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Challenges in Economic and Technological Development
Conference Proceedings

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FOREWORD

The “Challenges in economic and technological development” conference organised for PhD students and young researchers has brought together more than twenty researchers from Hungary and around the world. The PhD session was held in Hotel Palota, Lillafüred, Hungary, 15-16 October 2015. It was the very first time that the Enterprise Theory and Practice Doctoral School announced an international PhD session, and the papers presented reflected the diversity of topics of the doctoral school, spanning from the theoretical aspects of modern macro and regional economics to the problems focused on businesses and non-governmental organisations.

Over the past couple of decades we have seen how technological advances and economic development can lead to decreasing global inequalities. The very same developments however increase the inequality within nations; they tend to endanger the jobs of the lowest paid and the least educated people; they may even lead to the rise of new economic core regions, and to the decline of traditional ones. The papers submitted to the PhD session tackled the problems of development from three main perspectives.

The first group of papers focused on sustainability. Sustainability and development have been traditionally linked, and the topic has great potential for a multidisciplinary approach as well. The second main topic addressed by our authors was the one of lagging behind and catching up. This second phenomenon can be and was interpreted both at the level of regions, and also at the level of organisations. Last but not least, the third main focus area among the conference papers was the issue of innovation, analysed mostly from the perspective of organisations. Organisational innovations play a key role in the development of for-profit businesses, but they are equally as important for non-governmental organisations.

The Organising Committee thanks the European Social Fund for its generous support that made it possible to organise the PhD session in such an inspiring environment. We thank all authors and participants for their contributions. I hope that the Proceedings will stimulate further study and research in the aforementioned areas.

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INNOVATION MANAGEMENT AS "DRIVER" OF THE SCHOOL SYSTEM DEVELOPMENT STRATEGY OF THE REFORMED CHURCH IN HUNGARY

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SUMMARY

The innovation could be not only the engine of the industry and economy, but it is also a tool of development of the non-government sector of a certain country, and of other communities and organisations of the society. The innovation strategy and innovation management in certain circumstances are used in a planned way, and wittingly, but some elements of the innovation strategy and innovation management may occur even in those situation, when the organisation hasn't got a well-defined innovation strategy, or the innovation management of a certain process or activity is not wittingly planned.
In the first part of this paper we will give an example how the innovation strategy and innovation management was present in the life and activity of the Reformed Church in Hungary in its early time (16th-18th century) first of all in its service toward the larger society building up a strong educational system. In the second part of this paper we will present, how the innovation strategy and innovation management plays a significant role in the planning and implementing a coherent strategy of school system development of the educational institutions maintained by the Reformed Church in Hungary and in a wider sense in Carpathian Basin.

THE INNOVATION AS A "DRIVER"

The innovation occurs when there is a "driver" in the economy, in the industry or in a larger sense in the society forcing the participants to improvetheir products, to produce more vendiblegoods, and to make planning and developing, the production and the marketing processes more efficient.
"Knowledge is considered as an economic driver in today's economy, it has become a commodity that can be packed, bought and sold."(Innovation Management and the Knowledge - Driven Economy, 2004).
The fact that we are moving from the knowledge-based economy (and society) to a knowledge-driven economy (and society) underlines the crucial importance of those parts of the society in which the basic knowledge-system, and the ability to manage knowledge is being developed, the system of public education, as a basic system of the formal education.
The countries recognising this process made a significant effort of school-system improvement, which can be considered as structural innovation, process innovation, content innovation, and marketing innovation.
Since the traditional idea that innovation is mostly based upon research (technology-push theory) and mutual interaction between firms and other actors of the "market" is replacedby the current social network theory of innovation, where knowledge plays acrucial role in

fostering innovation the concept of the efficient school system is underlined, with a high focus on those students whose abilities are above average or outstanding.
Thomas W. Valente (University of Southern California) and other authors made significant research, and agreed that there could be four models of social network theory in promoting innovation: the first of structural diffusional networks which points on the importance in promoting innovation of those people, who have a wide personal network, the second one the contact diffusional networks which points to the fact that the speed of diffusion of the innovation depends on the social network of the opinion leaders, the third one the threshold modeland the forth one the critical mass model. (Valente, 2005)
The question how the school-system of the Reformed Church in Hungary through its country-wide school-system – congregation network, and Carpathian Region-wide school and congregation network can contribute in an efficient way to the knowledge management of the young generation is a live issue of the school-system development strategy of the church.

THE AIM OF THE STUDY

The main aim of the study is to show how a certain innovation strategy, some aspect of the innovation management, and some aspects of the innovation management techniques could be identified in the school system of the Reformed Church in Hungary concerning the protection of the learning path of the talented and gifted students in early time and to confirm in the decision-taking bodies of the church the importance of the strategy, and of the school-system improvement innovation strategy, innovation management and finding the right innovation management techniques even nowadays.The present paper doesn't tends to give a general view of this topic, it is rather focusing on a very special but significant area of the strategy of the church concerning the management of the learning path of the gifted and talented children and student in the early time and nowadays. The study also aims to give a working model on the background of the heritage of the protestant reformation for the TÁMOP-3.1.17. project of the Reformed Churchin Hungary for "Developing the church school system" concerning the social network and institutional network (primary, secondary and tertiary education) in educating the gifted and talented, and on the strategy of protecting the learning path of the gifted and talented. The study presents the innovation from the Tiszáninneni Reformed Church District as a social network model of the development of learning path protection of the gifted students, being developed and introduced during the mentioned project.

THE PROTESTANT REFORMATION AS INNOVATION

The Reformed Church in Hungary itself is a result of innovation.The Protestant Reformation from the 16th century could be understood as a strong innovation process. The main innovation concept of the Protestant Reformation could be summarized in the "Five Solas". The Five Solas are five Latin phrases which aim to give the core principles and the Reformers' basic theological principles of the Protestant Reformation. "Sola" meaning "only" or "alone" and the corresponding phrases are: *Sola Fide*, by faith alone; *Sola Scriptura*, by Scripture

alone; *Solus Christus*, through Christ alone; *Sola Gratia*, by grace alone;*Soli Deo Gloria*, glory to God alone. (Montgomery Boice, 2001)

The Protestant Reformation launced by Martin Luther in 31st October 1517was spread in Hungary very quickly. The first "wave" of the "Lutheran" reformation was followed by the second one the "Calvinist" reformation being stronger in Hungary as the first one. (MacCulloch, 2004)

Already in the early time of the Protestant Reformation in Hungary the new congregations and communities understood the importance of the personal, interiorised faith of the individual, and understood the importance of the public education in this process. In the early time any well-defined church structure and hierarchy missing the local congregation started schools, and opened its doors for the wide society, thereby laying the foundations of the Hungarian public education system. The first schools ("colleges") were founded in 1530 (Mezőtúr), 1531 (Sárospatak and Pápa), 1538 (Debrecen – called "the school of the poors"), 1545 (Kolozsvár – Cluj (actually Romania)). The first wave of the school openings from the 1530-1540th was followed by another from 1560-1570th, and by others during the 17-18th centuries.

The reflection on the cultural responsibility of the Reformed Church in Hungary and the dedication to the institutional education of the wider society resulted in a growing school system already at the end of the 18th century.

ASPECTS OF INNOVATION STRATEGY AND INNOVATION MANAGEMENT OF THE CHURCH SCHOOL SYSTEM CONCERNING THE PROTECTION OF LEARNING PATH OF THE GIFTED AND TALENTED STUDENTS

The structural network model of the learning path protection of the gifted and talented students in the early time – The model of the "particulas" – a genuine innovation of the Reformed Church

At the early time the schools were started, or founded primarily in such places where a wealthy promoter and sponsor could help the church to establish a larger school building. Those schools could develop both in their infrastructure, and both academically, were not only primary education and secondary level education was promoted, but even some sort of tertiary education (theological training, teacher training, law, or other). Those schools were named "colleges" and they became the spiritual, cultural and educational centre of a region. The smaller schools being started in villages they offered only primary education, but this for a larger population.

At the beginning in many villages the pastor of the local reformed church was even the teacher in the school owned by the church, or the church could hire a person being the organist or cantor in the local church and the teacher of the school. The so called cantor-teacher position was very frequent, and a well-respected position in the local society. Some other churches, mainly in bigger schools could hire an independent teacher, being the "rector or the preaceptor" of the school, or a second teacher.

The small schools with only a teacher were requesting professional and academic support from the colleges, which relation was even a formal one. The teachers in many cases were sent by the regional centre school, the so-called "mother school", and they provided even the curriculum, the school rules and regulations for the smaller school, ensuring even a certain professional control of the school. So the small schools became the "particulas" of the regional centre school.
One of the most important regional school centre was the Reformed College in Debrecen.
The database of the "particulas" by Dankó Imre from the end of the 18th century enumerates 584 schools being in some instance the "particulas" of the Debrecen College, mentioning even the type of connection with the mother school. (Dankó, 1988)
From this register it becomes clear that a well-functioning social network system was functioning among those schools, promoting the quick and uniform spread of the professional innovation in the school system. We will return to this topic later.
There were different type of "particulas". The direct relation among the "mother school" and its "particulas" manifested in the following: the student records and the registration of the final examinations were kept (even) by the mother school. The mother school regularly sent teachers to the "particulas", the curriculum and the school policies were given by the mother school. The second type is rather an indirect relation. Some particular schools of the mother school have been developing during a certain period so well that they even became local centre for some smaller school from the micro-region (e.g. Debrecen as mother school Kiskunhalas, Nagykőrös, Kecskemét, Komárom, Losoncwere functioning as local centres). In this case the influence of the former mother school became indirect, but still with a significant degree.

The process-innovation model of the learning path protection of the gifted and talented in the early time

There was a wittingly planned process of identification, mentoring the gifted and talented students, and protecting their learning path. This process was widely used in all school system, and it consisted of three phases.

From the smallest village to the largest college

The gifted and talented students from the small village primary schools were systematically sent to the "mother school" for high school education. There was a strong social network among the teachers of the "particulas", and the teachers of the mother school not least because the teachers of the small schools were sent by the mother school, being former student of the regional centre.
In some cases it was not easy to convince the parents of the students to send their children for further education, because many families looked on their children as valuable workforce in their farming activities. The prestige in the local community of the pastor and teacher helped to convince the parents.

The students were sent with a letter of recommendation, and the teacher receiving theletter had even the responsibility to be the mentor of the students, advising him even for further studies.

From the largest college to peregrination

After graduating from the high school there were three typical career the students could follow: the most possible, entering the work market, finding a job with this education, the second one, continuing their studies in the local tertiary education, or going abroad for further studies sponsored by local patrons.. The systematic delegation of young people to different universities of Europe was called the "peregrination", being a way to gain a higher education, with the responsibility to return home, and to exploit the knowledge gained abroad for the benefit of their native local community.

From peregrination back home

The students studying abroad had not only the responsibility to return home but even the unwritten expectation that they had to bring the newest books/science books from abroad and to donate to their former schools. Some students had even the vision to bring home not only books but even printing houses establishing them in Hungary and making it a printing house great power in the 17th-18th century. The students studying abroad after their homecoming became mostly school teachers at different school levels. Even the smallest schools from the villages could have teacher with such an experience although the majority of the became a high school teacher or professor at the tertiary educational part of a college.

The innovation of curriculum-content management

The school system belonging to the Reformed Church in Hungary for a longer time didn't accepted the central regulation of the curriculum, so they were challenged for a continuous curriculum innovation and development. This innovation had three coherent engines. The first one the well-qualified teachers studying at the most frequented universities of Europe(Wittemberg, Geneva, Heidelberg, Basel, Jena, Göttingen, Halle, Franeker, Groningen, Utrecht, etc) coming home they not only applied in their teaching the newest knowledge, but even became the authors of textbooks used widely in the school system. Taking as example the textbooks of physics, the science developing in a rapid way in the 17th-18th century we can find that the author of the first Hungarian physics textbook Szilágyi Tönkő Márton the former student and later teacher of the Debrecen College, edited in 1678 in Heidelberg. The book has three parts, an introductory philosophical one, the second one Physica generalisand the third one Physica specialis. The book was widely used not only in Debrecen but even in its "particulas" until in Debrecen another famous science teacher Maróthi György began his teaching activity writing a newer textbook. (Radnóti, 1995)
The third engine of the curriculum and teaching method development was the invitation of well-known teachers from abroad to teach at reformed colleges. The best example is that of Iohan-Amos Comenius one of the teachers with the most powerful didactic influence of the

17th century. In 1650 Zsuzsanna Loránffy widow of György I Rákóczi prince of Transylvania invited him to Sárospatak to teach at one of the first and most famous Hungarian Protestant College. Comenius remained there until 1654 as a professor. He wrote some of his most important works there.
All the innovations of the school system even through mother school and "particulas", of the structure of protection of the learning path of the gifted and talented student, even bringing them back after the peregrination and using them as well qualified teachers of the school system, paying a big attention to the curriculum development and on the introduction of the newest didactical methods in the education resulted in a prospering and mainly high standard school system of the reformed church.

STRUCTURE AND CONTENT INNOVATION MANAGEMENT -THE ELEMENTS OF THE STRATEGY OF THE REFORMED CHURCH IN HUNGARY IN THE PROJECT TÁMOP-3.1.17 IN LEARNING PATH PROTECTION OF THE GIFTED AND TALENTED STUDENTS

The Reformed Church in Hungary has been successfully applied to the TÁMOP-3.1.17. tenderof the EU for "Developing the church school system". The implementation of the projecthas nine professional pillars. Five of them are compulsory requirements of the tender, two are compulsory eligible elements, and two are free eligible professional activities. One of the optional elements is the "Education of the gifted and talented students".
In Hungary and in Hungarian state school system there is a well-developed network and a system of professionally developed curricular and extracurricular activities, projects and programs for identification, development and follow-up of the gifted and talented students.
Rather a significant part of the schools belonging to the Reformed Church are part of this national program functioning as "Talent Points" or being the member of "Talent Support Councils", but there isn't a structured network, and a coherent professional coordination among their activities.
The strategy of implementation of this pillar has three dimensions, which requires a complex innovation strategy and management. All three itself could be considered as innovation process which has to be coherent and synergic.
The *first dimension is a theoretical dimension*, which aims to develop the "Strategy of the Reformed Church in Hungary educating the gifted and talented students". This strategy gives the theoretical background of the professional activities and of the structure of the system dealing with talented students. This strategy has to be coherent with the National Talent Development Strategy.

The *second dimensionis a structural innovation*, which aims to establish the social network of the school system with a focus on educating the gifted and talented students. In the frame of the project the schools are invited to become "Talent Points" schools recognised by the National Talent Support Council as schools with special programs for gifted and talented students. The project will establish four Regional Talent Support Councils, and a National Talent Support Council for the schools of the Reformed Church. Both the regional and

national councils will have connection to other similar organisations and will have connection with the Hungarian speaking schools of the neighbouring countries.
The basic innovation was the establishment of a "Workshop for teachers from the reformed schools from Northern Hungary" as a professional foundation and frame of cooperation among the teachers in 2012. This network was incorporating the teachers from the 22 institutions from the Tiszáninneni Reformed Church District and the teachers from 7 Hungarian speaking institutions from Slovakia. Meeting two times a year this workshop was focusing on major areas, and problems of the Christian education, offering an efficient platform for networking and cooperation. After one and half year based on this workshop cooperation which is a non-institutional form of cooperation, the Talent Support Council of the Reformed Schools from Northern Hungary has been created (figure 1.). This structure was the model in the project mentioned below, challenging the schools from the other three church districts to create their talent support council, and a central council to coordinate nation-wide the development of gifted students.

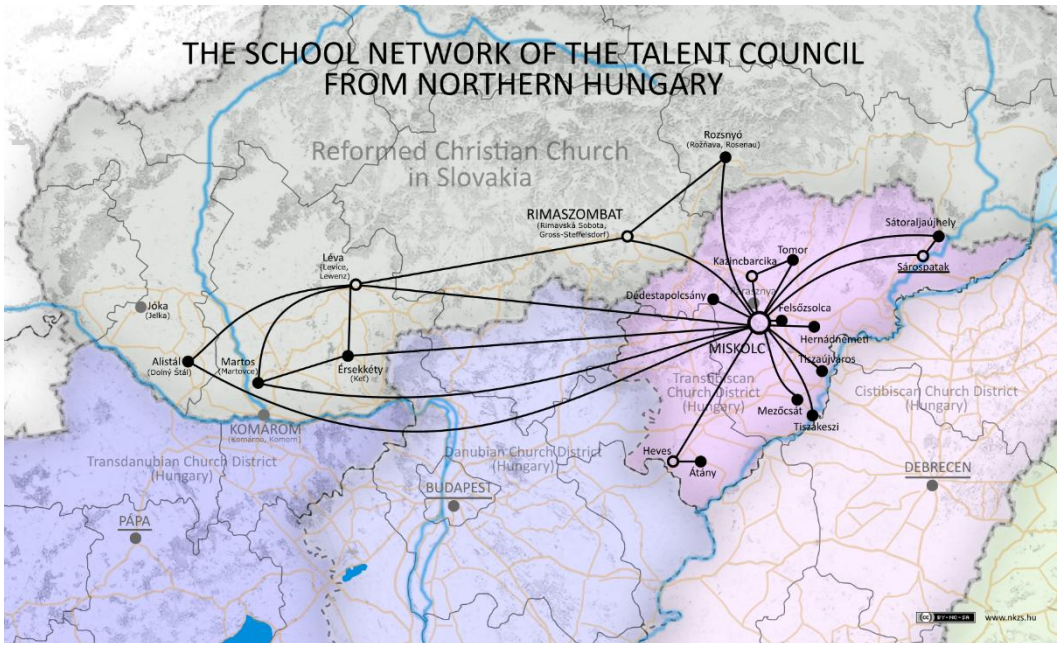

Figure 1. The school network and member schools of Talent Support Council from Northern Hungary

Source: Dr. Nagy Károly Zsolt (2015)

The *third dimension is a content innovation* and development. Because of the short time of implementation of the project there must be applied a triple segmentation of the content innovation. A time segmentation, a subject segmentation and a school type segmentation.
The project aims to develop enrichmentprogramsfor gifted for all school level (primary upper and secondary) both curricular enrichment programs bound to certain subjects and noncurricular enrichment programs. In the frame of the actually project in five subjects and in two different grade levels has been started curricular enrichment programs to be developed, only for one grade level in the primary and one in the high school. The program will be extended during the years covering all the school types of the school system, all the grades in which a certain subject is taught, and the majority of curricular and extracurricular activities.

The time frame of the project is 4-5 years, during this time based on the Strategy developed earlier a coherent structural innovation and content innovation will serve in the schools of the Reformed Church the identification, the development, the monitoring and the protection of learning path of the gifted and talented students.
These activities of the school system are not self-serving and self-interested, but they come from that biblical principle that everyone is responsible for the spiritual, intellectual and physical gifts, and is liable to use them for the benefit of the larger community.

CONCLUSION

The modern social network theory of innovation management has been compared with the practice of the reformed school system from the 17th century promoting structural and content innovation and protecting the learning path of the gifted and talented students in the education system, finding real similarities. A proper innovation strategy and management has been developed in the frame of the project to serve the school network in managing and protecting the learning path of the talented students. Based on this model three other regional councils were created in Tiszántúli Reformed Church District, Dunamelléki Reformed Church District and Dunántúli Reformed Church District. The nation-wide council is planned to be created in the near future.
The new concept of strategy development, of structural innovation, content innovation and segmentation has been presented in the frame of TÁMOP-3.1.17.tender of the EU for "Developing the church school system".

REFERENCES

CARRINGTON, PETER J., SCOTT, JOHN, WASSERMAN, TERRY (ED) (2005): Models and Methods is Social Network Analysis, Cambridge University Press, pp. 98
DANKÓ I (1988): A Kollégium partikularendszere, in: A Debreceni Református Kollégium története, szerk. BARCZA J, Budapest, pp. 776–810. (only in Hungarian)
MACCULLOCH, D. (2004): Reformation, Viking Penguin, pp. 103-153
Innovation Management and the Knowledge - Driven Economy, European Commission Directorate-general for Enterprise Legal notice, ECSC-EC-EAEC Brussels-Luxembourg (2004), pp. 4
MONTGOMERY BOICE J (2001): Whatever Happened to The Gospel of Grace?: Rediscovering the Doctrines That Shook the World, Crossway Books, a division of the Good News Publishers
RADNÓTI K (1995): A komplex természettudományos nevelés lehetőségeiről a magyar fizikatankönyvek tükrében régen és ma, in: Iskolakultúra, vol 8-9, pp. 79-94 (only in Hungarian)
VALENTE,THOMAS W (1995):NetworkModels of the Diffusion of Innovations. HamptonPress, Cresskill, NJ

HOW TO MEASURECOMPANIES INNOVATION CAPABILITY?

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SUMMARY

Although Innovation is defined by many classical sources (Schumpeter, Oslo Manual etc.) it is still remains a myth at companies what it really means. It is well understood that sustainable growth is not possible without proper innovation management. Lots of energy is invested to implement and setup well-structured stage gate processes – from idea generation till market launch with state of the art project management, however fundamental question is mostly ignored, neglected: what innovation culture matches to industries, markets certain companies serve.
This paper researches the literature of different innovation capability measurement systems Select one which has a fundamental new approach and shows the status of a model validation process at a new industry. The model main claim is that there is no good or bad innovation culture. The main question is how innovation culture/capability is matching to the company current and future targeted strategy and operational of excellence. During the validation process 2 strategic business fields are being selected similar in size and challenges (matured markets with stagnating product lifecycles, still need for 5-10 % of innovative growth within next 5 years which can be only reached via competence enhancement – not to be derived from current markets). These conditions provide excellent opportunity to validate the model at this industry and propose if applicable necessary adjustments.

INTRODUCTION

Studies have shown that companiesconversion rate from initial idea to proof of concept is somewhere around 10%(Hansenet.al. 2007)That is another way of saying that minimum around 90% of all innovation efforts are never commercialized or used in general. If any company could raise the ROII (return on investment on innovation) with just 10% this would give them a significant competitive advantage in global competition. It seems, however, that innovation is still in its infancy as a management discipline, and it seems that if companies start approaching innovation in a more systematic way – e.g. through the application of measured and managed innovation they could increase their ROI at no or small additional costs.
As a head of a Strategic Business Field (SBF) of a leading global German chemical company, generating closely triple digit million euro turnover annually I am facing a rather big challenge. There is a 3 % CAGR goal to be reached till 2020. Current markets served are matured and stagnating so innovative growth plays an important role in strategy.
In order to understand SBF's innovation capability several innovation measurement systems had been looked upon and one was selected for the test. Based on its standard questionnaire SBF mentioned above and another smaller SBF, similar in strategically growth challenge was

selected as benchmarking partner and the same questionnaire was applied. The both quantitative measurements were carried out August 2015. Results show that each unit have similar challenges with strong innovation barriers within structures and communication, however the weak innovation barriers such as available resources and risk taking needs also improvement to foster innovation. Currently a quantitative measurement, interviews are being prepared to validate the results of questionnaires Results will be presented to each business units board with concrete action plans..

The paper will first explain definitions used and provide a brief overview about the historical development of innovation measurement systems. Later it willintroducesome of the major innovation models and tools which were developed based upon. One of these measurementmodelsis chosen and introduced in more details and used. The initial results of quantitative measurement will be introduced. The scientific evaluation of the project can be finalized as soon as the interviewsconducted; quantitative results are crosschecked with the output of the questionnaire. It is expected December 2015. This research enables to see how the selected model works on the industry and wheatear if it needs further fine tuning. It helps to identify areas of improvement which increases the chance of innovative growth. It would enable to compare results of different SBFs within same company who share the same challenge: serving completly different markets with completely different technology, but having same strategically challenge.

DEFINITIONS

"An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations." (OSLO Manual 3rd Edition, 2005:47). When innovation meant or addressed this definition is being used in this paper.

The model which is finally chosen – Innolytics – is introducing 4 types of innovation characteristics which companies can be described.

'Operational Innovators' are companies which have a creative potential, however they focus on core operational business and processes. Normally there is hardly any detectable innovation strategy. Ideas are generated by individuals or teams during their operational activities.

'Innovative Optimizers' are focusing on incremental innovation. Innovations are controlled via processes and typically slow decision making. Typical companies are serving mid, long term stable markets.

'Strategic Innovators': Strong leadership via the whole company, small level of proactivity: Innovation is top down focusing of strategy, ambitious goals and values. Innovation culture is reactive. Typically fast follower strategy is conductedand avoidance of risk.

'Proactive Innovators': Pioneers for develop markets further. Very high readiness at all employees to drive innovation. Result oriented, strong innovation goals, high level of innovation speed. Able to handle complex, higher innovation grade.

BRIEF LITERATURE OVERVIEW

Historical development of innovation metrics

Innovation indicators (Gamal, 2011) over time can be split into four categories (Table 1). First generations of metrics werefocusing on inputs such as R&D investment, education expenditure, capital expenditure, research personnel, university graduates, technological intensity.

Table 1. Historical summary of innovation indicators

First Generation Input Indicators (1950s-60s)	Second Generation Output Indicators (1970s-80s)	Third Generation Innovation Indicators (1990s)	Fourth Generation Process Indicators (2000s plus emerging focus)
• R&D expenditures • S&T personnel Capital • Tech intensity	• Patents • Publications • Products • Quality change	• Innovation surveys • Indexing • Benchmarking innovation capacity	• Knowledge • Intangibles • Networks • Demand • Clusters • Management techniques • Risk/return • System dynamics

Source: Center of Acceleration Innovations, George University (2006)

The second generation extended input indicator pool with the intermediate outputs of S&T activities, like patents filed, scientific publications, number of new products, processes.
The third generation is focused on surveys and integration of publicly available data. The primary focus was/is on benchmarking and ranking a nation's capacity to innovate. Fourth generation metrics currently under development and including indicators about knowledge, network, and conditional (internal, external) factors.
‘Knowledgeindicators’are explaing how innovation is created, developed and diffused.
‘Network indicators’ describing interactions within and outside of the company. How different type of partners from the internal, external value chain can be integrated into the innovation creation process. Depending on level of innovation and cooperation capability of educational, government institutions are also considered.
‘Conditions for innovation’ indicators capturing infrastructural, cultural conditions, social attitudes, economical demand, political, regulatory impacts which are critical for innovation.

Measurement Models and Exploration Tools

Some major models are introduced including exploration tools based upon them. They differ how innovation is perceived as a process and which dimension are considered.

Diamond model

This model has 5 dimensions for innovation assessment: strategy, process, organization, linkages, learning (Tidd et. al, (2011)). The first dimension covers three components of 'Strategy' process: planning, how much innovation is embedded into strategy and finally how defined strategy is implemented. Second dimension 'Process' implementation: how new product development is part of the DNA of the company. Third dimension 'Organization' has two components. One explains how organizational structures enables top-down, bottom-up, lateral communication, the second addresses if management puts in place system to foster internal new product idea generation. Fourth dimension 'Linkages' describes how well companies connect with different external entities customers, suppliers, competitors, academe etc. and how these links can bring benefit to the company. Fifth dimension 'Learning' has four major aspects: first how organization is committed to learning and training its employees, second the ability to collect information from its 'Linkage', third how company can deal with lessons learned from good or failed innovation projects. Fifth how company can share these analyzed, collected information within the organization. A set of question is put into a questionnaire and all these 5 dimensions are measured it helps to decide how high or low (Figure 1.) a certain company is concerning innovation and helps to identify areas of development.

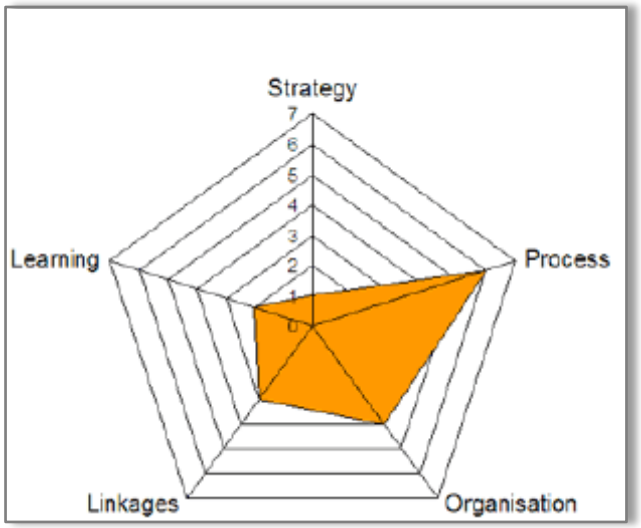

Figure 1. Diamond model Company with low innovation capability
Source:https://technopreneurship.wordpress.com/2007/05/07/how-to-measure-a-firms-innovativeness/

Innovation Funnel

Funnel model is describing innovation from end to end as a linear process. Usually split into 3 main, 7-9 sub steps (Table 2). 3 main faces are idea development, concept development, and concept to launch. It is also known as stage gate process. Two types of metrics considered to be used. First types are quantitative and focusing on understanding how work is carried out. Second type of metrics isquantitative and concentrating on conversion rate between different stages and other statistical data.

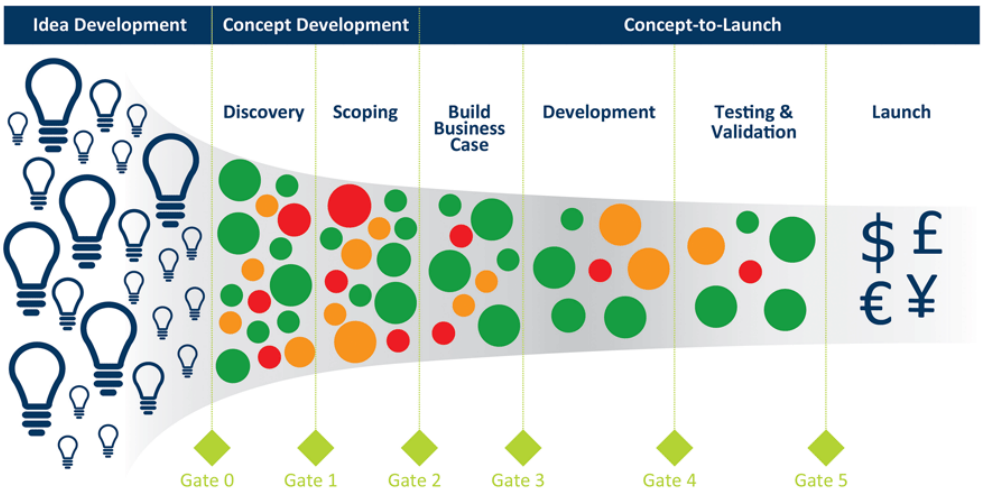

Figure 2. Innovation Funnel

Source: www.sopheon.com/idea-concept-development/

Innovation Value Chain

Innovation Value Chain (IVC) (Hansenet.al. 2007) It represents innovation as a three phase process: idea generation, idea development (conversion), diffusion, spreading of developed concepts (Table 2).

Table 2.Innovation Value Chain different stages

	IDEA GENERATION			CONVERSION		DIFFUSION
	IN-HOUSE Creation within a unit	CROSS-POLLINATION Collaboration across units	EXTERNAL Collaboration with parties outside the firm	SELECTION Screening and initial funding	DEVELOPMENT Movement from idea to first result	SPREAD Disse-mination across the organization
KEY QUESTIONS	Do people in our unit create good ideas on their own?	Do we create good ideas by working across the company?	Do we source enough good ideas from outside the firm?	Are we good at screening and funding new ideas?	Are we good at turning ideas into viable products, businesses and best practices?	Are we good at diffusing developed ideas across the company?
KEY PERFOR-MANCE INDICATORS	Number of high-quality ideas generated within a unit.	Number of high-quality ideas generated across units.	Number of high-quality ideas generated from outside the firm.	Percentage of all ideas generated that end up being selected and funded.	Percentage of funded ideas that lead to revenues; number of months to first sale.	Percentage of penetration in desired markets, channels, customer groups; number of months to full diffusion.

Source:Hansenet.al. 2007

Three innovation activities are addressed: accessing knowledge, building innovation, commercializing innovation. This model was developed further (Roper et. al. (2008) so it became easier for different industrial sectors and still provide comparability. Therefore this frame work became the base for NESTA, (National Endowment for Science Technology and the Art) United Kingdom's innovation agency innovation indexing project since 2008. (www.nesta.org.uk/wp14-07)

OSLO Manual Innovation Measurement Modell

This manual is prepared by a joint cooperation of OECD and Eurostat which provides guidelines for collecting and interpreting innovation data in an internationally comparable manner.

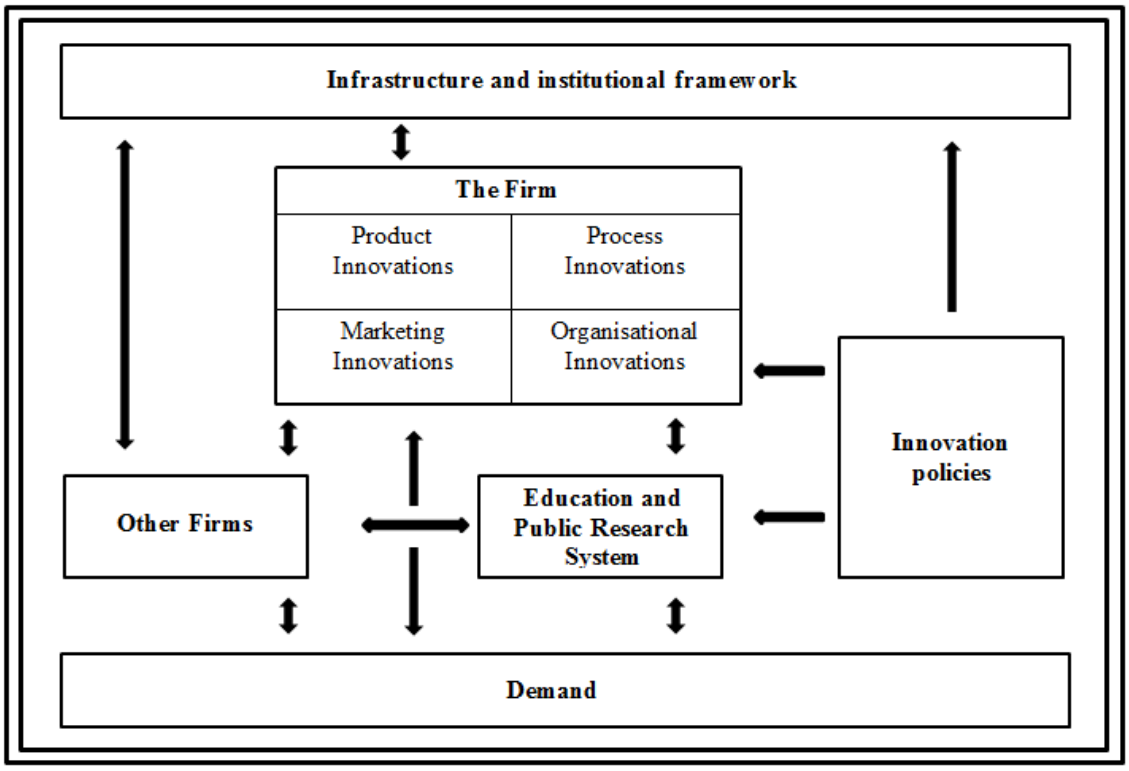

Figure 3. Framework of OSLO Manual about Innovation
Source: Oslo Manual 3rd Edition (2005)

It combines different insights from firm based theories and considers innovation as a system. The main components are innovation at the firm, linkages to other external institutions, policies impacting firm and also what type of demand to be fulfilled (Figure 3). Several models were prepared based on this framework.

IMP3rove- Europe Innvoa

Established by European Commission to improve innovation management performance of small- and medium-sized enterprises (SMEs). The assessment is systematically assessing along the dimension of A.T. Kearney House of Innovation model. It measures along the factors shown below (Figure 4). It has already a databank with more than 3000 companies data from different sectors.

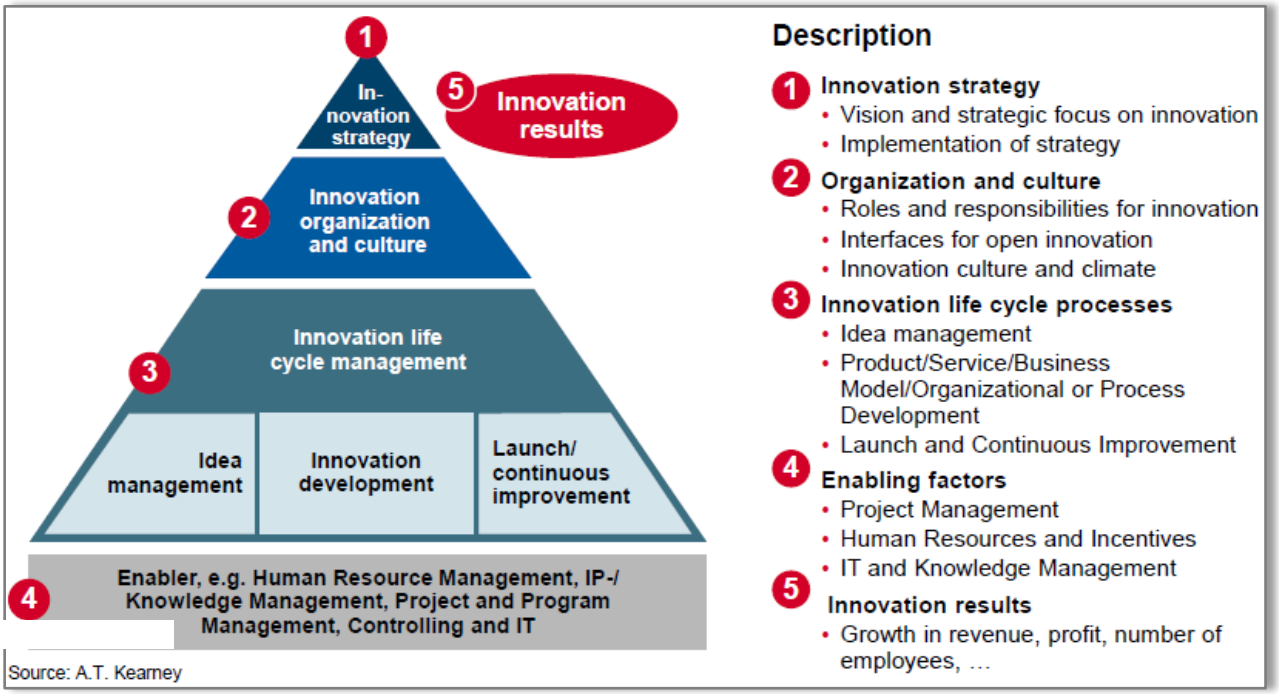

Figure 4. House of Innovation
Source: https://www.improve-innovation.eu

Innovation Radar

It was developed by Kellogg School of Management's researchers and was published in 2006. (Sawney et. al, 2006). It explains if companies take a business model innovation approach, compared to a more 'simple' product or process innovation view, are more successful. It addresses four major dimensions:

- WHAT: offerings a company creates
- WHO: customers it serves
- HOW: process it employs
- WHERE:points of presence how a company puts their value-proposition to market

Figure 5. Innovation Radar

Source: Sawhney et. al, (2006)

Innovation Maturity (IMMA) Model

The model developed by NC State University, CIMS. (Aiman-Smith et. al, 2005). The assesment is divided into three parts: core competences, management and environmentaldimensions. It rates performance on a scale from1..5 and presents results an easy to understandable heat map (Figure 6).

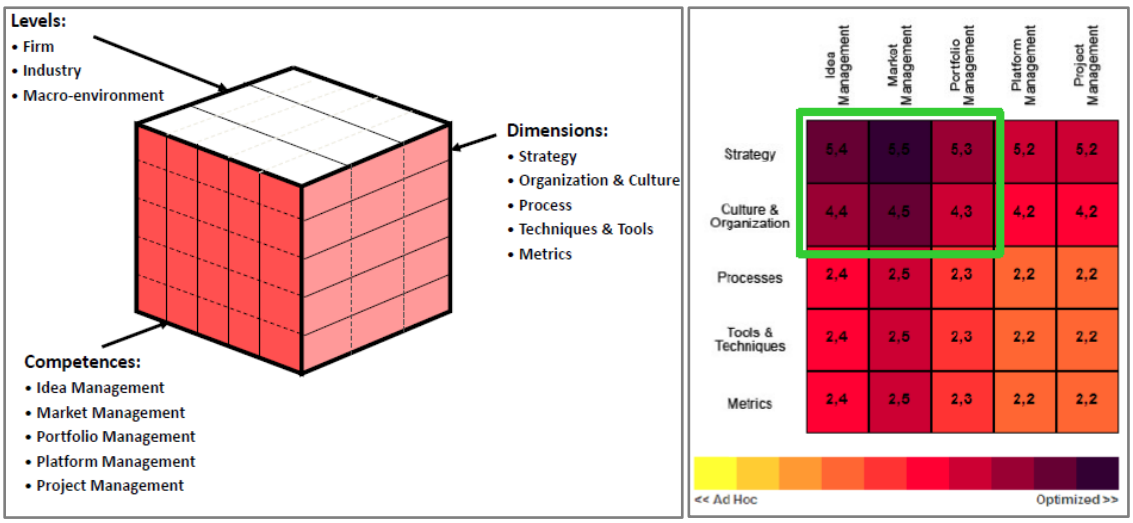

Figure 6. Innovation maturity 3D modell with output heatmap

Source: http://cims.ncsu.edu/tools-assessments/im-maturity/

Innolytics Model

Amabile's idea that the generation and development of ideas can be promoted onseverallevels of an organization (Amabile et al. 1996: 1158) is applied in the formationof the model. The model defines 4 levelsorganization,management,staff, environment10categories (strategy, values,managementstructure,management style, resources, team composition, incentives,communication, risk culture,working climate) and 48 items linked to the different categories.(Meyer, 2014) The received information puts it on a 2 dimensional space depending on impact on pace and level of innovation (Figure 7). Fundamental difference is from all other model that it emphasizes depending which current and future markets certain company is serving all 4 types are equally good. There is no such a thing as an absolute great innovative company which has to be all companies role model. What is important business must match its innovation type with markets are currently served and/or intends to serve in the future. This core message next to easy applicability (investment and maintenance cost, local support) and acceptance was the main criteria to choose the metric system for research.

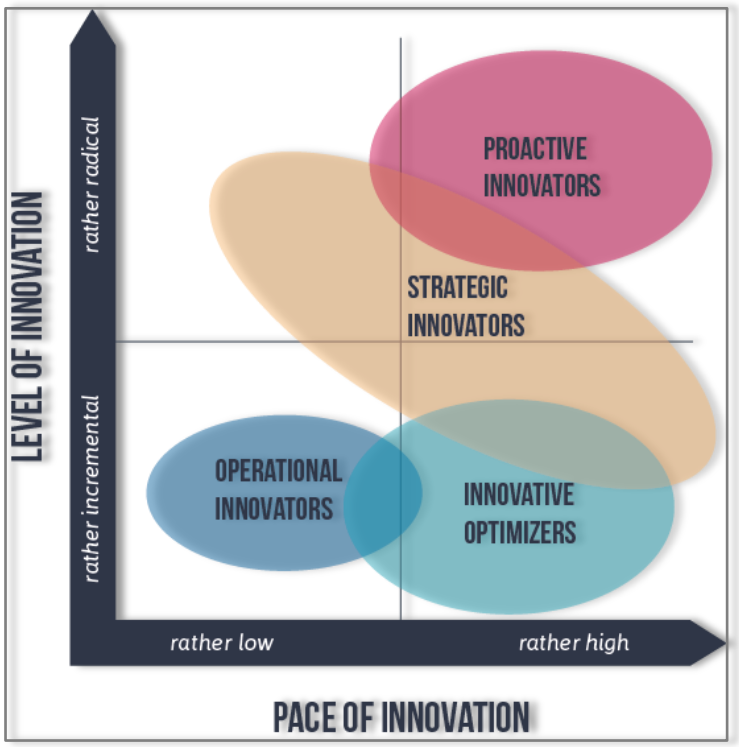

Figure 7. Innolytics model
Source: Meyer, (2014)

Summary of Different Models

The following table shows the overview of some typical innovation model and metric system (Table 3).

Table 3. Overview of some typical innovation model

Measurement Model	Ex. Of tools	Focus	Dimensions	Remarks
Diamond Model	• Improve	• Innovation process • Enabling factors • Linkage	Strategy, process, organization, Linkage and Learning	Adequate when innovation process on its infancy. It highlights key dimensions of innovation process as well as its enabling institutional factor
Funnel Model		• Tech. Innovation or • Product innovation focus • R&D process as the core activity	Strategic Thinking, portfolio Management & Metrics, Research, Ideation; Insight, Targeting; Innovation Development; Market Development; and Selling	Adequate model when there is a due innovation process in the organization
Innovation value chain (IVC)	• NESTA	• Idea Management	Generation, Conversion, Diffusion Knowledge acquisition, Building Innovation, commercializing Innovation	Emphasizes the assessment of the output of innovation process.
Oslo Manual	• IMMA	• 3 dimensional modell	Dimension Levels Competences	20 years of experiment well documented academic based source
	• Innolytics	• Complex Model	4 Level 10 Categories 48 Items	Emphasizes importance of matching innovation style and business, market conditions
	• Innovation radar	• Innovation output performance	Offerings, customers, processes, marketing	Does not ensure the sustainability of innovation process

Source: own research + Gamal,(2011)

RESEARCH DESIGN

Two Strategic Business Fields (SBF) of a leading German global company from the chemical industry were selected to participate in the research. Both SBFs are similar in size, similar in challenge: matured product portfolio, serving saturated markets still there is a necessity to grow beyond organic growth via innovation 5-10 % within next 5 years. For the quantitative questioning all white collar workers,management and employee level were selected at each unit including international sales force and asked in German and English language. Prior conducting official questionnaire a pilot test was carried out on one of the SBFs only to

validate the overall questionnaire design (Figure 9) and the main questionnaire (Table 4) for innovation and the technological background set up. Except some translation related topic the original structure of questionnaire was accepted after conducting pilot on a population n=50.

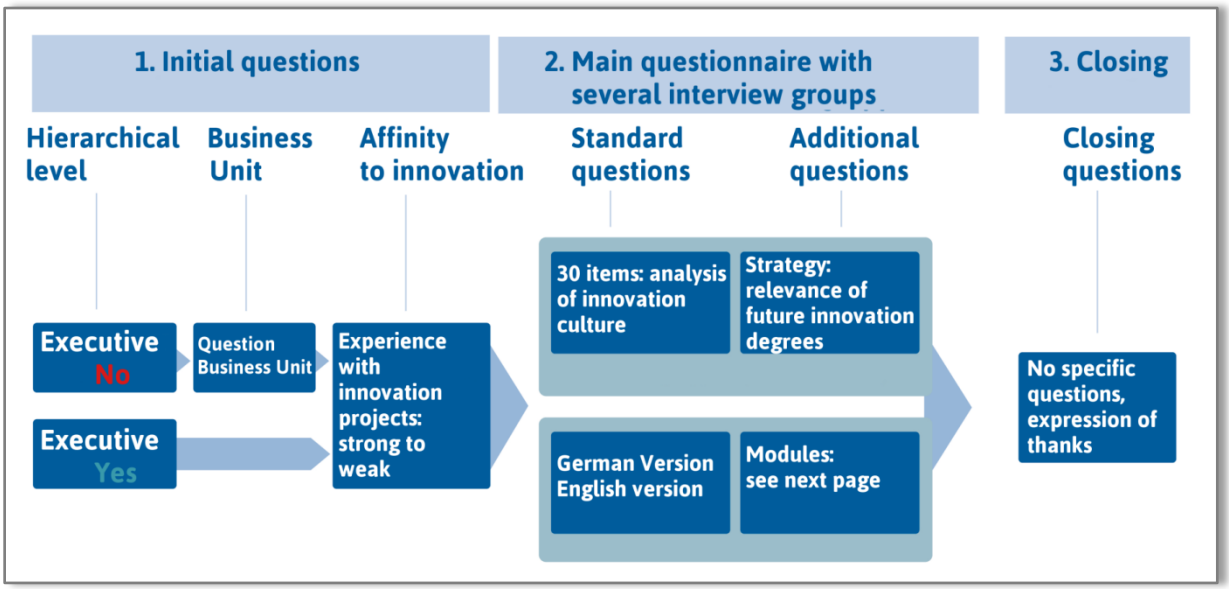

Figure 9. Overall Structure Design

Source: own research

Table 4. Questionare structure

Category	Basis 30 questions	Additional Module	Configuration
Strategy	3 Questions	Importance of various innovation degrees and -categories (10-15 questions)	Evaluation of: Strategic fields of innovation
Values	3 Questions		
Structures	3 Questions	Process quality	Specific processes & structures
Leadership	3 Questions		Innovation-Know-how
Resources	3 Questions		specific resources
Incentives	3 Questions		Influence of incentives
Team	3 Questions	Creative skills and teamroles Experience with innovation (5 questions)	Specific experience with innovation projects
Risk	3 Questions		
Communication	3 Questions		Informal networks Quality of networks Experience with innovation (5 -10 questions)
Climate	3 Questions		

Source: Innolytics GmbH (2015)+own research

RESULTS

The quantitative measurement took place at SBFs (SBF T, SBF N) between 15.06.2015 till 14.07.2015. Addressed population was n=210 at SBF T, n=67 at SBF N. Respond rate was 64% (133) at SBF T, and 80% (66) at SBF N. Management (37)/Employee (97) ratio 0.38 was at SBF T and Management (24)/Employee (30) ratio 0.8 at SBF N.
SBF T and SBF N was found on the same position according to the model: between 'Innovative Optimiser' and 'Strategic Innovator'. For future market challenges due to increased innovation pressure both SBFs suppose change to 'Strategic Innovator' type based on model proposal.

