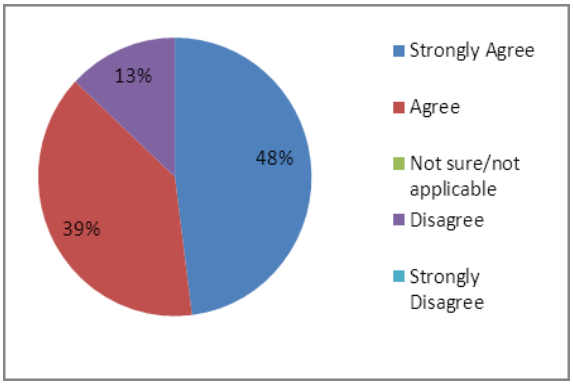


Fig. 1. Is evident consistency between the name of the study program and its content?

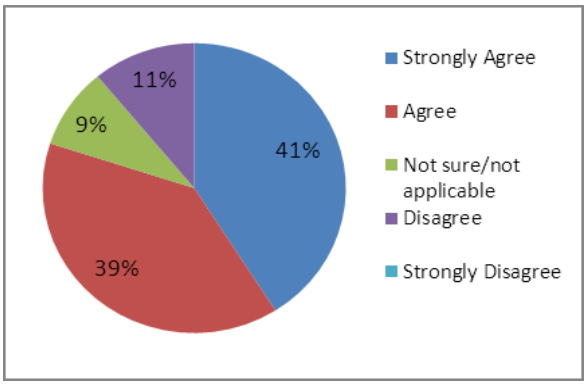


Fig. 2. Does agree study programme composition with the graduate profile of a student?

We have asked students of bachelor's degree, program study of Applied Informatics: "*Is evident consistency between the name of the study program and its content*?" (Figure 1). We have investigated this issue, or indeed the content of study during three years of their study corresponds witch the name of the degree program. More than 48% of students strongly agreed, 39% agreed. Overall, therefore, it expressed, or course content corresponds to the agreed program, nearly 87% of all students. Only 13% of students did not agree with the view that the name of the study program does not match the content. The reason could be that the students probably pointed to the absence of some subjects during the study.

Based on the above, we wanted to confirm the question with the next question in the questionnaire, which was: "Does agree Study program composition with the profile of a graduate student? (Figure 2). "This question surveyed the views from students, or individual objects that have been designed in each semester during every year of study correspond to the profile of the graduate. Based on the results, we can confirm, more than 41% of students strongly agreed with the view that the composition of the study program equivalent to filling a graduate of Applied Informatics. More than 39% of respondents agreed with this view, with 80% of students agreed with this view. Only 11% of students Applied Informatics disagreed with this opinion and requested for more innovative composition of study program of Applied Informatics. Only 9% of students did not answer for the question.

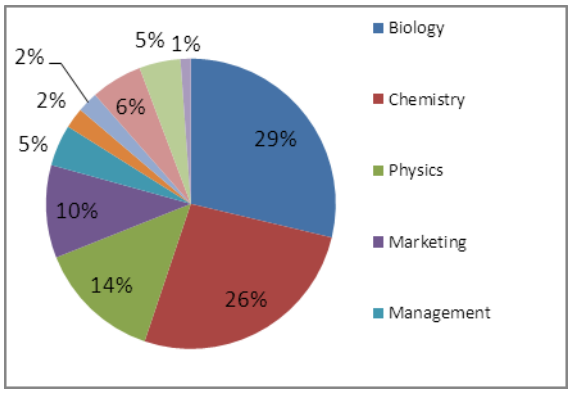


Fig. 3. Which subjects of the study program are at least beneficial for the market need?

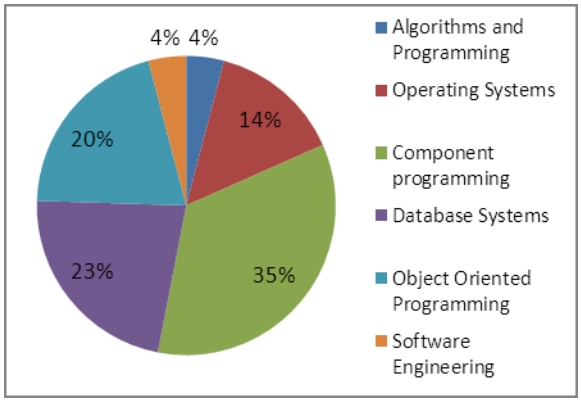


Fig. 4. Which subjects of the study program are the most useful for market needs

Other question that we have investigated form students about the quality of the study program was the question: „Which subjects of the study program are at least beneficial for the market needs? "(Figure 3). This question is one the most important for us, because it identifies which subjects during the study were, for students at least beneficial. Based on the above we can confirm more than 29% of students answered Biology, followed the subject: Chemistry, said 26% of students, and Physics 14% of students. Up to 10% of students reported that the subject of Marketing for least important, followed by 5% subject Management, Accounting 2% of the students said. Subjects that students identified as at least will be remove from new study program at the next accreditation process. More students these subjects not offered and will be replaced by new - attractive and more important subjects from the perspective of practice.

On the other hand we wanted to know which subjects students designated as important for extra practice and their future professional activity. More than 35% of students said that the subject is most beneficial for them Component programming and 20% students Object Oriented Programming i.e., that up to 55% of students deemed most beneficial to market needs programming, ie programming skills. It followed by a further 23% of students who identified the subject Database Systems 14% and Operating System. The remaining 4% of students identified as being most beneficial articles Algorithms and Programming and Software Engineering. In terms of commercial offers that are placed on the site Job, we can confirm the dominance of IT sector offers the most bids is aimed at the programming, database systems and operating systems. These skills are also important for positions as an analyst and consultant of software development. Mentioned objects which gained most evaluation by the students will be widely teaching time from the perspective of seminars.

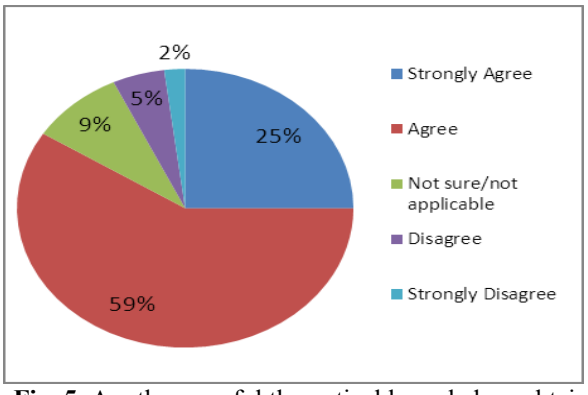


Fig. 5. Are there useful theoretical knowledges obtained from lectures during seminars?

The last graph shows the question: "Are there useful theoretical knowledges Obtained from lectures during seminars?" (Figure 5). As we can see from the responses of students, more than 25% said they strongly agree with the question that the theoretical knowledge of the use of lectures during seminars. Followed by 59% of respondents who agreed with that view. Jointly agreed with the interconnection of more than 84% of respondents. Only 9% of respondents were unable to

comment. 5% of students disagreed and 2% strongly disagreed with the statement that the knowledge gained during the lectures are applied during seminars.