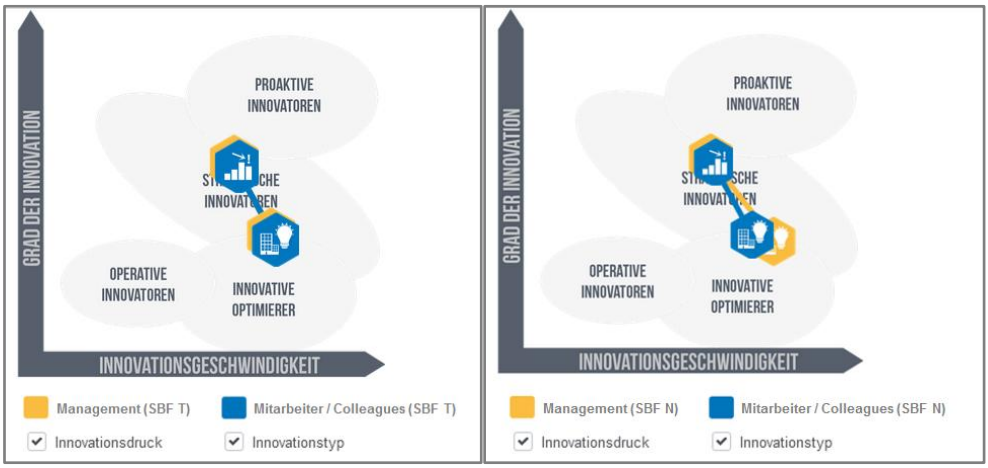

Figure 10-11.SBF T and SBF N Innovation Type
Source: own research

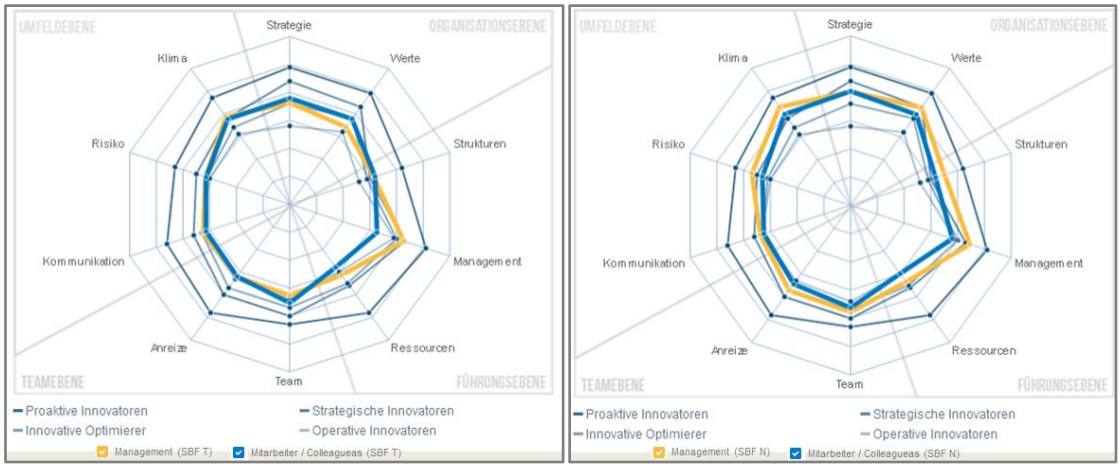

Figure 11-12.SBF T and SBF N Benchmarking Management Summaries
Source: own research

I will introduce all 4 levels (organization, management, team, and environment) of summary results and will present key finding(s) and question(s) which later can be considered at the quantitative interview.Benchmarking management summaries (Figure 11, 12) are showing

management and employee assessment and comparing data to 4 main innovation typesprovided by the original model.

Figure 13-14.SBF T and SBF N Organization Level Assessment

Source: own research

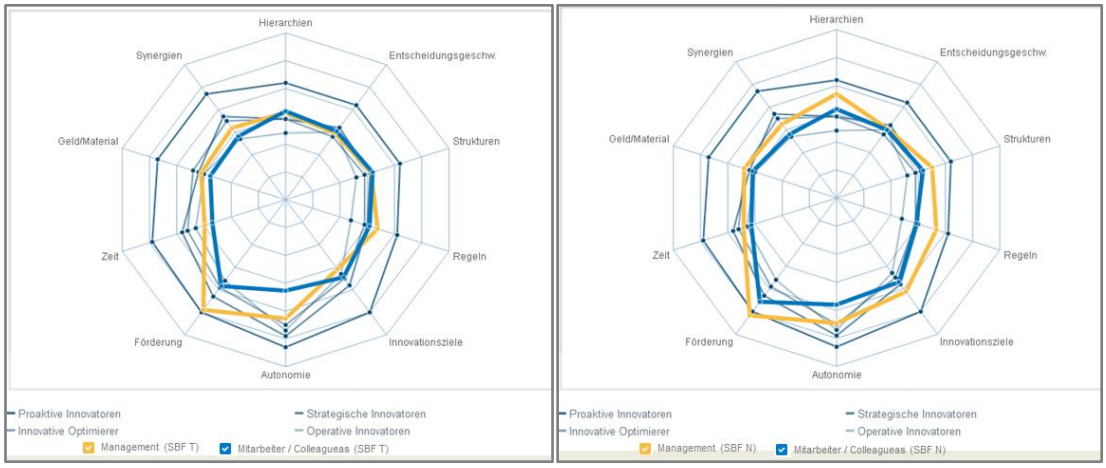

Figure 15-16. SBF T and SBF N Management Level Assessment

Source: own research

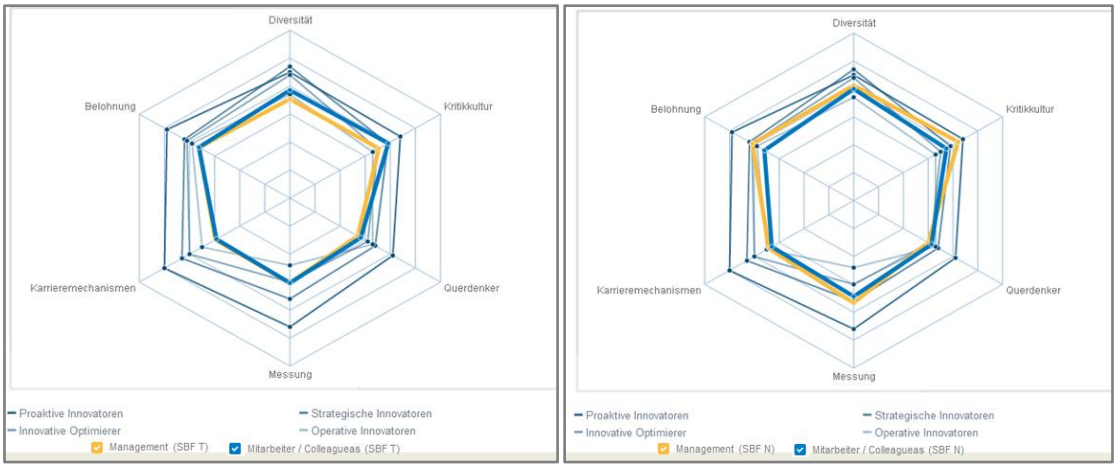

Figure 17-18. SBF T and SBF N Team Level Assessment
source: own research

Figure 19-20. SBF T and SBF N Environment Level Assessment
Source: own research

Organizational level data (Figure 13, 14) are showing management and employee assessment and comparing data to 4 main innovation types provided by the original model. Why there is significant difference between employee and management assessment? What does it mean role model within this organization which looks extremelyhigh? Is it an enabler or a barrier? Does it come from local (German) culture influence and has less to do with company culture?
Management level data (Figure 15, 16) are showing management and employee assessment and comparing data to 4 main innovation types provided by the original model. Why there is a huge difference how ideas are push forward from the management and from the employee point of view? Why is there such a large difference between management and employee assessment on authority?
Team level data (Figure 17, 18) are showing management and employee assessment and comparing data to 4 main innovation types provided by the original model. Extremely homogenous teams on both SBFs. Is this not a clear barrier?
Environment level data (Figure 19, 20) are showing management and employee assessment and comparing data to 4 main innovation types provided by the original model. It shows very

low level relating to internal, external partners and meeting culture. What does it mean in reality what are meeting relating to innovation are used for?

DISCUSSION AND CONCLUSIONS

The paper describes and addresses results in a working progress phase therefore drawing main conclusions at this stage are very limited. Innolytics model looks applicable at these two SBFs.

The current innovation type of both SBF seems to be matching with current empirical assumptions. The 4 level of organization, management, staff, environment indication and deviation must be validated through soon to be conducted interviews. These interviews (maximum 6) will be carried with each SBFs employees from sales, R&D, top management, production, supply chain,quality assurance.Full measurements and evaluation is planned to be finished till December 2015.

There are several business relevancies of conducted measurements next to the scientific ones. It points out the barriers of current organization and processes. It helps to identify concrete actions to improve innovation management efficiency. It can provide a common language among all other SBFs as standard tool to access innovation management worldwide within the company.

REFERENCES

M. T. HANSEN, J. BIRKINSHAW (June 2007). Innovation, Value Chain. Harvard Business Review 85(6)

OSLO Manual 3rd Edition (2005), ISBN 92-64-01308-3

D. GAMAL (2011) How to measure organizationInnovativeness. http://www.tiec.gov.eg/backend/Reports/MeasuringOrganizationInnovativeness.pdf

J.TIDD, J. BESSANT (2011) Managing Innovation – Integrating Technological, Market and Organizational Change. Wiley. ASIN: B005J58TKY

S. ROPER, J. DU, J.H.LOVE (2008) Modelling the innovation value chain. ELSEVIER V.37, Issues 6-7, July 2008 p961-977www.nesta.org.uk/wp14-07

M.SAWHNEY, R.C.WOLCOTT, I. ARRONIZ (2006) The 12 Different Ways for Companies to Innovate.MIT Sloan Management Review (April 2006)

L.AIMAN-SMITH, N. GOODRICH, D. ROBERTS, J. SCINTA (April 2005). Addressing your Organization's Potential for Value Innovation. Industrial Research Institute

T.M.AMABILE,R.CONTI,H.COON,J.LAZENBY,M.HERRON. Assessing the Work Environment for Creativity. Academy of Management Journal. p1154-1184

J-U. MEYER, Strengthening Innovation Capacity through Different Types of Innovation Cultures (2014).Presented at the 2014 ISPIM Americas Innovation Forum, Montreal, Canada on 5-8 October, 2014.papers.ssrn.com/sol3/papers.cfm?abstract_id=2506307

STUDY ON THE CREDIT GUARANTEE SYSTEM: THE CASE OF THE V4 COUNTRIES

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SUMMARY

Credit guarantee is an effective policy tool which is used by many countries around the world to support enterprises, especially in helping small and medium enterprises (SMEs) to easily access capital. Through this, credit guarantee promotes the development and prosperity of the enterprises as well as the development of the economy. Understanding the importance of credit guarantee, the V4 countries have also applied credit guarantee as an important policy tool to boost enterprises and develop the economy. This paper focuses on analyzing the operational model of credit guarantee system in the V4 countries using in-depth analysis of four case studies. Through this paper, the author analyzes the different experiences in the application of the credit guarantee system in the V4 countries. This study could provide useful information to managers, policy makers, credit institutions, the government etc., thereby helping them make policies and solutions to improve the efficiency of the credit guarantee system.

INTRODUCTION

Credit guarantee system have already been operating in the V4 countries and most coutriesin the European region. Credit guarantee is an important part in the financial system of the V4 countries. It is used to aid SMEs overcome obstacles in access to finance by providing guarantee services. Credit guarantee helps banks to unfreeze credit to enterprises, minimize risk, reduce cost of monitoring and supervision of banks in the lending process. At the same time, credit guarantee is a tool for governments to promote the economy of the V4 countries, help overcome the financial crisis in 2008 such as in the case of Hungary. During operation, credit guarantee system of the V4 countries have achieved the followingresults:

Table 1: Outstanding guarantees in the V4 countries

Country	Outstanding guarantees (Million €)						
	2007	2008	2009	2010	2011	2012	2013
Czech RP	451	530	701	943	829	855	661
Hungary	1,481	1,580	1,706	1,575	1,356	1,419	1,327
Poland	na	na	442	385	484	392	1,540
Slovak Rp	128	140	208	196	204	Na	Na

Source: http://www.aecm.eu (European Association of mutual guarantee societies)

Table 2: Outstanding guarantees to GDP in Europe

Country	Outstanding guarantees to GDP (%)						
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Austria	0.16	0.15	0.17	0.16	0.14	0.13	0.12
Belgium	0.10	0.10	0.14	0.17	0.19	0.20	0.19
Czech RP	0.34	0.34	0.49	0.63	0.53	0.56	0.44
Estonia	0.26	0.26	0.49	0.68	0.64	0.64	0.55
France	0.51	0.49	0.71	0.83	0.82	0.79	0.80
Germany	0.22	0.22	0.24	0.20	0.23	0.22	0.21
Greece	0.04	0.06	1.51	1.14	0.64	0.30	0.32
Hungary	1.49	1.50	1.87	1.64	1.37	1.46	1.36
Italy	1.89	1.92	2.11	2.13	2.08	2.28	2.11
Latvia	0.09	0.19	0.23	0.47	0.44	0.40	0.37
Lithuania	0.57	0.59	0.83	0.78	0.66	0.53	0.56
Poland	na	na	0.14	0.11	0.13	0.10	0.02
Portugal	0.27	0.52	1.63	2.18	1.89	1.80	1.83
Romania	0.31	0.33	0.60	0.74	1.09	1.34	1.14
Slovakia	0.23	0.22	0.33	0.30	0.30	na	Na
Slovenia	0.04	0.08	0.28	0.44	0.57	0.55	0.55
Spain	0.54	0.55	0.62	0.62	0.59	0.54	0.46
Turkey	0.34	0.30	0.45	0.39	0.52	0.58	0.63

Source: http://www.aecm.eu, http://ec.europa.eu/eurostat and own elaboration

To assess the performance of the credit guarantee system of one country, the researchers often use 2 uses two indicators: Outstanding Guarantees and Outstanding Guarantees to GDP. These indicators are higher it mean that this credit guarantee system operate more efficiently. Table 1 indicates this indicator of V4 Countries has tended to raise particularly credit guarantee system in Hungary with higher indicator than other countries. Besides, according to ACM (European Association of Mutual Guarantee Societies), the country with indicator of Outstanding Guarantees to GDP more than 1% which means that the credit guarantee system works well and efficiently. Based on Table 2, we can see only Hungary in V4 Countries with the indicator of Outstanding Guarantees to GDP higher than 1%. This demonstrates that other countries in the V4 Countries only operate at normal level. Also this index of Hungary is higher than other countries in Europe and its rank is second after Italy.

This paper focuses on the characteristics of the credit guarantee system in the V4 countries. Each country has its own characteristics and experiences in the process of operation. Therefore, by studying the characteristics of the credit guarantee system of each country, this study will help credit guarantee activities in the V4 countries to become more effective.

LITERATURE REVIEW

Credit guarantees are widely used in the world and are applied by many countries and regions around the world. Credit guarantee is used as a financial tool to promote SMEs, thereby promoting the development of economy. There are many authors who spend more time researching about the credit guarantee activities in the world. Jacob Levitsky and N. Ranga Prasad (1989) has performed research on guarantee system in 27 countries and continents around the world. This study have shown the basic characteristics of credit guarantee activities in 27 countries in the world. Through which the author analyzed and assessment of characteristics such as elements, scope, impact, additionality of Lending, creating in confidence, loss rate etc.

Credit guarantees have an important role in promoting, supporting SMEs in lending activity. According to studies were made by Levitsky (1997b); Beck, Klaper & Mendoza (2010) indicates that credit guarantee to increasing lending to SMEs, increases access to finance of SMEs, reduce the costs of borrowing.

Besides credit guarantee also encourages and support lenders by providing collateral as compensation in case the loan is not repay (Bookcock and Shariff, 2005), to diversify risk across of the loan guarantee means that credit institute will cooperate with many lenders to under write loans (Beck etal, 2010), allowing lenders to transfer risk of recovery of loan to guarantor (Levitsky, 1997b). Credit guarantee incentives the lenders to help them overcome the problem of information asymmetry (Beck et al., 2010). The guarantors will participate in the application and monitoring process.

At the regional level, the research by Hachinohe University Research Institute carried out a study on the credit guarantee system of the ASEAN countries. This study described the characteristics of the credit guarantee system of the ASEAN countries. At the same time, it offered some solutions to develop the credit guarantee system and credit information system of the ASEAN region based on the successful experience of Japan. The research conducted by the OECD (2012), studied the solutions to strengthen access to finance of SMEs through credit guarantee programs in Central Asia. Iihyock Shim (2006) studied the credit guarantee institutions in ASIA. This study focused on analyzing the role and activities of the government and the credit guarantee institutions in ASIA. This study also analyzed the lessons from the failure of the credit guarantee institutions.

All these studies indicate that credit guarantees have significant role in the financial system, bringing many benefits to SMEs, banks, economy etc.

CREDIT GUARANTEE SYSTEM IN THE V4 COUNTRIES

Credit guarantee system in Czech RP

In Czech RP, credit guarantee system was established and operated mainly by Czech and Moravian Guarantee and Development Bank–CMGDB. Credit guarantee is used quite commonly in Czech as evidenced, two thirds of banks have used such products for more than

five years. CMGDB help simplement the state policy in the economic development objectives and financial support for SMEs. Moreover, it also supports financing specific projects like helping to improve regional technical infrastructure and panel-block apartment houses reconstruction. CMGDB involved in a network of organizations to support SMEs. These institutions received considerable support through the PHARE program of the European Union. It helps CMGDB have adequate financial support to assist SMEs in the best way. Summing up the Czech experience over the 1992-1998 periods, it shows thatCMGDB could become an effective instrument for supporting SMEs.

Besides CMGDB, credit guarantee system of the Czech Republic has two credit guarantee institutions whichfocus on supporting export enterprises, these are Export Guarantee and Insurance Corporation (EGIC/EGAP) and Czech Export Bank (CEB). EGAP isspecialized in supporting large business transactions over CZK 1 billion, however, it also extends simplified version of bank guarantees for SMEs insuring against the risk of their calling (2 percent of new contracts in 2013). Czech Export Bank (CEB), which is partially owned by EGAP and the state, offers EGAP bank guarantees issued in relation to an export contract for which funding is provided by a commercial bank.

In the process of developing one of the successful experiences of credit guarantee system in Czech Republic as shown by the case of CMGDB which succeeded by the application of the Staff motivation. CMGDB performed staff motivation by adopting an internal system of financial motivation incentives through the following:

- Dividing the planned target volumes among the bank's branches according to their size (calculation based on the number of employees);
- Setting apart a certain sum from the bank's yearly payroll budget to be disbursed as a premium depending on the branches' share of target achievement to be paid out as branch employees' salary bonus;
- Determining the criteria for assessment of the branches' share of the realization of the business plan and achievement of specific targets, which shall be decisive for the corresponding yearly bonus payment.

Credit guarantee system in Hungary

Credit guarantee system in Hungary includes 2 big players: Garantiqa Creditguarantee Co.Ltd (Garantiqa Hitelgarancia Zrt) and Rural Credit Guarantee Foundation. Credit guarantee system in Hungary is one of the most developed in the region and successful in the world. Credit guarantee in Hungary has different guarantee schemes and they are actively supported by the government.All financial institutions have been using credit guarantees for more than five years in Hungary. It has an important role in promoting SMEs and the economy, particularly in the 2008 financial crisis.

In the development of creditguarantee system, Garantiqa Hitelgarancia Zrt Hungary plays an important role and in a case of best practice in Europe and in the world as presentedinthe following:

(1) *Guarantee for working capital needs:*
Garantiqa developed a guarantee linked with a credit card. This service provides full security, cash can be drawn, and suppliers can be paid from a guaranteed account. It is favorableandsafefor customersin paymentandensuresthe necessary workingcapitalforbusiness operations.

(2)*Procedure of issuing grants under special agreements with banks:*
Garantiqa has developed a procedure of issuing guarantees under special agreements with banks:
+ The institution had been looking for a method to undertake guarantees in bulk, yet in a prudent, risk-sensitive, cost-saving way for both the banks and the guarantor.
+ Conditions of creditworthiness have been defined jointly for each specific product initiated by the partner bank.
With its efforts, Garantiqa has achieved more success in promoting the development of SMEs and the Hungarian economy.
National Bank of Hungary analyzed the "entrepreneurial financing" and concluded that Garantiqa impacts the GDP. The analytical approach was on a " What if basis "; i.e., what could have been the GDP level without the credit guarantee support to SMEs:

- The GDP decline in 3 consecutive years could have reached 293 billion
- The direct public cost of credit guarantee is drawdown of state counter-guarantee: i.e., 0.06 of the year GDP

Table 3. The impact of credit guarantee activity on the budget

Year	GDP (Million HUF)	Potential GDP decrease p.a. in the lack of GHG-credit guarantee	Potential GDP decrease (MillionHUF)	Drawdown ofstate counter guarantee in HUF million	Counter guarantee drawdown/ est.GDP decrease, %	Counter guarantee drawdown /annual GDP,%
2009	25,626,480	-0.40%	102,506	16,894	16%	0.07%
2010	26,607,339	-0.40%	106,429	20,084	19%	0.08
2011	27,886,401	-0.30%	83,659	13,675	16%	0.05
Total	80,120,220	-	292,254	50,654	17%	0.06

Source: Zoltán Urban, CEO of Garantiqa

Table 4. The proportion of Loans extended to SMEs by Garantiqa/ Loans extended to SMEs by bank sector

Year	Loans extended to SMEs by Bank sector (cases)	Loans extended to SMEs by Garantiqa (cases)	Loans extended to SMEs by Garantiqa/ Loans extended to SMEs by bank sector
2005	82,206	23,668	28.8 %
2006	134,668	23,478	17.4 %
2007	143,673	25,669	17.9 %
2008	179,117	28,329	15.8 %
2009	292,476	33,880	11.6 %
2010	472,530	32,227	6.8 %
2011	442,957	30,635	6.9 %
2012	382,862	30,604	8.0 %
2013	618,671	28,208	4.6 %
Total	2,749,160	256,698	14.1%

Source: http://felugyelet.mnb.hu, http://www.hitelgarancia.hu and own elaboration

Credit guarantee system in Poland

Credit guarantee system in Poland was characterized by the credit guarantee funds and Bank Gospodarstwa Krajowego (BGK). The credit guarantee funds have 13 regional funds with 120 millions Euro and 47 local funds with 30 millions Euros. The credit guarantee funds have the following characteristics:

(1) National Credit Guarantee Fund

- Independent guarantee activity
- Supporting the development of the system by:
  - Organization of, and supervision over regional and local funds
  - Capital participation in regional & local funds
  - Re-guaranties for regional & local funds

Co-operation with 25 banks having 4 232 branches over the country provides guarantees according to 4 different procedures:Ordinary, Simplified, Portfolio, and Stand-by guarantees – borrower.

(2) Regional funds

Characterized by a heterogeneous, non-standardized product line, lack of transparency and regulation, and low, decreasing activity.

- Capital from 1 to 5 millions Euros

- Area of activity – at least one province
- Assessment of credit ability procedural, based on professional knowledge and tools

(3) Local funds

- Capital from 0.25 to 1 million Euros
- Area of activity - several municipalities or counties
- Assessment of credit ability based primarily on local knowledge and networking

Besides credit guarantee funds, Bank Gospodarstwa Krajowego (BGK) plays an important role in promoting SMEs and the Polish economy. BGK is owned by the state and is a tool policy for Polish government to promote SMEs. BGK implemented many credit guarantee programs for SMEs in which The BGK de minimis portfolio guarantee facility has significance and is one of the programs that are successfully applied. Itbeganoperating in2013 by BGK and the Polish government. The purposeofthis programwas a reaction to the economic slowdown, and the low efficiency of the existing framework of credit guarantees to provide support to SMEs. BGKperformedcreditguaranteeto 23commercialbanks. This program allows SMEs to seek guarantee for working capital and investment loans of up to 3.5 million PLN for the period of up to 27 months (working capital loan) or 99 months (investment loan), with the following key characteristics:

- Simple procedures for SMEs,
- Zero charge for guarantees in the first year of the guarantee,
- Low commission of 0.5% of the guarantee amount for the second and third year,
- Possibility of getting the financing without own collateral (Formally, the bank may request the collateral for the part of loan not covered by the guarantee.).

The program was designed also to encourage banks to increase their supply of credit, by:

- A risk transfer to the government up to 60% of the loan value,
- Short period of guarantee payout (15 working days),
- No capital charges on the guaranteed amount.
- The success of the BGK de minimis guarantee program points to the followings:
  - The scope of public intervention should be sufficiently large to make an impact, but adjusted to the current needs of SMEs. State aid regulations should be fulfilled.
  - Guarantee fees should be subsidized, as fees set at a level covering all costs are usually unacceptable for the SMEs.
  - Guarantee products should complement the operations of commercial banks: terms of guarantee should be unified and standardized to fit commercial banks' centralized structures and standardized credit products.
  - A portfolio guarantee scheme is the best choice for low value guarantees as it minimizes bureaucracy and speeds up procedures. However, portfolio guarantees need efficient IT solutions on both the public and private side.
  - As credit risk assessment is performed by the guarantor only at the level of the portfolio, the portfolio quality should be carefully monitored, and decisions on granting/renewing limits to the participating banks should be based on the assessment of the portfolio quality.

- Unfunded credit risk protection and capital relief is an important incentive for the banks to participate in the program. A clear recognition by the financial regulator/supervisor is needed in this regard.
- The impact of the program on SME sector should be constantly monitored.

Credit guarantee system in Slovakia

In Slovakia the use of credit guarantees is relatively small and has two main credit guarantee providers: the Slovak Guarantee and Development Bank; and the Slovak Business Agency focusing on the development of SMEs operating in the fields of infrastructure, environment, renewable energy sources and efficient energy. According to the banks, clients in Slovakia often face excessively restrictive conditions from guarantee providers. Moreover, the cost of using guarantees and the cumbersome administrative burden associated with the products are also important drawbacks.
Although the credit guarantee system of Slovakia is small but it has one outstanding characteristic that other countries can refer and study. This is the diversity of the product guarantees**.** Slovakia has applied the diversity and specific guarantee programs and loan programs, it cludes:

Guarantee programs:

(1)Bank Guarantees for Loans:
Providing guarantees to start-ups and expanding SMEs: Focusing on exploitation of new technologies, small craftsmanship and small family businesses, businesses operating in the processing of raw materials and materials, energy savings and renewable energy sources, environmental enhancement, export and tourism industry, agriculture industry.
Providing guarantees especially for financial loans used for: procurement of tangible assets, reconstruction and upgrade, including the renewal of tangible assets and the infrastructure in the regions, procurement of intangible assets, payment of the operating costs related to the procurement of new material stock, raw materials, partly prepared goods, for a preliminary shortage of money related to the payment of operational costs.

(2) Fast Bank Guarantees
The Slovak Guarantee and Development Bank provide bank loan guarantees to SMEs operating for at least 12 months.

Loan programs:
(1) Slovak Growth Capital Fund: provides funds in the form of venture capital investment for SMEs based in Slovakia
(2)Slovak Development Fund:provides venture capital investment for SMEs in development phase operating in Slovakia
(3) Micro-loan Program: supports start-ups and small enterprises. Micro-loan can be used for: equipment; refurbishment and repair of operating premises; and the acquisition of necessary

stock, materials, raw materials or goods. The program is open to entrepreneurs in selected districts of Bratislava and Trnava regions

(4) MICRO loans: provide direct loan to start-ups and expanding small entrepreneurs. The fund offers short-term and medium-term loans to fund working capital, fixed tangible and intangible assets, and to refurbish and modernize fixed assets.

CONCLUSION AND SOME SOLUTIONS TO IMPROVE THE SYSTEM OF CREDIT GUARANTEE IN THE V4 COUNTRIES

The Governments of the V4 countries, policy makers are aware of the importance for the country's development of economic support measures for SMEs. They have done different intervention approaches over the years and use many different tools to promote SMEs and the economy. Credit guaranteeis one oftheeffective toolstopromoteSMEsandthe economyofthe V4 countries.Guarantee system of the country in the V4 countries have different characteristics, each country has its own strengths in processing the application service guarantees for SMEs. Among them,creditguarantee system of Hungary is the best model and is a case study by more researchers. To complete guarantee system in the V4 countries more effectively, the author propose some solutions follows:

- Governments should have policies to support credit guarantee system and SMEs
- The credit guarantee system should diversify products and services simultaneously to guarantee programs consistent with economic conditions
- Building suitable risk-sharing mechanism between the guarantee organization and the bank for attaching responsibilities and rights of banks in credit guarantee activities
- Building guarantee procedure quick and short will save time and costs for SMEs banks and guarantee organization
- Improving the credit information system;thissystemwill be a placeto shareinformation aboutSMEs, the credit statusofSMEs, thenon-financialinformationetc.Based on these information the banks and the guarantee organizations can assess the financial situation of SMEs, risk of SMEs, from which they make better plans, loan etc.
- Creation of an enabling legal and regulatory environment for SMEs and business operations;
- Improvement of capacity-building, development of physical business support infrastructure -especially the establishment of micro-credit guarantee schemes-; for fostering entrepreneurship etc.

This article will help researchers, policy makers and governments have more experiences and knowledge of best practice cases in the application of credit guarantee in the V4 countries. From these experiences and lessons they can take measures and more effectiveprograms in operation of credit guarantee activity and promote the economy.

REFERENCES

BANK GOSPODARSTWA KRAJOWEGO: http://www.bgk.com.pl/

BECK, T., KLAPPER, L.F., & MENDOZA, J.C. (2010). The typology of partial credit guarantee funds around the word. Journal of Financial Stability, 6(1), 10-25.
CENTRAL STATISTICAL OFFICE OF HUNGARY: http: //www.ksh.hu
CZECH AND MORAVIAN GUARANTEE AND DEVELOPMENT BANK - CMGDB:http://www.cmzrb.cz/
CZECH EXPORT BANK : *www.ceb.cz*
DATABASE OF THE EUROPEAN UNION: http: //epp.eurostat.ec.europa.eu/portal/page/portal/statistics.
EUROPEAN ASSOCIATION OF MUTUAL GUARANTEE SOCIETIES: http://www.aecm.eu
EUROPEAN COMMISSION (2006). Guarantees and mutual guarantees. Best Reports, No3-2006
EXPORT GUARANTEE AND INSURANCE CORPORATION (EGIC/EGAP): http://www.egap.cz
GARANTIQA CREDITGUARANTEE CO. LTD: http://www.hitelgarancia.hu/
GARANTIQA CREDITGUARANTEE CO.LTD. (2012). Announcement. (http://www.hitelgarancia.hu/en/download)
GARANTIQA CREDITGUARANTEE CO.LTD. Annual Report 2005 -2013. (http://www.hitelgarancia.hu/en/introduction/annual-reports)
GARANTIQA CREDITGUARANTEEE CO.LTD. (2010). Business regulations. (http://www.hitelgarancia.hu/en/download)
IIHYOCK S (2006). Corporate credit guarantees in Asia. BIS Quaterly Review.
LEVITSKY J, RANGA N. PRASAD (1989). Credit Guarantee Schemes for Small and Medium Enterprises**.** World Bank technical paper number 58.
LEVITSKY J (1997b). SME guarantee schemes: a summary. The financier, 4(1/2), 5-11
Magyar Nemzeti Bank:http://felugyelet.mnb.hu
ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (2012). SME and Entrepreneurship Financing: The Role of Credit Guarantee Schemes and Mutual Guarantee Societies in supporting finance for small and medium-sized enterprises. Final Report, January 30, 2013.
ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (2013). SME and Entrepreneurship Financing: The Role of Credit Guarantee Schemes and Mutual Guarantee Societies in supporting finance for small and medium-sized enterprises. Final Report, 2012
Rural Credit Guarantee Foundation: http://www.avhga.hu/
Slovak Guarantee and Development Bank: http://www.szrb.sk/en/
Urban, Z. (2014). The model of Garantiqa Creditguarantee Co.Ltd In Hungary, 16. 10. 2014, Istanbul

THE HUNGARIAN SUSTAINABILITY REPORTS IN THE LIGHT OF THE GLOBAL REPORTING INITIATIVE (GRI)

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SUMMARY

In the practice of previous years, the sustainability reporting has worked on a voluntary basis, but from 2017 the EU prescribes it for specified companies compulsorily. The GRI Guidelines have been helping the high-quality and meaningful reporting for years, of which the latest G4 Guidelines are fully compliant with the information content required by the EU (this is a statement of my earlier researches).
My current research focuses on the content and qualitative examination of the Hungarian systainability reports in the light of the GRI system. The basis of my investigation are the reports published in 2014, which are classified based on whether they made in agreement with any GRI Guidelines, or not. My capital aim to compare the information content, which can be expected because of classification and, which actually appearing in the report, as well as to gain insight into the methodologies used by the undertakings and the reports' potential deficiencies. I also consider it important to compare the companies, which in 2014 reported on a voluntary basis and, which are obliged to reporting from 2017 by the respecting EU directive.
The results are extremely important for both regulatory and corporate point of view: helping to make reports more accurate and to present the real image of environmental performances. They may give base to the development of proper planning and measurement methodology, as well as the creation of the necessary eco-controlling system.

INTRODUCTION

The social and economic claim for the cognition of organizations' non- financial performance has been intensified since the millennium. According to this, the numbers of non-financial reports also have been increased.
In the practice ofprevious years,thisreportinghas workedon a voluntary basis, but from 2017 the EU prescribes it for specified companies compulsorily. The GRI Guidelines have been helping the high-quality and meaningful reporting for years, of which the latest G4 Guidelines are fully compliant with the information content required by the EU (this is a statement of my earlier researches).
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included in this group. I would like to point out those areas of reports, which have to be developed to achieve the level of G4 Guidelines. I also consider it important to compare the companies, which in 2014 reported on a voluntary basis and, which are obliged to reporting from 2017 by the respecting EU directive. But before these statistical and comparative analyzes, important to know the expectations of EU, and the content of the GRI Guidelines.
Theresults of my researchare extremely important forboth regulatory andcorporatepoint of view: helping to make reports more accurate and to present the real image of environmental performances. They may give base to the development ofproperplanning andmeasurement methodology, as well as the creation of the necessary eco-controlling system.

2. THE STATEMENT OF THE DIRECTIVE 2014/95/EU[1] AND THE GLOBAL REPORTING INITIATIVE (GRI)

During my previous research those systems were examined, which support the compilation of sustainability reports. The main viewpoint was the compliance of the Directive 2014/95/EU. The system of GRI was found the most appropriate for this, so in this paper only the regulations of the Directive and the Guidelines of GRI are presented, to understand the current research problem.

The regulations of the Directive 2014/95/EU

Before 2014, the Directive 2013/34/EU[2] had regulated the disclosure of non- financial information. It had expounded, that the management report (consolidated management report)are important elements of financial reporting. In this report the informations hadn't been restricted to the financial aspects of the business activities, it had been also necessary to analyze the environmental and social acpects of the business methods. The small and medium- sized organizations had got dispensation from this commitment.[2013/34/EU (26) paragraph]
The Directive 2014/95/EU – which published in the Official Journal of the Europen Union on 22nd October 2014 –modified the previous guideline from some aspects. The basic provisions of the Directive, that all companies -whitin the scope of guideline- have to prepare a non-financial report for the financial year starting on 1 January 2017 or during the calendar year 2017. (2014/95/EU Arcticle 4/1.)
I collected the most important ordinations of the Directive, which can be seen in the following points.

[1]DIRECTIVE 2014/95/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 22 October 2014 amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups
[2]DIRECTIVE 2013/34/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 June 2013 on the annual financial statements, consolidated financial statements and related reports of certain types of undertakings, amending Directive 2006/43/EC of the European Parliament and of the Council and repealing Council Directives 78/660/EEC and 83/349/EEC

1. The Directive's aim

The cardinal purpose that the environmental and social informations provided by organizations become transparent, besides the sustainable operation turn the essential principle. This consist in the foundation and dissemination of the integrated benchmarking: the sustainable global economy can be realized by combining long-term profitability with social justice and environment protection.
(2014/95/EU (3) paragraph)

2. The scope of the Directive

The content of the Directive related to companies that correspond to succeeding three criteria:

- they are large undertakings according to the Directive 2013/34/EU Chapter 1 Arcticle 3/4., thus on their balance sheet dates exceed at least two of the three following criteria:
    - balance sheet total: EUR 20 000 000;
    - net turnover: EUR 40 000 000;
    - average number of employees during the financial year: 250;
- on their balance sheet dates the average number of employees during the financial year more than 500;
- they are Public Interest Entities (PIEs) /all entities that are governed by the law of a Member State and listed on a regulated market, all credit institutions, all insurance undertakings and entities appointed by Member State as PIEs/.

(2014/95/EU Arcticle 1 (1)/1. paragraph)

3. The report's form

The non- financial statement should be included in the management report.
Memeber States may exempt those undertakings from the obligation, that prepare a separate non- financial report corresponding to the same financial year, provided that such separate report is published

a) together with the management report; or
b) not exceeding six months after the balance sheet date, on the company's website (in this case the separate report is referred to in the management report).

(2014/95/EU (6) paragraph; Arcticle 1 (1)/4. paragraph)

4. Group of enterprises

The parent company of a large group shall include in the consolidated management report a consolidated non- financial statement in case of exceeding on its balance sheet dates- on consolidated basis- the criterion of the avarage number of 500 employees during the financial year.
Memeber States may exempt those parent undertakings from the obligation, that prepare a separate non- financial report corresponding to the same financial year, referring to the whole group, provided they observe the deadlines.
(2014/95/EU Arcticle 1 (3)/1. paragraph, (3)/4. paragraph)

5. The content of the statement

The non- financial/ consolidated non- financial statement shall contain informations to the extent necessary for understanding of the company's/ group of enterprises' development, performance and its activities' impact, for at least the following topics:

- environmental matters (impacts on the environment; the use of renewable and non-renewable energy; greenhouse gas emissions; water and land use; air pollution; and the use of materials);
- social and employee-related matters (the actions taken to ensure gender equality; implementation of fundamental conventions of the International Labour Organisation; working conditions; social dialogue; the insurance of workers' right to be informed and consulted; respect for trade union rights; health and safety at work; dialogue with local communities and the actions taken to ensure the protection and the development of these communities);
- respect for human rights (the prevention of human rights abuses); and
- anti- corruption and bribery matters (instruments of the fight against corruption and bribery).

Whitin each topic should be detailed as follows:

a) the company's/ group of enterprises' business model;
b) the policies which are pursued by the company in relation to the matters (if the undertaking doesn't pursue any policies, they have to explain it), including the implemented due diligence processes (e.g. in the respect of its supply and subcontracting chains);
c) the outcome of these policies;
d) the capital risks related to the matters linked to the company's operations, and the way how the undertaking manages these risks;
e) the most important non-financial performance indicators relevant to the business activity.

In addition to all these, the non- financial/ consolidated non- financial statement, where appropriate, shall refer to and explain amounts of the annual/ consolidated financial report.
(2014/95/EU (6) paragraph, (7) paragraph; Arcticle 1 (1)/1. paragraph; Arcticle 1 (3)/1. paragraph)

6. Applicable guidelines

The Commission shall prepare non-binding guidelines on methodology of reporting, in order to facilitating the disclosure of relevant, useful and comparable non- financial informations.
These guidelines will include general and sectoral, non- financial key performance indicators.
In doing so, the Commission will have to consulting with the relevant stakeholders, and should take into account current best practices, the Union and international initiatives' results.
The Commission shall publish these guidelines by 6 December 2016.
(2014/95/EU (17) paragraph; Arcticle 2)

Global Reporting Initiative (GRI)

There are two important elements, which are needed for the properly complied sustainability report: a well-functioning information system and a framework for the relevant information content.
The controlling systems, like the eco-controlling systems assist the companies in decision-making through to make available the informations at the right time, at the right place. (Musinszki, 2014)
The Global Reporting Initiative is one of the leading systems on the area of the sustainability. GRI's idea was built on the thought of sustainable global economy. Companies should integrate sustainability into their operation, and control their performance and effects from four viewpoints: economic, environmental, social and governance.
For this reason, GRI has developed its Sustainability Reporting Framework, that enjoys synergies with other relevant international initiatives, frameworks and guidance. This reporting system helps the companies to measure, analyze and communicate their information, which are important from the aspect of sustainability. It is used by thousands of organizations of all sizes and sectors, all around the world.
The Framework contains the Guidelines and sector guidance.
The Guidelines help for the organizations in the preparation of their sustainability reports, independently from their size, sector or location. Figure 1. shows the evolution of the Guidelines.

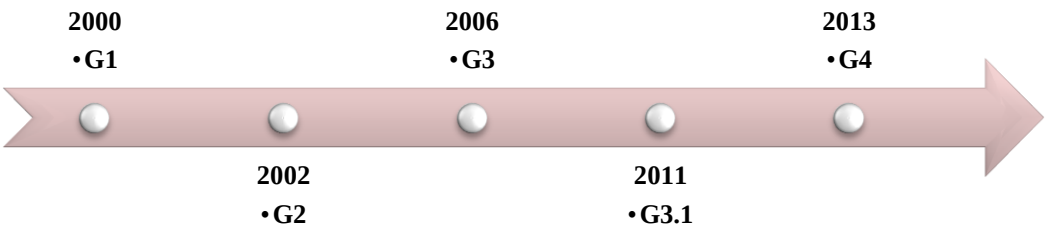

Figure 1. The evolution of the GRI Guidelines
Source: own work

GRI accepts reports based on G3 or G3.1, but which disclosed after 31 December 2015 should be managed in accordance with the G4 Guidelines.
The sector guidance makes the different sector's reports more accurate and understandable.
(Sustainability Disclosure Database- Data Legend, 2012)
In my earlier research, I have concluded the reports based on G4 Guidelines can meet the expectations of the Directive 2014/95/EU. Therefore, I consider it important to detail the recommendations of the G4, as well as the G3 and G3.1, because the Guidelines built on each other.

G3 GUIDELINES

The G3 Guideline consists of two major part:

- Part 1: Reporting Principles and Guidance- answer the question how to report (the most important principles are materiality, stakeholder inclusiveness, sustainability context and completeness);
- Part 2: Standard Disclosures- answer the question what should be reported.

The Standard Disclosures define informations are relevant for organizations and stakeholders. The Disclosures are structured in three main topic: Strategy and Profile, Management Approach and Performance Indicators.

The section of Strategy and Profile contains the informations to understand the background of the organization's performance, such as its strategy, profile and governance.
Here can be found:

- the statement of the most senior decision- maker of the company about why sustainability so important for the company and its strategy;
- the key impacts, risks, and opportunities;
- the relevant information about the organizational profile;
- the parameters of the report (its profile, scope and boundary; GRI content index and assurance);
- the governance structure;
- the sustainability charters, principles or other initiatives are subscribed or endorsed by the company; and
- the types of stakeholders have connection with the organization.

The section of Management Approach illustrates how the company approaches the different type of topics.
The Performance Indicators give comparable information about the company's performance in the areas of Figure 2.

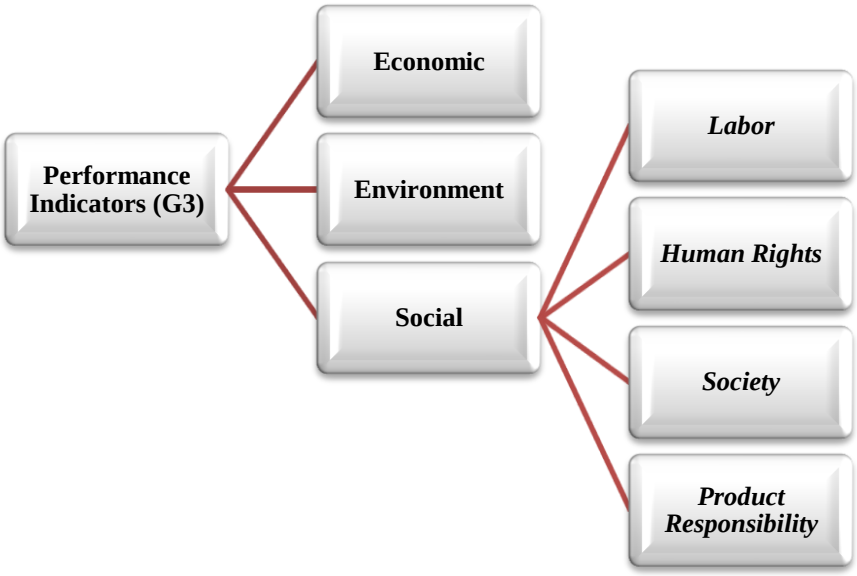

Figure 2. The categories of G3's Performance Indicators
Source: own work

Performance Indicators- Economic

The Economic Indicators try to exemplify the flow of capital, and companies' economic impacts all of the society.

The Management Approach is presented from the succeeding Economic Aspects: Economic Performance, Market presence and Indirect Economic Impacts, that data content expands on the following:

- *the generated and distributed direct economic value* (revenues, operating costs, employee compensation, donations, and payments to capital providers and governments);
- *the climate change's effects on the organization's activities* (financial implications, other risks and opportunities);
- *coverage of the benefit plan obligations*;
- *the financial assistance from the government*;
- *the ratios of standard entry level wage compared to local minimum wage*;
- *the features of the supplier contacts* (policy, practices and proportion of spending);
- *procedures for the local workforce's application*;
- *development and impacts of infrastructure investments and services*; and
- *the significant indirect economic impacts*.

Performance Indicators- Environmental

The environmental dimension means the company's influences on the living and non- living natural systems (ecosystems, land, air and water). The Environmental Indicators embrace the performance related to inputs (e.g. material, energy, water) and outputs (e.g. emissions, effluents, waste). On the other hand, they also measure the environmental expenditure, and impacts of product and services.

Organizations have to disclosure their Management Approach from the succeeding Environmental Aspects:

- *materials* (used and recycled input metarials);
- *energy* (direct and indirect energy consumption; improvements to save energy; application of renewable energy; reduction of the indirect energy consumption);
- *water* (total water utilization by source; relation of water recycled and reused);
- *biodiversity* (location and size of land owned or managed in protected areas; the activities' significant impacts on biodiversity; protected or restored habitats; strategies and actions for the protection of biodiversity);
- *emissions, effluents and waste* (total direct/ indirect greenhouse gas emissions and the initiatives to reduce them; emissions of ozone-depleting substances and NO, SO, other significant air; total water and waste discharge);
- *products and services* (initiatives to modify environmental impacts of products and services; the proportion of sold and reclaimed packaging materials);
- *compliance* (monetary value and non- monetry sanctions of significant fines);
- *transport* (environmental influences of transporting products, materials or workforce); and
- *overall* (total environmental protection expenditures).

Performance Indicators- Social

The Social Performance means the company's effect on the social systems. It has four focuspoint:

1. *Labor Practices:*
    - total workforce by employment type, contract and region;
    - fluctuation of total workforce;
    - percentage of employees covered by collective bargaining agreements;
    - minimum notice time period in case of operational changes;
    - percentage of total workforce represented in formal joint management–worker health and safety committees;
    - rates of injuries, occupational diseases, lost days, absences and the number of work- related fatalities;
    - education, counseling and risk- program for the emlpoyees and their families regarding serious diseases;
    - average hours of training per year per employee;
    - content of governance board and employees clustering by gender, age group and minority group membership; and
    - ratio of basic salary of different gender.

2. *Human Rights:*
    - number of those investment agreements which include human rights clauses;
    - percentage of those suppliers and partners that have crossed over screening on human rights;
    - total number of discriminatory incidents; and
    - situations which have had a risk for incidents of child or forced labor.

3. *Society:*
    - programs and practices that assess the influences of operations and activities;
    - total number of operations assessed for risks related to corruption;
    - number of business units which analyzed for risk of corruption;
    - percentage of employees trained in the organization's anti- corruption policies;
    - reactions for the incidents of corruption;
    - participation in public policy; and
    - monetary value and non- monetry sanctions of significant fines.

4. *Product responsibility:*
    - those life cycle stages in which the products' or services' impacts for the health and safety are assessed;
    - type of product and service information required by different procedures;
    - programs for being equal to laws and standards related for marketing communication; and
    - monetary value and non- monetry sanctions of significant fines.

(G3 Sustainability Reporting Guidelines)

G3.1 Guidelines

The G3.1 Guidelinesare an update and completion of G3 Guidelines. G3.1 comprise extended guidance for reporting on human rights, local community impacts and gender.
The changes can see in Figure 3.

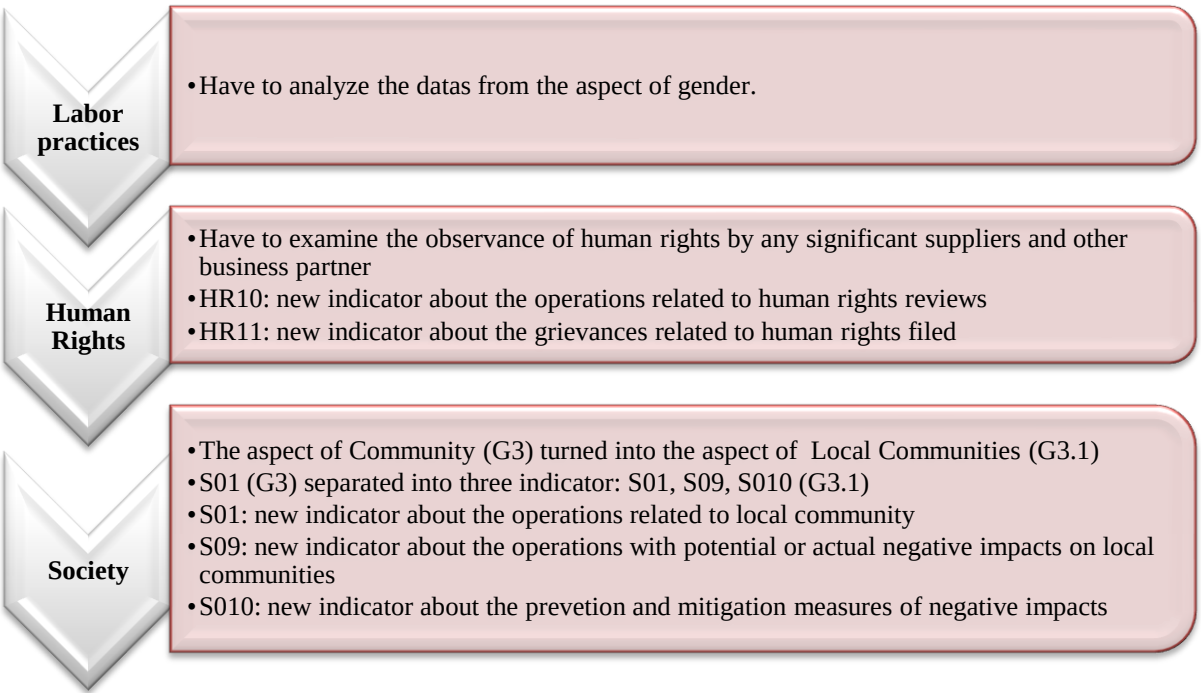

Figure 3. The G3.1 Guidelines' extended indicators
Source: own work (based on: G3.1 Sustainability Reporting Guidelines)

G4 Guidelines

The G4 Guidelines are the newest generetion of GRI Guidelines, which contain 6 significant changes compared to the past.

1. The sructure

The Guidelines are published in two parts:

- Part 1: Reporting Principles and Standard Disclosures;
- Part 2: Implementation Manual.

The first part contains Reporting Principles, Standard Disclosures (General and Specific), the criteria to be employed by any company to create its sustainability report 'in accordance' with G4, and the key definitions. The second part includes supporting guidance on the first.

2. 'In accordance' criteria

The former Application Levels (A, B and C) reflect the extent to which GRI Framework has been applied in the report. It has been replaced by 'in accordance with GRI' criteria, which offer companies two options to prove their report based on the Guidelines:

- Core option: includes the essential elements of a report;
- Comprehensive option: builds on the Core option, and requires some additional disclosures.

3. Materiality

Everything is about materiality. According to G4, the only relevant performance indicators that companies should report related to their material issues.

- First the companies collect those specific issues that will be material during their reporting period.
- For the "Core", organizations should report at least one of the relevant performance indicators for a given material aspect.
- For "Comprehensive,"companies should published all of the relevant performance indicators for a given material aspect.

4. General Standard Disclosures

There are some new elements have to be reported:

- company's material aspects;
- the description of organization's supply chain;
- 10 new disclosures inside Governance section (mostly about the board oversight /e.g. of sustanibility- related impacts/ and the remuneration ratios);
- section of Ethics and Integrity; and
- some other existing sections were comleted with additional requirements.

All together, the sections of General Standard Disclosures are the following:

- Strategy and Analysis;
- Organizational Profile;
- Identified Material Aspects and Boundaries;
- Stakeholder Engagement;
- Report Profile;
- Governance;
- Ethics and Integrity.

5. DMA (Disclosures on Management Approach) /part of Specific Standard Disclosures/

The new DMA reporting framework focuses on three areas:

- why a given aspect is material;
- how can manage the aspects; and
- how can management improves its approach.

6. Performance Indicators /part of Specific Standard Disclosures/

Some new Performance Indicators were added, which connected to the following areas:

- intensity of greenhouse gas emissions;
- energy use in company's supply chain;

- supply chain impacts related to environment, labor practices, human rights and society;
- some other existing indicators were reviewed; and
- everything focus on the materiality.

(G4 Sustainability Reporting Guidelines) (Global Reporting Initiative (GRI) G4 content index, 2013) (GRI's G4 Guidelines: the impact on reporting)

THE HUNGARIAN SUSTAINABILITY REPORTS

In the database of GRI the search based on different filters. One of the most important is the type of the reports:

- GRI-G1; GRI-G2; GRI-G3; GRI-G3.1; GRI-G4: a GRI Guideline is applied in the reports;
- GRI – Referenced: the reports make explicit reference to being based on the GRI Guidelines but for which there is no information;
- Non-GRI: the reports which contain informations about the organizations' economic, environmental, social and governance performance, but there is no reference to being based on the GRI Guidelines.

(GRI Sustainability Disclosure Database- Data Legend, 2012)

30 pieces hungarian sustainability reports was made in 2014, which distribution by types can be seen in Figure 4.

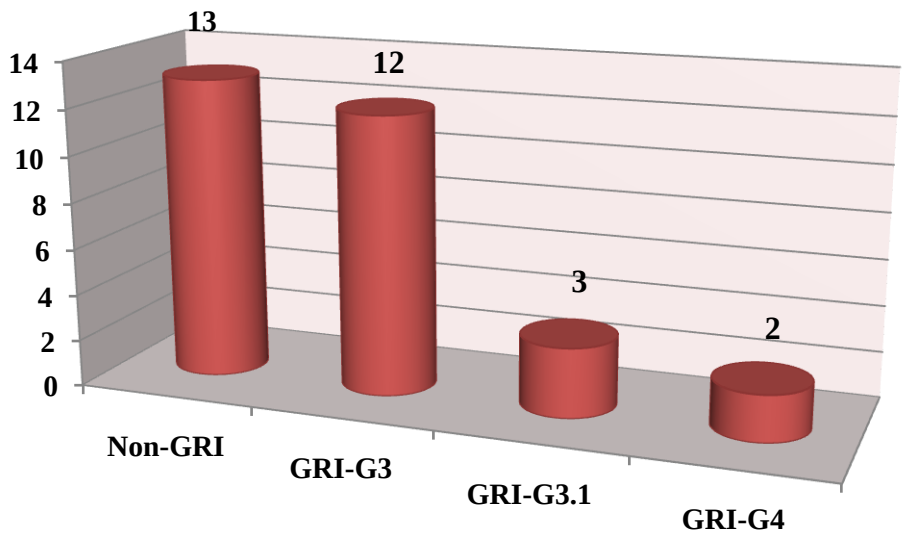

Figure 4. The types of Hungarian sustainability reports in 2014 (pc)
Source: own work (based on: GRI Sustainability Disclosure Database)

As shown, in most of the reports either the G3 Guideline is applied, or there isn't reference to the GRI Guidelines. Examining the forms of reporting, there are only 3 reports (2 from GRI-G3 type, and 1 from GR3.1), which was made in integration form: they include both non-financial and financial disclosures, beyond the basic economic informations.

In the following the characteristics, deficiencies and development paths of the different types of statements is summarized.

The ’Non-GRI’ sustainability reports

In the cathegory of ’Non-GRI’ reports a classification can be made: how many companies are within the scope of EU’s Directive, and how many aren’t. In short: how many companies will be obligated to report in the future, and how many can continue this. The results can be seen in Figure 5.

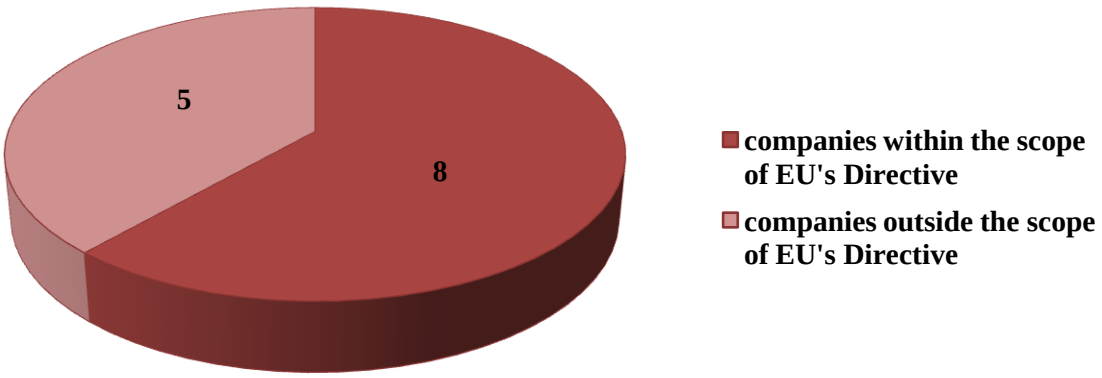

Figure 5. The classification of Hungarian ’Non-GRI’ reports in 2014 (pc)
Source: own work (based on: GRI Sustainability Disclosure Database)

The ’Non-GRI’ reports can be distributed into to groups according to the content (Table 1.). This subdivision helps to present the characteristics, and to explore the development opportunities.

Table 1. The content of the Hungarian ’Non-GRI’ reports in 2014

	Environmental Statement	Sustainability Report
Content	• management statement about the relevance of report • company highlights (shortage of financial datas) • presentation of health and safety policy • detailed datas about environmental effects, pollutant emissions, energy and water use, noise pollution, treatment of hazardous waste, input-output balance, etc. • possibilities of preventing emissions • presentation of environmental programs and action areas, with deadlines • steps taken to protect biodiversity • analysis of the implementation of past programs • applied environmental management systems (e.g. EMAS)	• management statement about the relevance of report • sustainability framework – community engagement – motivation of corporate developments in the supply chain – reduction of environmental burdens (e.g. water-energy- and material using, CO2 emissions, waste management, wastewater treatment, soil and nature protection, etc.) – etichal business particies – respect for human rights (e.g. discrimination cases, carrer advancement opportunities, the number and seriousness of accidents at work, etc.) • insurance of product quality • environmental steps for supply to sale • programs for the environmental protection • supply from local farmers • improving the livehood of small farmers • distribution of colleagues by gender • appreciation of colleagues • fairness in the workplace • opportunities for women • idea of sustainability growth • sustainability plan: regardless of company’s growth reducing the environmental burdens and increasing the positive social impacts

Source: own work

It can be seen, that the Environmental Statement type closes to only one side of the question of sustainability: environmental. The presentation of the economics and social performances are miss, the informations about the companies’ stategy and the management approach are deficient, thereby complicating the overall vision of organizationachievement.

The other type, the Sustainability Report gives a more complex picture of the companies’ activities and impacts. In several reports can be found the almost every elements of G3 Guidelines, but sometimes the structure is non-trasparent and the connections are unexplored. Therefore, many key issues remained untouched.

First step these companies should reach the level of G3 Guidelines with the expansion of investigation and target areas.

The G3, G3.1 and G4 sustainability reports

All the organizations, which reports based on the G3, G3.1 or G4 Guidelines, are within the scope of EU’s Directive. It shows a positive vision of the future, because the achieving of the desired G4 level is established.

The G3 and G3.1 qualifed reports are compliance with the proper Guidelines (in the end of the statement can be found a GRI reference list: which Guideline has comleted by the company). The difference between the reports are caused by the varied Application Levels.
The Application Levels can be the following:

- **A**, **B**, **C**: this reflect the extent to which GRI Framework has been applied in the reports (Figure 6.).
- **A+**, **B+**, **C+**: the '+' can be added to the Application Level if the report is externally assured.

(Sustainability Disclosure Database- Data Legend, 2012)

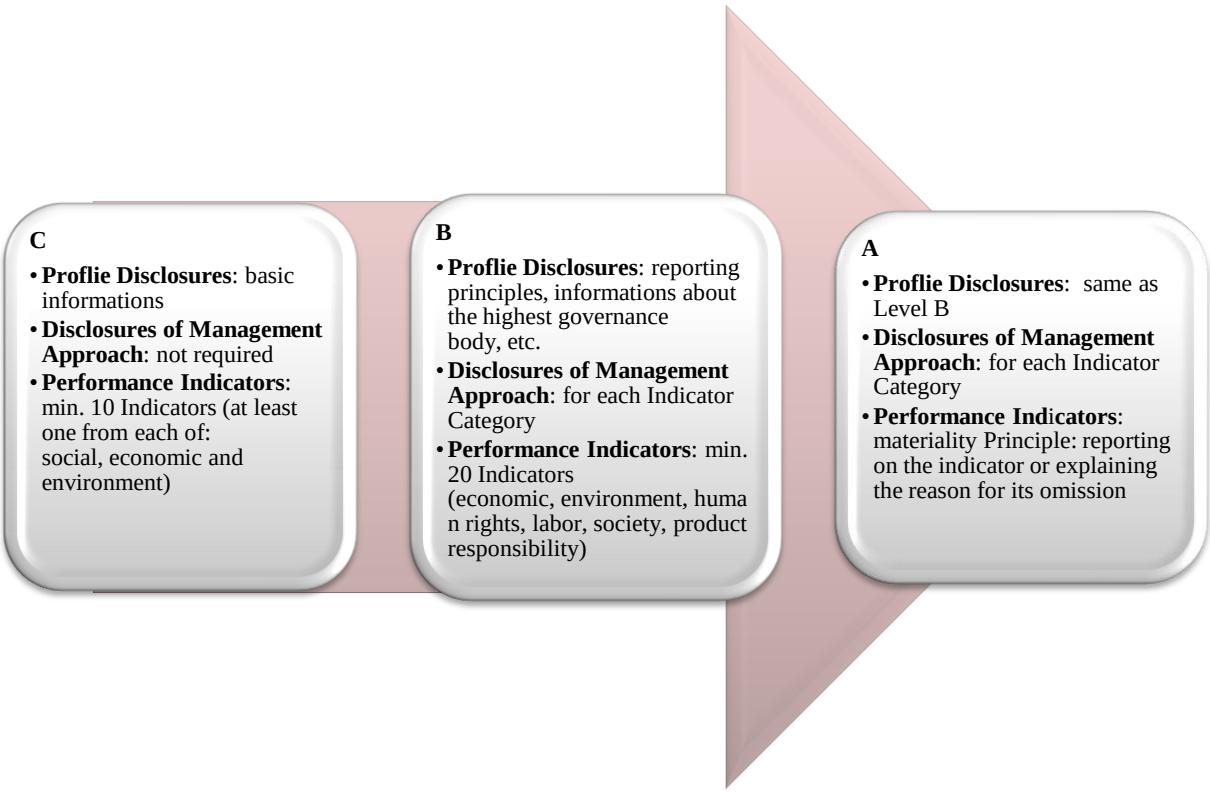

Figure 6. The G3 and G3.1 Guidelines' Application Levels
Source: own work

In Figure 7. can be seen, most of the reports haven't the highest Application Level, which can lead companies to futher developments and objectives. Namely, these statements have some significant defects, which should be replaced to achieve the A+ level, or even more the level of G4 Guidelines: e.g. adhere to materiality principle, detail the supply chain, complete the G3 based reports with the new indicators of G3.1, etc.

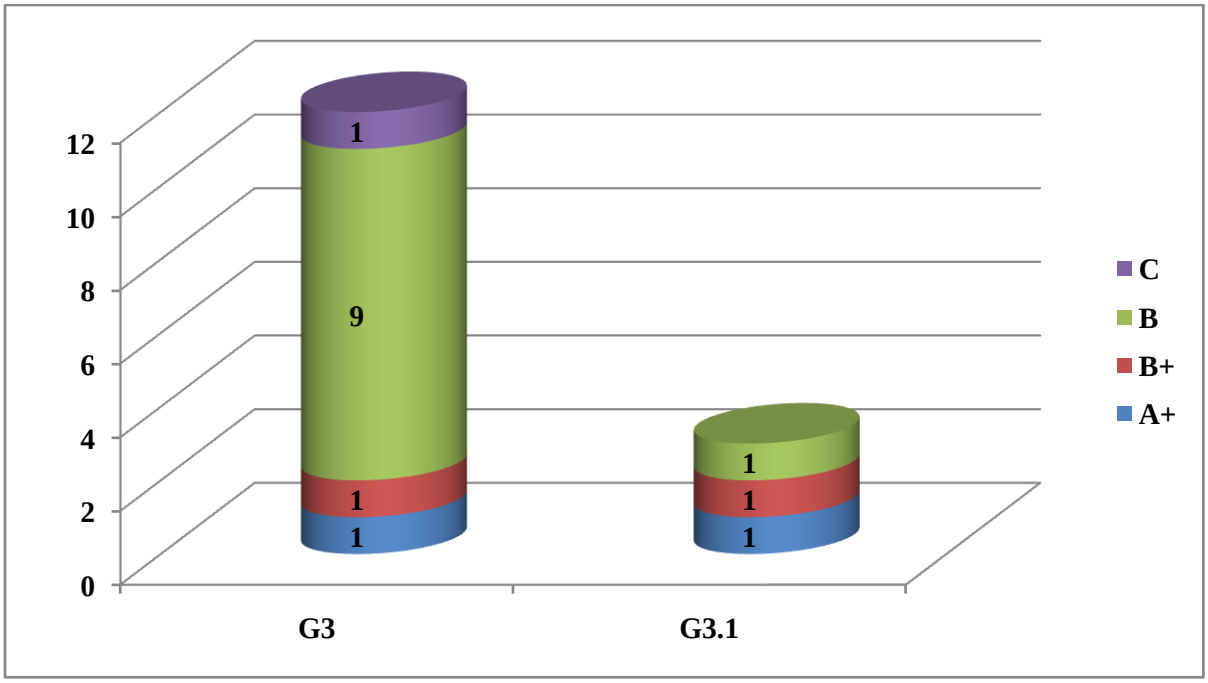

Figure 7. The Hungarian G3 and G3.1 sustainability reports' Application Levels in 2014(pc)
Source: own work (GRI Sustainability Disclosure Database)

In 2014 only 2 organizations can made their sustainability reports taking into account the G4 Guidelines. This isn't an appropriate starting point to comply with EU's Directive.
About the 2 statements can be said the 'Core' option is realized in them: the organizations presented at least one of the relevant, but not the all performance indicators for a given material aspect. This isn't perceived as a deficiency: every important area related to the companies' activities are emphasized, bearing in mind the principle of materiality.
Interesting, that these reports would able to give a complete image about the company, despite weren't created in integration form. In fact, compared with the integrated reports can be noticeable the independent form- if its contain some financial datas, too- can draws the attetion to the subject is important.

CONCLUSIONS

The implementation of Directive 2014/95/EU brought to the fore the examination of the sustainability reports' state. Based on my earlier research the applicability of GRI-G4 Guidelines-to comply with the EU's regulation- is known.
Examining the status of Hungarian reports we can get the result: several companies are dealing with the issue of sustainability on voluntary based, but the presentations of the outcomes have different quality. Two major groups can be identified: the companies who do their reports without GRI, and who apply the GRI, but on the highest level. In both cases significant developments are needed.
The group without GRI deals some significant sustainability issue, but the comprehensive, structured reporting form is missing. In most cases only one-two fields of sustainability are in the focus.

The other group applies the Guidelines, but unfortunatelly only the compliance with G3 Guidelines is typical. These reports are an excellent basis, but require some key supplements and extensions to reach the desired quality, e.g. focus to the materiality (which indicators are important, which aren't and why), analyze to the impacts of supply chain, examine the labor practices on the basis of gender; attention to the local communities, etc.

Currently only two organizations' sustainability reports (of CIB Bank and Telenor Hungary- the information based on the GRI Sustainability Disclosure Database) are made with harmony of G4 Guidelines, what will cause significant problems from 2017. Namely, to most of the companies, which are currently reporting, will be required to comply with the EU's Directive. But with the reports are currently made (with the exception of G4 based) this isn't feasible. The development should start, and the aim should be the compliance with the G4 Guidelines.

Those organization within the scope of EU's Directive, who haven't prepared sustainability reports yet, represent an interesting research area. The next step in my research will be a survey in focus with these companies and the organizations, who have already complied reports on voluntary basis. Questions will cover the motivational factors, backgorund systems, development opportunities, etc.

REFERENCES

DIRECTIVE 2013/34/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 June 2013 on the annual financial statements, consolidated financial statements and related reports of certain types of undertakings, amending Directive 2006/43/EC of the European Parliament and of the Council and repealing Council Directives 78/660/EEC and 83/349/EEC
from:http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0095&from=HU

DIRECTIVE 2014/95/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 22 October 2014 amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups
from:http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013L0034&from=EN

Global Reporting Initiative (GRI) G4 content index, 2013
from:http://www.pwc.com/us/en/about-us/corporate-responsibility/corporate-responsibility-report-2013/assets/docs/gri.pdf

GRI Sustainability Disclosure Database
from:http://database.globalreporting.org/

GRI Sustainability Disclosure Database- Data Legend (2012)
from:https://www.globalreporting.org/information/policy/Pages/EUpolicy.aspx

GRI's G4 Guidelines: the impact on reporting
from:https://www.kpmg.com/Global/en/IssuesAndInsights/ArticlesPublications/Documents/g4-the-impact-on-reporting-v2.pdf

G3 Sustainability Reporting Guidelines
from:https://www.globalreporting.org/resourcelibrary/G3-Guidelines-Incl-Technical-Protocol.pdf

G3.1 Sustainability Reporting Guidelines
from:https://www.globalreporting.org/resourcelibrary/G3.1-Guidelines-Incl-Technical-Protocol.pdf

G4 Sustainability Reporting Gudielines
from:https://www.globalreporting.org/resourcelibrary/GRIG4-Part1-Reporting-Principles-and-Standard-Disclosures.pdf
from:https://www.globalreporting.org/resourcelibrary/GRIG4-Part2-Implementation-Manual.pdf

MUSINSZKI, Z. (2014). Hierarchies and dimensions in the service of cost controlling. In A. Tóth (Ed.). Controller Info Studies (p. 129). Copy& Consulting and Unio Publishing. Budapest, Hungary.

HOW TO IMPROVE YOUR ERP SYSTEM – A 3.M THEORY

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SUMMARY

Research problem: Every enterprise (regardless of whether it is industrial, agricultural, or is in services) has at least a few unique features in its own accounting information system, as well as in its management support system. On the other hand, general ERP systems are not designed to support these unique accounting features of firms. These features are mainly found the in decision-support part of information system, and are reflected in data model of information system. Furthermore, managers continuously have to develop their decision-support information systems.
Methods: AIT-1, -2 and -3:
AIT-1: General IT solutions that are used in all companies.
AIT-2: Tested solutions applied in various firms/economic entities.
AIT-3: IT systems and solutions that are only needed at the given firm/economic entity, and are therefore unique and completely specific to that entity.
Contribution to the literature: There are always three data-models present when designing application development schemes for accounting information systems:
1.M: The data model for a decision support information system defined by long-term strategic goals
2.M: The data processing model used so far
3.M: The data model of the bought or adopted information system.
As such, one must be very careful when changing the decision-support information system of one's firm. These statements are supported by 28 years of research and experience at 24 different firms.

INTRODUCTION: SUBJECT OF THE RESEARCH

What are the challenges that managers of industrial, agricultural, and service companies have to face when developing their information systems? Having researched management information systems (MIS) for 28 years, and knowing the accounting information system of 24 firms, I can say that it is always the specialties of their information systems that are the most important from a management viewpoint.
To carry out their management tasks, managers need a lot of information, for example about the company's assets, capital, resource utilization, financial situation, and so on (Fabricius, 2011; Körmendi-Tóth, 2002; Sinkovics, 2010). The following table presents some details from the research that are useful for understanding the similar and different information needs of the management in case of different business entities, Table 1.(Ceginfo, 2015; KSH 2015; TRIUN 2015):

Table 1. These are some real life examples of management information requests. Out of the 24 companies in the table, 6 are large companies or subsidiaries of multinationals and 9 are international firms.

No.	Sign	Fild of operation of the Company	Monitoring time period	Revenue (in 2014 HUF, million)	AIT-1 :bookkeeping functions done in house or outsourced?	AIT-2 : most important module of the ERP	AIT-3 : management unique request: all are VARIOUS
1	PaP	H. Plastic products	1987-90	25 805	ERP - in-house	Production	Division level calculation of contribution, dynamic production planning
2	PiP	Z. Plastic products	1990-91	12 375	ERP - in-house	Production	Monitoring of production waste
3	HA	Metal products	1991-93	961	Outsourcing	Financials	Financial situation (DCF)
4	KT	Textil products	1992-96	7 779	ERP - in-house	Financials	Managing the financial situation of the firm after bankruptcy
5	BT	A. Trade of construction materials	1994-96	6 990	ERP - in-house	Financials	Monitoring of receivables
6	SZ	Diary product	1994-95	4 431	ERP - in-house	Sales	Monitoring sales by market segments
7	PH	Trade in pharmaceuticals	1995-96	30 020	ERP - in-house	Inventories	Monitoring medicine inventories by expiry
8	BK	Food wholesale	1995-97	5 302	ERP - in-house	Sales	Monitoring key customers and helping to keep key customers
9	InterI.	Commercial products and services	1997-2000	617	ERP - in-house	Financials	Monitoring of Receivables to ensure good cash flow
10	MuP	Ceramic product	1998-2000	10 625	ERP - in-house	Production	Monitoring of prodution costs
11	MiP	A. Plastic products	1999-2001	5 633	ERP - in-house	Production	Monitoring input usage and inventories in production
12	MB	B. Trade of construction materials	2000-2003	415	Outsourcing	Inventories	Managing stockpiles in accordance with customers' needs
13	OST	S. Industrial services	2000-2001	409	Outsourcing	Inventories	Managing inventories, utilizing old stocks
14	TK	C. Trade of construction materials	2001-2010	15 956	ERP - in-house	Financials	Monitoring customer credit limits (taking unpaid obligations into consideration)
15	KO	B. Plastic products	2003-2004	433	Outsourcing	Production	Labor utilization
16	BF	A. Industrial services	2001-2002	265	Outsourcing	Inventories	Availability of goods stockpiles
17	EV	Civil services	2003-2013	1 250	ERP - in-house	Industrial services	Costs of municipal services
18	TT	D. Trade of construction materials	2007-2009	4 228	ERP - in-house	Sales	Sales margin of different products
19	BH	B. Industrial services	2007-2015	680	Outsourcing	Industrial services	Accounting the amortization of machinery that is currently under-utilized (kept for spare capacity)
20	AT	Sped services	2010-2011	869	Outsourcing	Industrial services	Project level and transport vehicle level profitability
21	DPA	Car services	2009-2011	311	Outsourcing	Industrial services	Calculating the contribution of different operations
22	CA	Food products	2012-2014	838	Outsourcing	Production	Separating fixed and variable costs in production
23	AG	Car component products	2014-2015	31 715	ERP - in-house	Production	TQM statistis of production machinery
24	CO	C. Plastic products	2014-2015	17 500	ERP - in-house	Production	Calculating special production costs in case of continuous cost-cutting

The colours of the 1st table have meaning as follows:

1.1 In the 4th column, AIT-1: this is the basic method of bookkeeping and preparing annual reports. You can only see 2 cases in this column: bookkeeping by outsourcing or by an in-house ERP system.

1.2 In the 5th column, AIT-2: this column shows the most important parts of the companies' ERP systems (which are related the areas that determine the firms' success). The 24 companies can be put into 5 categories.

1.3 The 6th column is AIT-3, which contains the most important information requests of the management (at the moment). This information request is the *unique and special demand of the management*. There are 3 general cases when AIT-3 solutions are needed:

1.3.1 The ERP system cannot answer the management's unique (data) requests. In this case it is necessary to design a new subsystem.

1.3.2 A new system is introduced, but it cannot provide the appropriate data, or that data is wrong. In this case it is necessary to modify the system.

1.3.3 The management's information needs change faster than the how the ERP system can be updated (McGrow, 1993).

The following examples can help understand the three cases above:

"BH" – Industrial services in the 19th row of table 1:

(An example to 1.3.1) This firm has about a dozen special machines that are used for the maintenance of oil industry equipment. These machines are used intermittently, and therefore careful accounting of their operation is required to adequately track amortisation costs.

"InterI" – Commercial product and services in the 9th row of table 1:

(An example to 1.3.2) This firm got a new ERP system which provided information on the firm's receivables once a week. This had to be modified immediately, because the management needed daily information about the receivables.

"KT" – Textile products in the 4th row of table 1:

(An example to 1.3.3) During the bankruptcy procedure, the firm needed a new subsystem to track its obligations that were due in 14 days.

The examples above show some special Accounting Information Technology requirements of different firms. Below, we will summarize what one can generally know about AIT (Accounting Information Technology).

MATERIAL AND METHODOLOGY

2.1 Different enterprises (industrial, agricultural, service) have unique characteristics, which also make their accounting information systems needs special, meaning that in the end, every company uses a unique accounting information system (Fabricius, 2011; Körmendi-Tóth, 2002; Sinkovics, 2010; Rappaport, 1986).

2.2 There are 3 basic ways to develop an accounting information system in its entirety, or an essential part of it: in-house development, purchase, and modifying a purchased application to suit the given enterprise's needs. This last case is the most frequently used way of developing AIT systems (Fabricius, 2011; McGrow, 1993).

2.3 Lastly, The data structure of accounting information systems, in particular the structure (or network) of variables (the columns in the record database, e.g. product code, partner code, etc...) make it so that if an AIT software is used in data registry functions and accounting, then the software must be shaped to the company's accounting policy itself. Logically, this means if we purchase an ERP system, we also purchase a data model. More precisely we purchase the accounting policy defined by the AIT included in ERP. This is the basic rule of data models: if we purchase an ERP software, we also purchase a specific accounting policy(Fabricius, 2011).

The need to upgrade an accounting system is always brought on by the company adapting to market developments, or by the changing business situation of company. Therefore, there is always a new optimal structure for our AIT system, and there *must be an IT strategy to develop the data model of that new AIT system*(Fig 1.) (Fabricius, 2011; McGrow, 1993).

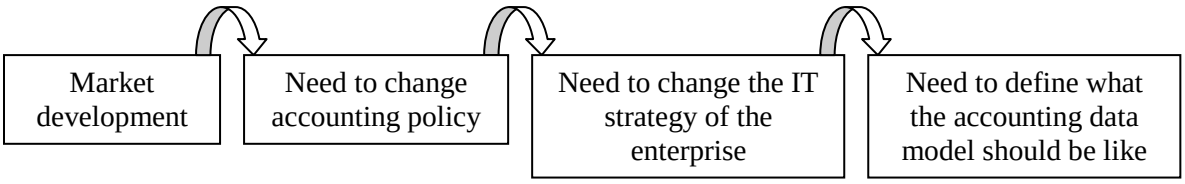

Figure 1. A logical way of data model development for AIT

2.4 Different enterprises (industrial, agricultural, service) have unique characteristics (as shown above in the table 1), which also make their accounting information systems unique. Our research confirms the contents of the cited sources in that the specification of the optimal accounting system for firm depends on the following:

2.4.1 The field of operation of the economic entity or firm in question (industrial, agricultural, services, foundations, budgetary organizations, etc…)

2.4.2 Its size (turnover) and number of employees

2.4.3 Ownership (private, public, budgetary)

2.4.4 Organizational culture

2.4.5 Managerial skills.

2.5 For studying the issues related to developing accounting information systems, and based on the table 1, it is useful to divide accounting information technology (AIT) functions into 3 separate groups:

2.5.1 AIT-1: General AIT functions that are used in all companies. These functions are usually included in ERP systems as standard/well known solutions, or templates. Some examples include: creating invoices, online transaction processing, financial accounting, preparation of the accounts, etc…

2.5.2 AIT-2: Tested functions applied in a given group of firms/economic entities (the function being specifically needed by that group), for example: inventory management, FIFO or other stock value calculation, tracking the momentary financial situation of the firm, etc…

2.5.3 AIT-3: AIT functions and methods that are only needed at the given firm/economic entity, and are therefore unique and completely specific to that entity. Examples include: solutions for tracking clients' credit limit, calculating the cost of municipal services, and solutions for calculating the amortization of assets that are held for security and reserve purposes only, etc….

It is apparent that the economic entities can use the same software solution to cover their AIT-1 needs, while the required AIT-2 solutions vary between a few well-defined categories. All AIT-3 functions are unique, and therefore the solutions used by the companies have to be unique. AIT-3 covers the management accounting and controlling solutions that are related to tracking the MIS/OLAP manager reports, the most important strategic goals and KPI-s (Key Performance Indicator as defined by the management) of the entity(Fabricius, 2011).

The term management accounting usually refers to monitoring and analysis of costs (Fabricius, 2011; Körmendi-Tóth, 2002; Sinkovics, 2010; Horngren, 2008). Table 1 shows that the AIT-3 solutions were related to cost-sensitivity in case of 13 companies out of the 24.
At the same time *the management accounting and controlling solutions have to be parcel central part of the whole accounting policy* of every firm and economic entity. The accounting structures and connections that fulfil the information need of managerial accounting are called "internal accounting" in the Hungarian accounting context.
Based on all the above, we can state that if market conditions or the company's business situation change, the accounting policy of the company have to be changed in accordance. However, the information system used to exercise the accounting policy is composed of different parts with different characteristics (AIT-1, -2 -3). Therefore, when developing the ERP system to match the changed accounting policy, the different parts of the information system have to be handled differently.

DISCUSSION

In figure 1, we showed the general logic of firms' IT development. The result of this development is a data model definition that is adequate for the new accounting policy – that is, adequate in light of market changes or a new business strategy (1.M). In case of a regular accounting information system upgrade, the above listed components mean that while we are working on the customization of the purchased software, we have to consider which IT solution fits which accounting policy, and (allowing for possible compromises), *which is the exact data model – accounting policy – that should be implemented?* Is it the data model used for reaching the firm's business goals (according the business strategy, 1.M), or the data model and accounting policy used so far (2.M)? Are we using it with the data model of the purchased ERP (3.M)? In the optimal case we are using the data model that matches our new business goals and accounting-information strategy (1.M).
To see clearly, we need a model that approaches systems development from a unique perspective; one that encompasses the 3.M syndrome (Fig. 2):

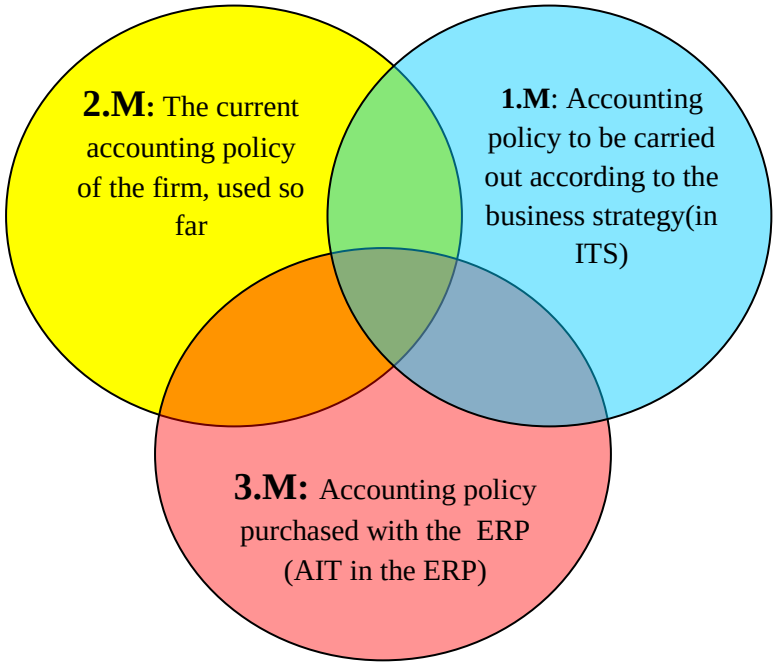

Figure 2. The 3.M Syndrome in introducing software systems is essentially a triple mind-split of accounting policies. If we are not careful, only the small intersection of the three sets will be utilizable in the new ERP system

3.M Syndrome in Information Technology:

There are always 3 data models present during the design and development period of accounting information systems:

1.M: The data model of the accounting policy laid out by the IT Strategy of the company (hereafter: ITS)

2.M: The current data model used so far

3.M: The data model of the purchased or adopted information (sub-)system(s).

CONCLUSIONS

During the management of IT systems innovation and development, we have to be aware that there are 3 models present; and we also have to ask ourselves the following: out of the three directions of 3.M, in which does the chosen IT solution shift the accounting information system under development? If we are not careful with the roll-out of the ERP, only the small intersection of the three sets (1.M, 2.M and 3.M) will be utilizable in the new accounting system.

It is prudent to attach two examples (4.1, 4.2) to the above reasoning. These examples will help understand the 3.M model, and show that the inappropriate handling of systems development affects different accounting functions to differing degrees.

4.1 In case of AIT systems operating with many templates (that is, well known and structured algorithms and/or data model solutions (Fabricius, 2011; McGrow,1993), we can be sure that the pre-development program used the same models as the current one, and a new IT Strategy will not require new models. These system-parts include those of financial accounting, cash-desk management, and invoicing; these are clearly functions of the accounting system that fall into the AIT-1 or AIT-2 category.

4.2 It is less clear *whether the purchased accounting method will fit* (that is, whether data models will match) *in case of special functions* of our firm's AIT (AIT-3).

Purchasing an ERP system is the most problematic in case of management accounting and controlling issues; that is AIT-3 functions. Since these are the accounting areas where we can find the most company/institution specific characteristics (that is, special AIT solutions), they are the ones most threatened according to the framework of the 3.M syndrome. This is because *the purchased ERP system comes with its own data model, and therefore, it is made for one specific accounting policy. By buying this system we buy the accounting policy, but this received accounting policy will not be suitable for the specific management accounting and controlling needs of our own company.*

OVERVIEW OF THE 3.M SYNDROME IN CASE OF PURCHASING AND INTRODUCING A COMPLETE PROGRAM:

Nowadays, in case of the innovation of a general ERP module based accounting system, the following data models/accounting policies are on the table:

5.1: **1.M:** This is the data model of our new, envisioned information system (according to our IT Strategy, hereafter referred to as ITS). If our implementation of the new IT system was done according to the recommendations of systems development methodologies such as SSADM (McGrow, 1993), then it must have been described and defined by our Requirement-Specification (Fabricius, 2011; McGrow, 1993). If this is not so, we are in a difficult situation, as our company's expectations about the new accounting information system do not even exist on paper, while it already has two other existing data models in place (2.M, 3.M). The first is 2.M, as old system functions are present even though we want to modify them, and secondly the system to be purchased is built on the chosen ERP system (3.M) – see some notes below.

5.2: **2.M:** This is the accounting policy that was used up to the present. We assume – and this is true for all accounting policies (data models) – that accounting tasks were partly done manually, and partly electronically. In general we can say that after implementing a new system, the ratio tasks carried out electronically will increase; however, we have to make sure that this actually benefits the management and the accounting staff.

5.3: **3.M:** The ERP system to be purchased (which hopefully has not yet been paid in the preparatory period) obviously has its own data model, and with it, the program will define a sort of accounting policy. Also must have been a data model which hopefully have been documented according to SSADM standards (McGrow, 1993). In connection with this, we should remember the following:

5.3.1 If there is no IT Strategy and Requirement-Specification (that is, our concept is not finalized) upon the purchase of the complete ERP system, we simply get the data model that is available, or the one used at former applications. This statement is also true in the form that for those accounting areas where we have concrete, definitive desires for the new accounting policy in the IT Strategy, implementation will be easier. For areas where we do not have these definitive needs, we are "lost": the accounting policy that will prevail will be the one brought along with the program.

5.3.2 All ERP systems have flexibility: this allows for customization. However, this flexibility is to our benefit if and only we have the Requirement-Specification (which is based on the IT Strategy) to direct the customization. Optimally, this should be done before actually paying for the new ERP system.

5.3.3: The required customization is done by the software companies: if they have a version of the system with similar parameters, they will of course bring that to our company, as it is in their interest also that there only be a minimal amount of modification required. Obviously, this will facilitate customization efforts only if we can compare that particular software version to the needs that are defined by our Requirement-Specification, and they match.

5.3.4: We have mentioned that the risk of data models being incompatible is the highest in case of AIT-3, that is, special accounting fields such as Controlling and Managerial Accounting, as these solutions are the most diverse across companies. This problem manifests mostly in case of decision-supporting information systems, as well as in case of special fields as production or resource management.

ADVICES AND NOTICES

We should make four other important notes concerning the 3.M Syndrome (6.1 – 6.6.):

6.1 The worst imaginable scenario is if we or any other parties involved in the implementation of a new system are not aware of the existence of the 3.M phenomenon.

6.2 The roll out of the software, training and customization must not be done at the same time (not even two of them). The reason for this is that if they are done simultaneously, participants will not be able to distinguish between tasks, and the 3 Models will mix. If rolling out, training, and customization happened at the same time, we would have to pay

special attention to the separation of the 3 Models at all time. If a user made a query or a developer modified the settings, they would have to be aware of which model they are acting based on: the previous reporting model, the desired (IT Strategy) model, or the one the software company brought. In case of the operating staff, it is hard to imagine that they studied the information strategy, or are well-versed in systems-organization – they will be looking to implement the practices they have established while using the previous system. Similarly, the programmer of the software will focus solely on configuration and issues regarding future maintenance needs.

6.3 The most sensitive and complicated field is AIT-3 solutions in Managerial Accounting systems: without extensive preparation, it is impossible to actually realize the concepts and needs of the management.

6.4 We cannot really blame the software company for not effectuating the concepts laid out in our enterprise's IT Strategy and Requirement-Specification: they do not know our exact desires or the needs of the management, and neither is it their areas of expertise.

If the Dear Reader has just been part of an information system development project, they can now, having read the risks associated with the "triple personality split" that is the 3-M phenomenon, easily assess whether the issues described here apply to them. If the Dear Reader experiences that after having completed the implementation of a new accounting software system or ERP, tasks take longer, need more labour, are more expensive, or the program does not even do what it is supposed to, than the unfortunate situation is that the new data model does not match the conceptualized accounting policy. The accounting system is suffering from a personality split. *Being aware of the 3.M syndrome helps avoid the emergence of such a schizophrenia of IT systems.*

REFERENCES

FABRICIUS-FERKE GY. (2011): *IT for controlling & managerial accounting.* CompLex Press Ltd, Budapest.

GÁBOR A. (1997): *Információ-menedzsment.* Aula Kiadó Kft, Budapest

HORNGREN, C.T – SUNDEM. G.L – STRATON, W. O. (2008). *Introduction to Management Accounting*. A Pearson Education Company. New York, USA,

HORVÁTH & PARTNER. (2001): *Controlling – The way to an efficient controlling system*. KJK Judiciary & Business Press Ltd, Budapest.

KAPLAN, R.S.- ATKINSON, A.A. (2003): *Vezetői üzleti gazdaságtan haladó vezetői számvitel.* Panem, Budapest.

KAPLAN, R.S. – COOPER, R. (2001): *Költség & Hatás.* Panem-IFUA Horváth & Partner, Budapest

KÖRMENDI L, TÓTH A. (2002): *Scientific approach to controlling and its application*. Perfekt Press Ltd, Budapest.

LAÁB Á. (2010): *Vezetői számvitel - módszertani füzetek.* CompLex Press Ltd, Budapest

MCGROW, HILL. (1993): *Software System Development.* The McGrow-Hill Companies, New York

RAPPAPORT, ALFRED. (1986): *Creating shareholder value: The new standard for business performance.* Free Press, New York

SINKOVICS A. (2010): *Corporate financial planning*. CompLex Press Ltd, Budapest

TOMCSÁNYI P. (2000): *Általános kutatásmódszertan*. Szent István Egyetem, Gödöllő

TÓTH E. (2008): *Döntéstámogató rendszerek.* Panem, Budapest
WITT, F.J - WITT, K. (1994): *Controlling a kis és közép-vállalkozások számára.* Springer-Verlag, Budapest
Ceginfo (2015). www.ceginformacio.creditreform.hu/ 2015.08.28. 16:30.
KSH (2015). www.ksh.hu/docs/hun/xstadat/xstadat_eves/i_qsf001.html. 2015.08.17. 16:34.
TRIUN (2015). www.triun.hu/adatlap/ 2015.08.28. 19:03.

FOSSIL OR RENEWABLE ENERGY? - METHODOLOGICAL ASPECTS OF THE ECONOMIC AND ENVIRONMENTAL COMPARATIVE ANALYSIS

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SUMMARY

If humanity wants to learn from theirearlier mistakes,required energy demand what need to the economy and living standards increase in, and technological obsolescence due to the loss of capacity should meet renewable sources, or replaced. It is particularly in those cases where the economic, technological or environmental conditions allow it. In several cases can encounter on the analysis of these developments in economic, environmental and social aspects. There several methods for the implementation of the measurements, but in most cases only one or two aspects examined. However, the enforcement of the principle of sustainability requires a complex comparison what we need to make any type of energy or energy-production methods in case of the most ideal ways of generating energy. Way for selecting adjusted to the economic, social and natural environment.

INTRODUCTION

Hungary's energy demand based on the experience and long-term forecasts in recent years, moving around 1,400 PJ, which compensate into domestically produced shows a decreasing value from year to year, and strong import dependency. Domestic investments are needed to increase production, but in view of climate change, by no means matter of this happening from what source, the size of ecological stress, and extent economical. In order to energy demands for us to satisfy, should be able to choose the best among the planned investments. These do not always coincide with the most economical or the most environmentally friendly. If you look at the position of our country (Figure 1), you will face is reported that 65.5% of our energy needs, imports about 803.2 PJ.