Strategic projects and goals on national levels are approved by the governments of the individual states in accordance with these essential objectives of the EU. With the ongoing transformation of education on the national level of all member states of the Union, a disproportional number of plans, projects and other documents are set forth at such rates that the implementation of one is not completed before another one is issued. Educational laws alone are amended several times per year. The goals of education are established by political priorities of the individual ministers of education, rather than on the basis of professional materials, and the ministers are often changed several times during one election period.

Upon evaluating the answers, many questions and hypotheses arose, suitable for further research or verification. The key subjects of further research should focus on detailed identification of the methods of educating students in regard to their current habits from school.

Another serious matter suitable for further research is a detailed study of the motivation of students for their further application in work life. The European Union strategy is targeting knowledge-based economy. Do the students realize what is expected from them? Do they want to focus on science and research? Do they consider it prestigious? Or are they primarily motivated by financial rewards? Are the EU representatives and the individual member states able to ensure sufficient financial rewards for scientific workers?

Conclusions and discussions

Based on these results we have obtained from students, we can confirm that in the upcoming respectively. The updated program of study for future accreditation be omitted certain subjects and did not offer further students during their studies. In addition, students will have an extension of time should be earmarked for teaching subjects have identified as being most beneficial for practice. It also plans to expand study program for other new items that could increase the attractiveness of study programs, such as. Project management for IT, game development and game programming etc.

Education policy is regarded as a coordinated policy. Each member state of the European Union individually defines its system for upbringing and education. The EU merely helps the member states establish common goals. In 2000, the document known as the Lisbon Strategy became the key strategic document that notably also touched the area of education in the EU. Given the globalized environment of Europe, the document emphasizes the teaching of foreign languages, creating a system of new educational methods using the internet and digital literacy. Further documents followed the Lisbon Strategy, with the current up-to-date program titled *Education and Professional Development 2020*. Quality education and professional training are essential for resolving the social, demographic, environmental and technological challenges of the world.

It is necessary to prepare high-quality programs focused on the basic subject of education that would solve the key areas of education regarding language training and motivation of students for self-education. The program should have clear and specific established goals that may not change 'annually' according to political decisions, but should be carefully maintained and implemented according to a stipulated schedule. It is critical that the established rules cover the majority population of children and students and not solve only the extremes on both ends - meaning only exceptionally gifted children or, on the other hand, educationally subnormal children.

References

Adams, D. (1993). Defining educational quality. Improving Educational Quality Project Publication #1: Biennial Report. Arlington, VA: Institute for International Research.

ET 2020: Strategicky rámec evropské spolupráce ve vzdělávání a odborné přípravě. 1. vyd. Praha: Ministerstvo školstvi, mládeže a tělovýchovy, Odbor pro záležitosti EU, 2010. ISBN 978-80-254-6941-5.

Gerkushensko, G. et al. (2014). Comparative Analysis on Personal Learning Environment of Russian and Slovakian Students. In ECSM 2014 / European Conference on Social Media. ISSN 2055-7213, Brighton UK: Academic Conferences &Publishing International Lim, 2014. s. 183-192. 779 s. ISBN 978-1-910309-28-5.

Gonge, S. S., & Ghatol, A. A. (2014). An art of teaching in teaching-learning process: An important part for educational accreditation, quality and assessment. Paper presented at the *Proceedings of the 2014 IEEE International Conference on MOOCs, Innovation and Technology in Education, IEEE MITE 2014,* 17-21. doi:10.1109/MITE.2014.7020233.

He, Y., & Hutson, B. (2016). Appreciative assessment in academic advising. *Review of Higher Education, 39*(2), 213-240.

Jankurová, A. (2014). Význam rozvoja ďalšieho vzdelávania v kontexte udržateľného rozvoja, In: *Socioekonomické aspekty trvale udržitelného rozvoje České republiky 10 let po vstupu do Evropské unie* - České Budějovice: Vysoká škola evropských a regionálních studií, o.p.s., 2014. - S. 120-125. 172 s., ISBN 978-80-87472-69-9.

Kohli, N. (2014). Role of accreditation in engineering education. Paper presented at the *Proceedings of the 2014 IEEE International Conference on MOOCs, Innovation and Technology in Education, IEEE MITE 2014,* 157-159. doi:10.1109/MITE.2014.7020261.

Lima, P. A. L., Franco Fraga, G. C. C., Dos Anjos, E. G., & Da Silva, D. R. D. (2015). *Systematic mapping studies in modularity in IT courses* doi:10.1007/978-3-319-21413-9_10

Mišútová, M. (2009). New Education Technology In Mathematics. Trends in Education 2009: Information Technologies and Technical Education, Palacky University: Olomouc, 2009.

Mišút, M., Pribilová, K. (2013). Communation impact on project oriented teaching in technology supported education. *Lecture Notes in Electrical Engineering*, 152 LNEE, pp. 559-567.

Mišútová, M., Mišút, M. (2012). Impact of ICT on the quality of mathematical education 2012 IMSCI 2012 - 6th International Multi-Conference on Society, Cybernetics and Informatics, Proceedings, pp. 82-86.

Ognjanovic, I., Gasevic, D., & Dawson, S. (2016). Using non-identifiable data to predict student course selections.

Internet and Higher Education, 29, 49-62. doi:10.1016/j.iheduc.2015.12.002.

Ölvecký, M., Gabriška, D. (2014). Motion Capture as an Extension of Web-Based Simulation. In: Applied Mechanics and Materials, vol. 513, pp. 827-833.

Porta, M. (2010). Implementing technology enhanced learning to impede the declining interest in computer science (CS) studies and careers in europe. Paper presented at the *CEUR Workshop Proceedings, , 709* 67-72.

Sedelmaier, Y., & Landes, D. (2015). A multi-perspective framework for evaluating software engineering education by assessing students' competencies: SECAT - A software engineering competency assessment tool. Paper presented at the *Proceedings - Frontiers in Education Conference, FIE, 2015-February* (February) doi:10.1109/FIE.2014.7044331.

Tokarčíková, E., Kucharčíková, A., & Ďurišová, M. (2015). Education of students of the study program informatics in the field of corporate social responsibility. *Periodica Polytechnica, Social and Management Sciences, 23*(2), 106-112. doi:10.3311/PPso.7473.

Toman, J., Michalík, P. (2013). Possibilities of Implementing Practical Teaching in Distance Education. International Journal of Modern Education Forum 2(4), 77-83.

http://www.eu-yzkum.eu/pdf/Podklad_seminar_4.pdf (cit. 12. 2. 2017).

http://www.nucem.sk/documents//45/aktivita_4_1/2-def-osvit-monogr-juscakova.pdf (cit. 12. 2. 2017).

http://www.unicef.org/education/files/QualityEducation.PDF (cit. 12. 2. 2017).