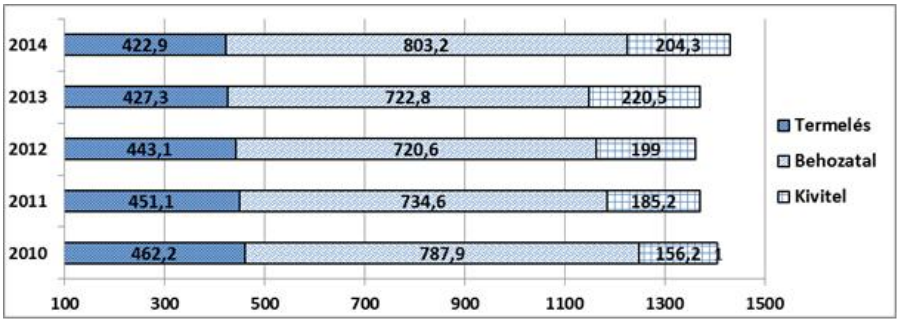

Figure 1: Energy balance of Hungary between 2010 and 2014 (in PJ).
Source: Own compilation based on KSH data

In the literature, we can find a number examples for impact assessment of investments, for theanalyses of the methods and we can get an image from themethodological background. This studyincludes these but not limited to, it would like to provide some insight into and introducesthe author's own method of comparison is which can facilitate the strategic planning of settlements.

MATERIALS AND METHODS:

The paper was carried out during the preparation of research literature, examined; I analysed the bibliographic sources of the energy production, both domestic and international relations. I introduce some of the most commonly used option in the impact assessment method based on the selected study sources. Finally, from my experience and earlier knowledge,I attempt to develop an evaluation method that examines onto the complex way in renewable energy generation investments.

RESULTS

Methodologies examples in the literature

Case of energy investments can be a common problem is that it is difficult to verify the economy goodness, if we only approached the technological efficiency side of the problem, while ignoring the environmental and social aspects. In this case the energy balance, identify affecting factors of the energy losses, the circumstances of technology construction are the focus of the investigation.Other cases, however, only the economic impact of investment capital like credit, interest rate, payback time, etc. is the central question of the studies. According to the literature, when evaluating projects are discussed, most of us focus on the economic / reward investigations they think. Today the most commonly evaluation of the renewable energy projects are carried out along the three axes according to Chen Yu-Chang (2013):

• The net present value (NPV) based,
• Multi criteria decision support,
• Real option approach.

Of course, in addition to the previously mentioned approaches, often appear in the Cost-Benefit Analysis (CBA) and sustainability analysis.

Net Present Value approach

This approach is a standardized test method to assess of renewable energy projects in the practice and research too. A series of studies prepared by the United Nations Environment Program, in order to be incorporated in a net present value-based simulation model for the valuation of financial protection chosen taking into account the decisions (Chen 2013). Its disadvantage only point of view the project payback can be tested in this manner. Even

suitable forming ranking besides typical line dividend, because includes distortion in three contexts too.

The net present value is may develop into one kind of rate, when of those distortions will systematically eliminating, even the internal interest rate and the calculative interest rate one kind of difference. This rate differences by ranking the same risk on an equal same ranking as the internal rate. If the cleaning has be done from the distorting effects, than the order of beneficial will disappear of the two methods,are permitted but only if the risk level is different between the projects, they can be ranked according to the standard rate differences. In some ways purpose differ from these hierarchy that decide by critical rate of capital income and it's feasibility which calculated spread of capital of investment variations. (Illés 2013).

Multi criteria decision support

Generally, there are two distinctive types of multi criteria decision support (MCDM) problems, because the problems are different attitude. One of the type, a number of alternatives are limited and the other case thenumber of solutions are infinite. Normally, the problems associated selecting and evaluation of alternative solutions is limited numbers. With regard to the planning problems of value attributed to all ranges. For this reason the possible of alternative solutions has infinite number. If this is the case, then this problem is called multi-objective optimization problem, not the more properties problems of decision making. The MCDM problem can be described by matrix of decision. Though MCDM problems can be very different, but there are common characteristics which are include:

- Many features / criteria is often creates a hierarchy among themselves
- Conflict between the criteria
- Hybrid nature
- Uncertainty
- Wide range
- It believes is not convincing

(Ling, Jian-Bo 2001)

Real option approach

The first user of the real option term was Stewart Myers in 1977, he examining the possibilities of application of the option pricing, it is not a financial, primarily is the properties investments area, where the added value this flexibility and the deferment meant phenomenon of learning. If we considered, as the real option decisions of production and investment making the possibility of postponing. Economists quickly realized that for real investment decisions made remarkable ability to provide added value created by the option theory to analyse financial options. The topic aroused the attention of the scientists first time in the 80s and 90s years, note, however, the wide spread is still had to wait until the mid-90s. Because the transition created by real options from the direction of specialized attention the theory the option, into the mainstream of the profession and science. The real options came along two

dimensions are typically concentrating on the timing and along the extension. Three types can be distinguished by:

- The real growth option
- The Insurance Options
- Learning real option

Realoptions approaches disadvantage:
The passive attitude of management is assumed, the easy to apply, instructive discounted cash flows based approaches that live with the assumption implicitly of the project will commence immediately and is expected by the end of the useful life working continuously, in spite of the uncertainty of the future. Thanks to the discounted cash flow ignore the procedures what can be built by the management flexibility to adapt innovations and added value to the project, and thus constantly underestimating the value of the investments. If the investment alternative during undervaluation occurs the under-investment, than will be competitive position reduction or losses. An effective project evaluation process also takes account of the uncertainty of decision making is essential for an active strategy to succeed(Csapi 2013).

Index of the Environmental Sustainability of the Energy Projects (IESEP)

Called the Environmental Sustainability Index of the Projects of the Energy (IESEP), is a normalized indicators developed by the aggregate indicator. The first aim of the index is to provide information on a quantitative basis including all effects - over the lifetime of energy project - all of which can be traced back to environmental sustainability indicators by examined the trends. Meanwhile, it provides an opportunity to illustrate what kind of environmental degradation would cause the given power project on environmental sustainability relative to the initial phase. The second goal is to facilitate a comparison among a starting and the alternative scenarios with the aim to find out all the effects of the original project. If we can estimate the expected development of selected indicators, passage of time, and it will actually be compared to the values of curve obtained IESEP with the baseline scenario. Thus can be provides an alternative among the energy projects the highest levels of environmental sustainability, in the area where the greatest difference compared with the base curve (Fabio, Jorge, 2011). In environmental terms, this results a successfully used to indicator, however, complex and full-blown investigations in my opinion, can’t be sufficiently used for comparison. There is a lack of economic aspects and does not recognize any social impact in the tests.

Cost benefit analysis

Condition of the Structural Funds and the Cohesion Fund are to support the justification to be justified. It mainly means aid the following conditions are satisfied:

• Social expediency can be verified
• Receive only the necessary amount of support to reality, over aid can’t happen;

• Operation of the tools established within the project, quality of service financially is sustainable.

Checking the payment terms of cost-benefit analysis is a by the method of. As required by at legal regulatory specifically for large and income-generating projects, obligatory to conduct the cost-benefit analysis. In other cases, obligatory proof of payment terms, which meaning a preparing a complex, detailed in cost-benefit analysis. Include another object of the cost-benefit analysis, as well as for each project is also necessary that on the basis of the calculations, rate and amount of aid provided for under the system of rules to follow and be deductible.(Nemzeti Fejlesztési Ügynökség 2007).A typical steps of CBA (European Commission 2014):

- Determination Objectives
- Identifying the project
- Technical feasibility and environment
- Financial analysis
- Economic analysis
- Risk assessment

The method can be seen that while the main disadvantage of phases in most countries show about a match, until that analysis the methodological solutions offered can be found considerable dispersion, so the results may very significantly owing to the variety of processes (Boros 2014). Another disadvantage can be considered the fact that in the analysis of all factors monetization need. Result of the monetization, ultimately, only take place through the analysis of the economic aspects. If there are multiple projects can be a difficult and lengthy the comparability.

Proposed assessment methodology, the complex Sustainability Index

My opinion in order to set the right decisions when selecting between investments maximally keeping mind the sustainability, the complex should be performed which take into account as well the economic, environmental, social and technical features. These viewpoints can help you compare succeed renewable projects already in operation or being planned, regardless of location and performance. After all we become capable of comparing into a uniform way the project data obtained from the chosen indicator derived, can help you can make a summary indicator. In this way, we can set up a hierarchy among the compared projects.

Possible indicators and their groupings

The complex comparisons we needed to collect different types of indicators. The indicators are grouped is similar to the frame like STEEPLE methodology. However, while the STEEPLE is an environmentally analysis method (Garaj 2012), until then the Complex Sustainability Index, provides an opportunity to compare and select energy-producing investments in accordance with our incurred needs. The choice of the indicators are influenced by to provide appropriate information or description of environmental, social,

technical and economic state of affairs, situations. The most important aspect has been to the temporal and spatial comparisons, comparability between groups the different economic, social aggregates, we can achieve (Havas 2007).If the method is applied in practice, we would like to, you need to have the reference data. Before, beginning the tests necessary to determine the net present value of energy investments in order to payback the investment. The conduct of investigations, I chose 25 indicators which were classified into four groups for the sake of complex comparability. You can use target indicators planned projects or projects already completed or projects operating indicators. In my opinion, the number of the indicators can be modified if our requirements require, we can be expand or decrease. The overall structure to achieve the results shown in Table 1, consider worthwhile to use as a basis. Indicators what we want to used, are natural pointers, for the sake of comparability, index numbers be established, this process, in the next chapter I want to be presented.

Table 1. Available indicators and their groupings

A. *Technical indicators:*	1. Satisfiability energy demand (%) 2. Installed capacity (MW) 3. Energy Production efficiency (%) 4. Operation time (years)
B. *Economic Indicators:*	5. Aggregate / expected investment costs (HUF) 6. (Expected) Annual operating costs (HUF / year) 7. (Expected) Payback period (years) 8. Own resources over the entire project (HUF or %) 9. The amount of state aid during the entire project (HUF or %) 10. Other subsidies rate during the entire project (HUF or %) 11. The amount of required investment credit during the entire project (HUF or %) 12. Together with the costs of producing energy taxes (HUF / MJ or HUF / kWh) 13. Logistics costs related to operations (HUF / year)
C. *Environmental Indicators:*	14. Environmental classification of operation site (Greenfield / Grey-field / brownfield) 15. Resource purchasing area (or if Km^2) 16. Annual amount of CO_2 emissions (t CO_2 / year) 17. Annual amount of SO_x emissions (SO_x t / year) 18. Annual amount of PM_{10} emissions (PM_{10} t / year) 19. Environmental classification of the generated waste (biodegradable / general / hazardous waste)
D. *Social Indicators:*	20. Primary labour needs for operation (People) 21. Linked labour needs for operation (People) 22. Contractor's headquarters (Hungarian local / non-local Hungarian / Foreign) 23. Operator headquarters (Hungarian local / non-local Hungarian / Foreign) 24. Foreign ownership share of the investment (%) 25. Domestic ownership share in the investment (%)

Source: Own construction

The aspect is based on the modified methodology of STEEPLE system. We can provide assistance to new fields that are planned and existing projects can be compared and examine know (expected) efficiency of the projects. It will enable us to common boundary conditions common method for examining the placed project far from each other in space and time in term of power generation efficiency of investment and in terms of sustainability.

Process of the Index-making

Using of the method the minimum and maximum indexes and by averaging could be determined. This methodology can be observed in case of the Green-index calculation as well (Tóth, Gal 2014). Though the purpose of the original investigation other than the case of the Green-index, because this index is intended changes to the green economy and greening measurement of the event in different countries for years (Szita 2014). This process of using a ranking can be formed between the best and worst value achieved within a given category. To passtocalculate of the indicator indexes the following formula can be used:

$$I_i=(X_i-X_{min})/(X_{max}-X_{min})$$

$$Z_i=\sum_{i=1}^{n} I_i/n$$

The above formula, the indicators than those used when more emphasis should be given a higher value. Such indicators include primary and secondary labour demand, the efficiency of the operating time. For those indicators where the higher the value those with fewer, the basic index calculation I used with this following modified form. As a result, the priority, together with the lower value get higher index is, in the line:

$$Ii=1-[(Xi-Xmin)/(Xmax-Xmin)]$$

We can find between these indicators from the above-mentioned categories some but not all like, the annual quantities of emission, power generation unit costs, foreign ownership share in the investment and annual operating costs. When has been convert the natural indicators to index, the next step to needed starting averaged these indexesinside its own indicator group, and we can get one consolidated group indices of in that the project. We can get the Complex Sustainability Index (CSI) from the average of the all group indices in the project, as we can observe in Table 2. To achieve a better fit to the own needs, and can be tested in the different group indices values separately. This could be especially useful in cases where the CSI show equal or nearly equal values in the case of the projects compared. So we can choose the most suitable version for us.

Table 2. Composition of Complex Sustainability Index

	Project
Group of the Technical indicators	I_1
Group of the Economic Indicators	I_2
Group of the Environmental Indicators	I_3
Group of the Social Indicators	I_4
Complex Sustainability Index	$I_{average}$

Source: Own construction

The deficiencies of CSI methodology

One of the most important conditions of the analysis is, the compare of same type and mainly let's energy generation projects. The CSI current form is not solved classification of the combined power plants,we can only make an analysis carry out if we a separate done the case of each department analysis. Results can only be obtained if there is a benchmark. The quality and accuracy of the comparison can be increases, by more evaluate completed or investment plan. The model presupposes baselineaccurate and real data if incorrect or false data in this case the end result can be mistaken conclusions can be drawn.

CONCLUSIONS

The energy projects evaluating and comparing several methods available in the literature. The most frequently used methods tried compared in Table 3. As illustrated, a number of methods available which one or two sides parallel is capable of observing the power generation investments. These investigations carried out in most cases from economy sides. In my opinion, in the future or in the case of strategic planning should be in addition to economic and environmental aspects to consider the social and technical aspects as well as characterized project indicators in such a way that no economic interests to rise over the decision above the other aspect, but on sustainability should be the priority.

Table 3. Comparison of Methods

Title of the methodology	Aim of the methodology	Methods	Disadvantage
Net Present Value	-Analysis of the payback on investment	Economic analysis	-It is difficult to compare -The presence of distortions
Multi Criteria Decision Support	- Information services for management - The easiest way of making information to available	Matrix investigation	- Many features / criteria is often creates a hierarchy among themselves - Conflict between the criteria - Hybrid nature - Uncertainty - Wide range - It believes is not convincing
Real Option Approach	- Added value investigation addition to financial values	Real Option Analysis	- Thanks to Careless attitude towards under-investment and the competitive position loss can occur.
IESEP	-Quantitative Environmental Analysis -Environmental status monitoring	Environmental analysis	-Not taking into account market factors
Cost Benefit Analysis	- Public utility is can be verified - Avoiding the over aid	Financial analysis Economic analysis Risk assessment	-There is no set methodology making the final results may differ significantly from reality
CSI	-Choosing Sustainability forms of energy production at the level of urban settlements	Technical analysis Economic analysis Environmental impact analysis Social Impact Analysis	-Problem of the mixed power examination

Source: Own construction

Thus, the complex Sustainability Index has big opportunities, however, this method must put under further investigations the eventual elimination of defects, and in order to minimize distortions. However, it can be used in some municipalities' energy strategy planning, selecting renewable energy production investments, subsequent verification of the completed projects and outcome studies. Thus, the complex Sustainability Index has big opportunities; however, this method must put under further investigations in order to elimination of the eventual defects, and minimize distortions. However, it can be used in some planning of municipalities' energy strategy, help selecting between renewable energy production investments, can make a subsequent verification of the completed projects and outcome studies.

REFERENCES

HAVASI É (2007): Az indikátorok, indikátorrendszerek jellemzői és statisztikai követelményei, Statisztikai Szemle, 85. évfolyam 8. szám, pp. 680.

BOROS Á(2014): Vízi közmű beruházások gazdasági értékelésének dilemmái - a 2007-2013 közötti magyarországi szennyvízkezelési projektek tapasztalatai, Forrás: http://phd.ke.hu/fajlok/1410529064-boros_aron_doktori_ertekezes_final.pdf (2015.09.23)

BÓTA G(2006): Vállalati gazdasági elemzések reálopciókkal; Forrás: http://www.kgt.bme.hu/doktori/phds/bota_g.pdf (2015.09.15)

CHEN-YU C (2013): A criticalanalysis of recentadvancesinthetechniquesfortheevaluation of renewableenergyprojects; Forrás: http://www.sciencedirect.com/science/article/pii/S0263786313000379 (2015.09.15)

CSAPI V (2013): A reálopció-elmélet alkalmazása a villamosenergia-szektorban; Forrás: http://www.asz.hu/penzugyi-szemle-cikkek/2013/a-realopcio-elmelet-alkalmazasa-a-villamosenergia-szektorban/csapivivien-2013-4.pdf (2015.09.24)

DR. GARAJ E (2012): Projektmenedzsment; Forrás: http://www.tankonyvtar.hu/hu/tartalom/tamop412A/2010-0017_35_projektmenedzsment/ch02s03.html (2015.09.26)

DR. LING XU, DR. JIAN-BOYANG (2001): IntroductiontoMulti-CriteriaDecisionMaking and theEvidentialReasoningApproach;
Forrás:
https://phps.portals.mbs.ac.uk/Portals/49/docs/jyang/XuYang_MSM_WorkingPaperFinal.pdf(2015.09.24)

EUROPEAN COMMISSION (2014): GuidetoCost-BenefitAnalysis of Investment Projects; 27.oldal; ISBN 978-92-79-34796-2 Forrás: http://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/cba_guide.pdf (2015.09.24)

MANZINI F, ISLAS J, MACÍAS P (2011): Modelforevaluatingtheenvironmentalsustainability of energyprojects; Forrás: http://www.sciencedirect.com/science/article/pii/S0040162511000266 (2015.09.15)

ILLÉS M (2013): A gyakorlat szempontjából felmerülő vállalatgazdaságtani problémák.Ekonomickéštúdie – teória a prax,
Forrás:
http://www.academia.edu/3640092/A_gyakorlat_szempontj%C3%A1b%C3%B3l_felmer%C3%BCl%C5%91_v%C3%A1llalatgazdas%C3%A1gtani_probl%C3%A9m%C3%A1k (2015.09.24.)

MUN J(2006): Real optionAnalysis versus tradicional DCF ValuationinLayman's Term; Forrás: http://www.realoptionsvaluation.com/attachments/whitepaperlaymansterm.pdf (2015.09.14)

KÖZPONTI STATISZTIKAI HIVATAL (2015): Primer energiamérleg (1990–); Forrás:http://www.ksh.hu/docs/hun/xstadat/xstadat_eves/i_qe001.html (2015.09.15)

NEMZETI FEJLESZTÉSI ÜGYNÖKSÉG (2007): Általános módszertani útmutató költséghaszon elemzéshez; Forrás: http://rs1.sze.hu/~kovacsg/%C1llamh%E1zt_ismeretek/CBA_utmutato.pdf (2015.09.13)

TÓTHNÉ SZITA K.(2014): GreenGrowthinthe OECD: State of the Art; 'Club of Economicsin Miskolc' TMP Vol. 10 Nr. 2. pp. 59-65

TÓTHNÉ SZITA K - GÁL B S (2014): A zöld világgazdaság és a megújuló energiaforrások helyzetének elemzése, Közgazdász Fórum, 17. évfolyam, 119-120.szám, pp. 10.

CLUSTER-ORIENTED STRATEGY FOR SMALL AND MEDIUM ENTERPRISE INNOVATION PERFORMANCE

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SUMMARY

Industrial clusters over the years has being the engine for growth in most economies accounting for most of national manufacturing sector. This sector turns to be the source of innovation and competitive advantage. It is further responsible for the establishing of new startups and social poverty alleviation in most countries especially in South East Asia but this happens not to be the case in sub-Saharan Africa. Indigenous cluster turns to be less innovative as compared with others in developing countries such as China and others. Therefore this study examines the current state of innovation capabilities of SME cluster and propose a conceptual framework that can aid in how information and technology is diffused. It further investigate the influence of both interaction of various stakeholders and the clustering environment on innovation performance. In addition this study provides a platform for government and major stakeholders to implement and evaluate cluster strategy.

INTRODUCTION

After the popularization of regional and national cluster by Porter (1990), it has played a significant role as to how nations gain both regional and national competitive advantage. The success of industry clusters can be attributed to the fact that firms within an industry cluster enjoys agglomeration effect of economics, technology and knowledge spillover due to geographical proximity, access to a pool of specialized skilled workforce among others (He et al, 2010; Porter, 1990; Boschma, 2005). All these forces turn to improve the innovation and value creation capabilities of firms within particular industry cluster (Porter, 1990; Damanpour, 1991).

Despite firms within industry cluster turn to be more innovative than firms outside the cluster there have being recent studies that suggest that after the 2008 financial crisis cluster especially small and medium enterprise (SME) oriented clusters have being faced with series of hurdles that affect its sustainability in both developed and developing economies. SME's arguably is the engine for economic growth in almost all economies, therefore the need to provide systems that would ensure its continuous growth is of critical need. Despite of this fact there are a series of factors that affect its development among which lack of innovation being of high priority (Sonobe and Otsuka, 2006; Oyelaran-Oyeyinka and McCormick, 2007; Aryeetey et al, 2009). Although policies are enacted to support the growth of clusters little has being done in terms of incentive provision to encourage siting and setting up of new firms within industry clusters to boost entrepreneurial and innovation activities of Ghana (Aryeetey et al, 2009; Yoshino, 2011).

In addition existing cluster are not innovative as compared with clusters in Asia and other parts of the world. And this is due to disabling labor, low capacity of firms to absorb existing and external knowledge within the innovation ecosystem and lack of innovative-networks among others. These factors have affected SMEs in terms of gaining access to financing, new market segments and labor force (Fafchamps, 2000; Oyelaran-Oyeyinka and McCormick, 2007). Therefore the purpose of this study is to theoretically examine how to enhance the innovative capabilities of individual firms within SME industry cluster in Ghana. The study seeks to find appropriate interventions to bridge the structural hole or gap that exists in the innovation ecosystem and this would aids firms to develop new absorption capability that would contribute to value creation, access to new market and technology and improved productivity (Granovetter, 1994). . This would further has a positive impact on how future coordination and interaction among the various actors are to be carried out in order to enjoy the huge social capital available (Powell, 1990).We further propose conceptual preposition that contributes to how individual firms can explore or exploit available social capital for the purpose of enriching it internal innovation process and capacity.

We divided this study into five main parts, the section 2 discussesthe challenges affecting small and medium enterprise innovation capacity in sub-Saharan Africa,section 3 discusses the significance of cluster and firm's innovation performance, section 4 focuses on the theoretical background for the formulated prepositions and lastly section 5 presents the conclusion for this study.

CHALLENGES AFFECTING SMALL AND MEDIUM ENTERPRISES

The nature of small and medium enterprises makes it significantly difficult to have a universally accepted definition for this concept. Diverse countries have different indicators to measure, categorize and define what a small and medium enterprise is. Despite of these differences in defining the term small and medium enterprises, most of the widely adopted definition are centered on the size of firm and employee, revenue turnover, asset among others (Lopez &Aybar, 2000; Kayanula and Quartey, 2000). Due to the scope of this study, we adopt the definition that is generally accepted in Ghana. In Ghana small and medium enterprises are categorized using the size of employee with micro enterprise as one with less than 5 employees; small enterprise as one with 5 to 29 employees while a medium enterprise is one with 30 to 99 employees (Osei et al, 1993; NBSSI, 1989).

The role of small and medium enterprises cannot be underestimated in the economy development of any country. It has served as the engine of economic growth both in developing and developed economies. In Ghana small and medium enterprisesplays a significant role in the development of national economy since it contributes to almost 90% of industrial and service inputs. It further serves as the large hub for employment in the country. Therefore the survival of this sector is critical and needs to be managed effectively if sustainable development can be achieved (eg. Kayanula and Quartey, 2000). Despite of this major contribution that any economy drives from the development of small and medium enterprises, most small and medium enterprise are faced with series of challenges that affects the growth and development of this sector. The series of challenges affecting the performance

of this sector is includes lack of managerial skills and training, the absence of economies of scale, lack of innovation due to low level of research and development activities (Rothwell, 1991; Rammer and Schmiele, 2008; Parker et al, 1995; Tellis Gerard, 2013)

In order for firms to improve its performance there is the need to adhere to measure that would mitigate this uncertainties that affect the development and growth of small and medium enterprises. Furthermore, an essential factor affecting small and medium enterprise is the dynamic nature of the business environment and the rapid changing of the innovation ecosystem.This assertion has been earlier held by Romer (1990) and Schumpeter (1962), that, innovation is an important driver for firm development and economic growth of a nation in general. Atuahene-Gima (2005) is also of the view that firms at the leading edge of radical innovation tends to dominate the world market at expense of more dormant ones Atuahene-Gima (2005).

INDUSTRY CLUSTER AND FIRM PERFORMANCE

In reorganizing the important role SMEs play in job creation, fostering the growth of innovation among other factors, Bologna Charter on SME was adopted by 48 member to improve SMEs abilities to manage innovation, reduction of financial barriers to SME innovation and facilitation of SMEs access to national and global innovation network OECD (2010).The size of a firm, the rate of R&D usage, with its investments in equipment and human resource development have the tendencies of improving both process and product innovation, which in the long run act as catalyst for firm's productivity and growth, this is more prominent in SMEs more than larger firms Hall H.B (2008).

In dealing with the aforementioned situations or challenges that affects small and medium enterprises, industry cluster provides are grounds for improved value creation and performance. This can be attributed to the number of benefits such as knowledge and information sharing that is simulated by the geographical proximity of firms within an industry cluster among others (Porter, 1990). Industrial cluster is recognized as the source of nation competitive advantage and also an engine for the development of indigenous innovative firms, despite this fact most countries in developing countries especially sub-Saharan Africa fail to provide the needed incentive and environment to back their cluster initiatives and strategies. This has resulted in the low capacity of indigenous firms to be innovative especially SME cluster even though these firms turn to share the same geographical proximity ((Aryeetey et al, 2009; Yoshino, 2011; Oyelaran-Oyeyinka and McCormick, 2007).

Despite of this fact, firms within an industry cluster are more innovative as compared with firms outside the cluster and this is confirmed by a series of studies. Furthermore, there is a positive relationship between cluster environment and firm innovation performance and this has being acknowledge by series of studies (Egbetokum, 2008; Griliches, 1995; Litctenberg&Siegal, 1991; Hall and Mairesse, 1995 Porter, 2000). In addition the due to the interactive flow of knowledge and information among actors in an industry cluster enables individual firms to enhance its internal knowledge and research intensity. And this has a

positive impact on firm's innovation process in relation to new product and service design and development.

And the case is not different in sub-Saharan Africa, this lack of cluster strategy or ineffective implementation of cluster strategy in order to foster growth and innovation of SME cluster can be attributed to the lack of informative data in relation to what makes clusters innovative in Ghana context on the part of the policy makers whiles individual firms lack the needed capacity to tap into this information and knowledge available in the innovation ecosystem in order to build its own competitive advantage. It will further aids in the innovation richness of the firms so as to compete with relatively larger companies (Griliches, 1995; Litctenberg&Siegal, 1991; Hall &Mairesse, 1995). SMEs must adopt innovative and dynamic approach to stay in the game (Mann, 2013, Bigliard B et al, 2011; Grant et al, 2002). Industry cluster therefore serves as a platform to boost firms' innovation performance resulting in growth and development both in the long and short run.

THEORETICAL BACKGROUND

Industry cluster forms the basis for both local and regional innovation development and growth. And this can be witness from the success stories of various cluster spanning through Pharmaceutical clusters, wine and food processing clusters, Hi-tech cluster like Silicon Valley among others. Industry cluster creates a platform for cooperation and information sharing, further enhancing coordination activities (OECD, 2001). In addition the geographical concentration of firms enables individual firm's to have access to a wide range of information about customers, suppliers and competitors and this enhance the decision making process of the firm involved. While this proximity facilitates effective communication among others, it further enables a comfortable grounds to breed trust within innovation network. The cluster network also forms bases for the development of new innovative product. The interactive nature of firms within a given cluster provides the grounds for continuous learning process through knowledge and information sharing, technology and knowledge spillover (Krugman, 2000).

Furthermore, industry cluster are seen as a source of knowledge creation and an essential source of value creation for both individual firm and regional competitive advantage and development as discussed by scholars of the knowledge based theory. From this perspective it emphasis that clusters should be a source for enhance value and innovation that would satisfy the needs and wants of customers. This is as a result of improve innovation through knowledge and information sharing either through formal or informal mediums among the various firms located in this proximity (Jaffe et al, 2003; Lawson & Lorenz, 1999; Lorenzen&Maskell, 2004). This provide firms with extra information on the needs and expectations of customers in relation to quality whiles on the other side firms gain access to competitors and industrial standards. This serves as a guide for firm innovation activities so as to be able to thrive in an ever evolving business environment. This would further enable firms to adhere to regulatory and industry policies and regulations (eg. Ackah et al, 2014; Katila& Ahuja, 2002). Based on the theory elaborated above the hypothesis below was formulated;

P1: the proximity of resources within the environment of an industry cluster enables the facilitation of coordination and interaction activities that has a positive impact on firm innovation performance.

Furthermore, in order to attain significant benefit from a localized innovation network depends on the topology or structure of the industry cluster. The setting and firm make up structure of the industry cluster accounts for the innovation competitiveness of this network. One of the most distinct characteristics of an industry cluster is its ability to efficiently organize productions utilizing a full range of specialized skills and resource whiles co-existing with other firms in a specific location. The dynamic and distributed learning process of firms within an industry cluster rather encourages firms to explore external environment to accumulate personal experience and knowledge that contributes to each actor's innovation process (Rullani, 2002; He et al, 2010). The more ties each firm has with other firms the more it can tap into the knowledge and skills available at their exposure. The absorptive capabilities of firms is essential despite open innovation is to adopt a collective intelligence approach to deal with specific projects. Despite inter-firm collaboration is based on the utilization of resources from both parties it is the responsibility of each individual firm to gain maximum benefit from this social capital (Siverberg et al, 1998; Burt, 1992). Evidently series studies attribute the growth of firms to its affiliation to its industrial association since each firm's success depends on the success of other firms within its supply chain network that includes competitor and others. The more interconnected and enhanced the value chain of entities in an industry cluster is the more social capital it enjoys (Gilbert, McDougall &Audretsch, 2006; Gilbert et al, 2006; Zaheer& Bell, 2005).

The structure of an industry cluster contributing to the innovative network creation and maintenance, the research intensity of firms within the cluster serves as an enabler for inter-firm open innovation activities. When other firms within the cluster have an improved innovation capabilities it boost the confident of other firms to form alliance so as to boost individual innovation performance. This can be seen through the investment in research and development of other firms, the patent and Intellectual property registration of other firm as a bases for its internal research intensity. Firms with relatively large research and development activities turns out to accumulate huge amount of data and information that other firms might like to tap into so as to improve its own. This enables firms to cut down its internal research and development investment whiles increasing its economic value (Tether, 2002; Geisler, 1995; Etzkowitz et al, 2000).

P2: the structural embeddedness of an industry cluster has a positive impact on individual firm innovation performance.

CONCLUSION

The purpose of this study to draw a conceptual preposition as to how cluster strategy can impact the innovation performance of small and medium enterprise. Despite of the fact that small and medium enterprises forms a significant part of nation industry resulting in it being a huge source of revenue for national development, it has being faced with a series of

challenges. These challenges thus has affected the continuous growth and development of this sector. In this study the definition used to categorized small and medium enterprise is based on the industrial definition provides by the National Association of Small Scale Industries in Ghana (NBSS). Furthermore, industry cluster overs the years have contributed significantly to the developing of many economies that has embraced this approach. The success as argued earlier on depends on a series of factors including the geographical proximity of both resources and labour, also the efficient flow of information and knowledge as a base for enriching the innovation performance of firms situated in it. Despite of this fact most countries in sub-Saharan Africa have not embrace this approach of integrating firms in order to achieve aggregate performance in relation to quality and value. In view of this, we argue that to boost the innovation performance of small and medium enterprises that turns to be resource and capital strapped to conduct high quality research and development national and policy makers should provide incentive to encourage small and medium firms to form industrial clusters. This would enables individual firms tap into the huge social capital that would arise from this form of cooperation. In addition small and medium enterprises can explore and exploit these available social capital to enrich its internal innovation process. And this would result in the commercialization of new improved product of significant value and others.

In addition the study further outlined some preposition that can be tested empirically in future research. Despite this study contributes to the how innovation performance of small and medium enterprises can be improved there still exist a number of limitation. Due to this limitations the researchers suggest that future research is needed to examine the empirically significant of the preposition set and how they affect individual firm innovation performance. The sample for such a study should also be large enough so as to generalize the obtained result.

REFERENCES

ARYTEY, ERNEST, GEORGE OWUSU, & PETER QUARTEY(2009) Industrial Clusters and indigenous private sctor in Africa: Ghana Case study. Background technical paper prepared for a study.

ATUAHENE-GIMA, KWAKU (2005) “Resolving the Capability-Rigidity Paradox in New Product Innovation, “Journal of Marketing, 69 (October), 61-83.

BOSCHMA, R. A.(2005): Proximity and Innovation: A Critical Assesment. Regional Studies, 1, pp. 61-74.

BURT RS (1992) structural holes: the social structure of competition. Harvard University Press, Cambridge

DAMANPOUR, F. (1991). Organizational innovation: A meta-analysis of effects of determinants and moderators. Academy of Management Journal, 34, 555–590.

FAFCHAMPS, MARCEL(2000) Enthnicity and credit in African Manunfacturing. Jornal of Development economies, vol. 61, no.1, pp.205-236.

GEREFFI, G., J. HUMPHREY AND T. STURGEON(2005) "The Governance of Global Value Chains". Review of International Political Economy 12, no. 1:78-104

GRANOVETTER, M. (1994) Business groups In N. J. Smeler, R., Swedberg (Eds). The Handbook of economic sociology: 453-475. Princeton, NJ: Princeton University Press.

GRANOVETTER, M. (1994) Business groups In N. J. Smeler, R., Swedberg (Eds). The Handbook of economic sociology: 453-475. Princeton, NJ: Princeton University Press.

GRANT K ET AL (2002) A Process of Innovation in Marketing by SME’s ANZMAC 2002 Conference Proceedings http://anzmac.org/conference/2002/papers/pdfs/p315_grant.pd

GRILICHES Z. (1979) Issues in Assessing the Contribution of R&D to Productivity Growth, Bell Journal of Economics 10, 92-116.
HALL, B. H., AND J., MAIRESSE (1995) "Exploring the relationship between R&D and productivity in French manufacturing firms", Journal of Econometrics, Vol. 65(1), pp. 263-293
HE ZHENG, LEZRAYMAN-BACCHUS (2010) Cluster network and innovation under transitional economies. An empirical study of the Shaxi garment cluster. Chinese Management Studies, vol. 4, no.4, pp.360-384.
KAYANULA D. &QUARTEY P. (2000) The Policy Environment For Promoting Small & Medium-Sized Enterprises In Ghana & Malawi Finance And Development Working Paper Series. Institute for Development Policy and Management, University of Manchester: http://www.man.ac.uk/idpm/
KEIZER, J., DIJSTRA, L., &HALMAN, J. I. M. (2002) Explaining innovative efforts of SMEs. An exploratory survey among SMEs in the mechanical and electrical engineering sector in the Netherlands. Technovation, 22: 1–13.
KRUGMAN, P. (2000) The Role of Geography in Development. International Regional Science Review, 2, pp. 142-161.
LICHTENBERG, F. R., AND D. SIEGEL (1991) "The Impact of R&D Investment on Productivity: New Evidence using Linked R&D-LRD Data", Economic Inquiry, Vol. 29(2), pp. 203-228.
OECD (2010) "SMEs and Entrepreneurship: Lessons from the Global Crisis and the Way Forward to Job Creation and Growth" Innovative SMEs and Entrepreneurship for Job Creation and Growth BOLOGNA
OECD(2001) Innovative Clusters. Drivers of National Innovation Systems. OECD Proceedings, Paris.
OYELARAN-OYEYINKA, BANJI& DOROTHY MCCORMICK, eds. (2007) Industrial clusters and Innovation system in Africa. Tokyo: United Nations University Press.
PORTER, M.E.(1990) The Competitive Advantage Nations, Macmillan, London.
PORTER, M.E.(1990) The Competitive Advantage Nations, Macmillan, London.
POWELL, W. W.(1990) Neither market nor hierarchy: Network forms of organization. In B. Straw &L. L. Cummings (Eds.), Research in organization behaviour: 295-336. Greenwich,CT: JAI Press.
SCHUMPETER, J. A. (1934). The Theory of Economic Development. Harvard University Press, Cambridge
SONOBE, TETSUHI& KEIJIRO OTSUKA(2006) Cluster-based industrial development: An East Asian Model. New York: Palgrave Macmillan.
TELLIS GERARD (2013) Unrelenting Innovation: How to Create a Culture of Market Dominance, Jossey-Bass, WarrenBennis Leadership Series.
TELLIS, GERARD J. AND PETER GOLDER (2001) Will and Vision: How Latecomers Grow to Dominate Markets. New York McGraw-Hill.

POSSIBLE APPLICATIONS OF GENETIC ALGORITHMS IN THE TIME SERIES ANALYSIS, USING STOCK MARKET DATA

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SUMMARY

In the decision making process the forecasting and time series analysis are important, but unfortunately the reliability of the prediction is often questionable. In today's rapidly changing business environment, it is crucial that decisions are based on correct information which means a better estimate of the expected economic developments. In this paper I examine the possible applications of using genetic algorithms in time series analysis to improve the reliability of the forecast. I try to submit the most relevant findings in the field of genetic algorithms and forecasting. My goal is to give a thorough description about the possible applications of genetic algorithms (GA) and I like to prove that this method can be useful in the time series analysis. The literature review is focused only to the prediction of stock market data. First I summarize shortly the most important methods of time series analysis, then I introduce the genetic algorithm and its main steps. The essential of the paper is the literature review, where I try to describe the most important applications of GA in finance. There are lots of interesting results in the forecasting of stock market data, which makes the GA more important. Of course the GA model is not perfect, it has some shortcomings and limitations of application. After drawing the conclusionsI hope this study will help the reader to understand better the genetic algorithm and its significance in the forecast.

THE MOST IMPORTANT METHODS IN FORECASTING

First of all, we need a definition for time series. “A time series is defined as a set of quantitative observations arranged in chronological order. We generally assume that time is a discrete variable.” (Kirchgässner, G. et al., 2013:1) The times series have always been important in econometrics and forecasting, but in the early years the applied methods were not as prudent as should be. It is more difficult to analyze than the cross sectional data, because economic observations can be assumed to independent in time, mostly they’re related to their (recent) histories. (Woolridge, F. 2002)

In the last few decades there has been a significant development in the time series forecasting.Because there are several different methods, it’s really important to choose the right method for the analysis, in theoretical standpoint and in practical terms too. “If the forecasting user can discriminate in his choice of methods depending upon the type of data (yearly, quarterly, monthly), the type of series (macro, micro, etc.) and the time horizon of forecasting, then he or she could do considerably better than using a single method across all situations” (Makridakis, S. et al., 1982:142) In this paper the applications of genetic algorithms are in the focus, that’s why I don’t evaluate the classical methods, just introduce

them. The commonly used analyzing-forecasting methods are the follow (Kirchgässner, G. et al., 2013):

- Box-Jenkins approach,
- Linear and nonlinear regression,
- Other stochastic and decomposition methods,
- Forecasts with minimal mean squared errors,
- Forecasts of ARMA (autoregressive moving average) and ARIMA processes,
- Vector autoregressive processes (VAR),
- Autoregressive conditional heteroskedasticity (ARCH) and generalized ARCH (GARCH),
- Genetic algorithms,
- Neural networks,
- Etc.

Every method has its own shortcomings and benefits too, but in this paper, for my comparison only the genetic algorithms will be detailed in the later chapters.

THE METHOD OF GENETIC ALGORITHMS

The researchers have always been interested in the laws of nature. They have tried to understand them, and have made some attempt to reinterpret the rules to use them in other fields. “GAs were first described by John Holland in the 1960s and further developed by Holland and his students and colleagues at the University of Michigan in the 1960s and 1970s. Holland's goal was to understand the phenomenon of “adaptation” as it occurs in nature and to develop ways in which the mechanisms of natural adaptation might be imported into computer systems. Holland's 1975 book Adaptation in Natural and Artificial Systems (Holland, 1975/1992) presented the GA as an abstraction of biological evolution and gave a theoretical framework for adaptation under the GA.” (Mitchell, 1995:1)Lots of time has passed since Holland has developed the base of genetic algorithms, the method has been refined since then, it has become more accurate, as well as newer types were born.We can use GA for several different goals, for instance optimization, minimum-seeking, variable selection etc., and it can be differentiated the binary GA from the continuous GA. (Haupt, R., Haupt, S., 2004)

The terms of GA’s is can be well-known from biology, such as adaptation, mutation, population, selection etc. The main steps of the model are the follow according to Acosta-González andFernández-Rodríguez (2013):

1. Determine the initial population, which represents a subset of possible solutions. We can called them chromosomes, and these are usually vectors, they have the same length, and contains binary coding. For example, “in K-dimensionaloptimization problem, a chromosome iswritten as an array with 1xK elementsso that chromosome = $[p_1, p_2, . . ,p_K]$ where p j , j = 1, . . . , K, are abinary variable taking values of zero when ratio j is not selected and of onewhen it is selected.” (Acosta-González &Fernández-Rodríguez, 2013:138)

2. Ranking. We should determine a fitness function and our goal (it can be some optimization). After that it is need to calculate the fitness function of each chromosomein the population. (Mitchell, M. 1999) Then the algorithm evaluates the chromosomes, and made a ranking.
3. Natural selection. We create a mating pool, which contains a subpopulation of chromosomes with better fitness function.
4. Pairing. Couples of chromosomes are selected with variety of methods (e.g. random pairing process etc.)
5. Mating. In this process the algorithm creates offspring solutions from the 'parents', from the mating pool. This is also called recombination or crossover, in which we separate the vectors to sub vectors, using a breaking point and then two sub vectors are exchanged between the two chromosomes. In the end we get new chromosomes, which are contains elements from the parents. For example, let's get "Mother=(0,1,0,|1,0), Father =(1,0,1,|0,1). If the break point isselected after the third position in every chromosome, two new chromosomesare created through the parents: Offspring 1 = (0, 1, 0, |0, 1) and Offspring2 = (1, 0, 1, |1, 0)." (Acosta-González &Fernández-Rodríguez, 2013:139)
6. Mutation. We can use a rate of mutation, but there is possible to save the best solutions with skip them from the mutation process. The mutation rate is usually a very small probability, to avoid bias. This prevents the algorithm from converging too quickly on a local minimum or maximum.
7. Convergence. From the step 2, we repeat the processes until the algorithm finds the optimal solution or maximum number of predefined generations are reached.

These steps only one way to use the GA for analysis, it can be some difference between the models, but the main elements are common. The method is not perfect, it has its own shortcomings, but the paper goal is not to analyses the method, rather to examine the possible applications in the empirical research. To do this, it is important to know the framework of the model.

POSSIBLE APPLICATIONS OF THE GA, USING STOCK MARKET DATA

Since 1975, a lot of researchers have tried to apply the genetic algorithms, for several different problems. In this section I summarize a few important studies and results, which are somehow connected to the financial (and within that stock market data) forecasting.

Allen and Karjalainen (1993) are used the genetic algorithms to find technical trading rules for S&P's Composite Stock Index in the period of 1963-89. They tried to prove that technical analysis is useful, and with the GA it was possible to reduce the variability of returns. They compared the results to benchmark models of a random walk, an AR model and a GARCH-AR model. The authors wanted to find decision rules which divided days into two disjoint categories, in and out of the market and they used past data only. They used a relatively simple GA, the parameters and the selection period wasn't optimal.After set up the GA, they found 82 different trading rules, Figure 1. shows an example for one. Allen and Karjalainen (1993) found that these trading rules appeared to better out-of-sample than a simple (buy-and-

out) one. Still, the final conclusions were that only large institutional investors could find it profitable to use GA techniques to improve the trading rules, small investors surely not.

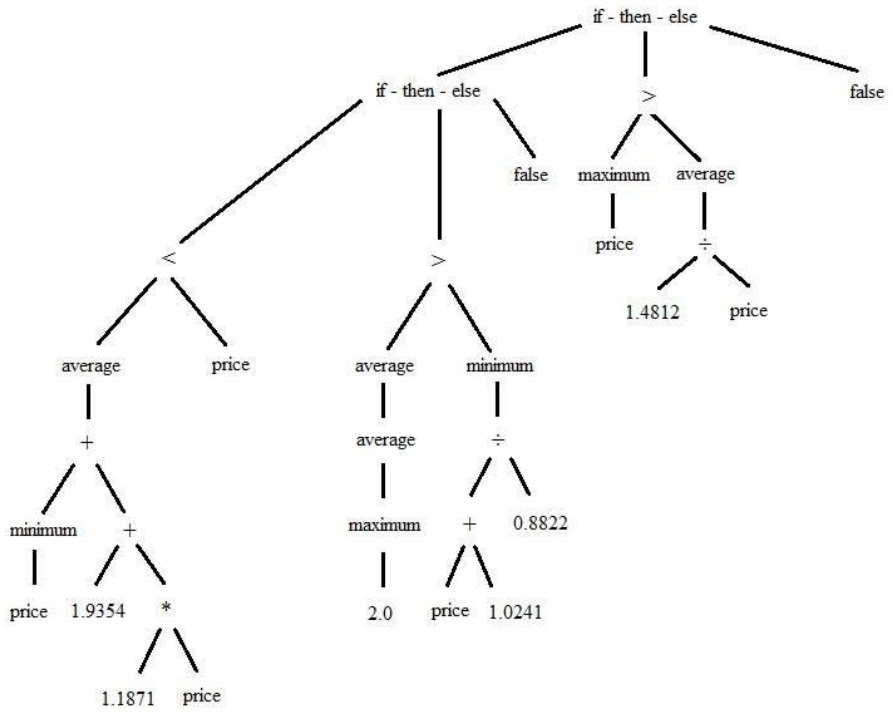

Figure 1. An example for trading rules, found by the GA
Source: own work based on Allen &Karjalainen (1993:19)

Leigh, Purvis and Ragusa (2002) have chosen a different approach to apply genetic algorithms. Their paper illustrated the potential of new application and combination of methods. They also used stock market data and technical analysis for stock market prediction. Their result proved "the effectiveness of the technical analysis approach through use of the ''bull flag'' price and volume pattern heuristic." (Leigh, Purvis and Ragusa, 2002:1) In the study the authors described four different but related experiments, which focused on stock market price prediction: pattern recognition technique of template matching, neutral network model to forecast the NYSE Composite Index, GA to improve the forecast's quality, and cross-validation experimental design. This approach is significantly different from the previous one, because they used the different models together, enhancing each other's effects. Furthermore, in the previous study the GA had an important, main role, while in this one it was 'only' one of the used methods, and the algorithms role was 'simply' to refine the model.
Ling, S.H. et al. (2003) chose another application form of the genetic algorithm. They used a neural network with a novel neuron model, and they tuned the model's parameters with genetic algorithm, using arithmetic crossover and non-uniform mutation. This is a slightly similar like Leigh's work, because the GA model is used to refine the main analysis, but here they used it before the application of the main model, to select the necessary parameters. "A novel neuron model with two activation functions has been introduced. By employing this neuron model in the hidden layer, the performance of the neural network is found to be better than that of the traditional feed forward neural network. Examples of multi-input XOR

problem, sunspot forecasting, short-term daily home electric load forecasting and pattern recognition have been given. The performance of the proposed neural network in these examples is good." (Ling, S.H. et al. 2003:12) According to the authors' conclusion, they evaluated the results compared to other neural network's performance, and not for the 'classical' methods. It's also a good example of how the machine learning methods taken over the role of the classical forecasting methods.

Another example of the use of GA for setting up the parameters is Lin, L. et al (2004). Because of the range of parameters can vary in a large domain, it is difficult to find the best parameter combination for the analysis. In their paper they applied the GA to overcome this problem in two steps. First, they set a sub-domain of the parameters with GA. After that they found a near optima value in the sub domain with GA. They used data from the Australia Stock Exchange, in the 1992-2002 periods. They proved that GA lost very little precision, but save a lot of running time.

In the past few years genetic algorithms and neural networks have become more popular. LakshmanNaik, R. et al. (2012) used the method of GA too. They classified the prone direction of the price for BSE index (India cements stock price index) futures with several technical indicators using artificial intelligence techniques. They made some comparison, and found that genetic algorithms provide more profit than other comparable models and buy-and-sell strategy. Their model is similar than the models which were used in the other papers, Figure 2. is illustrate the basic steps.