RECEIVED: 16 January 2017 **ACCEPTED: 10 May 2017**

Zuzana Horváthová, Ph.D., Doctor, Metropolitan University Prague, Czech Republic, The Department of Law and Public Administration, Field of scientific research: Social policy, Regionalism, Economic Geography, email: zuzana.horvathova@mup.cz

Marián Hosťovecký, Ph.D., Doctor, University of Ss. Cyril and Methodius, Slovak Republic, Faculty of Natural Sciences, Department of Applied Informatics, Field of scientific research: Visualization, Graphics and Multimedia Systems, email: marian.hostovecky@ucm.sk

Vadyba
Journal of Management
2017, № 1 (30)
ISSN 1648-7974

INNOVATIVE PROCESSES IN THE SHIPBUILDING AND SHIP REPAIR INDUSTRY IN LATVIA

Balajar Aliev[1], Yuri Kochetkov[1, 2], Konstantin Nedelev[1]
[1]Baltic International Academy, Riga, [2]Liepaya University, Liepaya

Annotation
Leading enterprises of the shipbuilding and ship repair industry in Latvia, for example, Riga and Liepaja shipyards tend to occupy a leading position in their niches in the European and world marketsThis means first and foremost commissioning and practical application of innovations and scientific achievements, i.e., innovation. The objective of the research is to determine the characteristics of innovative processes of enterprises in the shipbuilding and ship repair industry in Latvia. The novelty of the research lies in the fact that for the first time the overall system analysis of innovation processes has been performed, taking into account the existing risks in the Latvian shipbuilding industry. The object of research is innovation processes in the shipbuilding and ship repair industry in Latvia. The goal of the research is to investigate the influence and relationships of the main factors of innovative processes in the shipbuilding and ship repair industry at the system level. Methods of research comprise the mathematical modelling of the system and the analysis of the interaction of factors on the basis of graph theory; balance sheet analysis as well as pulse analysis in the system. For the shipbuilding and ship repair industry in Latvia, the research proposes an interactive model of innovations taking into account risks. The model of the innovation process has mathematically been considered as a signed weighted digraph. The main groups of risks are distinguished as separate vertices of the digraph since they play an important role in the system of operative factors: risks and negative relations violate the balance of the system. In general, the weighted digraph analysed in the research is unbalanced. Therefore, any innovation process is not sufficiently stable mainly due to the effect of risks. This reflects the need for continuous risk identification and management at all stages of innovation. The results have demonstrated that the system of factors in the model of innovation process is absolutely and pulse unstable. This reflects the need for continuous strict control of the innovation process, in particular of existing and potential risks.
KEY WORDS: shipbuilding branch, mathematical modelling, innovation, graph theory.

Introduction

To fulfil the mission related to an increase in the income and welfare of employees and shareholders, companies of the shipbuilding and ship repair industry in Latvia should develop a specific investment policy and formulate strategic objectives of performance (Kochetkov et al. 2016). First, it is necessary to identify and analyse the major factors of internal and external environment of enterprises that may have an impact on the nature of the investment policy. The main factors of the internal environment of enterprises are labour resources, availability of funds, organisational structure and marketing systems. Environmental factors include political, economic, market, social, etc. Then, connections and interaction are established between the parameters of internal environment of enterprises and the external positive and negative operating factors. This allows determining the most important directions of investment activity of enterprises and formulating strategic goals of enterprises consistent with their mission. Thus, the investment strategy of the industry is formed as a set of long-term areas of their development leading to the achievement of strategic goals.

Leading enterprises of the shipbuilding and ship repair industry in Latvia, for example, Riga and Liepaja shipyards tend to occupy a leading position in their niches in the European and world markets. This will enable enterprises to more effectively carry out their mission. To achieve such an ambitious strategic goal, industry enterprises should move to a higher level of economic growth based on knowledge, latest achievements of science and technology. This means first and foremost commissioning and practical application of innovations and scientific achievements, i.e., innovation. It is known that in the advanced industrialised countries up to 80–85 % GDP growth occurs through innovation.

The main added value in the new context of globalisation is now ensured by intellectual capital. The concept of innovation was introduced by Joseph Schumpeter in the 1930s. New methods, discoveries, inventions, i.e., the results of scientific and applied research and development are considered to be novelties. When novelties are transformed into new products sold on the market, they become innovations. Innovations establish real relationships between scientific and technological progress and business (Янсен 2002). Innovation is considered to be implemented if it has the scientific and technical novelty introduced in the production process, and the goods are sold on the market.

Subject and relevance. The development of the productive forces in modern conditions is manifested as the creation, development and use of new science-based technologies. Technology is the basic foundation of innovation. It is believed that scientific and technological progress is the process of introducing innovations and dissemination of advanced technologies and new products. According to the "new growth theory", the society development process is based on scientific

discovery and innovation, while technology is the way of the implementation of innovations (Romer 1990). At the beginning of the 21st century, in the advanced economies the fifth technological wave is the dominant one, which is based on computerisation, electronic devices and biotechnologies. Technological stratification is a characteristic feature of the shipbuilding and ship repair industry in Latvia. The outdated technologies of the third and fourth waves – the use of electricity, automation, use of chemicals (often with large amounts of manual labour) – are combined with progressive technologies of the fifth wave. This leads to distortions in the production process and reduces the competitiveness of enterprises. Therefore, the area for innovation in the enterprises of the shipbuilding industry is quite extensive.

The objective of the research is to determine the characteristics of innovative processes of enterprises in the shipbuilding and ship repair industry in Latvia. *The novelty of the research* lies in the fact that for the first time the overall system analysis of innovation processes has been performed, taking into account the existing risks in the Latvian shipbuilding industry. *The object of research* is innovation processes in the shipbuilding and ship repair industry in Latvia. *The goal of the research* is to investigate the influence and relationships of the main factors (stages) of innovative processes in the shipbuilding and ship repair industry at the system level; to analyse the possible situations in innovation processes. *Methods of research* comprise the mathematical modelling of the system and the analysis of the interaction of factors on the basis of graph theory; balance sheet analysis as well as pulse analysis in the system.

Analysis and computations

The innovation process can be represented as "the arena of innovations", where changes occur following certain trajectories (Янсен 2002) This process is subject to certain laws of development, which is an objective prerequisite for making strategic management decisions for the development of a particular enterprise. The main laws of innovative development are cyclical nature, lack of uniformity and certain stages of development, balance of component factors, etc. Innovation can be represented as a complex stochastic process of creation and dissemination of innovations. On the other hand, innovation can be considered to be an event, the occurrence of something new, as well as the process in which one innovation generates the other. Thus, technology improvement leads to the appearance of a new product that may require changes in business, the formation of new markets, etc. (Фостер 1987).

Innovation processes involve the complex of scientific, technological, financial, organisational and other activities. Until recently, a linear model of innovation was used, which consisted of a series of sequential stages:

- research and development;
- applied research;
- technological and development activities;
- development of innovations in production;
- industrial mass production;
- marketing and production distribution.