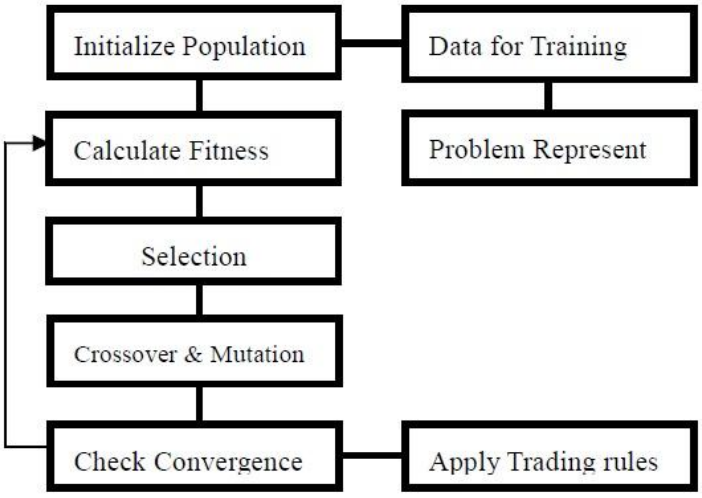

Figure 2. Basic steps of proposed GA model
Source: LakshmanNaik, R. et al., 2012:165

The presentation of application options is far from complete; I tried to describe the main possibilitiesin the case of stock market prediction. In the first few years the GA were used for the forecast, but in that time it was expensive and complicated. As the technology has developed, the GA became more popular (and understandable). In the early years the GA was used with the traditional analyzing methods, now it's changed. More and more researchers use the GA to set up the parameters for some other (artificial intelligence) forecasting method. I

think this is a possible way of using the GA, it's perfect for optimization, but it can't solve every task.

OTHER POTENTIAL USE OF THE GA

In my opinion, the development of genetic algorithms is far from over. There are always new combinations and methods, which can make the GA more popular.
One possible new direction is the combination with the Time-delay Added EvolutionaryForecasting (TAEF) method. "The method proposed is inspired in F. Takens theorem and consists of an intelligent hybrid model composed of an artificial neural network (ANN) combined with a modified genetic algorithm (GA). Initially, the TAEF method finds the most fitted predictor model for representing the series and then performs a behavioral statistical test in order to adjust time phase distortions." (Ferreira, T.A.E. et al. 2005:1) According to the authors, the modelwas able to classify that a time series tends or not to a random walk. But there are some limitations of the method when dealing with trends, seasonality, impulses, steps, and other non-linearities.
In my opinion in the future the hybrid models will be more popular. By crossing the various models the biases can be reduces and the synergy-effect is emergence. Cheng, C.H. et al. (2010) used a hybrid model too. They proposed a hybrid forecasting model, used multi-technical indicators to predict stock price trends. This hybrid model included four procedures to provide efficient rules for forecasting. The four models are based on Cheng, C.H. et al. (2010):

- Selection of technical indicators, based on correlation matrix,
- cumulative probability distribution approach (CDPA) and minimize the entropy principle approach (MEPA) to get linguistic values,
- rough sets theory (RST) to extract linguistic rules from the linguistic technical indicator dataset,
- genetic algorithms to refine the extracted rules.

"The experimental results show that the proposed model is superior to the two listed forecasting models (RST and GAs) in terms of accuracy, and the stock return evaluations have revealed that the profits produced by the proposed model are higher than the three listed models (Buy-and-Hold, RST and GAs)." (Cheng, C.H. et al. 2010:1)
I think it is worth to do experiments with genetic algorithms in the future, because of the development in technology provides increased opportunities.

CONCLUSIONS

In this study I want to present the basic genetic algorithms and the possible applications of the model in the stock market prediction. I selected from the relevant literature, but I can't introduce every results. The reader can see after reading this paper, that the GA is a popular method in time series analysis, mostly in the field of parameter selection. However, there are

other possible applications. In my PhD study I want to combine the GA method with other, mostly classical forecasting methods (such as ARiMA, GARCH, VAR), using data from the Hungarian stock exchange. This paper is the first step, aiming a literature review. I tried to concentrate not just the classical methods (which I will use in the future), but other options to provide a breadth of view. I hope the study can help understand the importance of genetic algorithms in forecasting.

REFERENCES

ACOSTA-GONZÁLEZ, E. &FERNÁNDEZ-RODRÍGUEZ, F. (2013). Forecasting Financial Failure of Firmsvia Genetic Algorithms, Springer Science+Business Media, New York

ALLEN, F. &KARJALAINEN, R. (1993). Using Genetic Algorithms to Find Technical Trading Rules, Wharton School, University of Pennsylvania

CHENG, C.H. ET AL. (2010). A hybrid model based on rough sets theory and genetic algorithmsfor stock price forecasting, Elsevier Inc

FERREIRA, T.A.E. ET AL. (2005). A New Evolutionary Method for Time Series Forecasting, Conference Paper, GECCO'05, June 25–29, 2005, Washington, DC, USA

HAUPT R. L, HAUPT S.E. (2004). Practical Genetic Algorithms, John Wiley & Sons, Inc., Hoboken, New Jersey.

LAKSHMANNAIK, R. ET AL. (2012). Prediction of Stock Market Index Using Genetic Algorithm, Computer Engineering and Intelligent Systems, Vol 3, No.7, 2012

LEIGH, W. &PURVIS, R. &RAGUSA, J.M. (2002). Forecasting the NYSE composite index with technical analysis,pattern recognizer, neural network, and genetic algorithm:a case study in romantic decision support, Decision Support Systems 32. 361– 377, Elsevier Science B.V.

LIN, L. ET AL. (2004). The Applications of Genetic Algorithms inStock Market Data Mining Optimisation, Proceedingsof Fifth International Conference on Data Mining, Text Mining and theirBusiness Applications, September 15-17, 2004, Malaga

LING, S.H. et al. (2003). A Novel Genetic-Algorithm-Based Neural Network for Short-Term Load Forecasting, Industrial Electronics, IEEE Transactions, Volume:50 , Issue: 4

KIRCHGÄSSNER, G. & WOLTERS, J. & HASSLER, U. (2013). Introduction toModern TimeSeries Analysis, Springer-Verlag Berlin Heidelberg

MAKRIDAKIS, S. et al. (1982). The Accuracy of Extrapolation (TimeSeries) Methods: Results of aForecasting Competition, Journal of Forecasting, Vol. 1, 111-153

MITCHELL, M. (1995). Genetic Algorithms: An Overview, Complexity, 1 (1) 31-39, Santa Fe Institute

MITCHELL, M (1999). An Introduction to Genetic Algorithms, A Bradford Book The MIT Press, Cambridge, Massachusetts

WOOLRIDGE, J. M. (2002). Introductory Econometrics, South-Western

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ECONOMIC CRISIS AND MORE SEVERE REGULATIONS: CHANGES IN THE LIQUIDITY MANAGEMENT OF THE HUNGARIAN BANKING SECTOR

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SUMMARY

The economic crisis of 2008 highlighted several weaknesses in the operation of the banks. There were austerities of the regulatory environment in the pre-crisis period, but the previous reforms were not enough to avoid the recession.
The recession also pointed out the necessity of more rigid regulation of liquidity management at banks, because several institutions got into bankruptcy situation, thanks to the inadequate liquidity management. The focusing on liquidity is justified by the fact that the current recommendations of Basel Committee on Banking Supervision regulate not only capital, but also the liquidity.
I intended to analyse the liquidity state of the Hungarian banking sector from 2007 until 2013, based on the data published by the supervisory authority. I paid special attention to the analysis of the changes of liquidity reserves, and the evaluation of the liquidity rates, which have been created from the data of annual reports. Considering the results having been received from the process of the examination, I think that the tendencies of the domestic banking sector are positive in the given period; at the end of the studied term the liquidity state can be judged appropriate, related to that of the beginning of the examined term.

INTRODUCTION

Concerning banks of today, we can say that they play an important part in modern economy, because by their (financial) transmitting activity – when they transmit the temporarily surplus amount of money coming from savers to the borrowers – the banks are considered as some "engines" of the economy, because without them investments having a key role in economic development could hardly be realised.[3]In addition to it, they have a decisive part in managing payments.
Considering the previously mentioned causes, it is very important for the economy that the banking system should be stable, because if there areserious problemsin the operation of banks or the whole system, their harmful side effects will surely be experienced by all participants of economy.
Knowing all these facts, the importance and the permanent relevancy of the bankregulation cannot be disputed, especially in the confused, "after crisis" period of today, when newer and newer elements of bank regulation are introduced.

[3]Especially in countries similar to Hungary, which have got continental type of financial system.

This study does not aim to describe the new regulations in details, but – besides reviewing the theoretical basis of the operation and regulation of banks briefly – it intends to examine the processes that occurred in the liquidity situation of Hungarian banks, as a consequence of the outbreak of the economic crisis and the introduction of "regulation package" on a European level.

The analysis starts from the hypothesis that the management of the Hungarian banks has taken the proper steps to achieve the realisation of the expected, favourable liquidity state, and the liquidity state of Hungarian banks can be considered appropriate. Furthermore, the study also supposes that the processes madein the present can mean a guarantee, that the future liquidity state of the banks will also be satisfactory. To prove these statements, we apply the formation and analysis of rates and indicators thatmostly represent the liquidity state of banks. The main source of the used data is adatabase, which is constructed from the data servedby the Hungarian banks to the supervisory authority, and which is published by the Hungarian National Bank. I made analysis referring to the period from the year preceding the outbreak of the crisis, until the last year on which I had audited data. So the analysed period covers the years from 2007 to 2013, and the study does not concern the whole sector of the credit institutions, but it only deals with the credit institutions operating in the form of banks.

THE SURVEY OF THE THEORETICAL BACKGROUND OF THE OPERATION AND REGULATION OF BANKS

The operation of banks differs from that of the enterprises in other sectors of the economy significantly, but there are some areas, where the operation of banks is similar to the operation of other profit-oriented companies. The latter case can be represented by the example that,in the long run,the aim of bank operation is also an increase in its wealth, i.e. maximisation of the market value of equity. (This purpose is in harmony with the intention of shareholders to maximise their wealth.) The increase of wealth can be realised on condition that the activity of banks is profitable (from year to year they can achieve profit). Thus, if the revenues of banks surpass the expenditures, the result will be positive, and this profit will increase the own capital. From this fact, the importance of profitability became obvious, but we have to mention, that it cannot be the only principle of the operation of banks. In case of banks the concept of liquidity and the concept of solvency are also very important, and their enforcement is essential, too, which may be the obstacle to the intention to increase profits (unlimitedly). The three basic, generally accepted principles of the operation of banks are profitability, liquidity and solvency, which are often mentioned as the "magic triangle" of the activity of banks. They are in interrelationship with each other. Amongthe enforcements of each principle there is partly one-way, partly reverse directed relationship, so their realisation must lead to some conflicts with each other.(Illés, 2004, p. 30)

But what do the two definitions in the "magic triangle" of banks mean, which have been mentioned earlier, but they have not been discussed in details? Let's start with solvency. The safe operation (i.e. solvency or paying capacity in the long run) means that banks havegot enough capital to cover the unexpected losses, which technically means that the market value of assets exceeds the value of liabilities, i.e. the value of the equity of the banks is positive. So

the solvent banks do not endanger the money of their depositors and creditors, because if the previously mentioned unexpected losses occur, they are covered by their own capital (more precisely by the guaranteed capital) and not by external sources.

The concept of liquidity is explained in different ways by experts. If the liquidity is regarded as a (characteristic) feature – similarly to solvency and profitability – and if it is examined in this context, we can say that there are two approaches. In the first case, if we speak about the liquidity of an asset, the concept means quick saleability, or rapid convertibility for cash. But if the liquidity of an economic participant is examined, we wonder if the given participantis able to pay in the short run, i.e. if he is capable to fulfil his immediate liabilities. (If he has enough liquid assets to settle his debts.) In case of studying the liquidity of banks, by that we mean the latter case.

Between the profitability and the solvency there is a reverse directed relationship, which means that when we want to increase one of them, the other one will decrease. The connection between the profitability and the liquidity is also oppositional. (The relationship between the solvency and liquidity can be called neutral, thus between these two factors there are no conflicts of interest.) As a consequence of these previously mentioned effects, it is difficult to find the balance amongthese three factors, and to achieve that banks should work properly – taking the different expectations into consideration simultaneously – by this balance. If any of these factors are neglected, critical situation might come into force.

The causes of the latest economic crisis can be derived from the events of 2007. The most critical feature of the deepening of the crisis was the appearance of the lack of liquidity. In August, 2007 there were serious liquidity problems in the interbank markets, and in September, 2008 this market totally collapsed. Banks previously considered as strong went bankrupt one after another, panic and total uncertainty became dominant. The banks did not dare to give loans to each other because they did not know who would be the next “victim”. The interbank market that worked on the basis of trust was paralysed, serious liquidity crisis evolved, which caused the bankruptcy of more and more banks, deepening the trust crisis further. (Radnai &Vonnák, 2009, p. 248)

The first chairman of Basel Committee of Banking Supervision emphasised during the very first meeting of the committee, that the objective of the organisation was “to help ensure bank solvency and liquidity” (Ingves, 2012, p. 5) Before the economic crisis, stress had been rather on solvency, but after the crisis beginning in 2008 it became obvious, that banks had not handled liquidity risks in the appropriate way, and besides that they had not estimated the possibility of the emergence of systemic liquidity risk in the proper way. The events of that time made it clear, that the regulation that had concentrated only on capital adequacy was not satisfactory, because several banks became bankrupt or got into bankruptcy situation, in spite of the fact, that they had been solvent. (Csikós & Szomorjai, 2014, p. 2)

As both the domestic and the European regulations are based on Basel recommendations, the quantitative regulation of liquidity had not been characteristic of them. It does not mean that legislation and supervisory authorities had not dealt with the liquidity statement of banks at all, but “the regulatory requirements had been minimal, and had not been in harmony among the member states.”(Seregdi, 2014, p. 109)However, the new rulesof the European Union, having come into force since 2014, which are based on Basel III. recommendations, also contain quantitative regulations in the field of liquidity regulations. The new regulation-

package consists of two parts: On the one hand it is made up of the so called directive (Capital Requirements Directive, CRD IV.[4]), which needs – similar to the previous practice – implementation into the legal system of member states. On the other hand, it is made up of the so called regulation (Capital Requirements Regulation, CRR[5]), which is valid directly in each member state. The liquidity regulations can be found in the latter document, so the two defined, compulsorily to-be-fulfilled liquidity indicators are determined in the same way in each member state, thus no differences are allowed among the ratios of the EU countries.
The first indicator is the Liquidity Coverage Ratio (LCR), the purpose of which is "to promote short-term resilience of a bank's liquidity risk profile by ensuring that it has sufficient high quality liquid resources to survive an acute stress scenario lasting for one month." (Basel Committee on Banking Supervision, 2010a, p. 8) To achieve this, it is needed to fulfil the minimum value of ratio, having been defined in the regulations. The indicator can be calculated with the help of the next formula:

$$LCR = \frac{Liquid\ assets}{Net\ liquidity\ outflows\ under\ stressed\ conditions\ (over\ a\ period\ of\ 30\ days)}$$

The second indicator, the Net Stable Funding Ratio (NSFR), is a ratio referring to a longer, one-year period. The aim of the creators is "to promote resilience over a longer time horizon by creating additional incentives for a bank to fund its activities with more stable sources of funding on an ongoing structural basis"(Basel Committee on Banking Supervision, 2010a, pp. 8-9), by the fulfilment of the minimum requirement of the indicator. The formula of the NSFR is the following:

$$NSFR = \frac{Available\ amount\ of\ stable\ funding}{Required\ amount\ of\ stable\ funding}$$

Furthermore the study is not going to deal with the NSFR, because its minimum standard will be introduced only in 2018, and the regulation belonging to it has not been finished yet. During the examination, the LCR will be taken into consideration later on, because the requirements of it have been used since the beginning of 2015. (The minimum standard concerning the indicator will be 100%, but this value will have to be applied only from 2018. The minimum standard will be gradually raised year by year from 60% of the year 2015 to achieve 100%.)

[4] The original title of document: Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC

[5] The original title of document: Regulation (EU) No 575/2013 of the European Parliament and of the Council 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012

THE ANALYSIS OF THE LIQUIDITY SITUATION INTHE HUNGARIAN BANKING SECTOR

Unfortunately the structure of database of the Hungarian National Bank does not make it possible to calculate the LCR referring to the Hungarian banking sector with the help of downloaded data, but besides that there are several indicators, with the help of which we can draw conclusions about the liquidity situation of domestic banking sector, and anticipate the future adequacy to liquidity requirements.

Defining the group of calculated liquidity indicators

During their liquidity management the banks can follow three strategies (Illés, 2004, pp. 39-40)

- Assets Conversion Strategies/Storing Liquidity: The fulfilment of liquidity needs takes place by (ex)changing accumulated liquid assets into cash.
- Borrowed Liquidity: Banks get sources/take loans from money markets to put an end to the lack of liquidity.
- Balanced Liquidity/Assets and Liability Management: This is the mixture of the previous two strategies.

If we look at the formula of LCR given in a former chapter, we can see the concept of net liquidity outflow in the denominator. The regulation calculates its sum with the help of the next formula:

$$Net\ liquidity\ outflow = \\ = Liquidity\ outflows - min\ [Liquidity\ inflows; Liquidity\ outflows * 75\%]$$

The regulation maximises the sum of inflows that can be taken into consideration as 75% of the outflows. By this, the intention of regulator becomes obvious: The maintenance of liquidity of banks has to be achieved not by increasing the amount of inflows but by keeping in reserve of liquid assets, i.e. by forming a buffer from liquid assets. (Liquidity buffer means the “liquid asset” category in the nominator of LCR, which contains the assets considered to be the most liquid by the regulation – e.g. coins and banknotes, assets representing claims on central bank, government securities –with the weight of 100%, and it also contains some less liquid assets – e.g. bonds, shares – but they are not taken into consideration in their total value.)Thus the adequacy to this indicator supports the Assets Conversion Strategies. So in this study we are going to form mainlysuch indicators – from the data of annual reports of banks – which examine the forming of reserves and the changing of amount of reserves. Thus these indicators let us draw conclusions referring to the questions on LCR.
In the case of the analysed indicators, generally we cannot speak about defined optimal values or minimum levels to be fulfilled, as in the case of LCR. During the examinationof these ratios, comparing them to their previous values, we can mainly be curious about the direction of changes, the characteristic features of the existing or evolving trends.

Assets, indicators in connection with assets

When we analyse the aggregated balance sheet of banking sector, at first we will examine the assets more comprehensively, because the supply of liquid assets in the banking sector, and the quantity of the liquidity reserves will come out from these data. In Figure 1 we can see the proportion of each asset item comparing to the total assets, approximately in such a structure, divided into categories as to be required from the banks by supervisory authority, in the form of declarations obligations. As we can see in the picture, during the analysed period, the largest proportion among the assets is represented by loans, which is not a surprise, because the most essential activity of banks is giving loans. In the quantity of loans, after the outbreak of the crisis, a decreasing trend can be noticed, and it can also be declared that the expansion of debt securities was realised at the "expense" of loans within the balance sheet of banks. This process can be explained by the fact that within the portfolio of banks, loans cannot be considered the most liquid assets, thus, as a consequence of the crises, to preserve their liquidity, banks preferred more liquid securities, and dismantled the stock of loans (which contained a lot of bad loans). The percentage of loans decreased from 68.12% to 53.69% within the period of 2008-2013. If we consider the absolute change of sum of loans and not the relative change (related to the total assets), we can state that fall was on a larger scale, because during the previously mentioned period, the total assets of the banking sector dropped massively, by 12.51%.

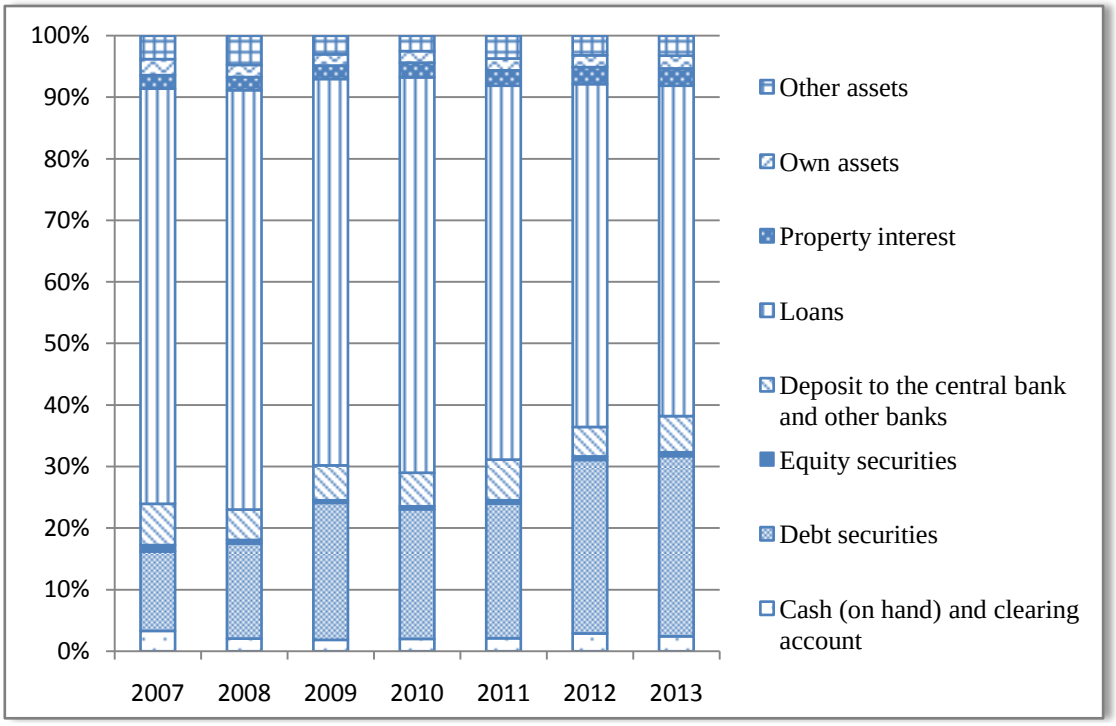

Figure 1. Structure of assets in the Hungarian banking sector

Source: own work on the basis of data from the Hungarian Central Bank

Parallel to the reducing of the loans the banks started to build up their liquidity reserves, which does not exactly mean the rise of the primary liquidity reserve (cash + receivables at the central bank and other banks), but it rather means the boom of the secondary liquidity

reserves (short term securities of the state and the central bank). It can be seen in Figure 2. While the value of primary liquidity reserve on the level of bankingsystem fluctuated around 2000 billion Hungarian forints (HUF) during the examined period, the value of secondary liquidity reserve (with the exception of a slight fall in 2010) showed continuous growth. The value of the latter reserve increased from 2 270 billion HUF to 6 222 billion HUF – by more than 174% – from 2007 to 2013. By the end of the given period, the amount of the two liquidity reserves amounted to32.24% of the total assets.

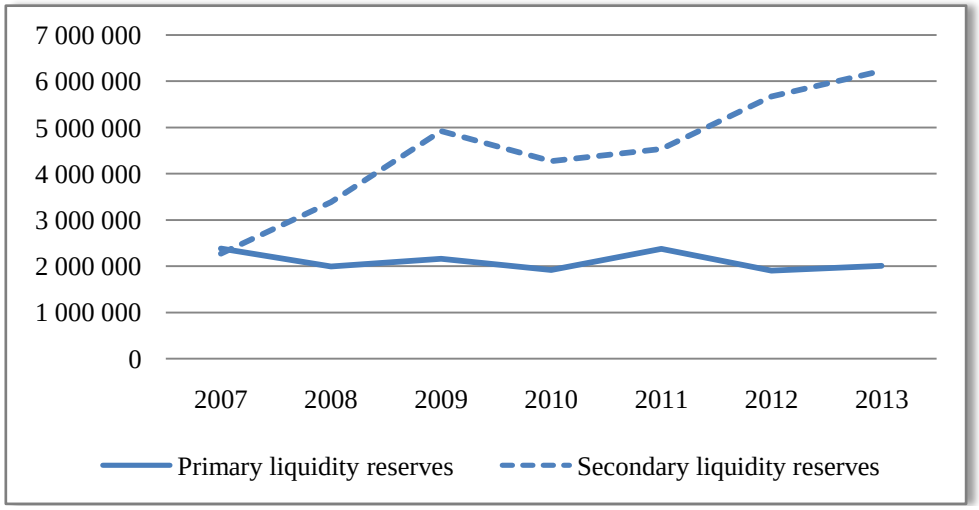

Figure 2. The changing of liquidity reserves in the Hungarian banking sector

Source: own work on the basis of data from the Hungarian Central Bank

With the help of the asset categories – which have been interpreted from the database and have been mentioned earlier – some liquidity indicators have been compiled, which enable us to draw conclusions referring to the liquidity state of banks. The values of these indicators in the examined period can be found in Table 1. The cash position (indicator)shows the proportion of the most liquid assets comparing to the total assets. The value of thisrate – similar to the absolute value of the primary liquidity reserve – fluctuates during the analysed term, and unfortunately, in the following years it does not reach its 2007 value of 3.33%.Although, comparing to the state of 31st December – which is represented by the data of the database from the audited reports of banks –the mid-year state may be different on a large scale, but there are no major signs that the banks have an intention of increasing the reserves of the most liquid assets.Naturally it does not mean a problem, especially knowing the fact that the proportion of government securities increased from 9.31% to 24.37% during the given period, because so the supply of liquid assets in the banking sector cannot be called inadequate, and besides that – from the point of view of profitability – holdinggovernment securities means a much favourable situation than holding cash.

Table 1. Indicators in connection with the assets of banks

Indicators	2007	2008	2009	2010	2011	2012	2013
Cash position	3.33%	2.08%	1.85%	2.04%	2.13%	2.92%	2.44%
Proportion of liquid securities	9.31%	11.60%	16.96%	15.19%	15.75%	21.56%	24.37%
Liquidity ratio	19.08%	18.41%	24.40%	22.01%	23.99%	28.79%	32.24%
Capacity ratio	67.44%	68.12%	62.75%	64.20%	60.74%	55.68%	53.69%

Source: own work on the basis of data from the Hungarian Central Bank

The liquidity ratioshows the proportion of liquid assets within the total assets.As a consequence of the processes concerningthe previously discussed two indicators, the value of this indicatorof liquidity– which is likely to be used the mostfrequently– shows rising trend on a large scale, and it means favourable changes concerning liquidity state of banks. The capacity rate – which indicates the proportion of the loans and lease within the total assets – decreased during the analysed period, and this fact can be considered as a positive process, because the high proportion of these less liquid assets is not preferable (by all means) in this unfavourable liquidity environment, such as the period after the outbreak of the economic crisis. The high amount of loans is disadvantageous mainly in this case, because the crisis also has an impact on clients, many of whom are not able to repay their loans, the proportion of bad – i.e. non performing – loans within the portfolio of banks rises, and the profitability of banks deteriorates. Besides that, the liquidity also goes bad, as the quantity of cash inflows declines.

Rates in connection with liabilities and own capital

We are also beginning the analysis of “liabilities and equities” in aggregate balance sheet of banking sector by structural examination.Figure 3 shows the proportion of each category within total balance sheet. The most liabilities of the banks come from collecting deposit, because the two largest categories on the side of “liabilities and equities” are the “deposits” and the “deposits from monetary financial institutions”. We can say that, during the examined period, the absolute value of both categories fluctuated permanently, but, all in all, the deposits not coming from monetary financial institutions, from the starting value of 10 476 billion HUF of 2007 changed into the value of 12 418 billion HUF, and the beginning value of the deposits from the monetary financial institutions changed from 4025 billion HUF to 3336 billion HUF by the end of the analysed period. The majority of these deposits is short-term. That is why– that their percentage increased a little within the side of “liabilities and equities” – it is not very favourable from the viewpoint of liquidity; it has got the risk, that if the banks are not able to renew these liabilities, they could be withdrawn before the time when the assets financed by them were returned. Moreover, deposits can be withdrawn before their term is over. From this point of view, issued debt securities are called “predictable” liabilities. In the banking sector, the value of this category decreased both relatively and absolutely during the examined period. Owner’s equity can be called stable, because it cannot be withdrawn from banks. It can be considered as a positive process, that the value of the

previously mentioned category showed growth during the studied period, although it is due to the capital injection of foreign parent companies, because from 2010 banks operated loss.

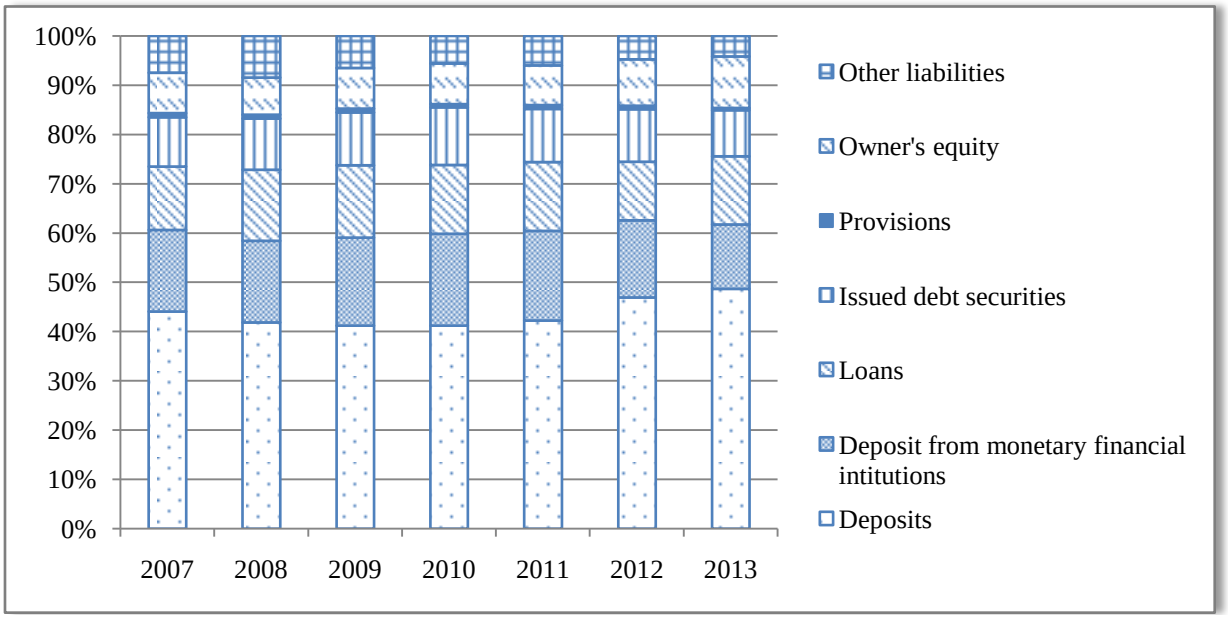

Figure 3. Structure of liabilities and equities in the Hungarian banking sector

Source: own work on the basis of data from the Hungarian Central Bank

In this subchapter, with the help of the data published by the Hungarian National Bank, two frequently used liquidity indicators can be calculated. The first indicator is the deposit composition ratio, which can be computed by the division of the demand deposits by the term deposits. In the indicator values a slight decrease can be noticed until 2009, andstarting from 2009 permanent increase can be recognised. The decrease of the proportion of the term deposit comparing to the demand deposit can be evaluated as a negative process, because in the long run depositors make available their money to their banks on a smaller scale, thus they secure to the banks less and less long-term, stable financial sources. It is worthwhile to mention, that according to the owned data, these processes cannot be judged properly as a whole, because some parts of demand deposits behave just like stable financial sources. Without knowing this proportion of demand deposits –which can be calculated by the banks' inner data – it would be misleading to draw far-reaching conclusions by the values of the deposit composition ratio.

The other indicator – the money market exposure – shows the proportion of the source from money market (which usually means short term interbank sources) within all the external sources. The value of the indicator of 2007 fell from 15.82% to 12.77% till the next year, and after that only a decrease on a smaller scale could be seen until 2013 (besides that the value of the indicator increased in 2011). During the examined period the indicator reached the smallest value at the end of 2013, by 12.52%. The processes can be explained by the events after the outbreak of the crisis, when the liquidity of the interbank market tightened, because the trust crisis had its influence here on a large scale, too. Naturally, from the viewpoint of banks it is very unfavourable, because turning toward the interbank market would offer such opportunities, which could simplify the liquidity management of banks significantly. So,

during the examined period the banks were able to avail themselves of the financial sources from the market less and less intensively,which fact is illustrated by the decrease of the denominator of the indicator.

Table 2. Indicators in connection with the liabilities and own capital of banks

Indicators	2007	2008	2009	2010	2011	2012	2013
Deposit composition ratio	36.59%	27.77%	26.03%	33.73%	34.63%	37.87%	54.15%
Money market exposure	15.82%	12.77%	12.73%	12.62%	13.82%	12.59%	12.52%

Source: own work on the basis of data from the Hungarian Central Bank

Coverage ratios

In case of the coverage-type ratios we compare the categories coming from one side of the balance sheet with categories coming from the other side of that. From the values of these indicators we can get the answer on which scale a category from the "liabilities and equities" side of balance sheet can provide cover for a category – which is similar or comparable to the previous category from a certain viewpoint– from the asset side of balance sheet.

One of the most characteristic coverage ratios – indicates the emergence of liquidity risk in the banking system – is the loan-to-deposit ratio, which compares the amount of loans of clients with the amount of deposits of clients originating from its name. The value of the indicator (also from an international point of view) can be called high, mainly the value of 162.72% in 2008, but by the gradual decrease of it after 2010 we can conclude that there was decline in case of liquidity tension. The abundance of liquidity before the crisis period was accompanied by the boom of loans, and the amount of loans in the Hungarian banking sector reached fairly high level. The amount of deposits was much lower – as the values of the indicator refer to it in the first half of the examined period – so it can be concluded that a relatively large part of loans was covered by financial sources from the market. It can be rather dangerous from the viewpoint of liquidity state of banks, if the liquidity of markets falls significantly, as it happened in case of the latest crisis.Based on the opinion of the experts from the Hungarian National Bank, the proper value of the loan-to-deposit ratio in the future should be 100%, because this time the vulnerability of the banking sector will diminish.(Fábián &Vonnák, 2014, p. 38) However we can also say that, compared to the beginning of the given period, the value of 110% in 2013 is fairly favourable.

The indicator of money market coverage compares the liquid assets to the sources from money market. As the access to the sources from the money market became hard to reach after the outbreak of the crisis, due to it their amount fell by more than 18% till the end of examined period, relating to the estimated value of the beginning of the period. These processes have already been mentioned in details, as there was a reference to the increase (of the amount) of liquid assets in the numerator of the indicator. As a consequence of these factors, the value of indicator increased –from 132.61% to 289.28% considering the analysed period as a whole (although meanwhile there were slighter declines). Taking the fact into consideration that serious vulnerability of liquidity can be indicated by the value of below

100%in case of this ratio (Illés, 2014, p. 50), it can be claimed that this indicator shows the favourable state and the continuous recovery of the liquidity of the banking sector.
The values of "liquid assets to external liabilities" ratio also sign advantageous situation in connection with the changes of the liquidity of banks within the examined period. Although the value of the indicator dropped by 5 percentage points from 2007 to 2008, but from 2008 it shows unbroken increase; the value rose from 15.02% to36.21% by 2013. This fact means that all the external sources – which are loaded by repayment obligation – can be covered on larger and larger scale by the most liquid assets in banking sector (and in this way it would mean slighter and slighter problems for the banks if these liabilities were subtracted from them suddenly).

Table 3. Coverage-type indicators of liquidity concerning banks

Indicators	2007	2008	2009	2010	2011	2012	2013
Loan-to-deposit ratio	152.98%	162.72%	152.43%	155.79%	143.74%	118.76%	110.37%
Liquid assets to external liabilities ratio	20.98%	15.02%	16.76%	24.15%	26.33%	32.03%	36.21%
Money market coverage	132.61%	157.22%	210.68%	191.40%	190.44%	254.48%	289.28%

Source: own work on the basis of data from the Hungarian Central Bank

CONCLUSIONS

To sum up, it can be said that the liquidity situation of the Hungarian banking sector, according to the examined data and indicators, demonstrated improving trends from 2007 to 2013. From the indicators relating to "assets" side of balance sheet it is only the cash position, whose value of 2013 is less favourable comparing to that of 2007. From that point of view it cannot be said to be fortunate, that the value of the category of the most liquid assets declined, but besides that, during this period there also occurred some processes, which were able to counterbalance it.
The dismantling of the amount of loans, parallel to thedevelopment of the secondary liquidity reserves, can be considered positive from the point of view of liquidity. It is more than possible, that the shift from loans to the government securities (in the balance sheet of banks) was realised not only as a result of the own decision of banks, in the process it played an important role that the willingness of clients to take loans also declined on a large scale during the analysed period. The causes of the occurrence of this process are not (so) essential for us, because we consider only the fact, that by this process the liquidity state of banks improved, and the fulfilment of minimum requirements of LCR is likely to be realised much easier. (These government securities can be included in liquidity buffer in the numerator of LCR such as liquid assets, whose value can be taken into consideration in 100%.)
During the examination of "liabilities and equities" side of balance sheet it was stated that the amount of the term deposits decreased, but meanwhile the amount of the demand deposits

increased. It can be noted that, from the point of view of LCR, it can be called an advantageous process, when the deposits have longer and longer terms, and they are more and more stable, because it can lead tofewer and fewer liquidity outflows in the denominator of the indicator, thus improving the value of this indicator. On the other hand, it has already been referred to the fact that, the value of stable sources of banks cannot be estimated totally precisely, because in connection with that, exact data are not available. (E.g. we cannot know which part of demand deposits can be considered stable.) In addition to it, unfortunately we have no information on maturity structure of liabilities, so we are not completely sure, if the occurring processes had unfavourable impact on liquidity.

The LCR – as its name demonstrates – can be classified into the third group of the indicators analysed in this study, because considering its type, it can be said, that the indicators from the third group stay the nearest to it. From this point of view it is optimal, because each of liquidity indicators from the coverage type signs the improvement of the liquidity situation of banks.

Considering the previously mentioned results, the basic assumption of the study– namely that the liquidity of the Hungarian banking sector is appropriate – has been proved. After the outbreak of the crisis the management took the proper steps to achieve the appropriate liquidity situation. It can be stated if we consider the favourable value of the majority of the examined indicators, and the improvementof these indicators comparing them to the previous conditions. I expect the continuation of these processes in the near future, based on the fact that the minimum value of the introduced liquidity ratio is going to increase. Thus the banks cannot be satisfied if they have fulfilled the required level as regards to this ratio, because next year they will have to adapt themselves to a higher minimum requirement. In this way liquidity reserves are likely to rise in the banking sector. If the analysed processes, trends go on in the future, the Hungarian banks are likely to be able to fulfil the minimum requirements, which have been introduced by the CRD IV. and the CRR, and (besides that,) which will come into force in the future.

Naturally, we cannot forget about the fact that the changes in the regulatory environment of today and in the future could cause obstacles referring to the liquidity management of banks. As an example we can mention the change of the instrument of minimum reserve[6], and the appearance of guidelines coming from national supervisory authorities. But it will be the subject matter of another study in the future, concerning another period to analyse.

REFERENCES

BALÁS, T., & MÓRÉ CS. (2007). *Likviditási kockázat a magyar bankrendszerben. MNB-tanulmányok*. Retrieved from https://www.mnb.hu/letoltes/mt-69.pdf

BASEL COMMITTEE ON BANKING SUPERVISION. (2010a). *Basel III: A global regulatory framework for more resilient banks and banking systems.* Basel,Switzerland

[6] In connection with this subject matter a more detailed analysis can be read in the following article: Csikós, Gy. D., & Szomorjai, P. (2014). Hamarosan életbe lépnek az Bázel III-as likviditási előírások (https://www.mnb.hu/letoltes/csikos-szomorjai-baze-iii-as-likviditasi-eloirasok.pdf)

BASEL COMMITTEE ON BANKING SUPERVISION (2010b) *Basel III: International framework for liquidity risk measurement, standards and monitoring.* Basel,Switzerland

BOZSIK, S. (2001). *Banküzemtan.* Miskolc: Miskolci Egyetem

CSIKÓS, GY. D., & SZOMORJAI, P. (2014). *Hamarosan életbe lépnek az Bázel III-as likviditási előírások*. Retrieved from https://www.mnb.hu/letoltes/csikos-szomorjai-baze-iii-as-likviditasi-eloirasok.pdf

EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EU. (2013a). *Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC.* Brussels, Belgium

EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EU. (2013b). *Regulation (EU) No 575/2013 of the European Parliament and of the Council 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012.* Brussels, Belgium

FISCHER, É.,& HOMOLYA, D. (2009). Viharba kerülve esőkabátban – avagy a hazai bankszektor forrásoldali likviditási kockázatai és az azokat mérséklő tényezők 2008 második félévében. *Hitelintézeti Szemle, VIII* (3), 235-247.

FÁBIÁN, G., & VONNÁK, B. (Ed.). (2014). *Átalakulóban a magyar bankrendszer – Vitaindító a magyar bankrendszerre vonatkozó konszenzusos jövőkép kialakításához.*Retrieved fromhttp://www.mnb.hu/letoltes/mt112-kulonszam.pdf

FOGARASI, I. (Ed.). (1997). *Bankmenedzsment: A bankvezetés gyakorlata.* Budapest: Saldo

ILLÉS, I. (2004). *Bankmemezsment.* Budapest: Perfekt

INGVES, S. (2012). *Current focus of the Basel Committee: Raising the bar.* Retrieved from http://www.bis.org/speeches/sp121115.pdf

KIRÁLY, J. (2008). Likviditás válság (Lehman előtt – Lehman után). *Hitelintézeti Szemle, VII*(6), 598-611.

RADNAI, M., & VONNÁK, D.(2009). Likviditási kockázat az Európai Tőkemegfelelési Direktíva tervezett módosításában. *Hitelintézeti Szemle, VIII*(3), 248-256.

SEREGDI, L. (2014). Nyitva maradt kérdések a hitelintézetek és befektetési vállalkozások prudenciális szabályozásában. *Hitelintézeti Szemle,XIII*(2),101-119.

SZEMÁN, J. (2015). A magyar bankrendszer CAMELS típusú elemzése. In Karlovitz, J. T. (Ed.), *Fejlődő jogrendszer és gazdasági környezet a változó társadalomban* (pp. 121-132). Komárno: International Research Institute.

CORPORATE SOCIAL RESPONSIBILITY IN THE FINANCIAL SECTOR

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SUMMARY

In my research I shall examine the current level of the CSR activities and strategies of the Hungarian financial sector based on the analysed data. I expect to prove that banks consider CSR as a factor of strategic importance and their scope of used CSR tools could be broaden. I shall present that Hungarian CSR practices of banking sector differs from other sectors' CSR activities and from the internationally applied strategies.
The concept of corporate social responsibility is not new in the banking sector, but nowadays, it becomes highly topical since the crisis has significantly highlighted the need for integration of moral principles in the banking business. Knowledge of business practice indicates the fact that the acceptance of moral principles in business is not integrated into management decisions of companies.
Management of a banking organization should have appropriate policy in place for establishing positive organizational culture and social responsible mindset of staff members. If commitment for becoming a social responsible banking organization between management and staff, and accountability and creditability can be demonstrated through effective and efficient internal audit, customers and the community will be benefited with risks reduced and quality enhanced. Banks should involve their employees in CSR acticities, because they will be more committed for the organization.

INTRODUCTION

In my research I examine the CSR activities of financial sectors (banks, insurance companies, investment funds and real estate).
It is to assume that the more conscious, more innovative application of CSR strategies may influence the social reputation of the companies positively. So it is worth for the companies to invest in CSR activities, because it is profitable in the long run. For verifying this assumption it is important to analyse the efficiency, impact of CSR on business performance.
Each company differs in how it implements corporate social responsibility, if at all. The differences depend on such factors as the specific company's size, the particular industry involved, the firm's business culture, stakeholder demands, and how historically progressive the company is in engaging CSR. Some companies focus on a single area, which is regarded as the most important for them or where they have the highest impact or vulnerability - human rights, for example, or the environment - while others aim to integrate CSR in all aspects of their operations. For successful implementation, it is crucial that the CSR principles are part of the corporations values and strategic planning, and that both management and employees

are committed to them. Furthermore, it is important that the CSR strategy is aligned with the company's specific corporate objectives and core competencies. (Tsoutsoura, 2004.)
On the basis of studies finding a positive correlation between social responsibilities and corporate productivity, it can be stated that a socially responsible attitude of a company can be considered a long-term and strategic investment which results in competitive advantages in a favourable corporate environment and will finally lead to economic returns. In addition, it will create a "win-win" type situation from which the company and its environment, as well as society, will profit. By a favourable corporate environment we mean that corporate people promote and give a positive evaluation to CSR initiatives. There may be considerable divergences between certain countries and regions in this respect. It is not surprising that companies committed to CSR try to have a positive impact on their environment as well by, for example, increasing customer awareness and promoting the development of a regulatory system for the promotion of CSR.
Companies have to behave in a responsible way, but the reason for doing so should not be profitability. However, it is not a problem if there are forms of social activities which comply or can be made to comply with business interests. It is crucially important that a company should be trustworthy, as this model is based on trust. The new business model seems to ensure real competitive advantages if the corporation environment develops. However, later it can appear in the form of a basic expectation, resulting in a competitive disadvantage for companies thinking in a different way. (Waddock - Graves,1997)

MOTIVATION AND EXPLANATION OF THE TOPIC SELECTION

Management without caring needs and expectations of stakeholders in a community will not be competitive compared with those who do in the 21st century. Demand for accountability and transparency from both public and private sectors has become soaring. In the olden days, management was seeking for survival and profits. Nowadays, management concerns managing financial and non-financial results with awareness of risk and maintenance of transparency. As a result, corporate social performance (CSP) has possessed equal importance of corporate financial performance (CFP). (Yeung, 2011)
The term "Stakeholder" has been put into today's management vocabulary. In fact, it provides a full picture for management to map their „ought to be" – „obligations" as well as their „need to be" – „customers' requirements". Having a stakeholder map, it can widen the horizon of marketers in the sense of making them realize the importance of social responsibility; and the need of fulfilling requirements of customers and the society. Stakeholders do not want to have any undesirable events found in the market. Issues that they are concerned are things that affect their health and safety. Products or services that consist of misleading messages in advertisements are especially the worry of the public. They want to get a real message from marketers, instead of marketing gimmicks. Hence, marketers should develop an awareness of social responsibility when devising marketing campaigns.

ROLE OF BANKS IN CORPORATE SOCIAL RESPONSIBILITY (CSR)

An important component of the economic system is represented by the financial institutions. They have an important role owing to their function of attracting financial resources from theeconomy and their redistribution to businesses that are looking for financial resources to finance new projects or projects in development. In addition, financial institutions are able to catalyse the introduction of rules on sustainable development. Similar to other companies, banking and financial institutions have a certain conduct in dealing with the local community, labour and the environment, and their relationships can be used as key tools in imposing principles of sustainability to the borrowers. (Matei, 2013)

Taking deposits, granting loans and providing complementary services are the core business of banks. No matter what kinds of countries, what kinds of culture, and what kinds of banking products and investors, banks need to be responsible for their customers in a social responsible way.

„Businesses not only must deal with hard-number economic realities, but they also have to address the perceptions and beliefs of their customers. Thus, organizations must adjust to the changing outlook of the consumers who buy what they try to sell. It's not certain, however, what form this adjustment should take." (McEwen, 2008)

In order to fulfill the dimensions of CSR as mentioned above, Murphy (1999) identified some of the key steps to evaluate ethics in product / service management. First of all, marketers need to have an intention to identify and judge ethical behavior. Secondly, they need to establish proper channels to implement a particular marketing program with formal ethical analysis of products/ services. Consequences of marketing programs shall be clearly identified, and unethical practices shall be properly managed with staff commitment. Examples of implementing ethical marketing programs can be provision of sufficient product instructions as well as appropriate warning labels for the products that they introduce and maintain in the marketplace. Protecting environment, product safety and hygiene are hot issues in today's marketplace. Lastly, marketing organizations, including marketing staff of banking and finance organizations should have ethical standards for developing and introducing new products. Specific ethical policies should be put in place to shape ethical behavior of staff.

All in all, CSR in banking industries should comprise the above-mentioned elements: risk assessment, effective and efficient internal audit process with value added to stakeholders. Hence, in order to maintain competitiveness in the market and responsible to customers, bankers need to understand the economic situation, re-focus marketing strategy with prudent risk management system, identify the concerns of customers, implement fair operation procedures to protect customers and the community as a whole.