This model prevailed in many countries in the mid-20th century. The disadvantage of this model is a simple linear relationship between the constituent factors: the greater the volume of scientific and applied research, the more innovations in production. In practice, however, this model does not account for the influence of the market and the complexity of the relationship between science and industry. Therefore, now we use a more complex interactive non-linear model of the innovation process. For the shipbuilding and ship repair industry in Latvia, the research proposes an interactive model of innovations taking into account risks (Aliev et al. 2016) (Fig.1).

Characteristic features and advantages of the proposed model are as follows. Since the model is interactive, there are "loops" of feedback among the individual stages of the innovation process. The impact of the external environment is also taken into account. Implementation of various stages of the innovation process can take place in parallel, i.e., simultaneously, which allows for significant time saving and estimation of the effect of both internal business processes and external factors. An important advantage is the control of non-linear model. Managers, responsible for the innovation process, can make decisions at different stages of the innovation process, in response to changing consumer requirements. The results of the first stage of innovation (scientific and technological research) can successfully be considered and implemented at all stages of the process. When any useful innovations appear in the world's practice of shipbuilding and ship repair, in addition to the ones already being implemented, they can also be introduced in the innovation process.

The interactive model of the innovation process (Fig. 1), in terms of its analysis, is an open "soft" system consisting of several interconnected elements (Gigch 2010). The system has a certain structure and relations among the elements. It is known that a complex system often reacts to external and internal influences not as people expect (Форрестер 2003). For the analysis of the model of innovations as a complex system, a systematic cognitive approach has been used within the framework of the research. The soft system can adapt to changing conditions, and there an important role is played by a subjective factor – people (researchers, managers, technicians, etc.) (Checland 1988). The model of innovation process as a system demonstrated in Fig. 1 can be mathematically viewed as a signed directed weighted graph. In the research, the graph theory has been used, allowing one to perform an in-depth analysis of causal relationships in complex systems (Roberts 1986).

All elements of the system marked by numbers in Fig. 1 and the risks are the vertices of the signed directed weighted graph under analysis. The main risks are highlighted separately, as they play an important role in the balance of the system. There are a total of 11 vertices in the graph: $\mathbf{u}_1, \mathbf{u}_2, \ldots \mathbf{u}_{11}$, interconnected by arcs (arrows) in the system. The designations of vertices ($\mathbf{u}_i$) of the graph are demonstrated in brackets, Fig. 1. In the directed graph under consideration, four arcs are negative, the remaining ones are positive. The sign "+" is assigned to the arc ($\mathbf{u}_i$, $\mathbf{u}_j$) if an increase in $\mathbf{u}_i$ leads to an increase (strengthening) of $\mathbf{u}_j$, and a decrease in $\mathbf{u}_i$ leads to a

decrease in u_j. The sign "-" is assigned if an increase in u_i leads to a decrease in u_j and a decrease in u_i leads to an increase in u_j. The sign "+" indicates a positive causal relationship, and the sign "-" indicates a negative relationship. Any graph is a pair (**U, A**), where **U** – a set of vertices, and **A** – set of arcs connecting vertices. In this directed graph (digraph), there are both contours (closed chains of the arcs of one direction) and semi-contours (a chain of arcs of different directions).

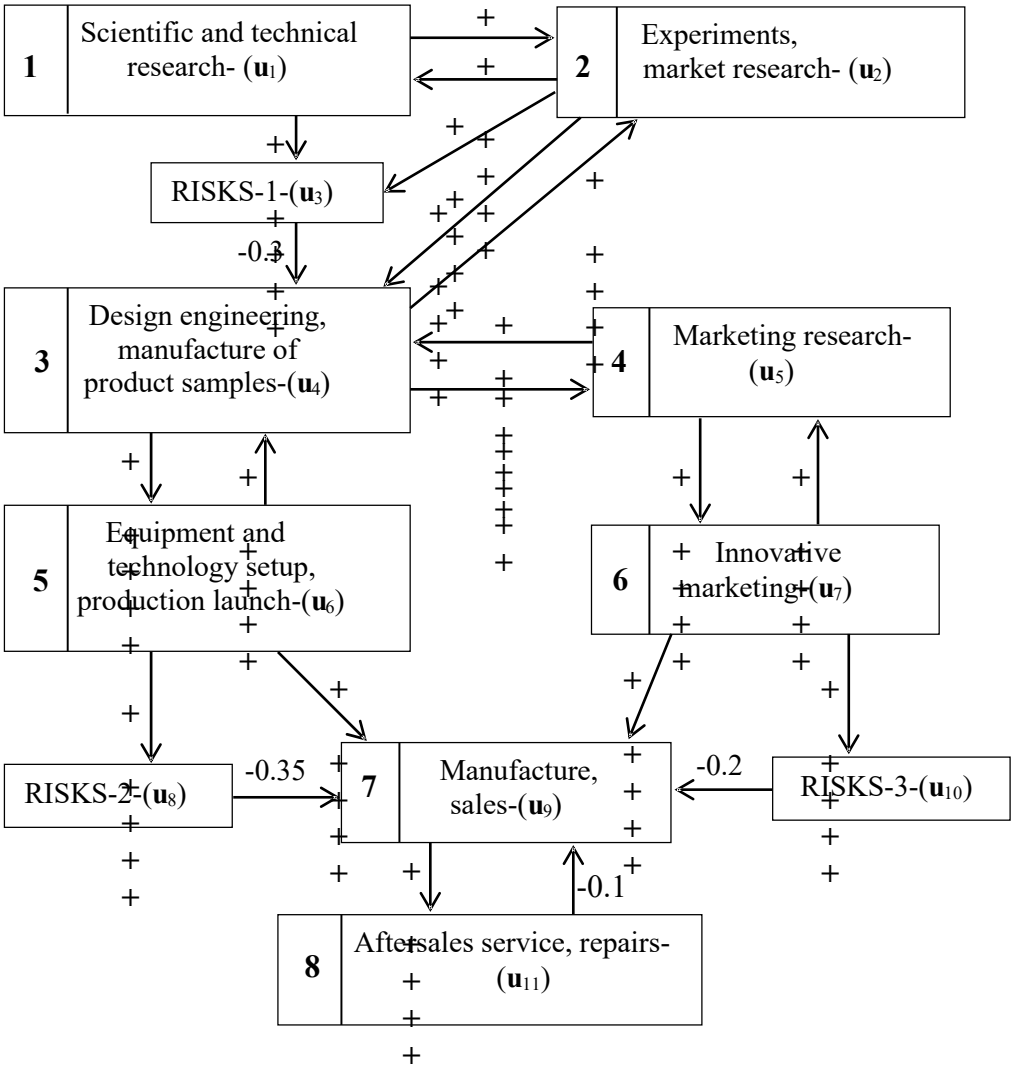


Fig. 1. Nonlinear interactive model of the innovation process in the shipbuilding and ship repair industry in Latvia.

Loops of feedback are contours. All of them, except one, are balanced – have positive feedback, and there are no negative arcs. For example, the contour $u_4 - u_5 - u_4$: designing and manufacturing samples of the goods it is necessary to conduct simultaneously the relevant market research, identify consumer needs, evaluate the possible volume of sales. This naturally affects design engineering, as it is necessary to take into account the requirements of market. There is negative arc of feedback (-0.1) only between two vertices (u_9 and u_{11}). With a small probability (10 %), the vertex u_{11} can exert a negative impact on the process of production and sales (u_9) due to detection, for example, of the hidden defect that should be removed, etc.

Risks (vertices u_3, u_8 and u_{10}) can occur at different stages of the innovation process, and with a certain probability have a negative effect on the subsequent stages of innovations. Since negative arcs emanate from vertices of risks, the corresponding semi-contours will be unbalanced. Risks and negative relations play a negative role and upset the balance in the system. The greatest danger to the innovation process is demonstrated by RISKS-2 (vertex u_8), which occur at an important stage of innovation in the process of adjustment of equipment, technologies and product launch (vertex u_6). In the opinion of experts, these risks with a fairly high probability (0.35) can adversely affect the production and sales of products. The causes of RISKS-2 can be very different: technology errors, poor quality tools and supplies, lack of qualified workers, etc. If RISKS-2 are detected in the process of adjustment of equipment and technologies, they can be eliminated at once at the very same stage (u_6). However, this is not always the case; negative consequences of risks can be identified in the production process, and even during the sales of products,

which is undesirable. This requires changes in the production technology or equipment replacement.

Sufficiently large risks arise at the first two initial stages of the innovation process (vertices u_1, u_2). These risks with a probability of 0.3 can adversely affect the subsequent third stage of innovations – the vertex u_4, when the design and manufacturing of samples of goods take place. Therefore, the contour $u_1 - u_3 - u_4 - u_2 - u_1$ is unbalanced and contains one negative arc $u_3 - u_4$. The presence of unbalanced cycles in the system of signed digraph (contours and semi-contours) demonstrates that the weighted digraph is unbalanced. The imbalance of a digraph indicates that there are hidden problems in the system, which are mainly caused by the effects of various kinds of risks. Therefore, the system will not be stable enough, and various malfunctions can appear. It is virtually impossible to eliminate the causes of imbalance (risks) completely, but they need to be identified and controlled as far as possible.

In the stable functioning of the innovation process, an important role is played by marketing (vertices u_6, u_7). Conducting market research, search for potential buyers of new products already at the stage of designing and manufacturing of samples of goods (u_6) are the key to business success in the context of fierce competition. Here, the presence of the feedback from the vertex u_5 to the vertex u_4 is of importance. At the designing stage, this allows taking into account the individual needs of customers, thereby improving the competitiveness of products on the markets. The introduction of novelties and innovations often requires the search for new customers and expanding sales markets. The process of innovative marketing can give rise to certain risks, the vertex u_{10}. The risks are mainly associated with the modern features of the world economy and politics. Changes in the economic and political conditions in different regions of the world can lead to unpredictable situations, adversely affecting the sales of products. According to industry experts, the probability of the negative impact of these risks on the vertex u_9 (production and sales of products) accounts for 20 %. These can be, for example, unforeseeable changes in the requirements for the characteristics of products, repudiation of the planned contracts, changes in the political situation in the country of the customer, etc.

The weighted digraph considered in the research has been tested for absolute and pulse stability. The lack of stability of the digraph means that the system described by it (innovation process) may exhibit and amplify the negative impact of any factor which, for example, may restrain innovations. To test the stability, the adjacency matrix of the weighted digraph has been analysed (see Fig. 2). Since the digraph is weighted, its adjacency matrix shows the negative probabilities of operating risks. The adjacency matrix takes the following form: $A = (\alpha_{ij})$, where

$$(\alpha_{ij}) = \begin{cases} +1, \text{ if the edge (i, j) is positive,} \\ -1, \text{ if the edge (i, j) is negative,} \\ 0, \text{ if the edge (i, j) is absent.} \end{cases}$$

$$A := \begin{pmatrix} 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -0.3 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -0.35 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -0.2 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -0.1 & 0 & 0 \end{pmatrix}$$

Fig. 2. The adjacency matrix of the weighted signed digraph corresponding to the model of the innovation process in the Latvian shipbuilding industry.

The characteristic polynomial of the adjacency matrix of the digraph A has the following form:

$$C_A(\lambda) = \det(A - \lambda E) = \alpha_{10} \cdot \lambda^{10} + \alpha_9 \cdot \lambda^9 + \ldots + \alpha_1 \cdot \lambda^1 + \alpha_0 \cdot \lambda^0,$$

where det – the determinant of the matrix;
E – the corresponding unit square matrix;
α_i – the coefficients of the characteristic polynomial at roots λ_i.

Parameters λ_i are the roots and the eigenvalues of the matrix A only if they satisfy the equation:

$$C_A(\lambda) = \det(A - \lambda \cdot E) = 0.$$

Performing calculations, the following roots of characteristic polynomial that are the eigenvalues of the matrix A have been obtained:

-1.953; -1; -0.554; 1.861; 1; 0.646; 0; 0; -0.316i; 0.316i; 0.

It has been found out that there are eigenvalues of the adjacency matrix that exceed 1 in modulus. In this case, the signed digraph and the corresponding system of factors of the innovation process will be both absolutely (by value) and pulse unstable (Roberts 1986). Introduction of pulse into any vertex of the digraph (changing its value) in the future may cause the increasing pulses in other vertices and lead to negative consequences for the introduction of innovations, as well as innovation process may slow down or stop completely. The main reasons are risks and their negative effect resulting in the imbalance of the system as a whole. For example, in the market study (vertex u_6) one may find that the new products will not have sufficient demand. The occurring risks (u_3) can then lead to the rejection of further stages of this process and the given innovation as a whole.

To solve the problem of prediction of pulse propagation (any external influences) in a weighted digraph system, the theorems on the autonomous pulse processes in signed digraphs have been used in the research (Roberts 1986). Knowing the initial pulse being introduced to some vertex of the weighted digraph and its adjacency matrix A, it is possible to calculate the values of the pulses in other vertices at any time **t**. The time

interval $(t_{i+1} - t_i)$ may be different, for example, one or two months, depending on different conditions at different enterprises. The pulse process, in which the i-th component of the vector **P**(0) defining an external pulse is equal to "1" and all other components are equal to zero, is called a simple pulse process with the initial vertex u_i. Initial unit pulse introduced into the vertex u_i then propagates throughout the system over certain amount of time. For the stand-alone pulse process, the following formula is used in the weighted digraph:

$$\mathbf{P(t)} = \mathbf{P}(0)*A^t,$$

where **P** (0)=(0,0, ... 1,0, ... 0) with "1" at the i-th place;
P (**t**) – the vector of pulses at time **t**.

To calculate the propagation of the pulse process in the weighted digraph with initial vertex u_i, the following formulas are used:

$$V_j(t) = V_j(\text{ref.}) + \{\text{element i,j in matrix } E + A + A^2 + A^3 + ... + A^t\},$$

where Vj(t) – the value of vertex u_j of the digraph at discrete points in time t = 0, 1, 2, ...,
E – the identity matrix.