The concept of corporate social responsibility is not new in the banking sector, but nowadays,it becomes highly topical since the crisis has significantly highlighted the need for integrationof moral principles in the banking business. Knowledge of business practice indicates the factthat the acceptance of moral principles in business is not integrated into management decisionsof companies. It also cannot be accepted that self-regulatory instruments of companies such asCSR will be effective. The existing experience with the implementation of CSR and ethical principlesin the banking sector leads to the opinion that

the social responsibility of banks and ethicsin banking sector are perceived as an appropriate marketing tool for public communicationand are not integrated into policies of individual commercial banks. Experience with the crisisdemonstrated that there is a lack of moral principles of managers' decisions. (Lenka, 2011)

The international financial crisis was a signal of alarm which resulted in a change of the vision of the social responsibility linked to the granting of credit to individuals. Due to the crisis forms of manifestation it led to the emergence of the concept of responsible lending. Not understanding the financial mechanisms of crediting by the population, together with the lack of accountability on the part of banks led to the emergence of a crisis generated by the loans obtained without a careful evaluation of the possibility of redemption, as was the case with the credits obtained with the ID card. As a result of these realities, most banks that have launched social responsibility programs, have at least a financial education program, which aims to disseminate among the population, especially young people, the advantages of using banking products. An interesting category of CSR programs is represented by the activities involving employees of the companies, as the ones from the banking sector, which involves employees as volunteers in various programs supported by banks.

THEORETICAL BACKGROUND

Carroll's CSR Pyramid

One of the best known and most widely accepted definition of CSR is by *Carroll*, who saysthat corporate social responsibility encompasses the economic, legal, ethical, and discretionary (philanthropic) expectations that society has of organisations. The CSR pyramid distinguishes various layers of responsibilities. The foundation is economic responsibility. At the same time, however, companies also need to comply with legal norms. Ethical responsibility equals the obligation to conduct in a fair way and to do the right thing, going beyond mere compliance with rules. It can also mean discretionary or philanthropic responsibility (Carroll, 1991).

The banking sector responded relatively late to the challenges of CSR. First it consideredenvironmental, then social issues (Vigano –Nicolai, 2009). CSR as an instrument of the business sector serves to increase and legitimise the sector's economic performance and also appears as the embodiment of the fundamental principles of business ethics (Scholtens, 2006).

The 2008 financial crisis drew attention to the necessity of CSR in this sector also, increasingthe need for trust, as well as accountability and transparency that lead to it. Besides the role ofan intermediary which channels savings into investments, traditionally considered as themain social function of financial institutions, besides efficient allocation and risk management, the need for ethical and responsible conduct has led to financial and investment processes pointing beyond the protection of the legitimate interests of depositors and owners(Tzu-Kuan Chiu, 2013).

Banks' stakeholders include the owners, borrowers, depositors, managers, employeesand regulators. Compared to many other sectors, a key characteristic of the banking sectoris that it

affects a large number and a great variety of people. This results in considerably more complex information asymmetry. Another feature of the system is that in order toensure the stability of the banking sector, it is characterised by much stricter regulation(Yamak et al., 2005). Since the banking sector differs from other economic sectors, itsCSR practices are also different. Here there is more emphasis on responsibility in the areasof bank lending, investment and asset management operations, where combating briberyand money laundering are particularly important issues, being the key elements of anticorruption efforts, which is a crucial part of the banks' CSR activities (Vigano– Nicolai,2009).

Although banks have smaller direct impact on the environment, their indirect environmentaland social responsibility may increase if they grant credit to companies which pollute the environment, produce unsafe products or violate human rights (Idowu – Filho, 2009). This way banks act as mediators of sorts, which may cause significant damages (Thompson – Cowton, 2004). The indirect impact may arise not only in relation to the usersof banking services, but also the suppliers. As the management element of the responsiblesupplier chain, integrating environmental and social aspects into supplier policies hasbeen adopted to finances as well.

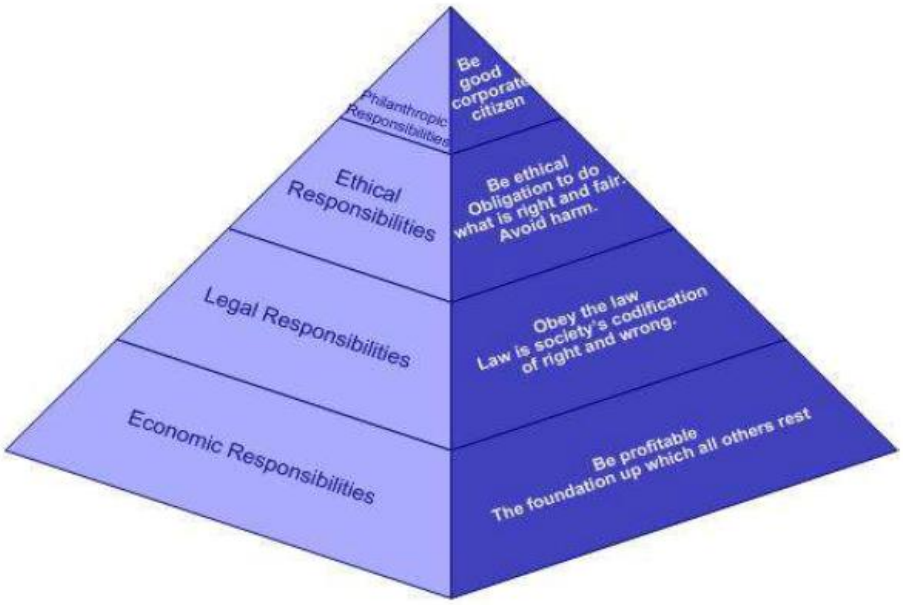

Figure 1. Carroll's CSR Pyramid

Source:http://research-methodology.net/carrolls-csr-pyramid-and-its-applications-to-small-and-medium-sized-businesses/

Applying Carroll's CSR model to the financial sector, the levels of responsibility in terms of the banks are the following (Carroll, 1991):

Economic responsibility. This is the traditional reason for having banks, in other wordsto increase the owners' welfare, ensure profitability and growth. One of the means of thisis financial innovation. Since individual and corporate financial interests are constantlychanging, banks create new opportunities for risk management and the effective mediationof resources. This involves developing new products, redefining the existing ones

andcreating new channels. Interaction with stakeholders has a crucial role in determining thesenew products (Decker – Sale, 2009).

Legal responsibility. Regulation is determined by statutes, and its aim is to minimiserisk and ensure safety and confidence in the financial system. In practice, statutes aresupplemented by the compliance with the guidance of various supervisory bodies andtrade associations, which is signified by the compliance function (Decker – Sale, 2009).Such statutes include Recommendation No. 11/2006 or 6/2013 (III.11) of the HungarianFinancial Supervisory Authority in Hungary; Compliance and the Compliance function inbanks, the Guidelines on Internal Governance (GL 44, September 2011) or the Guidelineson Certain Aspects of the MiFID compliance function requirements in the European Union;and the Foreign Account Tax Compliance Act, the Dodd-Frank Wall Street Reform andConsumer Protection Act (2010) or the UK Bribery Act, 2010 (Wieland, 2013) at an international level.

Ethical responsibility. Ethical norms can be interpreted through individual conscienceand the expectations of external stakeholders. The motto of the London Stock Exchange „Myword is my bond" embodies the basic ethical principles of honesty and sincerity, which together with trust, are traditionally linked to the financial sector (Decker – Sale, 2009).The codes of ethics that embody voluntary constraints also include the basic principles ofintegrity, fair conduct, respect and transparency in the financial sector. The ethical valuesand expectations of stakeholders are most apparent in the stakeholder dialogue, which putscommunicative ethics into practice. Decker and Sale (2009) draw attention to the factthat the compliance approach, which is aimed at compliance with statutes, often does notfavour the establishment of ethical business practices and business culture.

*Discretionary (philanthropic) responsibility.*It cannot be interpreted through external expectations; it is a voluntary activity, however,it has become common practice among banks, contributing to the better reputation of the financial sector (Decker – Sale, 2009). In the years following the crisis, there wasan apparent shift in social expectations towards the general domains of CSR in thebanking sector and its preferences. There is a need for the endorsement of social expectationsin CSR that are more directly linked to the bank's business activities and clientele.
(Lentner, 2011) As far as stakeholders are concerned, the key expectations of clients include secure products and appropriate information provision. Employees want a safe workplace that is free from discrimination, and the respect of human dignity, while competitors expect faircompetition. Banks not only need to watch the direct environmental impacts of their ownoperations, but also the impacts of their lending activities (Thompson and Cowton, 2004). From a social aspect, there has been a new development in recent years, namely helping the poor. One example is the micro-loan programme through low-income banking (Tzu-Kuan Chiu, 2013). The backdrop to this is the UN's Principles for Responsible Investment,which stresses the importance of „inclusive finance" for vulnerable groups which otherwisecould not afford financial products and services (PRIs 2011).

CSR Communication Tools

The communication tools of corporate social responsibility can be categorized based on the quantitative research of Ipsos-Insight, The Worldwide Qualitative Research Company in 2002-2003:
The use of *logos* is the simplest and the most common means of communication of CSR activities because it has simple application if the report had already learned of the society.
The *short labels* are easier to understand, however, require greater attention to the target people and preliminary campaign is needed before use.
The advantage of *information papers* is that the person may decide to read it or not. It is costly, less efficient and pollutes the environment, which is not compatible with socially responsible behaviour. Only specific events, conferences connected should be used.
The *advertisements* are very effective CSR communication tools as it is widely available for the target group, but only for short, simple information suitable for broadcasting. The social ad is the most common way of CSR communication, which is preferable for the media.
The *report of a truly independent body*, which is known and recognized in society, may be the most reliable means of communication.
The *journalist report* gives an opportunity to provide more detailed information, but the credibility of the report depends on the individual, so media meeting or journalism forums may prove more effective tool.
The *company report* is equally important for all stakeholders and gives a free opportunity to further express of the CSR activities. (Ásványi, 2010)

Extending this list some more categories can complete the CSR communication tools of Ipsos Insight (Ásványi, 2009):
Thematic reports are publications, which refer to the performance of a business on a specific issue.
CSR awards provide a platform for unified communications. Companies are presented as an example. They communicate truthful information. CSR actions are evaluated by an independent body. They could include special initiatives, which are organized in the company.
CSR conferences aimed to support the domestic spread of CSR thinking and development of good practices. CSR events include specific initiatives or campaigns organized by the company to support or enhance knowledge on a specific issue or cause.
The number of *CSR related sites* is growing steadily in our country, which is a positive trend. These sites focus on CSR communication and its delivery to the society: alternate.hu, csr.lap.hu, www.bpcsr.com, www.csrhirlevel.hu, www.csrhungary.eu, www.csrpiac.hu, www.csrservices.hu. It is important to mention the blogs and forums growing up today which don't give fully credible information but indicate that the society does address the issue and people are interested in corporate social responsibility. These methods may refer to a unique activity on a specific issue or to more constructive, wider and long term consultations: csr.blog.hu, csrblog.blogspot.com.
The aim of *CSR-related applications* is to encourage the valuable news on promoting CSR, strengthen the press echo of CSR action and show the positive examples.

The corporate website is a tool that increasingly is used by businesses for communicating CSR issues. They usually have a specific section in their website where they set out their policies for the economic, social and cultural issues. It can also include reports, publications and CSR-relates conferences, events, websites but also updated information.

The study "Communicating corporate social responsibility" (CSR Europe, 2000a) and "The first ever European survey of consumers' attitude on corporate social responsibility" (CSR Europe, 2000b) provide further communication tools: *codes of conduct and communication on product packaging.*
There are two other CSR communication tools which can help companies to be able to communicate their CSR initiatives. *Presentations and conference calls* also give opportunity to the publication of CSR activities. The company can show what it does exactly for responsibility. The *company magazine* helps to inform the employees about the CSR initiatives of the company.

INTERNATIONAL HISTORY OF THE TOPIC

World Bank

One of the well-known international financial institutions is the World Bank, which aims notonly at financing investment projects, but also at the introduction of principles relating to theprotection of the environment or of the population's health and safety.Therefore, in 2007, the World Bank has implemented Environmental, Health, and SafetyGuidelines – EHS Guidelines. These guidelines provide the measures achievable with existingtechnologies and levels of performance. Areas subject to these guidelines are: the environment,health and safety, the health and safety of communities, building and laying up. Besides these,there are sectoral guidelines applicable for the following sectors: agriculture, forestry, industry,chemical industry, oil and gas, infrastructure, processing industry, energy and mining.

International Finance Corporation (IFC)

Of the international financial institutions, an important activity in this field is compiled by theInternational Finance Corporation (IFC). This does not involve only the financing of economicentities from developing countries, but also the implementation of policies aimed to protect theenvironment and respect human rights. IFC's involvement started in 1989 with thedevelopment of the procedure concerning the evaluation of projects in terms of environmentalimpact, named Safety Policy, based on the World Bank's policy.
The year 2006 was marked by a new step in the field of sustainable development through theadoption of IFC's Sustainability Framework. IFC's Sustainability Framework is made up ofeight performance standards that IFC clients must fulfill. By implementing these standards, theIFC`s clients will minimize, and even eliminate, some negative effects on the environment,labour or local communities. Also the fulfillment of these standards of

performance ensures tothose companies' competitive advantages and the discovery of new opportunities fordevelopment. These standards were developed taking into account the *commitments* of the IFC3:

- IFC's mission is the fight against poverty, this can be achieved through the promotion ofsustainable growth and sustainable investments;
- IFC is considering avoiding disproportionate distribution of the economic developmentcosts, environmental destruction and unsustainable use of natural resources; this can be
- achieved through a strong commitment of companies towards stakeholders, so as to avoid ormitigate negative effects on people and the environment;
- climate change is a global challenge, and reducing emissions of greenhouse gases is apriority for IFC, which cooperates in this respect, with the private sector and offersinnovative investment tools and consulting services to ensure friendly solutions;
- IFC supports low-carbon economic development, supporting access to clean energyservices;
- in the future, IFC will also require its customers information on emission of greenhouse gases, which will allow the quantification of the carbon footprint of the IFC's investment portfolio;
- IFC recognizes the responsibility of economic operators on the observance and protection ofhuman rights;
- IFC believes that women have an important role in the process of economic growth andpoverty reduction. In this sense, IFC plans to create opportunities for women and eliminategender discrimination through investments and advisory activities.
- In order to help the partners and to unite the public perception about the way of assessmentof investment projects, the following *performance standards* have been developed:

1. Assessment and management of environmental and social risks and impacts;
2. Labour and working conditions;
3. Resource efficiency and pollution prevention;
4. Community health, safety, and security;
5. Land acquisition and involuntary resettlement;
6. Biodiversity management and sustainable management of living natural resources;
7. Indigenous peoples;
8. Cultural heritage.

Depending on the obtained score, the investment's projects are classified into three categories,reflecting the impact of the project on the environment and the community, namely: A (highimpact), B (medium impact), C (low impact). (Matei, 2013)

Global Reporting Initiative (GRI)

Another important step in promotion of corporate social responsibility is the foundation of theGlobal Reporting Initiative (GRI). GRI was founded in 1997 by the US non-profit organizations- the Coalition for Environmentally Responsible Economies (CERES) and the Tellus Institute. GRI was created to develop and disseminate guidelines for reporting on sustainabledevelopment. Using guidelines developed by GRI, companies, institutions and otherorganizations have a pattern of social responsibility assessment and dissemination through thereporting of information to stakeholders regarding involvement and social performance. Theguidelines consist of principles and indicators used in evaluating the performance of economic,social and environmental sustainability of an organization. At the same time, the guidelinescreate unified reporting results, which make easier the comparisons between different regions ofa country or between different states. Besides the guidelines there were created sectoral lines,due to the diversity of companies and the specific problems of some fields, used in thecalculation of specific indicators for sectors such as finance, media, telecommunications, theautomotive industry. Rounding guidelines are not mandatory, but, lately, the interest ofcompanies is on a steep slope reflected in the growing number of reports sent by corporationsand SMEs. (Matei, 2013)

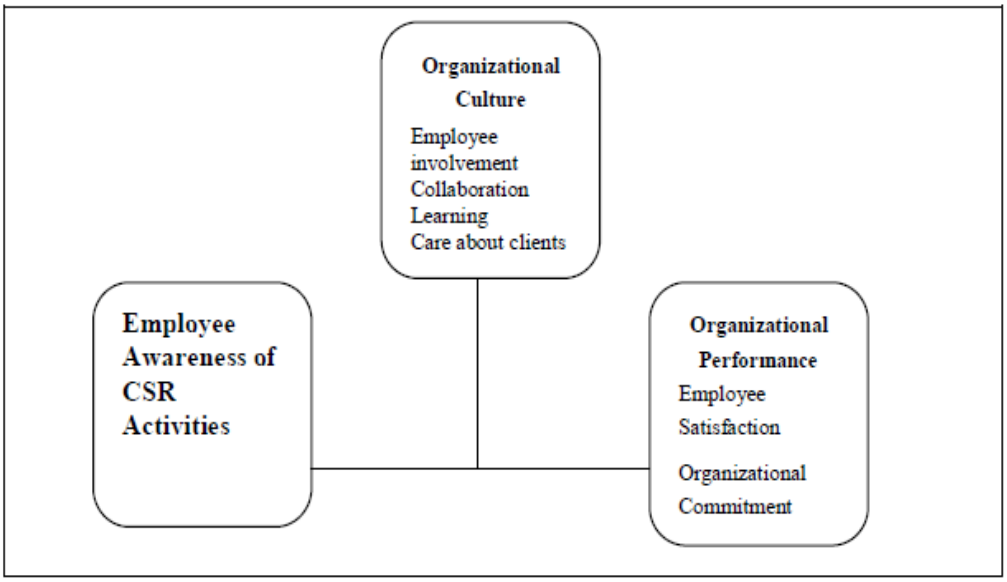

Figure 2. The Factors of CSR
Source: Malik, 2015

CSR OF THE FINANCIAL SECTOR IN HUNGARY

*Chart 4*shows banking activities and CSR activities in relation to the typical CSR areas of the banking sector. Banking activity is interpreted in terms of the balance sheet total and the number of branches, while CSR activity shows whether the bank integrates CSR initiatives into its business activities or just applies the philanthropic aspect. The following CSR map is

based on information available on the websites of Hungarian commercial banks.(Lentner, 2015)

In my opinion, the CSR approach can be expanded to other areas. During decision making, benefits and damages could be considered, which are yielded or caused by that particular decision outside of a given organisation and not influencing their profit in the short-term.

For example, faulty product development causing system-level failures may destroy the savings of certain household groups. The basic principles could be laid down in voluntary codes of ethics that go beyond the statutes in order to keep to the right directions. There should be more stress on guaranteeing compliance with the Codes Of Ethics in banking organisations.(Szegedi, 2010)

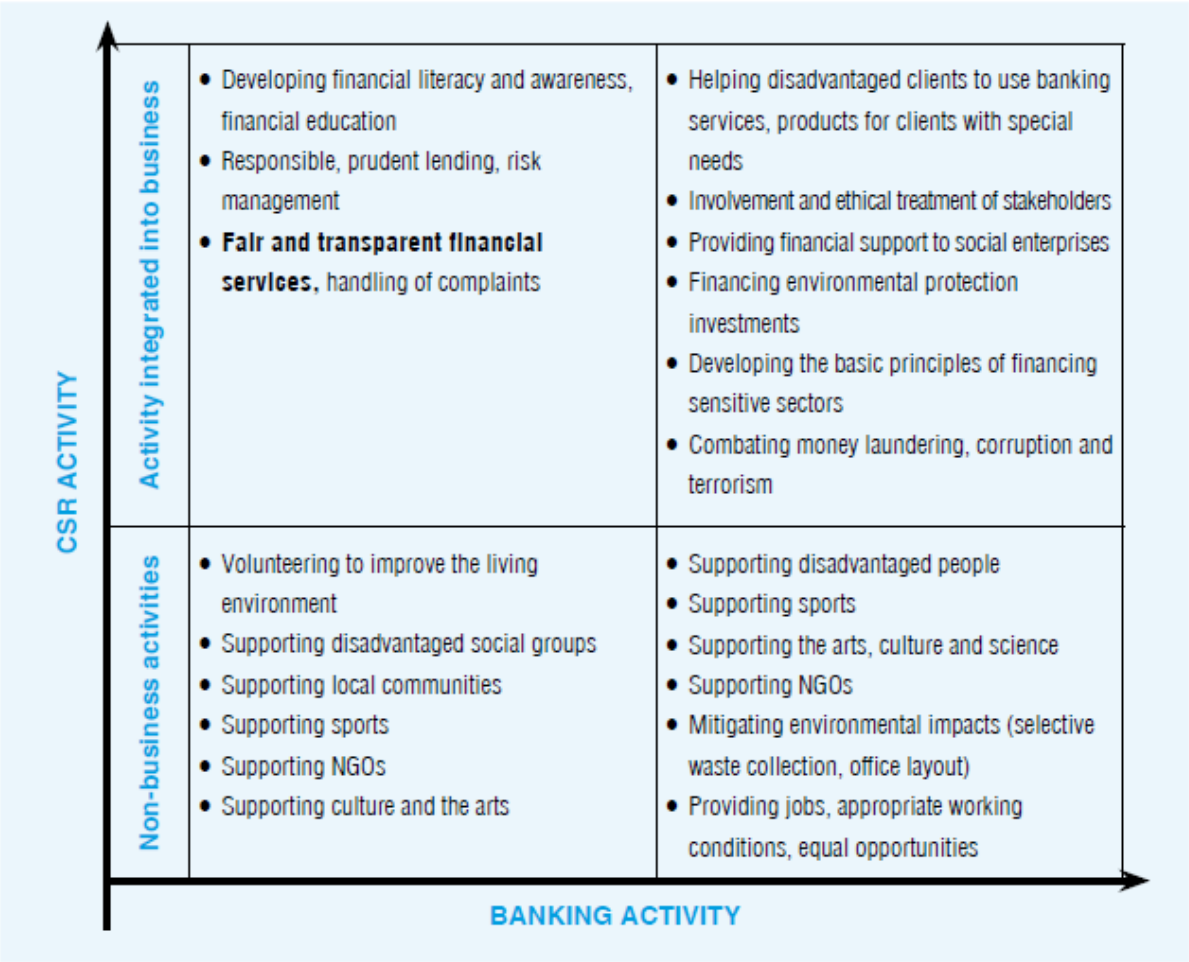

Figure 3. CSR and banking activities of the banking sector

Source: Lentner, 2015

HYPOTHESES

Based on the Hungarian and foreign literature I studied, I made my assumptions which are the following:

- The members of the financial sector consider CSR as a factor of strategic importance. For them CSR means not only compliance with the obligatory reccomendations and regulations but also commitment for the real social and environmental issues.
- CSR tools:
    - Most members of the financial sector apply few kind of CSR-tools or methods, and they only wish to maintain the scope of used techniques and not broaden it.
    - The CSR activities and strategies of the financial sector is primarily based on doing community activites. The reason for that is community activities can be carried out easily and are expected to have the most significant impact or added-value on the society and clients.
    - Concentrating on fewer tools results in higher efficiency than if the y would concentrate on many tools on a lower level.
- There is a positive relation between the profitability of the financial sector and its applied CSR strategies (its social and environmental activity, the benefits provided for the local communities, the level of the CSR' strategic significance).
- The applied CSR strategies in the financial sector differ from other sectors' CSR strategies, because every sector considers different forms effective
- The applied CSR strategies in the Hungarian financial sector differ from other countries' CSR strategies, because Hungary adapts consciously to the national economic, social and environmental situation.
- CSR activities of banks have a positive effect on employee organizational commitment and organizational performance, and they also become more committed to social, economical and environmental issues.

METHODOLOGY

Secondary Research

I would carry out a secondary research first, to get to know the theoretical background of the topic. I would study the national and international history and literature about the connection between CSR and the financial sector.
The appropriate national and foreign literature can provide a fundamental basis for defining the conceptual definitons and the specific dimensions of Corporate Social Responsibility.
I will collect indicators used currently and statistical data from databeses and it is likely that my main source of information will be the home pages of banks. Banks publish annual Corporate Social Responsibility and Sustainability Reports that can be used for making qualitative and quantitative comparisons among certain banks.

Primary Research

Secondary research can help to reduce the area to be tested and to specify the problem statement and the related goals.

I would carry out an exploratory research based on primary and secondary data in a more formalized, structured way. I would use questionnaires and interviews.

Questionnaires

(1) Sample and data collection
I would draw my sample from the employees of banks and the clientsof banks. The primary data of employees of banks and the clients will be collected while secondary data will be collected from articles, reports and website of the corporation.
In the questionnaire I would use a "7 Likert Scale" and tests/measures (written questions with yes/no answers)

(2) Interviews
Face-to-face interviews will be collected through primary data techniques. These will be structured interviews with prepared questions. Respondents will be either presently working in banking-related industries (or exposing to finance academics).
It is an opportunity to visit the banks and have the survey filled by the employees.

(3) Analysis of data
The data will be analyzed using correlation, regression and analysis of variance by SPSS (descriptive statistics, reliability analysis).

EXPECTED RESULTS

According to the data I will analyse, I can draw my conclusions related to the current level of the CSR activities and strategies of the Hungarian financial sector.
I expect to verify most of my hypotheses with proving that banks consider CSR as a factor of strategic importance and their scope of used CSR tools could and should be broaden.
It may also turn out that it is worth for the banks to apply CSR techniques in the long run, because CSR has positive effect on their profitability.
Banks also should involve their employees in CSR activities, because they will be more committed for the organization.
At last, but not least I would like to present that Hungarian CSR practices of banking sector differs from other sectors' CSR activities and from the internationally applied strategies.

CONCLUSIONS

All in all, management of a banking organization should have appropriate policy in place for establishing positive organizational culture and social responsible mindset of staff members. If commitment for becoming a social responsible banking organization between management and staff, and accountability and creditability can be demonstrated through effective and

efficient internal audit, customers and the community will be benefited with risks reduced and quality enhanced.

An organization needs to have the followings in place in order to become a social responsible bank to meet customer requirements:

- Establishing a mindset of risk management, business ethics and corporate social responsibility through internal management of people and process;
- Understanding complex financial products through external management of economic situation and internal management of people and process for the benefit of investors, management and community;
- Protecting rights of customers with setting up channels for customers to address complaints through internal management of implementing strategy for financial crisis and external management for stakeholder consideration, accountability and creditability.

REFERENCES

ÁSVÁNYI, K. (2010): Corporate Social Responsibility and CSR Communication according to the Society

ÁSVÁNYI, K.(2009): CSR communication of the large banks. Proceeding, Marketing Faculty Club, 15. Jubilee National Conference, University of Kaposvár, Faculty of Economics, Kaposvár - Hungary

CARROLL, A.B.(1991): The Pyramid of Corporate Social Responsibility: Toward the Moral Management of Organizational Stakeholders. Business Horizons

CSR EUROPE (2000a): The first ever European survey of consumers' attitude on corporate social responsibility. CSR Europe Publications.

CSR EUROPE (2000b): Communicating Corporate Social Responsibility. CSR Europe Publications.

DECKER, S. – SALE, C.(2009): An Analysis of Corporate Social Responsibility, Trust and Reputation in the Banking Profession. In: Idowu, S.O. – Filho, W.L.: Professionals Perspectives of Corporate Social Responsibility

IDOWU, S.O. – FILHO, W.L.(2009): Professionals Perspectives of Corporate Social Responsibility

LENKA, B. – JIRÍ, P.(2011): Corporate Social Responsibility in Commercial Banking – A Case Study from the Czech Republic

LENTNER, CS. ET AL (2015): Corporate Social Responsibility in the Banking Sector. Public Finance Quarterly, 2015/1

LENTNER, CS. (2011): A pénzintézetek társadalmi felelősségvállalásának új dimenziói és a könyvvizsgálat szerepe. Számvitel, Adó, Könyvvizsgálat. Vol2011/6. pp 280-283.

MALIK ET AL (2015): Corporate Social Responsiblity and Organizational Performance: Empirical Evidence from Banking Sector. Pakistan Journal of Commerce and Social Sciences. 2015, Vol. 9 (1), 241-247.

MATEI, M. – VOICA, M.C.(2013): Social Responsibility int he Financial and Banking Sector. Economic Insights – Trends and Challenges. Vol. II (LXV) No. 1/2013, 115-123.

MCEWEN, W.J.(2008): When the Going Gets Tough. *The Gallup Management Journal*, New York

SCHOLTENS, B. (2006): Finance as a Driver of Corporate Social Responsibility. Journal of Business Ethics. 2006. 68 (1), pp. 19-33.

SZEGEDI, K. (2010): The Concept and Development Tendencies of Corporate Social Responsibility, "Club of Economics in Miskolc", 2010, 70.

THOMPSON, P. – COWTON, C.J. (2004): Bringing the Bank Environment into Bank Lending: Implications for Environmental Reporting. The British Accounting Review. 2004, 36. pp. 197-218.

TSOUTSOURA, M. (2004): Corporate Social Responsibility and Financial Performance. Haas School of Business. Berkeley, California

TZU KUAN CHIU (2013): Putting Responsible Finance to Work for Citi Microfinance. J Bus Ethics
VIGANO, F. – NICOLAI, D. (2009): CSR in the European Banking Sector. Evidence from a Survey. In: Barth, R. – Wolff., F.: Corporate Social Responsibility in Europe: Rhetoric and Realities. Edward Elgar Publishing Inc.
WADDOCK, S. A. - GRAVES S.B. (1997): "The corporate social performance –financial performance link." Strategic Management Journal, 1997, 18 (4): 303-319.
WIELAND, ZS. (2013): Compliance funkció. Felelős vállalatirányítás-integritás és átláthatóság erősítésének eszközei. E&Y Baker &McKenzie Conference
YAMAK, S. (2005): State as a Stakeholder. Corporate Governance, 2005/2. pp. 111-120.
YEUNG, SHIRLEY (2011): The Role of Bank sin Corporate Social Responsibility. Hang Seng School of Management, China. Journal of Applied Economics and Business Research, 1(2): 103-115

CUSTOMER ORIENTATION OF THE MUNICIPAL SERVICE PROVISION COMPANIES IN HUNGARY

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SUMMARY

The municipalities in Hungary play a significant role in the provision of public services and they are responsible for a vast array of local services. The goal of the recent state reform is to create a legal framework in order to increase the efficiency and effectiveness of the local services. The municipalities are obliged to enhance the performance of the service delivery and thus are expected to support the goals of the central government.
The aim of the study is to scrutinize the availability of marketing concepts in order to improve the organizational performance. The research is being carried out with respect to water and sewage provision, maintenance of public space and cemetery, waste management, public transportation, heat supply and municipal nourishment.
The fitness of marketing concept to strengthen the customer dimension outputs of the service provider firm depends on the existing level of market orientation.
According to the market orientation model I support the notion to develop a customer focused organizational design that permeates the whole firm in order to create pervasive results.
It is to presume that the low level of competition and the low level of market turbulence and the bureaucratic structure of the firm have negative impact on the market orientation and that results poor customer dimension performance.
The study investigates if there are benchmark solutions that fit the goals and could be promoted among all municipal service companies.

INTRODUCTION: PROBLEM FORMULATION, RESEARCH GOALS AND QUESTIONS

The revolving issue of public management reforms is to operate state institutions and agencies in an effective and efficient manner since the Woodrow Wilson adminsitration introduced the „*Taylor-principles*". (Jenei 2005) In the 1990's when communist Central and Eastern European Countries began to transform to market societies the mainsteam public administration theory promoted the neo-liberal solutions of New Public Management (NPM). Undoubtedly, the novelty and virtue of NPM was that it placed the needs of the customers (citizens) in the center of service provision. (Osborne-Geabler 1992) The ideology was reflected in the Hungarian municipal law as a result of a political bargain in 1990. In the last 25 years it has been emphasized that the essential element of the public services are the customers in Hungary too. Unfortunatelly, not much headway has been seen eversince, and there is a growing dissatisfactions and displeasure with the municipal service quality still today. Although the law provided significant freedom for the municipalites to choose their

best solutions for services provision, the customer oriented operation has failed to establish its foundations.

According to my consideration the Hungarian state reform today can not be regarded complete nor comprehensive without the development of the service provider companies that are mostly under municipal ownership. Those contracted companies are the real subjects of the change if the goal is to be able to provide services that efficiently use public assets and effectively serve and satisfy the needs of local citizenry. Those utility and public service companies can not afford to insist to their old processes, structue and even their culture. There is only one sole question remains: how it is possible to finaly enhance the performance of local services that can create increased customer value?

The goal of my research is to answer this question, which would indicate that there is at least one suitable solution to develop local public service companies to raise effectiveness. This probably results a new local service model that can be easily adapted to all public service branches that is in line with state reform and also strenghtens democratic values and well being as outcome.

During the course of my research I investigate the municipal service branches to reveal the best solutions that provide the highest customer satisfaction. I am interested if there are commonalities among the best performing service providers, and if so, what are those organizational features that cause the extraordinary effects and how can those be transfered to other service providers? The investigated branches are: water and sewage provision, maintenance of public space and cemetery, waste management, public transportation, heat supply and municipal nourishment.

ENVIRONMENTAL BACKGROUND OF THE RESEARCH: THE RECENT HUNGARIAN PUBLIC SECTOR REFORM

The modern democratic society is built on the division of the taks between the state and the market. The initiatives that aim the reform of the state often encompass changes of the public institutions regarding effectiveness and responsiveness for the sake of the citizens. The goal to raise effectiveness and efficiency of public services has a long history that often meant to adapt market solutions sinces the1980's. (Pollit-Bouckaert 2011)

NPM advocates that the competitiveness among the service providers creates innovation, improves the quality and enhances commitment on both user and supplier side. (Osborne-Geabler 1992) On the other hand NPM is no substantive public administration theory, rather a collection of practical "*market-like*" solutions that can not be adapted without proper modifications and precautionary measures. (Frederickson et al. 2013)

In Hungary it was only a few shining examples that broke the surface of bureaucratic burden that was inherited. Thus the NPM practice that borrowed its logic from public choice theory proved to be a dead end. Meanwhile the goals still remain: to facilitate an effective and efficient public service provision.

The Hungarian municipal model that reflected NPM was built around the idea that efficiency and effectiveness lie in authonomy, and so, local authorities enjoyed a vast field of organizational options to choose the best fitting service design, portfolio and service

substance. This local system appeared very flexible, which attracted more and more service provision duties that were constantly delegated by the state without funding. (Vigvári 2012) Random privatization without feasibilty studies did not break monopolies, but complicated the monitoring of service performance, while customers felt even more exposed to service provider companies. In later years the central government gradually begun to cut subsidies for municipalities and the connotation was the growing dept and the decline in the service performance of municipal companies. (Vigvári 2012) The practice of privatisation, outsourcing, downsizing and the adaptation of managerial tools did not resulted the requested solutions because of the concerns about the deterioration of democratic values, the fear of corruption, the bureaucratic mismanagement and the lack of competences. Consequently, the theme of the public administration reform in Hungary is still the same now as 25 years earlier and there are only a few lessons learnt.

In recent years there are significat changes being seen in the Hungarian public administration that involve the whole of the public law and service provision. The firs step of the reform was to separate and redifine the duties of the state and the municipal level in order to create a framework for the local public services to raise effectiveness and set up a customer oriented system. The 2011 CLXXXIX Act of Local Authoroties evidently had this ambition, as well as the Kálmán Széll Plan 2.0. Latter claims that it is unavoidable to *„enhance public service provision so that it can both reach a higher efficiency (cost cutting measures) and effectiveness on the output side*". (Széll Plan 2.0, p.31.) The same principles and goals appear in the Magyary Program, which is the driving document of the state reform; it says that the public services are expected to be "*effectice – economical - efficient – safe – controllable – responsive"* at the same time. (Magyary Program 12.0, p.5.)

It is worth to notice that significant portfolio of the public servives are provided by the municipalities for the local citizenry, and the sector is responsible for 25-30% of the public spending and manages 75% of public assets in Hungary. Albeit the local level is far from to be regarded as homogenious as the municipal sector embrace 3200 various local authorities and 13-14.000 municipal institutions, agencies and public service provider firms, all with different managerial approaches to service provision, resulting very diverse solutions all over the counrty. Given the circumstances it is viable to presume that there are better and lesser performing municipal institutions and service companies, when the state reform is introduced. However, it is now a general and extensive requirement to take actions in order to develop the municipal service providers to meet the above ends of the state reform.

THE LITERATURE OVERVIEW OF MARKET ORIENTATION RESEARCH

The growing impatience form the side of the stakeholders and the pressure of the central government led the municipal service providers to understand that organizational changes are neccessary and can not be postponed. Promptly after the realization of this urgency it is the lack of develompent tool the reality that must be faced with. The seeking behaviour of the service providers focused attention on marketing theory that could be the possible source of the change.

Among market orientation approaches marketing as an organizational culture is a strong and viable concept that frames marketing as an inner environment of the company, where all departements are the funds of customers and employees are keen to work together to satisfy needs. (Narver- Slater 1995) Inevitably, it is the culture to be changed first before all other organizational aspects could be the subject of modification, and to make the employees sensitive to change that is the first stage. (Kotter 1995)

The beginning of the market orientation (MO) research theme goes back to the 1990's, when the aim was to conceptualize the customer focused and market knowledge driven organization. Two collateral models were developed by Narver and Slater, and by Kohli and Jaworsky. Both of the concepts capture the marketing driven organizational behaviour in a realible and valid manner and are able to measure MO of actual firms. Accoring to Narver and Slater MO is an organizational culture that provides the values for the customer oriented behavior, exhibited by all members of the organization. (Narver-Slater 1990) While the other approach claims that the attributes of MO is the generation of market intelligence and the dissmenitaion of the intelligence through the whole organization, as well as the ability to plan and elaborate response actions based on that intelligence. (Kohli-Jaworsky 1990)

The body of the MO research has been erected since the 1990's, and a few undisputed conclusions were drawn:

1. Organizations with higher MO value are capable of better market performance in financial terms.
2. In the case of higer MO value, the employee commitment and employee satistaftion is also higher within the organization.
3. Organizations with higher MO value are capable of creating more satisfied and loyal customers. (Oudan 2007)

In 2005 in a metaanalyses all the kvantitative research results were studied in a joint paper to come to a final conclusion about the effects of MO. The enlarged comprehensive modell included all the dimensions of the antescendents and consequences of MO, as well as the moderators that impact the strength of the MO-performance relation. The results showed that MO leads to innovation, which causes better customer satisfaction and quality which impact the overall performance of the organization. (Kirca et al. 2005) (Figure 1.)

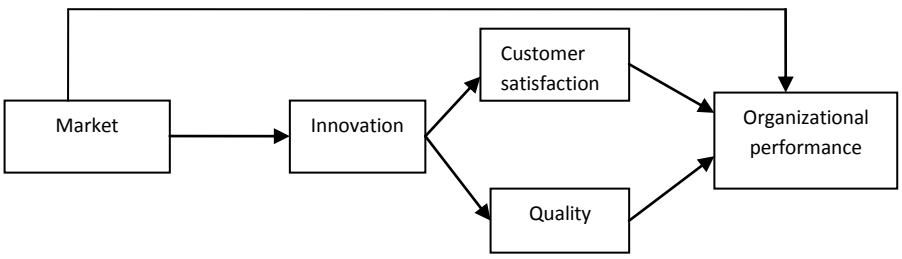

Figure 1. The enhanced model of market orientation and performance

Source: Kirca et al. Journal of Marketing (2005, 69.p.31)

In the public sectror customer satisfaction is an output indicator of the daily operation, but it impacts outcome indicators such as higher standards of well-being and the endurance of democratic values. (Denhardt et al. 2013, Andreasen-Kotler 2008)
In the case of the nonbusiness (nonprofit and public) organizations it is to assume that the goal is to ensure long term operation and to create enduring resources, rather than exploring short term profit opportunities. Nonbusiness organizations therefore put their efforts in maintaining good relationships with their key stakeholders. (Andreasen-Kotler 2008) Obviously, satisfaction as a result of organizational operation is a relevant dimension in the public sector, namely customer satisfaction is highlight in the case of municipal services.
The municipal utility and service provider companies are typicaly owned by the municipalities in Hungary, and they pursue long standing service stability and safety while completing their tasks, at the same time budgetary stability is an expectation too. Essentially, customer satisfaction is an increasingly important indicator of overall performance. (Hetesi-Veres 2013)

RESEARCH METHODOLOGY, THE MODEL AND THE HYPOTHESES

Whilst serving the the local communities municipal services have important role in regional competitiveness and in social-economic prosperity becouse local public service quality influences both residential and investment decisions. (Piskóti 2012)
This research includes the following municipal service branches: water and sewage provision, maintatnance of public spaces and cemetery, waste management, public transportation, heat supply, and municipal nourishment.
The research questions are scrutinized with the Kohli-Jaworsky MO model, which is the best tool to measure the pervasiveness of the marketing concept that is acquired by the service provider company. It is presumed that there are better performing service providers who design the organizational structure and workflow to utilize market intelligence in order to increase customer satisfaction.
This study investigates if there is a benchmark solution, that fits the customer related performance goals best and could be promoted among all municipal service companies.
I presume that the low level of competition and the low level of market turbulence and the bureaucratic structure of the firm have a negative impact on the MO, thus results in poor customer dimension performance.
The research plan includes a kvalitative preparatory phase that involved the adaptation of the Kohli-Jaworsky MO research questionnaire, which have been accomplished last year. In the preparatory phase secondary data collection of existing literature and several expert interviews have been elaborated in order to build to research model. The research model is shown in Figure 2.

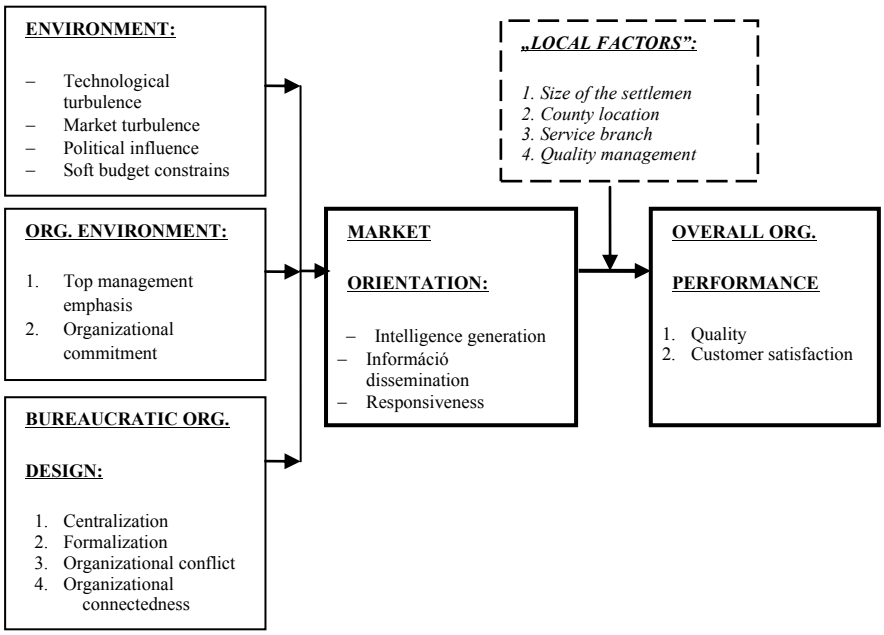

Figure 2. The research model of market orientation adapted to local public services
Source: own work accoring to Kohli and Jaworsky

The adapted research questionnaire includes 65 questions that have been validated by 5 service provider managers and 3 academican. The primary data collection was carried out in July and August of 2015. The research questionnaire was filled out by 201 public service provider companies. The questionnaire was disseminated to the service providers of those 583 local municipalities, where the local population is over 3000. We requested the executive officer or the branch manager to fill in the questionnaire who is directly responsible for the provision of the service. The service provider companies in the research sample cover 80 % of the whole population of Hungary.

The recent research phase is the analyses of the collected data in line with the hypotheses. In case the research model and its hypotheses are verified it is to conclude that marketing concept, namely the market orientation model is a usefull tool to enhance the service design in order to create increased customer satisfaction in the public sector.

The research hypotheses according to the research model:

- H.1., The greater the MO value the greater the customer orientation.
- H.2., The greater the bureauctaric structure the lower the MO value and the customer satisfaction.
- H.3., The greater the organizational and top management commitment the greater the MO value and the customer satisfaction.
- H.4.1., The lower the market and technological turbulence the lower the MO value and the customer satisfaction.
- H.4.2., The greater the political influence the lower the MO value and the customer satisfaction.
- H.4.3., The greater the soft budgetary constrain the lower the MO value and the customer satisfaction.

My principal precondition is that all the MO value will show a generaly low level accompanied by relatively low customer satisfaction in all the municipal public service branches. This would suggest that there is an opportunity to unfold for introducing marketing activities within the local public service sector. It is presumed that process of gathering and dissmeniating intelligence on the customer needs and the responsiveness according to those needs would lead to higher MO value that causes better quality and customer satisfaction in overall organizational performance (H.1).

I also presume that the bureaucratic structure of the servive providers and the lack of market- and technological turbulence cause low MO values, and that impact the customer satisfaction negatvively (H.2.,H.4.1.). Meanwhile, the soft budget constartin and the political influence is distracting the service provider's attention from the audience of the services and this causes low customer satisfaction via low MO (H.4.2,H.4.3). Soft budget constartin is a typical phenomenon of the public sphere and in our case it means that the management of the service provider is expecting extra subsidy from the municipality within the fiscal year. Becouse the service provider is confident about the extra subsidy - which is above the agreed and granted amount – its behaviour creates lame operation in economic sense. (Kornai 1986)

According to the preparatory expert interviews it is to hypothyse that some local factors are in the position to moderate the strength of the MO-overall organizational performance relation.

It is to be noticed that in the market orientation model the customer satisfaction is measured by the subjective reflection of the service provider, which also presents reliable results corresponsive to the literature. (Kirca et al 2005) Prior studies warn that measuring directly the customer satisfaction of the audience in the public sector (by asking the customers instead of the provider) would to lead to biased result, as the customers of the public services are always influenced by unknown, hidden factors such as the low level of information, domain heuristic and political prejudism. (Pollit-Bouckaert 2011)

Afterall, the verification of the hypotheses would suggest that it is fair to say that market orientation as a development tool is a valuable asset to change organizational culture in the municipal service provision sector of Hungary.

PRELIMINARY RESULTS AND CONCLUSIONS

Organizations can not afford to disregard the needs of their customers irrespective of the sector and operational environment, preferably customer needs should be in the center of the operation in the public services as well. (Kotler- Levy 1969) Yet, this principal notion makes a slow realization process that the public service providers are just begun to embrace. (Kotler-Lee 2007)

In Hungary it is the central government that pushes the municipalities to change their operation and tries to force service providers to increase efficiency and effectiveness. The state reform has it obvious aim to react on the problem of low service quality, customer dissatisfaction, wastefull and lame management. I am preoccupied with the idea that the municipal service sector could benefit from the introduction of service culture, where the provider is dedicated to constantly pursue higher customer satisfaction. Such an orgaizational

culture is modeled by MO, which in practice contributes to customer oriented behavior of all empolyees and exhibits the market oriented mind-set. (Narver –Slater 1990)

In the CEEC-s there has been a constant quest for such an organizational design in the public service sector since democratic transition, but without overwhelming achievement. False understanding of privatization, erroneous downsizing and unsound adaptation of managerial tools left a bad aftermath. Today, it is no time to waste and no chance for risky trials.

According to the secondary analyes of the litreture and to the expert interviews it is the organizational culture to be changed first. (Shafriz et al. 2012) This also means, that an organizational culutre is needed, which benefits and contributes to the creation of the marketing mind-set. There is a good reason to be confident that the operalization and the adoption of the marketing concept will lead us to such a desired outcome.

In this PhD research I scrutinize the fitness of the MO model to fulfill this gap. I support the idea to develop a customer focused organizational design that permeates the whole firm in order to realize pervasive results. I pose the question weather there are better performing service providers that already exhibit such patterns. For the answer the MO measurement tool is used as a research instrument to find out those antescendents that cause customer satisfaction. I am recently analyzing the collected data of 201 public service provider firms to assess which environmental and organizational features cause the extraordinary customer dimension performance.

The verification of the hypotheses will have me to conclude that it is the market orientation to be developed for dramatic changes in the municipal service provision sector of Hungary.

Preliminary result of the analyses to be presentedon the conference of "*Challenges in economic and technological development"* this October.

REFERENCES

2011. CLXXXIX. Act of Local Authoroties, Közigazgatási Szemle

ANDREASEN A. P-KOTLER P. (2008) Strategic Marketing for Nonprofit Organisations. 7th edition, Pearson Prentice Hall, New Jersey.

CONVERGENY PLAN OF HUNGARY 2012-15.(2.0), Budapest

FREDERICKSON H.G.-SMITH K.-LARIMER C.W.-LICARI M.J. (2013) The Public Administration Primer. 2nd edition, Westviev Press, Philadelphia.

DENHARDT R.B.-DENHARDT J.V.-ARISTIGUETA M.P. (2013) Managing Human Behavior in Public and Nonprofit Organizations. Sage Publications, California.

HETESI E. –VERES Z. (2013) Nonbusiness marketing. Akadémia Kiadó, Budapest.

JAWORSKI BERNARD J.-KOHLI AJAY K. (1990) Market Orientation: Antescendents and Consequences - Journal of Marketing. 57. p.53-70.

JENEI GY. (2005) Közigazgatás-menedzsment. Századvég Kiadó, Budapest.

KIRCA A. H.-JAYACHANDRAN S.-BEARDEN W. O.(2005) Market Orientation: A Meta-Analytic Review and Assessment of Its Antescendents and Impact on Performance - Journal of Marketing. 69. p.24-41.

KORNAI J. (1986) The Soft Budget Constartint, Kyklos, Vol 39., Facs I. p.3-30

KOTLER P.- LEVY S. (1969) Broadening the Concept of Marketing Journal of Marketing Vol. 33., p.10-15

KOTLER P.-LEE N. (2007) Marketing in the Public Sector, a Roadmap for Improved Performance. Pearson Education, New Jersey.

KOTTER JOHN P. (1995) Leading Change, Why Transformation Efforts Fail. Harvard Business Review 1995 March
THE MAGYARY ZOLTAN PLAN (2012) Ministry of Public Administration and Justice, 12.0. Budapest.
NARVER J.C.- SLATER F. S. (1990) The Effect of a Market Orientation on Business Profitability - Journal of Marketing. 54. p.20-35.
NARVER J.C.- SLATER F. S. (1995) Market Orientation and the Learning Organization, Journal of Marketing, Vol. 59. p.63-74
OUDAN, R. (2007) Market Orientation, Benefits to Firm and Economic Development, Theories, Concepts and Methods. VDM Verlag Dr. Müller, Deutshland, Saarbrücken.
OSBORNE D. – GAEBLER T. (1992) Reinventing Government, How the Enterprenual Spirit is Transforming the Public Sector. Penguin Books, New York.
PISKÓTI I. (2012) Régió- és telepüésmarketing. Akadémia Kiadó, Budapest.
POLLIT C.-BOUCKAERT G. (2011) Public Management Reform, Comparative Analysis: New Public Management, Governance and the Neo Webarian State. 3rd edition, Oxford University Press, Oxford.
SHAFRIZ J. M. - A. C. HYDE (2012) Classics of Public Administration, (J. Steven Ott: Understanding Organizational Culture), Cengage Learning; 7th edition
SHAFRITZ J.M. -J. S. OTT- Y. S. JANG (2015) Classics of Organization Theory, Cengage Learning; 8th edition
VIGVÁRI A. (2012) A magyar önkormányzati modell korszerűsítésének egy lehetséges forgató-könyve - Pénzügyi Szemle, p.68-87.

A REVIEW OF THE ECONOMIC GROWTH AND DEVELOPMENT THEORIES

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SUMMARY

The analysis of economic growth and development is coeval with economics. The importance of it is shown by the constant development of theories concerning economic growth during the ages. In my paper I introduce the most important models of the field.
I summarise the change from the early development models which depended on the homogenous factors of production - land, labour, capital - to the current ones which depend on the human capital growth and development. Nowadays there are two path in the mentioned research. One of them is dealing with the Solow growth model and think toward and explain the developing countries economic growth with the human capital and its characteristics. The other line of analysis deals with the distribution of income between the factors of production.
In the second part of the last century a new wave of theories appeared. According to them in the globalised world it is unwise to deal with economic growth in a narrow way - within the borders of a country - because the international trade, distribution of labour and dependence relations have a big effect on it (Girco and Keohane in: Bartha et al., 2013). Institutional economics marks new ways of research as well, so the education becomes the centre of attention during the research of economic development.
The main goal of the review of the literature of growth and development economics is to lay the foundations of my research modelling on the relation of future economic growth and the higher education system.

INTRODUCTION

The development as a general concept means the process that turns from a lower quality to a higher level. (Szentes, 2011) The separation of the development and growth concepts is necessary, the former means a qualitative change, than the latter which means a quantitative expansion, and furthermore the growth is necessary part of the development in many cases but at the same time it can be opposite. (Meyer & Solt, 1999; Szentes 2011)

THE BEGINNING OF THE MODERN GROWTH THEORIES

The physiocrat and mercantilist theory

The representative of the French physiocrats, Quesnay (1694-1774) held an opinion of the value and value making that form in the agriculture, and he identified the agriculture as the only source of the generation of income and for this the land as a factor of production.

According to the standpoint of the physiocrat group the economic life without governmental intervention is natural. The view of the French mercantilist group was that the economic power of the country is determined by the money and the accumulation of precious metals, and they wanted to reach that with active foreign trade. (Sikora, 2004)

The theory of Smith and Ricardo

The role of the human capital – thus indirectly the education – in the economic growth was pointed out by the two prominent figures of classical economics: Adam Smith (1723-1790) and David Ricardo (1772-1823). Smith in his book The Wealth of Nations (1776) resisted to the physiocrat and mercantilist philosophy.He rejected that the trade or the natural factors would be an unilateral building blocks of the economy, and economic growth. In the view of Smith the productive human work was the source of richness. With the help of Ricardo's Labour theory of value the price of the good can be determined and the relationship between them accordingly how much labour was used during the production, hereby he categorised them to cheap and expensive categories. Ricardo's theory has contributed significantly to the analysis of the economic relations in 19th century. According to the theory the country's welfare, so in the mean of the initial theoretical examinations the economic growth based on trade, which depend on the exploitation of the comparative advantages and not to make any administrative obstacles in front of the international flow of goods. (Smith, 1992; Samuelson & Nordhaus, 2009; Bartha et al., 2013)

The Marxist theory and it's afterlife

Karl Marx (1818-1883) extended Ricardo's Labour theory of value, and according to it the value of different goods is determined by the inherit amount of work (expense), so the work is the value holder, that's why the physical work is the only value making working activity. Marx's view that the intellectual work is unproductive, it does not create value. Today we know that is not true, the value made by the unproductive workers usually intangible – for example increase the reputation of the company or can improve the general social esteem – nevertheless if it is difficult to quantify but we talk about a value-crating process. Jean-Baptiste Say opposed to Marx's theory and he emphasised the intellectual labour's ability to create value-added against the physical labour. He thought that the intellectual activity, the thinking provided the conditions of the physical work so that's why the physical work make value. (Deane, 1997)

Theory of Schumpeter

Joseph Schumpeter (1883-1950) was significantly differed from the previous growth theories. According to him, which was explained in his work, The theory of economic development, that the innovative, the initiative, and the enterprising people have a key role. (Sikora, 2004; Mátyás, 2003)

Then after the Second World War the research that dealt with economic growth has two significant groups. One of them emphasized the endowment of physical capital, while the other one examined the effect of the human capital on economic growth. (Sikora, 2004)

Economic growth theories based on physical capital

The economic growth theories which are based on physical capital related to two economic schools, to the growth theories which are based on Keynesian theory and to the neoclassic economic theory. The model which is based on the Keynesian theory related to the American Evesy Domar and the English Roy Harrold. According to the theory the output is depended on the capital, therefore on the supply of machines. According to the Harrod-Domar theory the market developed with the result of investments so the Gross National Product (GNP) growth is the result of investment in physical capital. As the result of it the production function is a linear function (Mátyás, 2003; Harrod, 1948; Domar 1957):

$$Y_t = aK_t,$$

where Y is the output, K capital supply, MPK is the marginal productof capital

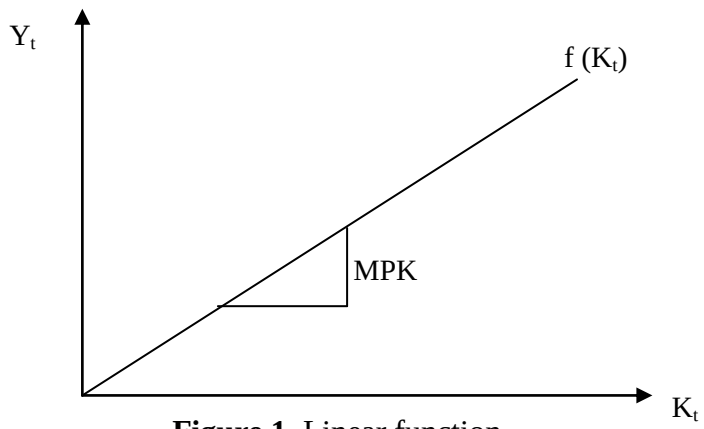
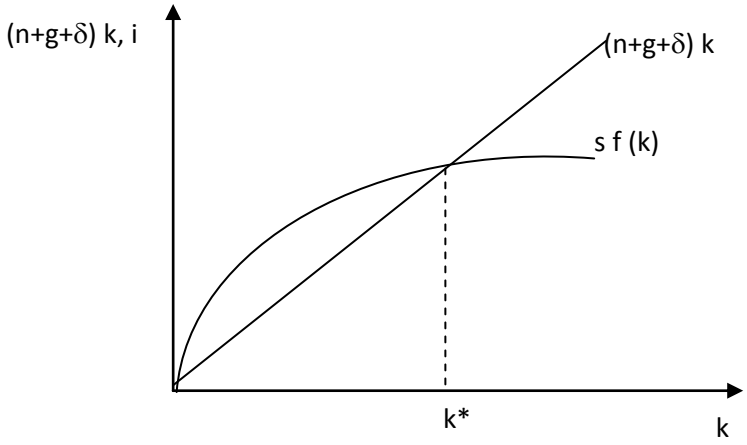


Figure 1. Linear function

Source: own editing

Hicks separated the investments into two groups, one of them was the autonomous investment, and the other one was the induced investment. The first one is the independent variable of the growth model. According to Hicks' economic theory which was published in 1950 the autonomous investment triggers the growth process, so that's why it can be the source of economic growth. According to the theory that was made by Harrod-Domar pair of authors, the given period's output is determined by the capital which is available at the beginning of the period. This causing the capital based production function's marginal capital will be a constant value. The model is dealing with only the physical capital as a factor of

production because, the evolving economic crisis (1929-1933) resulted in rich labour force. The capital created the bottleneck as a factor of production, and this effect could developed the Leontief production function. (Szentes, 2011; Sikora, 2004; Deane, 1997; Mátyás, 2003)
The neoclassical economic growth theory of the American Solow, which is a supply-side approach assumes substitutability of factors of production. The technological progress, the population growth and the depreciation connected to the national economy production function, and with the help of it the economic growth can be determined. According to empirical research, between the years of 1909 and 1949 the labour productivity doubled, which is only one-eighty part attributable to the expansion of physical capital, the residual – major – part resulted because of the technological progress – according to him. (Solow, 1994; Mankiw, 2005)



Where the n is the population growth, g is the technical progress, δ is the attrition of capital stock, i is the investment rate, k is the capital stock per capita

Figure 2. Solow growth model
Source: own editing

Growth theories based on human capital

The first important stage of the growth theories which are based on the human capital relied on the growth-accounting, the prominent figure of which was the Russian Simun Kuznets. In his theory he examined the long-term growth processes in a complex way, he determined as a combined effect of many factors, on which – in his opinion –the population demographical characteristics, and the economic distribution of it, the structural changes in population, or the technical progress, the capital, the change of labour or the change of the social environmenthas an impact. Kuznets was awarded the Noble memorial prize in economics, because he took a significant part in determining a clear concept of the GDP, and until today the Gross Income per capita is the important element of economic rankings between countries. In addition to this Kuznets detailed indirectly related costs – such as educational costs – which have an influence on the size of national income. In his view, the condition of the long-term GDP growth resulted from in addition the physical capital stock growth, the

technological advance and the human knowledge development and expansion. With the further elaboration of the theory of Kuznets it can be defined that the present return of unit of a physical capital is higher than the productivity of a previous period, because the economy's general knowledge pool is increased, which we called the knowledge production. (Sikora, 2004; Kuznets, 1981)

After the Conference of Capital Investment in Human Being which was held in the United States in 1961,the importance of the human capital in the economic growth was widely accepted. In this topic Becker examined the investment and return of the human capital investment. The conclusion of Becker's published work can be interpreted as for future benefit we make an investment – furthermore we resign from a current consumption. According to the author the result of the so called family production is the future benefit, where the future cumulated income of one child is correlated with the bringing-up, so with the measure cost connected to education. According to this theory, those who have higher education they achieve a higher level of lifetime earnings. (Sikora. 2004; Becker et al., 1990)

Becker presented the importance of investment of human capital in the microeconomic level (household), while the Human Capital the work of Schultz published in 1972 was a macro approach. According to Schultz the human capital is similar to the physical capital in that to obtain the human knowledge is a long, costly process, which has a continuous return. As the result of it, it should be realised any kind of investment in human capital – for example the fee-paying education – profitable in long run and have additional benefits in the lifetime earnings. In his empirical examinations he identified that in the period after the Second World War the economic growth in respect of the profitability of total capital was approximately the same, however the profitability of the physical capital had decreased over time, and was replaced by the human capital. (Sikora, 2004; Schultz, 1972)

Dension made his examination in the USA between 1948 and 1981, and stated that the Gross National Product (GNP) average annual growth rate was 3.2% to which the contribution of physical capital was one-sixth, and the amount of work expansion contributed the same amount. The remaining part – four sixth – the growth residuum, which contains the education, the expansion of knowledge and the innovation of Schumpeter, the quantifying of them is a difficult task. (Sikora, 2004; Magas, 2002)

The main element of the growth theory developed by Lucas is concentrated on the human capital and the cumulation of knowledge. The Endogenous growth theory was born before the other – for example Nelson-Phelps, Uzawa – growth theories and had a new structure. It contains the technological parameter, the stock of human capital, the latter to determine the optimal allocation is the task of the economic decision-makers: who are the active labour market participants, and who take part in the expansion of knowledge. According to Lucas' theory the expansion of the human capital stock is determined by the invested efforts, which confirms Dension 33 years overall research. (Valentinyi, 1995; Lucas, 1990)

For the new human capital development, the growth theory which was started by Denison, Lucas herded to a new way, was a good basics for it. Becker-Murphy-Tamura presented that the human capital stock allocation does not influence significantly the economic growth rate, if the country's human capital stock is low. According the theory of Azariadis-Drazen the human capital stock has to reach a certain level, to start the economic growth. (Valentinyi, 1995; Becker et al., 1990; Azariadis & Drazen, 1990)

The contribution of Romer and Lucas for the growth theory was significant, they greatly transformed the previous mentality. According to Romer if we tested a not convex product set and not every variable of the production function is concave, it can be stated that the technological knowledge of public goods become available for everybody over a period of time. Breaking with the classical perception of the growth theory, the doubling of the expense of the factors, that purchased on a competitive market resulting in doubling of output volume. However, in the case of goods that originated from non-competitive market (e.g.: public good) the multiple use of the society knowledge as a multiplicative effect increases the output, so increasing the level of knowledge with "x" amount increase the output more than the amount of "x". (Romer, 1990; Meyer, 1995)

THE CRITIQUE OF THE NEOCLASSIC ECONOMICS

Adapting the neoclassical models into practice is difficult because of the many simplistic conditions, such as the examination of two countries, production of two goods, two factors of production used for production, spatial and temporal constraints and dissolve the static approach. In addition, than is also the problem market ideas of neoclassical economy, such as the effectiveness of the market, the perfectly pure competition, the homogeneity of factors of production etc. The neo-classical growth theory overlooked with many elements during the investigation, which I detailed in the summary of literature, such as the technical development, human capital, or the existence of state interventions. (Mátyás, 2003; Szentes, 2005)

The changes in the world economy during the 20th century, such as the appearance of the stagflation, the end of the gold standard system, the oil crisis, he strengthening of European integration and the disintegration of the Eastern block, or the emergence of new economic powers in Europe and outside the United States, drew attention to the applicability of earlier models limitations and marked new research directions. (Szentes, 2005)

THE APPEARANCE AND SPREAD OF NEW INSTITUTIONAL ECONOMICS

During the operation of the economy and society several phenomena can be found, which go beyond the neoclassical economics inquiry, however it has a significant impact on its operations. (Bartha et al., 2013)

The Institutional Economy birth was induced by the global politics and scientific changes during the two world wars. At the same time in the field of neo-classical economythe mathematized, formal models strengthened. These models do not describe macroeconomic operations country-specific or case-specific, but describe it in general. So for a few decades they had a leading role and appropriated the explanations of the economic discipline events, with their model which had a high level of abstraction.(Hodgson 1998)

The reason of the marginalization of the institutional economic is the lack of fixed theoretical basis, and the lack of disciplinary laws existence. In the last half century came to the fore by created the world economic change incomplete,or defective neoclassical theories resulted.

The researchers of the institutional economics tried to modulate the mistakes inherited in the neoclassical explanations, and overcome the weakness of the model. So it formed the neo-institutional economic trend, where the focus of the analysis is on the institutional system and its embeddedness, however it does not reject the neoclassical trend theories. (Brousseau & Glachant, 2008)

The economic thinking that are explanatory power of institutions based on interdisciplinary approach, it adapts political science, sociology, psychology, and other typically other social science researches results, and with it they seek to describe the functioning of the economy, or the part of it. In addition, the institutional economics formalised mathematical modelling, used other methodological tools used by social sciences for investigation such as case studies, historical analysis, field studies, etc. The followers of institutional economics interpret their knowledge as the complement of the classical economics, rather than a current struggle for life and death as the enemy. During the research, starting from the neoclassical model it can be determined the economic growth is the result of factors of production and productivity. However the neoclassical theory does not detail the productivity, for that the institutional trend provides explanation. In the field of institutional economics, researches focused on the economic growth examined for example the efficiency of the market, the legal system operability, education intensity, labour organization, or even the corruption and other moral, ethical issues that media can span. Based on this research, the first step in the field of institutional economics is the factual documentation of the changes in the economy, and gathering the basis, then the determination of the causal relationship between the variables.

In my opinion, the strength of the new types of economic analysis originated from with the improving the neoclassical models try to prove, or refute the hypotheses set on the operation of the economy, while continuously integrated the previous experiences into the model, functions as an evolutional theory. All this might be necessary, as assumed by the classical economics rationality disprove the empirical researches, economic participants are often unable to get to know the full set of information of the whole market (over-supply of information, or lack of information), and their decision are not controlled by rationality, but in many cases they decide on emotional or random basis. (Bartha et al., 2013; Williamson, 2000; Rutheford, 1996)

CONCLUSION

With the writing of the article I had the opportunity to get to know the cause of the economic growth and development and had a view of the main line of mainstream and institutional theories founding, and theoretical contributions to the theory of economic growth in researching.

Table 1. How the different theories contributed to the development of growth theory

Author(s)	Contribution to the theory of economic growth	Role of human capital	Role of education
Quesnay (physiocrat)	Exclusivity of agricultural income-generating ability.		-
Mercantilists	Wealth, prosperity is the accumulation of money and precious metals through an active foreign trade.	-	-
Smith	Productive human labor legacy is the wealth.		-
Ricardo	The dominance of labour theory of value in the process of production of a product, the theory of comparative advantage in international trade.	-	-
Marx	Productive work is value-bearer.		-
Say	Intellectual work the bearer of values, physical work can also create value by it.		Intellectual work depends on education level.
Schumpeter	Role of innovations: innovative, proactive, and enterprising people role.		-
Harrod - Domar	Economic growth depends on capital adequacy.	-	-
Solow	Population growth, technological progress per capita and the impact of the amortization on the economy.	The growth rate of human capital determines the economic growth.	-
Kuznets	Complex analysis of long-term economic growth. (e.g.: demographics, technological advances, changes in capital and labor, social, environmental change)	Demographic and sociological characteristics of human capital.	-
Becker	Learning interpret as an investment.	-	Longer education time means higher investment.
Denison	The education, knowledge expansion, the Schumpeterian innovation are the part of Growth residuum.		Education and knowledge expansion.
Lucas	The importance of the role of human capital and knowledge accumulation. Determination of the optimal allocation of human resources.		-
Becker – Murphy - Tamura	Human resource allocation will not affect the economic growth if countries have less human resources.		-
Azariadis - Drazen	Critical level of human capital, which triggers economic growth.		
Romer	Knowledge level multiplier multiplicative effect on emissions.		Knowledge level multiplies the economic growth.

After writing the article the direction can be targeted for further research focusing on institutional economics research in the field of higher education and economic growth.

REFERENCES

AZARIADIS, C., DRAZEN, A. (1990). Thershold Externalities in Economic Development. Quarterly Journal of Economics, 105.

BARTHA, Z., GUBIK, S. A., SZITA, T., K. (2013). Intézményi megoldások, fejlődési modellek. Miskolc: Miskolci Egyetem.

BECKER, G. S. ET AL. (1990). Human Capital, Fertility and Economic Growth. Journal of Political Economy.

BROUSSEAU, E., J.-M. GLACHANT (2008). New Institutional Economics, A Guidebook. Cambridge: Cambridge University Press.

DEANE, P. (1997). A közgazdasági gondolatok fejlődése. Budapest: Aula Kiadó.

DOMAR, E., V. (1957). Essays in the Theory of Economic Growth. New York: Oxford University Press.

HARROD, R., F. (1948). Towards a Dinamic Economics. Some Recent Developments of Economic Theory and their Application to Policy. London: Macmillans.

HODGSON, G., M. (1998). The Approach of Institutional Economics. Journal of Economic Literature.

KUZNETS, S. (1981). Struktúra és növekedés a modern gazdaságban. Budapest: Közgazdasági és Jogi Könyvkiadó.

LUCAS, R., E. (1990). Supply-Side Economics: An Analytical Review. Oxford Economic Papers, 42.

MÁTYÁS, A. (2003). A modern közgazdaságtan története. Budapest: Aula Kiadó.

MAGAS, I. (2002). A kapitalizmus felülnézetből. A piacok és a természet logikája. Budapest: Aula Kiadó.

MANKIW, N., G, (2005). Makroökonómia. Budapest: Osiris Kiadó.

MEYER, D. (1995). Az új növekedéselmélet. Közgazdasági Szemle, XLII. évf. 4. sz.

MEYER, D. & SOLT K. (1999). Makroökonómia. Budapest: Aula Könyvkiadó.

ROMER, P., M. (1990). Are Nonconvexities Important for Understanding Growth? American Economic Review, Papers and Proceedings, vol. LXXX.

SCHULTZ, TH. W. (1972). Connection between natural resources and economic growth. In: Eicher, D. – Witt, D.: Agriculture in Economic Development. New York.

SIKORA, T., G. (2004). Humán erőforrások gazdaságtana. Miskolc: Bíbor Kiadó.

SMITH, A. (1992). Nemzetek gazdasága, e gazdaság természetének és okainak vizsgálata. Budapest: Közgazdasági és Jogi Könyvkiadó.

SOLOW, R., M. (1994). Perspectives on Growth Theory. Journal of Economic Perspectives

SZENTES, T. (2011). Fejlődés-gazdaságtan. Budapest: Akadémiai Kiadó.

SZENTES, T. (2005). Világgazdaságtan, Elméleti és módszertani alapok. Budapest: Aula Kiadó.

WILLIAMSON, O., E. (2000). The New Institutional Economics. Taking Stock , Looking Ahead. CA, Berkeley.

RUTHEFORD, M. (1996). Institutions in Economics. The Old and the New Institutionalism. Melbourne.

VALENTINYI, Á. (1995). Endogén növekedéselmélet. Közgazdasági szemle, XLII. évf., 1995. 6. sz.

THE SYSTEM-WIDE APPROACH AND PERFORMANCE MANAGEMENT OF THE LIFELONG LEARNING

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SUMMARY

Lifelong learning is about strategy drafting and accepted by the European Union so it have been becoming increasingly important in Hungary, as well. This strategy results in the improvement in quality of life for the society, those who living in the Member States. The main aim of my publication is to examine the possibilities of our country, in order to be accordance with the Union strategy. I'm dealing with specifications of this sector, the examination of the levels of lifelong learning and the systematization of the levels.
During the examination I deal with the sectoral specifications, the investigation of the Life Long Learning levels, and to arrange these levels into a system. I would like to prove through my publication that learning is useful and important at all times of life, furthermore studying has positive effect on the competitiveness-driven labour market.

THE LIFE LONG LEARNING DEFINITION'S DEVELOPMENT AND THE EXAMINATION OF THE DEFINITION'S CONTENT

In order to deal with the theme of lifelong learning in greater detail, it is important to examine the appearance of lifelong learning and the development of its definition(s). I summarize the development of the definition in international and national way in the following table.

Table 1. Lifelong learning historical structure

	International level	National level
1970	UNESCO conference- Introduction to Lifelong Learning- Paul Lengrand.	
1972	UNESCO Commission – The right to Lifelong learning and its necessity.	
1973	OECD- strategy for Lifelong learning.	
1990s	The definition appears again in the field of education.	
1993	The Maastricht Treaty places Thy system of European Economic Community based on economic relations on a new basis.	
1996	Learning is hidden treasure- as UNESCO defines the definition.	
1997	The Communication from the Commission about the role of universities in the Europe of knowledge.	
2000 November	Mrs. Viviane Redingintroduced „ The Commission Memorandum" about lifelong learning.	
2002	Council decision-The central role of lifelong learning in the knowledge society.	
2005 September		The Hungarian strategy about lifelong learning is drafted.
2006	Each member states shall draft its national strategy about lifelong learning.	
2007-2013		Determination of the main action and support trend.
2014-2020		Development of framework strategy.

Source: own work

As it can be seen from the table, the 70s is marked as a milestone, since Paul Lengard made a presentation at the conference of UNESCO about the Introduction of lifelong learning, which received a lot of the attention.Reflecting to this the UNESCO created an international commission which task was to make a survey which reflects the present situation of the education on international level.(Fieldhouse 1996). This survey e known as the Faure report, for the simple reason that the leader of this commission was Edgard Faure. Based on this

report a so called student society should be created and emphasis should be place on the individual right to life long learning and last but not least the need for quality ofit.(Faure,1972) At this time the concept was formed which emphasizes the possibility for studying should be ensured for more people and the situation of disadvantaged people should be given high priority. (Jarvis 1983,1995).Not only the UNESCO but also the OECD considered the lifelong learning as an important field of the education since it responded with a report to the situation. The report called The strategy for the lifelong learning. This report is particulary great emphasize on the global economy, competitiveness and the connection between learning and work. OECD considers very important the rule of basic education, however it thinks that education beyond compulsory school age is very important, in the view of competitiveness.(Dave,1973) In the next ten years the importance of this area is a bit neglected then in the 90s they realized that it is worth dealing with lifelong learning in order to reduce unemployment. Thanks to this the re-mapping of lifelong learning, development of a precise definition and drafting strategies had started again. In 1996 a new report have been published, it is called the Delors-report, which appeared in the UNESCO publication, called Learning is a hidden treasure.(UNESCO REPORT) In this publication the definition of lifelong learning can be seen, which is the following:

On the eve of the 21st century the education has the responsibility to help everyone gaining dynamic knowledge from the childhood throughout life about the world, other people and himself. This educational continuity, which accompanies the whole life while also taking into account the social dimension has been called “Lifelong education” by the Commission.(Medel - Ohsako, - Mauch, 2001)

This definition argues for the individual development and learning says that it is a key which helps to adapt the expectation of our century and helps to the individual to respond to the more dynamic changes. At the same time OECD responded with its own programme which is called Lifelong learning for all. As the title suggests OECD's aim to ensure lifelong learning for everyone. This concept has evolved due to the fact that the periodically recurring learning of individuals can be utilized in all aspects of life. The concept mentions three main targets which are the followings: personal development, social inclusion and economic growth. The OECD wished to present in more detail the thoughts being behind the programme with the following conceptual definition:

This form of learning involves all forms and scenes of individual and social development- formally in primary school, vocational education, higher education and adult training educational institutions or informally at home, at work and in the community. This system-wide approach focuses on the expectation related to the skills and knowledge which everyone should have regardless ofthe age. It highlights the need for children at an early age to be prepared for lifelong learning and efforts should be made to ensure that all adults, who need training, will receive the opportunity for learning whether employed or not.

Dealing with the topic of lifelong learning it is essential to present the definition drafted by European Council:

Lifelong learning involves all formal informal and non-formal education from the pre-school age to the pension age. So this definition includes all the activities which happens in order to develop knowledge, abilities and skills personal, civil, social and employment-related perspective.(2002/C 163/01 Council Resolution on lifelong learning)

As it can be seen the definitions are different, however some parts of it are contain all the definition which are the followings:

- Individuals from the age of childhood, time should be given to that part of the learning.
- The centre is the individual's development is to obtain a dynamic knowledge.
- The continuity is mentioned in both the two concepts. However the minimum school-leaving age is 16 (in Hungary) but it should be encourage individuals acquiring knowledge in their older age.

It is hard to focus on one single definition because complete definition made up of several. In each case it must determine the common points of definition and the elements which is found important and essential. In my point of view the system-wide approach which is prudent to mention, since the process forms a system and this area should be handled as a system, as well. In each cases individual has to think that the education is the area in which is worth investing time and energy. However the target is missing from the system-wide approach definition, why individual has to study what the main aim of this area. The definition accepted by the Council clearly identifies these targets.

We had a leap forward in history namely the European Union drafted the Lifelong learning definition in 2002. , so it began to fill a central role. It sees the definition as the tool of combating problems related to competitiveness, employment and economic growth.

These measures showed that the most important capital is the human being and the main tool of developing individuals is the lifelong learning, so each Member States shall draft its own strategy about Lifelong learning until 2006. Hungarian strategy was completed by September 2005.

THE SYSTEM-WIDE APPROACH OF LIFELONG LEARNING STRATEGY

The levels of lifelong learning programme varies from country to country because the national emphasis is different. However the main idea is to show the growth in employment, in several countries. It is important to mention the main directives of the strategy, published and accepted in 2005 which are the followings (www.nemfi.hu)

1. strengthening the enabling role of the education
2. strengthening the connection between education and economic
3. increasing the effectiveness of education
4. improving the quality of training

The idea of extension of learning in time and space has been already formulated earlier. However the recent events had promoted the elaboration of the idea and the connection with specific objectives. The next chart helps us to see through the concept and it can present for us - in detail - how individual elements are constructed and how they help to achieve the main aim.

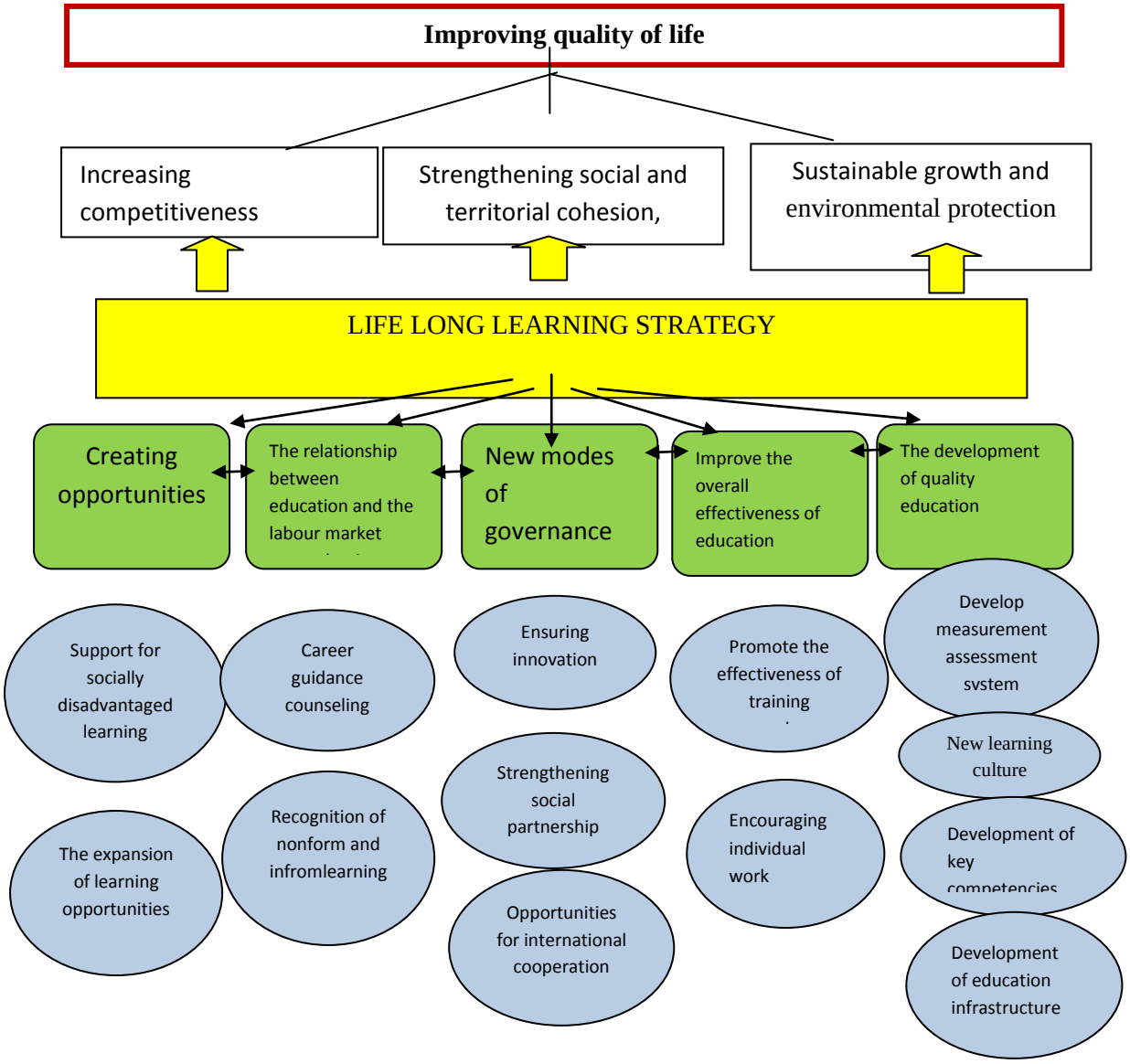

Figure 1. Life long learning strategy system in Hungary
Source: Based on Life long learning strategy Hungary

As we can see the strategy is divided into five main parts which are marked with green. Some parts of these elements have been already mentioned at the directives of the strategy. However it is important to talk about what kind of actions belong to these directives (Actions can be see with blue colour in the chart) I think it is difficult to systemize this area because it is extremely diverse and concentrates on lots of territories. It is established that certain areas are related to each other. Furthermore it should pay attention to the fact that interaction of these

areas helps to achieve the main objectives. On the word system not necessarily the chart mentioned before is the first thing we think about however the question that how the determination and practise works in certain levels and areas. Hereafter I present the levels and specification of this area.

THE LEVELS AND SPECIFICATION OF LIFELONG LEARNING

It is essential to mention, that lifelong learning is important for everybody, however the mandatory school age is 16 in Hungary, so I did my research over the age of 16. It is worth to examine the willingness for further education in this period and the impact of the qualifications gained after graduation and finding job on the individual performance and how it can improve the quality of life

What kind of specifications does the lifelong learning have?

If we think about education the first is formal education we associate. However non-formal education and informal education should be handled as the part of the adult training and all the theoretical and practical training which we can access nowadays, as well.

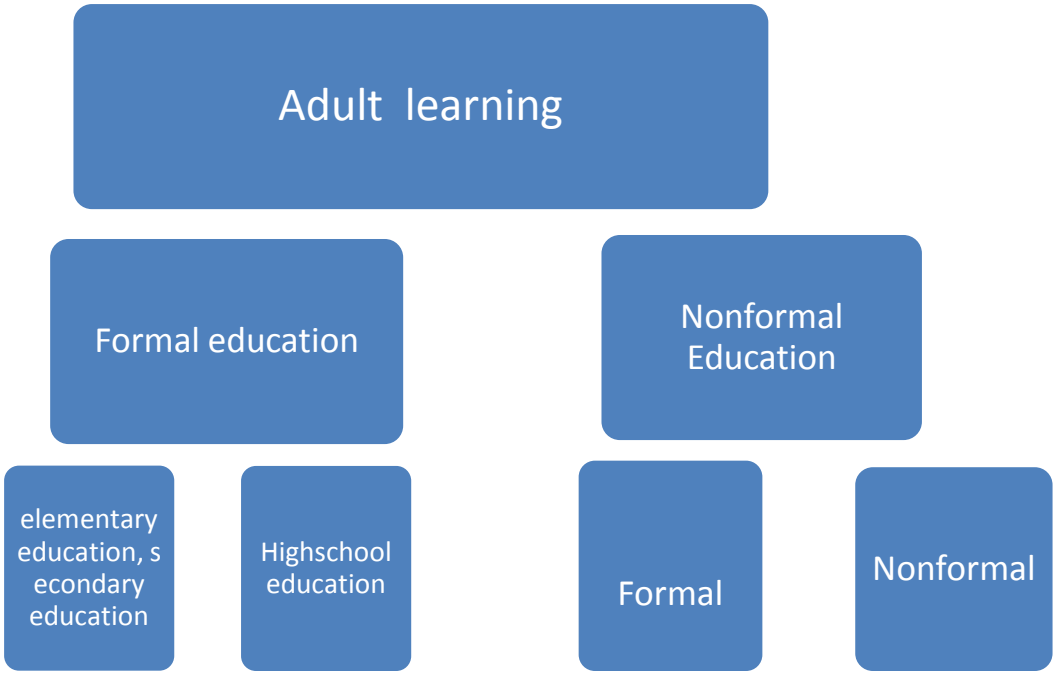

Figure 2. Adult learning construction

Source: own work

The figure above illustrates what kind of groups we can create in the area of adult training. Basically dual division prevails as the formal education and non-formal education. First I show the formal education system, it is more fundamental and well-known than the non-formal education system

According to the Hungarian laws qualifications can be completed in this form of the education exclusively. Explaining this statement more, I have to interpret what we call educational qualification. I mean completion of elementary education, secondary school leaving certificate (general or vocational secondary school) and college fund or diplomas at masters. Professional skills can not belong to the educational qualification. The adult learning happens in formal education system. It is worth to note that diplomas are very popular nowadays, so the number of university applications has been started to increase in the last years. The definition of informal training can not be explained as easy as the training form mentioned before. The informal trainings like nationally registered trainings and qualifications obtained in training centre, furthermore obtaining driving licence belongs to this form of training. The definition of non-formal training is not as concrete because an embroidery study group or a handicraft club can be called as non-formal training, where the end of the course individual obtains only the knowledge but not necessarily diploma or any certificate. The informal education is present during all life within formal education and non-formal education as well. It is essential that individual cooperating and contributes its own success thereby improving the quality of life.

If we examine the levels of lifelong learning we can mention the information included in the chart, since the preliminary education ensuring offering basic level of qualification then the acquisition of secondary skills is possible in secondary grammar school or in vocational school, and university studies are included in formal education system.

CONCLUSION

I think it is important to know these tiny parts of the lifelong learning theme presented before in order to we can continue examinations in the near future. It can be seen that lifelong learning is not new definition however in Hungary it started to known and started to take measures, draft the strategy and apply it from 2000. Furthermore, I think it is useful to present the definition. As we can see in my presentation the definitions are different all have same elements, which mention that education is a process which start at the age of 5-6 and continues all life. It is not necessary to study in the school bank, we can acquire knowledge beyond any educational institution and this kind of knowledge contributes the rise in standard of living and obtaining a stable position in the workplace, as well as formal education. The introduction of the system is also essential because in order to deal with the issue in a detailed way and take in accordance with performance evaluation, it is need to know which sector and age are suitable for continuing the research.
In conclusion, I think that this short summary aroused thoughts into the readers mind and service as an introduction in the topic of the lifelong learning.

REFERENCES

DAVE, R. H. (1973): Lifelong Education and School Curriculum. UNESCO UIE, Hamburg.

ECD (Organisation for Economic Co-operation and Development) (1973): Recurrent education: a strategy for lifelong learning.

http://epa.oszk.hu/00000/00035/00108/2006-11-3l-Ohidy-Lifelong.html

FAURE, EDGAR (1972): Learning to be. The world of education today and tomorrow. UNESCO, Paris, International Commission on the Development of Education.

FIELDHOUSE, ROGER (1996): A History of Modern British Adult Education. NIACE, Leicester, 5-6. old.

http://janus.ttk.pte.hu/tamop/tananyagok/life_long_learning/3_az_lllparadigma_elzmnyei.html#21b

JARVIS, PETER (1983, 1995): Adult and Conituning Education. Theory and Practice. Routledge, London and New York, 16-42. old

MEDEL-ANONUEVO, C. - OHSAKO, T. - MAUCH, W. (2001): Revisiting Lifelong Learning for the 21st Century. UNESCO UIE, Hamburg, 2. old.

http://www.nefmi.gov.hu/europai-unio-oktatas/egesz-eleten-at-tarto/egesz-eleten-at-tarto-090803-2

http://webcache.googleusercontent.com/search?q=cache:ZySP_MmoXckJ:www.unesco.org/education/wche/+&cd=1&hl=hu&ct=clnk&gl=hu

OECD (1996): Lifelong Learning for All. Meeting of the Education Committee at Ministerial Level, 16–17 January, 1996, Paris, OECD.

UNESCO (1970): An introduction to lifelong education.

UNESCO (1972): Learning to be. The world of education today and tomorrow.

UNESCO (United Nations Educational, Scientific and Cultural Organization) (1996): Learning: the treasure within. Report to UNESCO of the International Commission on Education for the Twenty-first Century. Vendome.

BASICS OF MARKET-LIKE OPERATION IN THE BUSINESS SERVICES

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SUMMARY

The basic element of business service provider model is the competition in the daily operation of service centres. This competition is natural factor on the business service market, e.g. each outsourcing service providers need to compete continuously with other providers for acquiring new and retaining the current customers considering of price, quality and other different factors of service compliances. If the outsourcing provider company underperforms in these indicators during the partnership and there is a rigorous and consistent service legal agreement between the two partners then the provider could even lose the client. This means a clear market-based operation that after a time becoming the part of corporate culture and intercorporating the thinking about the daily business. If the service recipient is satisfied with the partnership then the provider could improve the quality of service and decrease the operational cost to be more efficient and competitive on the market.
This paper explores the different elements of market-based operation that is fundamental in the various business service providing. The research explains the differences of its significance in the business models focusing on the different motivations, competencies and relations.

INTRODUCTION

In the last decades the business services are reported as the fastest growing area of the European economy. For this reason, in addition to the Lisbon Strategy in 2003, the European Commission adopted a strategy for the development of the services that is intended to analyse the performance of European companies by the business competitiveness of services and their contribution. This document not only contained an analysis, but also a strategy for European economic policy to the development of business services. The business services is a generic term that covers a wide range of services, but mostly inter-company (business-to-business, B2B) transactions. These intermediary services include software development, labour hire and various counselling through a translator, or even bookkeeping activities.

"Business services is a set of service activities that – through their use as intermediary inputs – affect the quality and efficiency of the production activities, by complementing or substituting the in-house service functions."(Rubalcaba & Kox, 2007, p. 3)

The business services aspart of the production services are within the business-related services. It consists two broad groups of service activities, on the one hand the operational business services, which provide a relatively standardized services and the knowledge-intensive business services, which are generally customer-specific services with relatively

high knowledge content. Thosefeature of business services that it can be provided in-house as well, could distinguish them from those other business-related services, which can only be obtained only from other external service provider (e.g. energy, banking, insurance, and telecommunications).(Rubalcaba & Kox, 2007)
In the business services sector the most important two operating models of global sourcing are the outsourcing and the shared services. Of course they have many definitions in the literature but to introduce two favourite of them that could be seen below.

"The outsourcing is essentially nothing more than the transfer of activities previously performed within the company outside contractors."(Hinek, 2009, p. 11)
"Shared services is a collaborative strategy in which a subset of existing business functions are concentrated into a new, semiautonomous business unit that has a management structure designed to promote efficiency, value generation, cost savings, and improved service for the internal customers of the parent corporation, like a business competing in the open market."(Bergeron, 2003, p. 3)

Because of the lots of similarities in the goals and the tools used in both model, many expertsin the literature think that the shared service concept is only one subtype of outsourcing. Because of this there are many confusingterms in the literature like"SSC outsourcing" (Thorniley, 2003), "captive outsourcing"(Futó & Klein, 2007)or "internal outsourcing"(McLemore, 1997)(Góber, 2004)which cover the shared services solution.
But it is important to emphasize that there are more fundamental differences between outsourcing and shared service models. The simplest way to illustrate the most important difference that all the (narrow and extended) definitions of outsourcing state that "outsourcing"means transferring a former internal function to an external (not the same) organization. Thus, in the relation of logical interpretation of sourcing models, the "outsourcing" means crossing the organizational boundaries. In the contrast of it, all the (narrow and extended) definition of shared services emphasizes that here is no transfer of function, but rather a reorganization, that meansthe concerned function remains within the organizational boundaries in some way. This "some way" is realized in many ways but typically in an internal service centre. Terbócs (2007) definitional approach could help to understand what a shared service centre is:

"... from the service recipient not fully independent business unit that providing services for more organizational departments." (Terbócs, 2007, p. 17)

This definition enables to integratea variety of different shared service solutionsof the business practiceinto a theoretical framework. From the outsourcing the main distinctive feature of the shared service centre is that it is not totally independent of the parent organization.
Establishing a shared service centre is only one option for optimization of service functions. There are another options like optimization of business processes and the reengineering. To decide which processes need to optimize it is worth to analyse business processes in the viewpoint of volume, strategic importance and process costs. It is not necessary to optimize

those services that the company can deliver in-house cheaper than external providers. But if services are less important strategically company could consider to buy some part of services from external providers. However if the cost of service providing outweighs the level of market competition then the process must be optimized. In the strategically key processes the classical optimization methods should be used because its cooperation with the core activities the organizational consolidation is not beneficial and outsourcing could not mean as an option. If the processes are less important strategically optimized it is used to optimize in the form of consolidation but a company has to decide which location is better for service functions, the corporate centre or a shared service centre that operates as a separate organizational unit. In this situation the outsourcing can emerge as a real alternative. (Marciniak, 2013)

If we analyse what is the most important distinguishing point between the simple centralization and the shared service solution than we could say this is the market-based relationship in the service provision. Since the shared service model also means an internal service delivery but there is market-based relationships between the service centre and the service recipient organization or department. This relationship is fundamental to the entire shared service model, as it determines what level of benefits will be achieved through the model, is there any incentives that promote the further development of organizational efficiency to a higher service level or how independent could be the service centreas a division in the whole organization, or what kind of operational difficultiescould the centre overcome in the everyday operation.

THEORETICAL BACKGROUND

Transaction cost theory

The issue of competition within the organization leads back to Coase, who in his transaction costs theory (Coase, 1937) made distinction between market and hierarchy as two endpoints on the coordination scenes of organization and the hybrid solutions between the endpoints.

It is important to emphasize that the two solutions are not so far apart. Some researcher (Kapás, 2003)has recognized that the hierarchy (company) and the market is also very similar to each other and, indeed, they are interpreted on the basis of each other. That means the market and the company is not just an alternative to other, but complement each other as well. The subject, location, time, institutional contexts and social relations of the transaction determined which coordination mechanisms are able to effectively coordinate the relevant transaction. Both the market and the company as well as hybrid solutions can be effective in transactions in certain institutional environment, but there is no guarantee that an effective institution ever created. (Kapás, 2003)

A service centre affiliated to the classical organizational hierarchy is monopoly in service delivery and does not need to endeavour to improve the quality of service and reduce the cost of it. In this case the service centre could become too comfortable and take the things for granted and it reduces the operational efficiency. In order to dislodge the service centre from this convenient situation the management of the parent organization needs to break the

monopoly and have to compete it taking interest in more economical operation. Indeed in order to increase the efficiency of the hierarchy it should be replaced or more precisely be combined with a market or market-based solution.