The adjacency matrix A of the weighted digraph (Fig. 2) has been used as a reference. The predictive values of the vertices of the digraph are shown in Table 1 for different points in time, ranging from t = 1 to t = 7. Introducing a unit pulse to the vertex u_1 (e.g., obtaining a positive result of scientific and technical research suitable for practical use), pulses gradually spread across the digraph system. As a result, at t = 4 pulses reach the vertex u_9, and the processes of industrial production and distribution of new products are initiated. At t = 5, pulses reach the vertices u_0, u_{11} and there may be a negative effect of the risks of the third stage, as well as requests for service and warranty repairs from customers of new products.

Table 1. Forecast values of digraph vertices in the standalone pulse process for different points in time. t = 1, 2, ... 7 – points in time.

t	The vertices of the signed digraph										
	u_1	u_2	u_3	u_4	u_5	u_6	u_7	u_8	u_9	u_{10}	u_{11}
1	1	1	1	0	0	0	0	0	0	0	0
2	2	1	2	0.7	0	0	0	0	0	0	0
3	2	2.7	3	0.4	0.7	0.7	0	0	0	0	0
4	3.7	2.4	4.7	3.2	0.4	0.4	0.7	0.7	0.7	0	0
5	3.4	6.9	6.1	1.79	3.9	3.2	0.4	0.4	0.86	0.7	0.7
6	7.9	5.19	10.3	12.17	2.19	1.79	3.9	3.2	3.25	0.4	0.855
7	6.19	20.07	13.09	6.08	16.07	12.17	2.19	1.79	4.404	3.9	3.25

I
n different vertices of the digraph, a rise (increase) in pulses occurs differently. At t = 7, the highest value is achieved by pulses at vertices u_1 and u_5: when tests of new product samples are performed, the research of possible markets immediately begins and market research for future product sales is initiated. This increases the risk of the first stage of the innovation process, the vertex u_3. At the same time, the preparatory process for the production of new products may begin, technology is developed, and devices, tools, etc. are designed (the vertex u_6). Scientific and technical research also continues; the pulses grow at the vertex u_7. When the production and distribution of new products are implemented (the vertex u_9), it is also required to carry out maintenance of sold products and, if necessary, correct defects and faults (u_{11}). Risks of the second (u_8) and third (u_{10}) stages are also increasing and may adversely affect the final stages of the innovation process. Apart from the main risks taken into account in the model, other risks may appear and pose an adverse effect virtually at any stage of innovation. Therefore, the system of continuous identification, evaluation, monitoring and control of risks should be developed. Final decisions on risk management and mitigation should be made by senior management of enterprises.

Conclusions

To achieve a leading position in the global markets, companies of shipbuilding and repair industry in Latvia should move to a higher level of economic growth corresponding to the fifth technological wave, which is based on intellectual capital and innovation. Innovations can be considered as a complex stochastic process of creation and diffusion of innovations. The research proposes a non-linear interactive model of the innovation process in the Latvian shipbuilding and ship repair industry, taking into account the adverse impact of risks. This model adequately takes into account the impact of all major factors and their interaction in the innovation process.

For the analysis of the model of innovation process as a complex system, a cognitive systems approach has been used. The model of the innovation process has mathematically been considered as a signed weighted digraph. The main groups of risks are distinguished as separate vertices of the digraph since they play an

important role in the system of operative factors: risks and negative relations violate the balance of the system. The greatest negative impact on the innovation process can be posed by risks related to launching of new products into production. In general, the weighted digraph analysed in the research is unbalanced. Therefore, any innovation process is not sufficiently stable mainly due to the effect of risks. This reflects the need for continuous risk identification and management at all stages of innovation. An important role in the stability of the innovation process belongs to marketing, timely search for new sales markets.

To test for absolute and pulse stability of the model of innovation process, the analysis of the adjacency matrix of the corresponding signed weighted digraph has been performed. The results have demonstrated that the system of factors in the model of innovation process is absolutely and pulse unstable. Due to the risks in the system, the innovation process can be slowed down or even stopped. In general, the process of pulse propagation in the innovation model is quite uneven and unstable: values of pulses in the digraph vertices at subsequent time periods can be reduced. This reflects the need for continuous strict control of the innovation process, in particular of existing and potential risks.

References

Aliev, B., Kochetkov, Yu. (2016). Risks in the shipbuilding and ship repair industry in Latvia. *Journal of Management*, vol. 28(1), 9 – 13.

Checland, P.B. (1988). Soft systems methodology: an overview. *Journal of Applied System Analysis*, vol. 15.

Gigch, J. P. (2010). *Applied General Systems Theory,* 439p. California State University. Harper Collins Publishers, USA.

Kochetkov, Yu., Aliev, B. (2016). Evaluating the strategic directions of innovative development of the shipbuilding industry in Latvia. *Computer Modelling and New Technologies*, vol. 20(1), 27 – 32.

Roberts, F.S. (1986). *Discrete Mathematical Models, with Application to Social, Biological and Environmental Problems,* 496p. Prentice-Hall, USA. Russian translation, Nauka, Moscow.

Romer, P. (1990). Endogenous Technological Change. *Journal of Political Economy*, University of Chicago Press, vol. 98(5), 71 – 102.

Форрестер, Д. (2003). *Мировая динамика,* 384с. Издательство «Terra F.». Москва. [in Russian].

Фостер, Р. (1987). *Обновление производства: атакующие выигрывают.* Издательство «Прогресс». Москва. [in Russian].

Янсен, Ф. (2002). *Эпоха инноваций.* Издательство «ИНФРА-М». Москва. [in Russian].

RECEIVED: 16 January 2017 **ACCEPTED: 10 May 2017**

Balajar Aliev is Master of Business Administration (MBA), Doctoral student in Baltic International Academy (Latvia). University study: Baltic International Academy (2011-2013), MBA. Balajar Aliev is President of Administration of Shipbuilding company in Liepaya (Latvia). Publications: several. Scientific interests are regional economy and development, competitiveness and innovation issue, analysis of systems. Address: 4 Lomonosova St., LV-1019, Riga, Latvia. Phone: +37129623317, Fax: +37163480858, e-mail: boris@albjs.lv

Yuri A. Kochetkov is Dr.sc.ing., Professor. University study: Riga Polytechnic Institute (1966 – 1971), mechanical engineer. Post-graduation: Moscow Institute of Instrumental Equipment (1977 – 1981), Candidate of technical sciences (1982). 1993 – Dr. sc. ing. (Latvia). Yuri Kochetkov is Professor of Econometric in Baltic International Academy (Latvia). Also he is scientist in Institute of Mathematical Sciences and Information Technologies of Liepaya University. Publications: 76 scientific papers and 3 patents, teaching aids and synopses – 6. Current research interests: social economical statistics, mathematical modelling and analysis of systems. Yuri Kochetkov is a member of Latvian Association of Statistics. Address: 4 Lomonosova St., LV-1019, Riga, Latvia. Phone: +37163480858, Fax: +37163480858, e-mail: Jurijs.Kocetkovs@rtu.lv

Konstantin Nedelev is Professional Bachelorhood of Business Administration (2016), Master degree student. Scientific interests are regional economy, competitiveness and innovations in the conditions of globalization. Address: 4 Lomonosova St., LV-1019, Riga, Latvia. Phone: +37129595920, Fax: +37163480858, e-mail: elektrika88@gmail.com

Reikalavimai autoriams, norintiems publikuoti savo straipsnius

Mokslinio žurnalo „Vadyba“ steigėjas yra Lietuvos verslo kolegija. Nuo 2002 m. leidžiamame žurnale spausdinami Technologijos, Socialinių mokslų bei Fizinių mokslų tematikos straipsniai. Pagrindinis mokslinio žurnalo straipsnių bei atliktų mokslinių tyrimų uždavinys – išryškinti problemas ir pateikti galimus jų sprendimo būdus regiono viešosioms ir privačioms organizacijoms. Straipsniai gali būti tiek empirinio, tiek ir teorinio pobūdžio.

Redakcijai pateikiami straipsniai privalo būti originalūs, ankščiau niekur nepublikuoti. Draudžiama šiame žurnale išspausdintus straipsnius publikuoti kituose leidiniuose.

Bendri reikalavimai

- Redakcinei kolegijai pateikiami straipsniai privalo būti profesionaliai suredaguoti, be rašybos, skyrybos ir stiliaus klaidų. Straipsniuose turi būti naudojama mokslinė kalba.
- Straipsniai rašomi anglų kalba.
- **Straipsnio apimtis 6–8 puslapiai** (tik porinis puslapių skaičius).
- Straipsnio struktūra turi atitikti moksliniams straipsniams būdingą struktūrą. Jame turi būti išskirtos tokios dalys:

1. Straipsnio **pavadinimas**. Straipsnio **autorius, Institucija**, kurią atstovauja autorius. Straipsnio autoriaus **elektroninis paštas**.
2. **Anotacija** su pagrindiniais žodžiais ta kalba, kuria rašomas straipsnis. Anotacija turėtų trumpai apžvelgti straipsnio turinį, nurodyti per kokią prizmę bus analizuojama problema. Anotacijos tekstas turi būti aiškus ir glaustas. **Anotacijos apimtis turi sudaryti ne mažiau arba lygiai 2000 spaudos ženklų.**
3. **Pagrindiniai žodžiai –** tai žodžiai, kurie išreiškia svarbiausius nagrinėjamos temos požymius. Penki ar šeši straipsnio pagrindiniai žodžiai privalo būti įtraukti į Lietuvos Nacionalinės M. Mažvydo bibliotekos autoritetingų vardų ir dalykų įrašus. Ar pagrindinis žodis yra įtrauktas į šį sąrašą, galima pasitikrinti bibliotekos elektroninėje svetainėje adresu: <http://aleph.library.lt/F/UYSMKM4NY8C9H33SP6PV8F2585NQU59CEEBJVCYCA3HUQNQCR5-31681?func=find-b-0&local_base=LBT10>, „paieškos lauke“ įvedus „Tema, dalykas (lit)“ (lietuvių kalba) ir „Tema, dalykas (eng)“ (anglų kalba).
4. **Įvadas**, kuriame suformuluotas mokslinio tyrimo tikslas, aptarta nagrinėjamos temos problema, aktualumas ir jos ištirtumo laipsnis, išskiriamas tyrimo objektas, uždaviniai bei tyrimo metodai. Analizė – straipsnio medžiaga. Straipsnio poskyriai *nenumeruojami.*
5. **Analizė – straipsnio medžiaga**. Straipsnio poskyriai *nenumeruojami.*
6. **Išvados**. *Nenumeruojamos.*
7. **APA (American Psychological Association) metodinių reikalavimų pavyzdžiai**

Šaltinių citavimo pavyzdžiai

Citata trumpesnė negu 2 eilutės:

Anot tyrėjos, „studentams sunku perprasti APA reikalavimus“, tačiau tyrėja nenagrinėja konkrečių mpriežasčių (Jones, 1998, p. 199).

Citata ilgesnė negu 2 eilutės:

Jones tyrimas rodo:

Studentams sunku perprasti APA metodinius reikalavimus, ypač rašantiems pirmą darbą, kuriame reikia nurodyti šaltinius. Šie sunkumai gali kilti ir dėl to, kad daugeliui studentų nesiseka susirasti metodinių reikalavimų aprašo arba jie drovisi prašyti pagalbos darbo vadovo. (p. 199)

Citatos perfrazavimas:

Anot Jones (1998), APA metodiniai reikalavimai citatų šaltiniams yra sunkiai perprantami tiems, kurie juos taiko pirmą kartą.

APA metodiniai reikalavimai citatų šaltiniams yra sunkiai perprantami tiems, kurie juos taiko pirmą kartą (Jones, 1998, p. 199).

Literatūros sąrašo sudarymo pavyzdžiai

Cituojamas vieno autoriaus šaltinis:

Berndt, T. J. (2002). Friendship quality and social development. *Current Directions in Psychological Science, 11*, 7-10.

Cituojamas autorių kolektyvas (3-7 autoriai):

Kernis, M. H., Cornell, D. P., Sun, C. R., Berry, A., Harlow, T., & Bach, J. S. (1993). There's more to self-esteem than whether it is high or low: The importance of stability of self-esteem. *Journal of Personality and Social Psychology, 65*, 1190-1204.

Cituojama iš numeruoto periodinio šaltinio:

Scruton, R. (1996). The eclipse of listening. *The New Criterion, 15*(30), 5-13.

Cituojama iš žurnalo:

Henry, W. A., III. (1990, April 9). Making the grade in today's schools. *Time,* 28-31.

Cituojama iš knygos:

Autorius, A. A. (Leidimo metai). *Pavadinimas: Paantraštė*. Vieta: Leidykla.

Cituojama iš vėlesnių leidimų:

Helfer, M. E., Keme, R. S., & Drugman, R. D. (1997). *The battered child* (5th ed.). Chicago, IL: University of Chicago Press.

Cituojama iš internetinių šaltinių:

Autorius, A. A., autorius, B. B. (publikacijos data). Pavadinimas. *Internetinio šaltinio pavadinimas, numeris/tomas* (jeigu yra). Paimta iš http://www.someaddress. com/full/url/

PASTABA. Išsamiau apie APA stiliaus metodinius reikalavimus žr. OWL, Purdue for a complete listing of sources and formats, http://owl.english.purdue.edu/owl/resource/560/01/

8. Autorių trumpas CV, kurį sudaro: autoriaus vardas, pavardė. Mokslinis laipsnis. Darbovietė. Pareigos. Mokslinių tyrimų kryptis. Adresas. Telefonas. Kita informacija apie autorių. Autorių CV turi sudaryti **ne daugiau kaip 3000 spaudos ženklų**.

Reikalavimai straipsnio surinkimui ir sumaketavimui

- Straipsniai turi būti parengti MS Word programa A4 formato lapuose.
- Dokumento paraštės: viršuje – 2,0 cm, apačioje – 2,0 cm, kairėje – 2,0 cm ir dešinėje – 2,0 cm.
- Straipsnio tekstas: mažosiomis raidėmis lygiuojamas pagal abu kraštus, dydis – 10 pt, šriftas – Times New Roman, pirma pastraipos eilutė įtraukta 0.5 cm.
- Straipsnio pavadinimas: didžiosiomis raidėmis, kairėje, dydis – 14 pt., **Bold**.
- Autoriaus vardas, pavardė: mažosiomis raidėmis, kairėje, dydis – 12 pt., **Bold**.
- Institucijos pavadinimas: mažosiomis raidėmis, kairėje, 10 pt., *Italic*.
- Elektroninis paštas: mažosiomis raidėmis, kairėje, 10 pt., *Italic*.
- Anotacijos: teksto dydis – 8 pt, pavadinimas – 10 pt, **Bold**. Po paskutinio pagrindinio žodžio taškas nededamas.
- Skyrių pavadinimai: mažosiomis raidėmis, kairėje, dydis – 11 pt., **Bold**.
- Žodis *literatūra* – 10 pt, literatūros sąrašas – 9 pt dydžio.

- **Paveikslai** ir **diagramos** turi būti aiškūs, brėžiniai – sugrupuoti į vieną objektą.

Lentelės ir **schemos** turi būti sunumeruotos, ir turėti pavadinimus.

1. Lentelių pavadinimai rašomi virš lentelės centre.
2. Paveikslų pavadinimai rašomi po paveikslu centre.

Pateiktas tekstas papildomai redaguojamas nebus.

PASTABA. Patogu naudotis parengtu straipsnio šablonu.

Requirements for the authors, who want to publish their articles

The founder of a scientific journal "Vadyba / Journal of Management" is Lithuania Business University of Applied Sciences. Since 2000, the journal publishes technology, social sciences and physic sciences-related articles. The main goal of the scientific journal articles and conducted research is to emphasize the problems and present possible solutions for the public and private organizations of the region. The articles can be both empirical and theoretical.

The submitted articles must be original, previously unpublished. It is prohibited to publish the articles of this journal in other publications.

General requirements

- Articles submitted to the Editorial Board must be professionally edited, without spelling, punctuation and style errors. The articles must use scientific language.
- Articles shall be written in English.
- **The article shall be up to 10 pages long. The last page should take at least half a page, i.e. about 2/3 of the page.**
- The structure of the article must have a structure of a scientific article. It must contain the following:

1. The **title** of the article. Article's **author, institution**, which the author is representing. **E-mail** of the author of the article.
2. **Abstract** with the main words in the language of the article. The Abstract should briefly cover the contents of the article; specify the aspect of how the problem will be analyzed. The text of the Abstract must be clear and concise. **The Abstract must contain at least 2000 characters.**
3. **Keywords –** these are the words that express the most important features of the topic. Five or six keywords of the article must be included in the Lithuanian National M. Mazvydas library records of authoritative names and subjects. It is possible to check if the keyword is included in this list in the website of the library: <http://aleph.library.lt/F/UYSMKM4NY8C9H33SP6PV8F2585NQU59CEEBJVCYCA3HUQNQCR5-31681?func=find-b-0&local_base=LBT10>, by specifying the "topic, subject (lit)" (in Lithuanian) and "topic, subject (eng)" (in English) in the search field.
4. **Introduction**, which formulates the purpose of the scientific study, discusses the question of the study, its novelty and degree of research, specifies the object of the study, objectives and methods.
5. **Analysis – article material**. The sub-sections of the article are *unnumbered.*
6. **Conclusions**. *Unnumbered.*
7. **References.** *Unnumbered.* References in the body of the article should be cited in parenthesis by indicating the surnames of the authors and year, e.g. (Cooper 1994), (Cleland J.; Kaufmann, G. 1998). If an internet source does not have an author, the link is placed only in the main text in parenthesis. Letters "p" and "pp" are not written next to the pages.
8. Examples of referencing:

Books

Valackienė, A. (2005). *Crisis Management and Decision-making*. Technology, Kaunas.

Berger, P. L., Luckmann, Th. (1999). *The Social Construction of Reality.* Pradai, Vilnius.

Journal articles

Boyle, T. (2003). Design principles for authoring dynamic, reusable learning objects. *Australian Journal of Educational Technology*, 19(1), 46–58.

Book articles

Curthoys, A. (1997), History and identity, in W. Hudson and G. Balton (eds), *Creating Australia: Changing Australian history*, 25 - 84. Allenn and Unwin, Australia.

Web documents

Wiley, D. A. (2003). Learning objects: difficulties and opportunities. [Retrieved March 18, 2009], <http://opencontent.org/docs/lo_do.pdf>.

Statistical information and web resources

Lithuanian Emigration Statistics. (2009). Statistics Lithuania to the Government of the Republic of Lithuania. [Retrieved February 16, 2009], <http://www.stat.gov.lt/lt/news/view/?id=6819&PHPSESSID=5b1f3c1064f99d8baf757cde1e135bc0>.

9. **Summary** with **the keywords** is written in English. **The summary should include at least 3000 characters.**
10. Short CV of the authors, which consists of: name, surname of the authors. Degree. Work. Occupation. Research direction. Address. Telephone. Other information about the author. The author CV must include **up to 3000 characters**.

Requirements for the outline and layout of the article

- The articles must be written in MS Word A4 pages.
- Document margins: top – 2 cm, bottom – 2 cm, left – 2 cm and right – 2 cm.
- Full text: in lowercase letters, aligned to both margins, size – 10 pt, font – Times New Roman, first line of the paragraph indented by 0.5 cm.
- Title of the article: in capital letters, left alignment, size – 14 pt., **Bold**.
- Author's name, surname: in lowercase letters, left alignment, size – 12 pt., **Bold**.

- Institution name: in lowercase letters, left alignment, 10 pt., *Italic*.
- E-mail: lowercase letters, left alignment, 10 pt., *Italic*.
- Abstracts: text size – 8 pt, title – 10 pt, **Bold**. A full stop is not put after the last main word.
- Section names: lowercase letters, left alignment, size – 11 pt., **Bold**.
- Word *Literature* – 10 pt, literature list – 9 pt.

- **Figures** and **diagrams** must be clear, schemes – grouped into a single object.

Tables and **schemes** have to be numbered and titled.

1. Table titles are written above the table in the centre.
2. Figure names are written under the figure in the centre.

The text will not be further edited.

NOTE. It is obligatory to use the prepared template for the article.

Klaipėdos universiteto leidykla

Vadyba 2017’1(30). Mokslo tiriamieji darbai

Klaipėda, 2017

SL 1335. 2017 05 15. Apimtis 15,5 sąl. sp. l. Tiražas 50 egz.
Išleido ir spausdino Klaipėdos universiteto leidykla
Herkaus Manto g. 84, 92294 Klaipėda
Tel. 8~46 39 88 91, el. paštas: leidykla@ku.lt