Resource dependency theory

The resource dependency theory is sometimes classified as one of contingency theories, but the interpretation of environment is different from other contingency theories, because here the environment means those organizations which the organization has exchange links and cooperation with. The organizations are interested in maximizing their resources and ensure their continuous supply, avoid the uncertainties and to minimize dependence on others. According to Pfeffer and Salancik the resource dependency can be regarded as important input and output for organizations, where it is essential which organizations control them because the resources are such company-specific and operational factors of production, which can be purchased on the markets as well. The resource dependence theory interprets the organizational ability as well as a routine or a set of routines, where it is relevant, how the organization performs a simple or more complex activity. (Gelei & Schubert, 2006)(Szolár, 2009) Among the co-operating organizations the relationship-specific investments have key roles, which is classified by Bensaou on basis of the buyer and supplier relative importance to each other and distinguished four basic connection types (Király, 2011):

- market exchanges: no party will invest in specific projects in the form of relationship (the partners retain their independence);
- captive-buyer company: the buyer invests unilaterally in lay-specific assets (the supplier is dominant);
- captive-supplier company: the supplier invests unilaterally in the relationship (the buyer is dominant);
- strategic partnership: both cooperating party has high relationship-specific investment (mutual dependence).

In practice, all four connection types exist but due to the mutual benefit and satisfaction of the partnership efforts (win-win relationship) in long-term only the market exchange relations and strategic partnership could survive.

In the case of shared service centres the dependency is special because the previously decentralized organizational functions will be centralized be the centre of the service provider, the company dependent on, however, the dependence on two-way and reciprocal, because by default the service centre, the company owns, so its existence-operation funding resources to the level of care depends on the parent company. The company's dependence on the extent of the service centre is much smaller than in the case of a service is outsourced to external providers. (Marciniak, 2014)

RESEARCH QUESTION, METHODOLOGY AND LIMITATION

The shared service centre is essentially market participants at a certain extent. But it is an interesting question, what kind of parts consists this market-based relationship between the

provider and the recipient of the service which parts departments and how it is working. The results of the research literature examined in an interview series. It was also tried to reveal what other factors play a role in the market-based operation. All of these factors have collected in a simple market-based operation model. The relevance of the collected factors were examinedin a questionnaire and successfully validated in the Hungarian market but these market results are not part of this research study.

MARKET-BASED OPERATION IN THE SHARED SERVICE MODEL

In the operational excellence of a service centre both the external (e.g. tax system, etc.) and the internal (e.g. performance management, etc.) factors play important roles. Since the external environmental factors for a service centres operating on a particular location are enablers, at least as long as the centremoves to another location, and it has very little influence but the internal factors are the keys. The internal factors are shapedby the parent company itself or the service centre. Therefore, this research study focuses only on this latter issue.
Generally the market-like relationship in the shared service model results a market-based operation. According to our researches it has more basics. These basics are illustrated on the following figure.

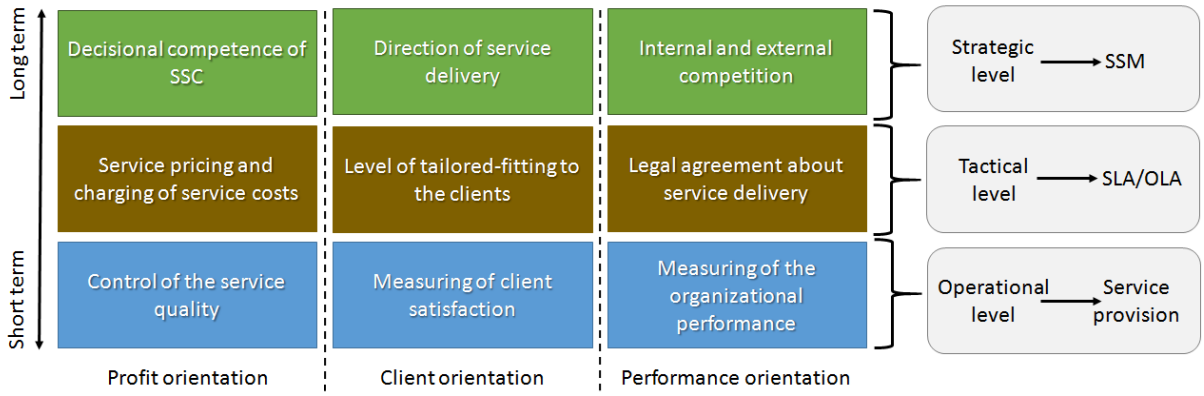

Figure 1. Market-based operation model in shared services
Source: own work

The market-based operation has three levels that range in time dimension from short term till long term. The first level is the operational that concerns with the daily issues of service provision. Control of the service quality is vital for the long relationship and help to remain the operational excellence. Measuring the client satisfaction is important to know in time how and what need to change about the service delivery. Measuring organizational performance is a key issue in the shared service model as well. The managers of service centres need to focus their efforts in two directions. First, they need to change the dashboards they use to more effectively communicate their value to their internal customers and prompt conversations that progress beyond money saving ideas to processes that improve business results. Secondly the parent organization require the continuously looking for newer cost savings and efficiently-oriented arrangements. These efforts need exact points of reference that is impossible without measuring organizational performance.

The second level is tactical that is usually controlled by a legal agreement. It could be service level agreement (SLA) or an operational level agreement (OLA). Nowadays there are some shared services organization where is no legal agreement between the peers but they are only few and more and more centre realized the importance of it. In the daily operation it is very important how the service pricing and the charging of the service cost elaborate and function. And it is also not irrelevant what level client-centric the services delivered from the service centre.

The third level is the strategic that is related to the shared service management (SSM). It consists of the decisional competence of the service centre that means what kind of decisions the service centre could decide independently. Very important is the direction of the service delivery. There are service centres which deliver only to internal organizational departments but there others which deliver not only internally but externally as well. There could be two different competition in the shared service model. The internal competition means that there are more service centre in the parent organization and these centres are competing with each other to win the delivery of a certain service. The external competition means a continuously measuring between the market players. It is not only about the price but about the quality as well.

In the following partssome important parts of this model will be analysed.

PARTS OF MARKET-BASE OPERATION MODEL

Direction of service delivery

One of the key questions about the market-based operation is the direction of service provision. The centreprovides the service only inward or outward as well. In general terms, the greater proportion have the external customers, the more market-based is the operation. An external client will use a particular service only that if the service compared to other services available in the market is competitive in price and quality. This in turn induce the service centre competition, which has a positive effect on the quality of the service. In addition, if a service centrecan provide only inward, it is not sure that it has a real picture about the price and quality of service.

Service pricing and charging of service costs

Among the service recipients it is frequent the frustration and dissatisfaction. The primary interest of the recipients is the good service levels and the low price. The successful shared service centers are constantly improving service levels and fairly impose a fee for their service.

In order to maintain the efficiency of services and trying to keep the number of transactions proportional to their cost structure. As the volume increases, new resources and costs are incurred. In a fair and equitable system the cost of internal support services is directly charged in proportion of the services they used. However, this cost-chargeback often operatein an oversimplified cost model. In this case, the cost of the service organization are overly

aggregated to feedback accurately the relative use of each resource users. As a result, some users still support others. (Marciniak, 2014)
The pricing and charging of services are also important issues. The most important questions are the following: what kind of charging system is in use, how price of service provided is calculated. The type of pricing determines the type of service centre responsibility. The more profit-oriented is the pricing, the more market-based is the operation.

Competition of service centres

The competition meanswhat is the parent company's practice about using of services from internal or external ways. It is an opportunity or not for the recipient departments to choose between an internal provider andan external market company if both option exists. The more open is the regulation, the more the market-based is the operation.(Marciniak, 2014)

Decisional competence

In the case of shared service centers' decisional competence, two interrelated and important question arises at this time:

- who conclude a contract with the organizational units;
- who and how determine the transfer price.

The former issue concerns to opt for internal or external service suppliers, ifthere is an appropriate external suppliers in the market and the department have a choice to choose and it is not mandatory to use the internal service center. On the second question determines whether the corporatecentreor the service centredecide about the internal transfer price and with what methodology andwith what profit content. (Marciniak, 2014)
The decision-making competence factor means that the practice of shared service centres may be different regarding to the decision-making powers of service centres. These decisionsare concerning with service operational issues (e.g.customers, pricing, service portfolio, etc.) and these decisions are taken at different level in the organizational hierarchy. The widening of decision-making competence will increase the operational independence and means a transition to a market-based operation.

Measuring organizational performance

In relation to establishing and managing ofa sharedservice centrethe measuring and evaluating of the centreperformance is a key issue. Selection of the appropriatemethod forevaluationensures that theorganizationconsciouslyanalyse theirefficiency related to the services bythe sharedservicedepartments. However,it is very difficultto measureobjectivelywhena service centreperforms well. Of course thegoalis clear:provide services faster, better andmore efficiently.However,how this provision will beplan, measuredand reportand how ithas beencommunicatedit is amore difficult question.
If aservice centredoes not examinetheir performancecontinuouslyanddo not benchmarkitwith others, it will not be able toooperate market-based.In this context,it is also a questionwhether

the service centrebenchmarks withonlyan internal or externalorganizations.Thelevel of tailored-fitting to the clientsis also importantbecauseit shows how aservice centrecouldserveunique needsofserviceability. The broaderis the customer base, the higher is theratio ofthe externalclients, the highermay be thelevel of tailored-fitting to the clients and it meansa moremarket-basedoperation.(Liddel, 2009)Those sharedservice centresfollow thebestpracticeswhich measure theirperformancewith theBalanced Scorecard(BSC)model. In particularthose who pay attention tothe customers,evaluate whichservices are able to create value, howsave operationalcosts andwhat are the resultsof the internalproductivity.

Measuring of client satisfaction

Not only the shared service organization need to measure its own performance but it is useful if the centre gets external feedbacks as well. The main stakeholders are the customer so it is useful to measure their satisfaction about the service provided. If this is not done in the centre, the centre will not be aware of the demands about services and will not be able to grow properly and move towards a profit centre.

Service Quality

The guaranteed service level should be accountable and should result a strong improvement in service quality. The requirement should include guarantee for business continuity, a proactive monitoring and event management as well.(Mártonffy, 2011)

Legal Agreement about service provision

The legal framework formarket-based operation based on a service legal agreement (SLA). This agreement regulatesallmatters relating tothe quality and quantityofservices, it represents the basic of accountsand disputes as well. The more accurateand more wide-spreadthe service centreuses theseservice contractswith (internaland external)customers,the morethemarket-based will be theoperation. (Marciniak, 2014)
In the literature,the SLAactuallymeans two things: ameasuringsystem model and atype of contract. The first is aperformancebenchmark,which ismonitoredforall users ofthe service. The secondisan internalcontractis concludedbetweentheprovider and theservice recipient.
Some of thesharedservice centrescalled it as SLA, but usuallythe internalcustomersdo not use anSLA, but anOLA(Operational Level Agreement)contract.The differenceis that the SLAis acontractand not toooften thatthe internalclientsenter intosuch a thing, but it is morefrequent toensure an internal agreement (OLA)to ensure theoperation.
Consideringthe purpose andstructureof the two agreementsare very similar.The three mainfactors oftime, moneyand quality.The receivers want services quickly,cheaply andat very goodquality,but thecentreswant themexpensive andless rapidly. It is aconflict of interestthat iscontinuallyshaped bythese agreementsandpartnership during the cooperation. (Marciniak, 2014)
The service level agreement is a written agreement for operational control and coordination between the partiesin both the outsourcing and shared service model. During the negotiations

the demands and requirements of both parties will be clear which will be the basis for future cooperation. The point is that the service level will be agreed by both parties. So in this case the agreement is a document which regulates cooperation between the parties to the expected level of service through the accomplishment till its inspection.(Gast, 2010)
Aservice level agreementis always apart ofalargeragreement orcontractthat defines thetype ofservice provided, the value, the terms and the conditions. Typically itdetailsthe terms of servicequality. For example, theresponse time, the availability, the speed, etc. There are threemainelements:a detailed descriptionof the services, theservicesexecution andmonitoring ofstandardsandindicators ofthe pricingregulations.

CONCLUSIONS

The research succeeded to reveal all of those factors which are important to operational excellence in business services but mostly in providing shared services. These factors could be integrated in a management framework where the factors could be grouped by different dimensions. This research will continue to measure all of these factors on the market players.

REFERENCES

BERGERON, B. (2003). *Essentials of Shared Service*. Hoboken: John Wiley & Sons, Inc.

BHATTY, S., & HUBERT, B. (2008). Balancing the Stakes: Risks and Critical Success Factors for Procurement Gainshare Arrangements. New Delhi: TPI.

BODNÁR, V., & VIDA, G. (2006). *Folyamatmenedzsment a gyakorlatban*. Budapest: IFUA Horváth & Partners.

BŐGEL, G. (1999). *Nyereségközpont, üzletág, divízió.* Budapest: Kossuth Kiadó.

BŐGEL, G. (2009). *Üzleti elvárások - Informatikai megoldások.* Budapest: HVG Kiadó Zrt.

COASE, R. (1937). The nature of the firm. *Economica, 4*(16), 386-405.

COKINS, G. (2010). Why Are SSC Chargebacks So Inequitable. London: Shared Sercvice News.

FEKETE, G. (2007). Shared Service Center - eredmények és kérdőjelek. Budapest: Business Online, Letöltés: 2012.10.12., Forrás: http://bonline.hu/cikk/61355/.

FUTÓ, P., & KLEIN, G. (2007). *A Magyarországra kiszervezett üzleti folyamatok és üzleti szolgáltató központok. A befektetés-ösztönzés, a munkahelyteremtés és munkhahelymegőrzés feltételeinek elemzése a szektorban.* Budapest: Gazdasági és Közlekedési Minisztérium.

GAST, Z. (2010). *Shared Service Center - Kontrolling Szolgáltató Központ - E.On Hungária Zrt.* Budapest: Budapesti Corvinus Egyetem.

Gelei, A., & Schubert, A. (2006). *Kompetencia alapú versenyképesség egy vezető FMCG vállalat példáján.* Budapest: Budapesti Corvinus Egyetem, Műhelytanulmány.

GÉRÓ, P. (2007). Megosztott szolgáltatások - Összefogott tudás. Budapest: EGovernment Konferencia - Stratis Tanácsadó Kft. .

GÓBER, L. (2004). A beszerzési folyamatok kiszervezése. *Műszaki-gazdasági információ. Vállalatirányítás, 1*.(3.), 49-55.

HEIDRICH, B. (2006). *Szolgáltatás menedzsment.* Budapest: Human Telex Consulting.

HINEK, M. (2009). *Az outsourcing - A tevékenység-kihelyezési döntések elmélete és gyakorlata.* Pécs: Pécsi Tudományegyetem, Közgazdaságtudományi Kar, Gazdálkodástani Doktori Iskola, Doktori Értekezés.

KAPÁS, J. (2003). A piac mint intézmény - szélesebb perspektívában. *Közgazdasági Szemle, L. évf.*(december), 1076-1094.
KIRÁLY, É. (2011). *Vállalati kapcsolati rendszerek a hazai kiskereskedelmi gyakorlatban*. Gödöllő: Szent István Egyetem, Doktori Értekezés.
LIDDEL, J. (2009). Top ten tips for Better Benchmarking. SSON: Alsbridge.
MARCINIAK, R. (2013). Choice between Outsourcing and Shared Services. Zilina, Szlovákia: EDIS Zilina University Publishers.
MARCINIAK, R. (2014). *Osztott szolgáltatások - egy innovatív forma vizsgálata.* Miskolc: Miskolci Egyetem, PhD Disszertáció.
MÁRTONFFY, A. (2011). Outsourcing ügyesen. *ITBusiness, IX.*(47.), 10-12.
MCLEMORE, I. (1997). Internal outsourcing through shared services. *Controller Magazine, 1997*(December), 49.
RUBALCABA, L., & KOX, H. (2007). *Business Services in European Economic Growth.* New York: Palgrave Macmillan.
SHARMA, M. (2011b). Outsourcing Pricing Models – FTE based or Transaction based? New York: Corrystone Global Partners.
SHARMA, S. (2011a). Outlook 2012 The Changing Landscape of the Global Service Industry. New York: Global Services.
SZOLÁR, É. (2009). Szervezetelméletek a felsőoktatás kutatásban. *Új Pedagógiai Szemle, 59*(8-9), 27-46.
TERBÓCS, K. (2007). *Shared service center Humán Erőforrás Szolgáltató Központ a Magyar Posta Zrt-nél.* Budapest: Budapesti Corvinus Egyetem, Szakdolgozat.
THORNILEY, D. (2003). *Shared Services - Moving into Central and Eastern Europe.* London: The Economist, White Paper.

HOW CAN A MULTINATIONAL COMPANY SUPPORT THE SOCIAL SUSTAINABILITY WITH LEAN TOOLS?

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SUMMARY

The article will introduce the principles of Lean and Sustainability. It will analyze the points where overlaps occur between these two fields and see how a well-functioning unified system, focusing on both areas could be developed. It will study the effects of Lean tools on the pillar of Social Sustainability. Finally, it makes proposals how to develop a human sustainable system and what could be applied from those mentioned above.

INTRODUCTION

One can only wonder how a "simple" corporate system can be compared to the system of sustainability. The answer lies in lean and the production system of Toyota. In contrast to other corporate governance systems, their approaches do not want to stay within the company, but it is willing to expand. According to Liker (2008) the Toyota did not try to use capacity purchase for its expansion, but globalized its culture by exporting the Toyota DNA since the 1980's. These DNAs have reproduced themselves in new areas, integrated through the supply chains into the production of countries. From economic point of view this implementation to avoid wastefulness and losses has positive effects, but regarding its environmental and social consequences are not that obvious.

Womac and Jones (2009) even go much further and require building up a lean organization in which everything is controlled by this approach, from the raw material to the consumer, including the planning, manufacturing, delivering and marketing. The workers regarded partners in this process since they are essential parts of this lean system:

1. respects and involves the worker in improving processes and provides opportunities for personal development
2. pays attention to working conditions by creating ergonomic and safe workplaces

These are important from sustainability point of view because we spend one third of our lives at our workplaces.

Consequently, the social sustainability is the interest of companies. The appropriate application of lean principles and tools, which were introduced above, can conduce to this but these alone are not enough since the recreation within and out of the company is also essential to avoid accumulative stress and burnout syndromes. The responsibility of the management and HR in this issue is obvious but certain guidelines and help from the EU and the countries are also indispensable. The Social Infrastructure Operational Program, which is examined in the article, can provide a good example for this and this shows that the improving conditions (nutrition, sport facilities, fringe benefits) have a relation to the number of sick leave days.

The article examines the most well-known tools of lean from the social sustainability point of view based on the scientific literature of the topic supplemented by own personal experience and examples.

LEAN, SUSTAINABILITY AND THE MULTINATIONAL COMPANIES

How can we collate these systems? Researchers from Cape Code Community College (2008) made a comparison between lean and sustainability in their study, but in many cases real-life examples from multinational companies are missed out and it considers only bare concepts, leaving out the practical realization and the real background. This is why business practice is also taken into consideration in my amplifications, which highlights the weakness of theoretical comparison. (Table 1)
Lean is on the right track, but in many aspects it has not reached the goal which is required to reach global sustainability and it is also evident that organizations dealing with sustainability could learn from this systemas it is seen in Table 1.

Table 1. Comparison of lean and sustainability based on its realization in business practice

	Lean	Sustainability	In real life	Multinational companies
1	Long term philosophy - create value for people, community (inc environment), economy	Invest in long term - consider people, community, financials, environment	It is true that both systems plan for long-term but in case of lean the economic consideration is more important unlike sustainability, where society and environment play significant roles.	Provide compensation to employees; benefits (vouchers,sport, culture, accommodation), health care services. Social Infrastructure Operational Program, “Improving health and encouraging health-conscious behaviour” tender.
2	Create the right process to produce the right results	Ensure the ecosystem is in balance; if necessary intervene in the system	In fact, both systems consider well-functioning procedures necessary and make intervention in them. In the second one it happens globally, while in the first one they pay only attention to only the sites and factories or those areas which are obliged by law, like emission rates. (Roncz, Tóthné Szita, 2011)	For better working environment the offices can use different automatic shading systems and/or air vent system instead of air conditioning. Environmental friendly solution when the company applies renewable energy.

3	Add value by developing people and partners	Invest in people - Consider stakeholders including your staff and partners (e.g. suppliers)	At this point the two systems could be in line with each other, but while lean mainly focuses on only the professional development, but sustainability pay attention to social development as well. The only obvious exception is Japan, where the sustainable approach really applied towards the employees. (Fazekas, Ozsvald, 2000)	For the office workers two ways are possible, the leader and the professional development program. Training materials - which are not closely related to everyday work / general expectations - are not supported e.g. "unofficial" language trainings.
4	Continuously making problems visible and solving root causes drives organizational learning	Be transparent and consider the whole system vs. treating symptoms	One of the main points of lean principles is to reveal problems and find solutions instead of finding someone to blame, then to share our results with other teams, departments and sites. (Cusumano, Nobeoka, 1998) (Melton, 2005), (Staats, Upton, 2011) This point is hardly manageable outside the company, where they fight against not the symptoms but the causes, however such channels, which could transmit the information and the achieved results do not exist and even if they do, they are often so bureaucratic that their efficiency is lost.	Visualisation and poka-yoke solutions for white collar workers are important too. As a result of the solution-focused process the employee-involvement can be increasing in the daily work. It could decrease stress level as well.
5	Minimize or eliminate waste of any kind	Creating waste harms something else in the system	In this point both concepts are on the right track, however, like in the first point the motivation is different. Since companies are profit oriented, this distinction is inevitable. (Dües et al., 2012)	Internal information sharing to avoid double works, duplicate testing, documents, investments and researches.

Source:edited by the author based on Schatzberg and Lebica (2008)

LEAN TOOLS FOR THE SOCIAL SUSTAINABILITY AND THE BETTER WORKING ENVIRONMENT

Find the failure but not the guilty – poka-yoke, andon, visualisation

One of the advantages of lean is that it focuses on the problem to be solved, therefore even if the worker makes a mistake, he will understand his responsibility focusing on the solution and

not on the negative consequences. Hence one of the important efforts of lean is to prevent, or even to predict the potential mistakes. This is why it uses preferably the poka-yoke solutions, systems. Meaning of these Japanese word; poka is an inadvertent error and yoke is prevention. (Dennis 2007)

„Error-proofing or failsafe device: Tools, devices which prevent mistakes (warning in case of failure), or recognise the reject and stop the further operation. The first is the warning poka-yoke, the second is the control poka-yoke. Tools like this obsolete the unwanted mistakes. The simplest solutions operate with the shape of the product, or the part, avoiding the different usage of their original functions." (Kosztolányi, Schwahofer, 2014:122) Think of the chargers of the classic mobile phones and the jack plug of the headphones. A long time ago they could be easily mixed up because of the similar round shape.

Considering the social sustainability this must be a major tool or approach.The aim is to use as many poka-yoke solution as possible in the everyday routines of white collar workers.
Andon is a type of poka-yoke system. This is a light triggered by an abnormal working or breakdown and it means that human invention is required. (Manos, Vincent, 2012)
Ries's team created a special andon system which works like the immune system. "Just as with the Toyota Production System, the key to being able to operate this quickly is to check for defects immediately, thus preventing bigger problems later. For example, we had an extensive set of automated tests that assured that after every change our product still worked as designed." (Ries 2013:176)

"When our immune system detects a problem, a number of things happen immediately:

1. The defective change is removed immediately and automatically.
2. Everyone on the relevant team is notified of the problem.
3. The team is blocked from introducing any further changes, preventing the problem from being compounded by future mistakes …
4. … until the root cause of the problem is found and fixed." (Ries, 2013:177)

If we want to avoid the problem sometimes we don't need to use complicated machines or equipments. The single point lesson as visual management tool can present the easy solutions. As Manos and Vincent (2012) define in their book the visual management and how single point lesson can guide the employee through the process steps, identifying much easier the defects and this way the waste is reduced.

"Single point lessons are created on single sheets of paper to describe a problem, a change or basic information. ... This paper must be displayed on the workplace where the information is required." (Kosztolányi, Schwahofer, 2014:54). This could be a document about rules, laws or standard changes which is useful for designers, approvers. For instance, turning the computer on, the information is displayed immediately in a window in a concise form.

5S in the aspect of Sustainability and Human side

Table 2. 5S in connection with Sustainability and Human side

5S	Equivalents in Sustainability	Human side
Seiri – Sorting	Eliminating unnecessary material	No distraction during work
Seiton - Straightening or setting in order / stabilise	No more waste of time, clear systems	Decrease duplication or repetition in documentation (clear filing system) and communication within and between departments
Seiso - Systematic cleaning	Safer environment, less danger and accidents	Regular updating and archiving of documents don't generate mistakes latter
Seiketsu - Standardizing	It is easy to follow and understand, more satisfied staff	A new employee can comprehend the system and comfortable working environment
Shitsuke - Sustaining the discipline or self-discipline	Less maintenance, storage and stock-taking cost, smaller energy consumption	Employees can suggest improvements and this involvement could increases motivation and work efficiency

Source: edited by the author

As I have mentioned earlier lean tools are quite widespread, still the most well-known one is 5S, which derives from the list of five Japanese words. (Melton, 2005) In order to understand 5S, some explanations are needed in Table 2. The involvement of employees (both white and blue collars) is very important for the company. (Rothenberg et al., 2011) This is not just a tool or theory but also a working method.

5S is a special and popular tool of lean, the first step to introduce lean methodology in a company and a useful theory for the continuous improvement as well. If we use it properly the employees will be more satisfied.

ERGONOMIC WORKPLACES

Every action during work is an ergonomic motion. "Poor ergonomics has perhaps the biggest impact on safety. Ergonomic injuries comprise more than 50 percent of all workplace injuries in North America. ... The most important ergonomics risk factors are posture, force, and repetition." (Dennis, 2007:22)

The ergonomics which is an important point in lean, is a proactive approach when you create a workplace. The aim of ergonomics is a safe, clean, and easily maintainable workplace, in one world a sustainable workplace. Tasks, information, equipments, and documents are accessible and the whole working environment fits and suits each employee. The Figure 1 represents the working areas and the next pictures (Figure 2-4) show the perfect workplaces for office workers.

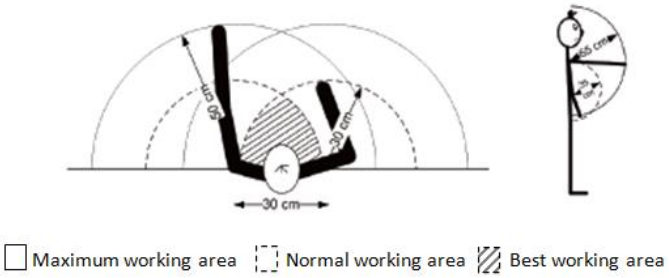

Figure 1. Ergonomic workplace
Source: Kosztolányi, Schwahofer 2014:57

Figure 2-4. Perfect sitting workplace; Correct lightning on the desk; L-shape working place for office workers
Source: OMMF 2012: 7, 13, 23

The anthropometry, the physiology and the psychology are the three main factors when we would like to focus on social sustainability. (Kosztolányi, Schwahofer, 2014) If we pay attention for these factors the stress level might decrease.

REDUCING STRESS LEVEL AT WORKPLACE

EU tender for healthier employees

Based on the statistical office, in 2010 the average life expectancy in Hungary was 74.7 and the 58% of the population was overweight. (KSH, 2010) The improper eating habits, lazy lifestyle and the stress contribute to the emergence of the common causes of death.
Since we spend significant amount of our life in our workplace one question, if something can be done by the enterprises and the state within an organizing framework, may arise.
I think I do not need to prove the obvious fact that the company's, the employee's and the employer's interest is spend less days on sick-leaves. In spite of this fact, the prevention is mostly left to the workers; the companies take only such actions which are required by the law as a basic requirement in certain areas.
I suppose when a company pays attention to the worker's health and not only their performance, the productivity figures are improving. (See at Figure 5.)

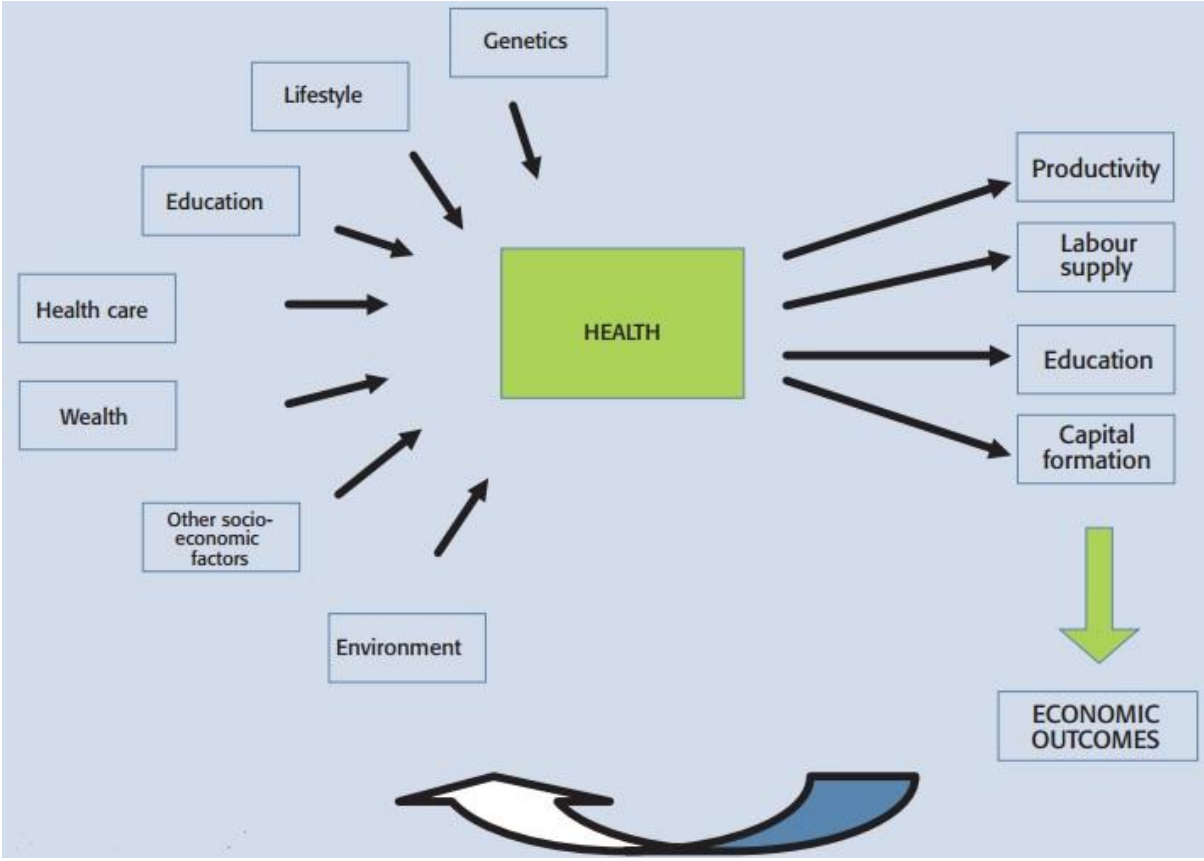

Figure 5. Health inputs and health outputs

Source: ec.europa.eu

As it can be read in a publication of the European Commission which deals with the contribution of health to the economy, “the healthier individuals could reasonably be expected to produce more per hour worked. On the one hand, productivity could increase directly due to enhanced physical and mental activity. On the other hand, more physically and mentally active individuals could also make a better and more efficient use of technology, machinery or equipment. A healthier labour force could also be expected to be more flexible and adaptable to changes (e.g. changes in job tasks, in the organization of labour)” (Suhrcke et al., 2005:22).

I studied a company which participated in a tender to start a health preservation program within the TÁMOP-6.1.2/A-09/1-KMR-2009-0117 Social Infrastructure Operational Program, "Improving health and encouraging health-conscious behaviour". I had a chance to do my research within this program. One part of the program which dealt with the workers began in 2010 May and ended in 2011 March.The goal of the program was to provide the necessary knowledge and skills about healthy lifestyle for 200 people, which provided not only free sport programs but some nutritional advice as well in addition to recreational possibilities.

The result of the research was very satisfying, because the average sick leaves per month decreased with 25.5% as Table3 shows.

Table 3. Results of program.

	2009	2011*
Average sick leaves in a month (day/person)	1.45	1.08
	*(2010.05.-2011.03.)	

How do you control your body weight?	2010	2011
Exercising	54%	64%
Moderate diet	46%	68%
Skipping/leaving out meals	7%	3%
Slimming diet	11%	11%
In no way	27%	6%

How do you see your health condition?	2010	2011
Very bad	6%	0%
Bad	46%	0%
Average	40%	37%
Good	8%	63%
Excellent	0%	0%

How often do you do sport?	2010	2011
Never	18%	6%
More rarely than once a week	26%	14%
Once a week	24%	38%
More than once a week	32%	42%

How often do you eat per day?	2010	2011
Once	0%	0%
Twice	6%	5%
Three times	51%	58%
Four times	33%	17%
More than four	10%	20%

Source: edited by the author

If we observe this example from the social sustainability point of view, it can be assumed that the work atmosphere gets better and the risk of burnout syndrome reduces due to the bigger attention paid to workers and health. It might have positive effect indirectly on their families and their close environment because the everyday stress level may decrease, and its positive influence on the economy can be calculated too.

Lean tools for healthier employees

When you look through the lean tools you can find a lot of suggestions to solve your problems in a more effective and sustainable way:

- 5S → to keep clean and tidy your environment
- Ergonomic workplace → liveable and healthier working area
- 30 second rule → to reach every document, part or equipment within 30 sec
- Waste (Muda) reduction → decrease the time wasting because of downtime etc.
- Lead time reduction → usage of automatic systems for the less repetitive movement
- Suggestion system → improve the moral
- Blame-free environment → easy to focus on problem solving
- Katayose → balance between each worker process to avoid inconsistency
- True North → clear company policy and long term objective
- Yokoten → internal Benchmarking to share the knowledge in every plant and division

(Kosztolányi, Schwahofer, 2014).

The best lean tools are the long term planning, the mentoring or coaching and the increased involvement, because every employee could feels the care and attention of the company and all of these can contribute to an environment which enables the free creativity.

CONCLUSIONS

Every activity in lean which the customer is willing to pay for is value added (production, planning, shipping etc.), the others which are out of this category but still useful for the production are non-value added (service areas: administration, purchasing, finance, maintenance, warehousing etc.). The non-value added expression, however, does not equal to waste (muda) and prodigality.

In this article the focus was on the office workers because the lean with its plenty of tools mainly concentrates on those who work in the production area. These tools with little modifications or even entirely can be applied in white-collar positions, moreover with a little more effort all tools can support the social sustainability. However the well-known tools like 5S, the ergonomic workplaces, visual tools and poka-yoke solutions have already been introduced, but this is only the tip of the iceberg. There are plenty of other useful tools which could be introduced vertically in certain levels of a company or could be integrated horizontally in agriculture, in the service and public sectors. As the Toyota DNA ran earlier within supply chains and divisions, it could work in these fields too.

Of course we should not forget sustainability because lean has still got to learn a lot from it. The HR and the management are responsible for providing the appropriate working conditions for their employees. Nevertheless, a company which thinks responsibly is able to look further ahead and as it can be seen from the results of the Social Infrastructure Operational Program, this could have short and long-term benefits for the workers, the companies and the states as well.

A company which follows the principles of both lean and sustainability will find essential to have a long-term cooperation with its workers, therefore it tries to affect not only the quality of their work but their living conditions too. The introduction of lean is not necessarily smooth since it comes with radical changes compared to the previous habits, but its advantages compensate that even within short-term.

REFERENCES

CUSUMANO, M. A. & NOBEOKA, K. (1998). *Thinking Beyond LEAN, How multi-project management is transforming product development at Toyota and other companies.* New York: The Free Press

DENNIS, P. (2007) *Lean Production Simplified: A Plain-Language Guide to the World's Most Powerful Production System.* New York: Productivity Press.

DÜES, C. M., TAN, K. H. & LIM, M. (2012). Green as the new Lean: how to use Lean practices as a catalyst to greening your supply chain. *Journal of Cleaner Production* xxx (2012) pp.1-8.

FAZEKAS, K. & OZSVALD, É. (2000). Növekvő munkanélküliség, rugalmasabb munkaerőpiac - a japán stílusú foglalkoztatási modell átalakulása.(Increasing unemployment, more flexible labour market – the transformation of Japanese employment.) *Közgazdasági Szemle*, XLVII, 2000 February, pp. 157–177.

KOSZTOLÁNYI J., SCHWAHOFER G. (2014). *Lean szótár (Lean dictionary)* Budapest: KAIZEN PRO Kft.
KÖZPONTI STATISZTIKAI HIVATAL (2010). *Társadalmi helyzetkép, 2010 (Social situation report, 2010)* 5p., 23p. KSH Retrieved March 6, 2014, from http://www.ksh.hu/docs/hun/xftp/idoszaki/thk/thk10_egeszseg.pdf
LIKER, J. K. (2008). *A Toyota-módszer 14 vállalatirányítási alapelv. (The Toyota Way: 14 Management Principles.)* Budapest: HVG Kiadó Zrt.
MANOS, A.,VINCENT, C. (2012) *The Lean Certification Handbook: A Guide to the Bronze Certification Body of Knowledge.* Milwaukee: ASQ Quality Press
MELTON, T. (2005). The benefits of LEAN manufacturing. What Lean Thinking has to Offer the Process Industries. Chemical Engineering Research and Design, 83 (A6) pp.662–673.
NEMZETGAZDASÁGI MINISZTÉRIUM (OMMF) (2012). *Amit a számítógépes munkahelyekről tudni kell! (What you need to know about the computer jobs!)* Retrieved September 09, 2015. http://www.ommf.gov.hu/index.html?akt_menu=507
RIES E. (2013) *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses.* Budapest: HVG Kiadó Zrt.
RONCZ J., SZITA TÓTHNÉ K. (2011). Sustainable development and dilemmas in sustainability measurement. *The 17th Symposium on analytical and environmental problems, SZAB Kémiai Szakbizottság Analitikai és Környezetvédelmi Munkabizottsága.Szeged.* (2011 September 19.) pp. 90-94.
ROTHENBERG, S., PIL, F. AND MAXWELL, J. (2001). Lean, Green, and the Quest for Superior Environmental Performance. *Product and Operations Management.* Vol. 10. No. 3. pp. 228-243.
SCHATZBERG K. & LEBICA J.(2008).*Lean Thinking for Sustainability* Retrieved:Oct 2008: Cape Cod Community College, Melissa McEwen and Kelly Meade Haley & Aldrich, Inc.http://standards.ieee.org/about/nesc/interps.html
STAATS, B. R. & UPTON, D. M. (2011) *Lean Knowledge Work Harvard Business* Review (Oct. 01, 2011) pp. 100-110.
SUHRCKE, M., MCKEE, M., ARCE, R. S., TSOLOVA, S. AND MORTENSEN, J.: *The contribution of health to the economy in the European Union.*23.08.2005. Retrieved March 6, 2014, http://ec.europa.eu/health/ph_overview/Documents/health_economy_en.pdf
TÁMOP - A Magyar Köztársaság Kormánya (2009). *TÁMOP-6.1.2/A-09/1-KMR-2009-0117: Társadalmi Megújulás Operatív Program, "Egészségre nevelő és szemléletformáló életmódprogramok" pályázat 2009*. (Social Infrastructure Operational Program, "Improving health and encouraging health-conscious behaviour" tender 2009) Retrieved March 6, 2014, from http://palyazat.gov.hu/doc/3377
WOMACK, J. P. & JONES, D. T. (2009). *Lean szemlélet: A veszteségmentes, jól működő vállalat alapjai. (LEAN Thinking: Banish Waste and Create Wealth in Your Corporation)* Budapest: HVG Kiadó Zrt.

ROLE OF CORE COMPETENCIES AND COMPETITIVE ADVANTAGES IN EVALUATION OF COMPETITIVENESS OF SMALL AND MEDIUM SIZED ENTERPRISES: EMPIRICAL STUDY BASED ON COMPETITIVENESS DATA OF HUNGARIAN FIRMS

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SUMMARY

The Small Business Competitiveness Research Group of University of Pécs Faculty of Business and Economics led by Dr. Laszlo Szerb, has developed the Small and Medium Enterprises' Competitiveness Index (SMECI). The this indexwas based upon a the data of a representative cluster sampling survey, carried out between 2013-2014, focusing on Hungarian small and medium enterprises (SME).The approach utilisesBarney's resource-based and Miller's configuration theories and accepts Czakó-Chikán's definition of firm-level competitiveness and accommodates it to a conceptual model, thus allows index creation.In their view, an interconnected system containing ten internal competences shape the competitiveness.
According to Szerb, the key of competitiveness lies in the well-synchronized system of the competencies, because individualcompetences can easily be copied. According to the theory of core competences, company should focus on high-performance competences, which can provide the greatest competitive advantage. Regarding small enterprises however, this theory is thought to be only partly valid.Because of these characteristics, the "penalty for bottleneck" method is often used, which has establishedtheoretical background in literature (e.g., Theory of Weakest Link, Theory of Constraints, Six Sigma Management). Consequently, the methodology of SMECI – while determining firm-level competitiveness it – paradoxically validates the impact of bottleneck competences, which are generally competitive disadvantages.
This study follows multiple objectives. The first is to specify a methodology – using Szerb's theoretical basis – which enables the examination of the improving effects of high-performance core competences and competitive advantages. The results are comparable to Szerb's results, since both approaches rely on the same dataset.Finally, an experiment is reported that links the two logics, which are complementary and not contradictory. According to the author's opinion, the joint application of the two approaches can provide a more complete picture onsmall enterprises' competitiveness.

INTRODUCTION

The Small Business Competitiveness Research Group of the University of Pécs; Faculty of Business and Economics led by László Szerb, has developed the Small and Medium Enterprises' Competitiveness Index (SMECI) (Szerb et al., 2014). This index was based upon a data of a representative cluster sampling survey, carried out between 2013-2014. The survey focused on Hungarian small and medium enterprises (SME). The approach utilises Barney's (1991) resource-based and Miller's (1996) configuration theories and accepts Czakó-Chikán's (2006) definition of firm-level competitiveness. It accommodates these concepts to a conceptual model, thus allowing index creation. In their view, an interconnected system containing ten internal competences shape the competitiveness. These competencies enable

small firms to compete effectively against competitors and to provide products/services that are highly appreciated by customers.

According to Szerb et al. (2014), the key of competitiveness lies in the well-synchronized system of competencies, because a certain individual competence can be easily copied. According to the theory of core competences, a company should focus on high-performance competences, thus providing the greatest competitive advantage. Regarding small enterprises however, this theory is thought to be only partly valid. Because of these characteristics, the "penalty for bottleneck" method is often used (Rappai & Szerb, 2011), which has established theoretical background in the literature of Theory of Weakest Link, Theory of Constraints and Six Sigma Management (see Goldratt, 1994; Stamatis, 2004). Consequently, the methodology of SMECI – while determining firm-level competitiveness – paradoxically validates the impact of bottleneck competences, which are generally competitive disadvantages.

This study follows multiple objectives. Firstly the literature review will introduce the theories regarding competitive advantages and disadvantages. Following, these approaches will be connected. After the theoretical background, the formation of the reward-function will follow based on the reward for high performance; similarly to the penalty-function based on the penalty of bottleneck theory. The formation of these functions enables the calculation and comparison of the financial connections, in regards to the two functions which are the base of the competitiveness points. The goal is to be able to give a better explanation for the financial performance of SMEs. According to these financial correlations, it became clear that a new financial factor analysis needed to be defined, instead of the present complex performance indicator. Lastly the analysis's global results will be described. According to the gathered data, it is visible that the model of core-competences and competitive advantages provided only slightly better results from the bottleneck and competitive disadvantages methodology. This indicates that a deeper analysis is needed with a segmentation of SMEs according to industry, activity, life-cycle or size to gain a broader picture of the competitiveness of SMEs.

THE RELEVANCE OF COMPETITIVENESS ANALYSIS OF SMES

The European Union recognising and acknowledging the social and economic importance of Small and Medium Sized Enterprises (in short SMEs); also analysing the impacts of the 2008 crisis on the financial sector, the "Entrepreneurship 2020" action plan has been announced. This action plan names measures that need to be implemented on the level of the whole European Union, also on the level of individual member states. The aim is to develop entrepreneurial activity, to make the number of active entrepreneurs higher, to re-start economic growth and to make unemployment lower (COM, 2012, 795 final). According to the EU initiative, an implementation plan titled "SME strategy 2014-2020" has been composed in Hungary, which describes the present situation in detail. It provides a vision for the future with an attached implementation plan (Hungary's Office for National Economic Planning, 2013). The difficulty with this strategy is, that its success and the efficiency of invested funds is at question, since there is a low amount of empirical studies about SMEs competitiveness. These are limited, not sufficient to show precisely what corporate factors, and how they influence the competitiveness.

Competitiveness has been analysed with definitive instruments, theoretical approaches and empirical tests, both domestically in Hungary and internationally, including different levels: products, business, industry, corporate, regional, international, national and subnational (see Török, 1989; Delgado et al., 2012; Wang, 2014). From the list, the relevance of analysis of competitiveness on a firm-level can be highlighted; since even prominent figures of contemporary economic thinkers like Porter and Krugman agree; that those having competitiveness are companies and not regions or countries. Szerb (2010) emphasises, that firm-level specifics in the competitiveness methodologies cannot be excluded. Among competitiveness research the analysis of large corporations and clusters dominate, while the competitiveness of SME is rarely analysed (see Porter, 1998; Lengyel, 2001; Rugman & Verbeke, 2001; Chikán, 2006; Cerrato & Depperu, 2011; Kállay, 2012). A relative low number of studies can be found in regard to SMEs (Szerb, 2010). Those that investigate this field usually focus on a specific theory, or in empirical studies focus on one business sector, region or cluster, with a narrow firm sample size. Since SME competitiveness is a considerably neglected field, the following concerns can be described:

1. The weight of the SME sector in Hungary, in regards to occurrence frequency (prevalence) is over 99.5%, it employs over 70% of labour in all national economic fields, it is responsible for circa 55% of gross national added value, also about 20% of all exports (based on data tables of the Hungarian Central Statistical Office, 2013, www.ksh.hu). It can be stated that this sector in an important element of the national economy, nonetheless our knowledge of the internal factors that shape competitiveness is limited. Usually aggregated statistical data is used as an approach to draw conclusions. This also means that it is not precisely known which are those appropriate economic and professional policies that can strengthen the competitiveness of SMEs, with optimal resource allocation.
2. It is well known that the competitiveness of bigger enterprises is better than at smaller ones – regardless of the definition of competitiveness – still, it is not known how small companies become big, thus more competitive. Those enterprises that are fast growing, those gazelles which are responsible for the bulk of new workplaces are in the focus point of research (Henrekson & Johansson, 2010; Acs, 2011; Csikány & Takács, 2015). The main problem with these gazelle studies is, that they don't focus on competitiveness. These studies also doesn't substitute the systematic analysis of a much higher number of SMEs. On the other side, we are not sure which are those companies that close down – or go bankrupt – because of their own fault, or because of a change in the business environment.
3. It can be stated that owners, leaders, employees and generally the stakeholders don't receive much information about the real competitiveness of the firm. The question is what actions need to be taken in order to strengthen an SME's ability to seize opportunities and to enhance income generation. It is frequent at SMEs to overstate their real position and competitiveness.

The Small Business Competitiveness Research Group (University of Pécs, Faculty of Business and Economics), led by László Szerb, conducted explorations on SME competitiveness on a representative Hungarian firm sample, in the period of 2004-2007 and

2013-2014. This made it possible for the Small and Medium Enterprises Competitiveness Index (SMECI) to be assembled (Szerb, 2010; Szerb et al., 2014). This exploratory work is making up for the research deficit on a Hungarian level – it can be understood as an expansion to the research focused on big and medium sized businesses by the Competitiveness Research Centre (Corvinus University of Budapest) – nevertheless it is also rare on an international level.

SMECI theory and methodology

Szerb (2010, 2014) acknowledges the definition of firm-level competitiveness by Czakó-Czikán (2007) which is the following: "The competitiveness of the national economy, is the competence/ability of the national economy to make, use and sell in the global competitive environment products and services. During this process the yield of the factors of production and also the wealth of the citizens is growing in a sustainable fashion." (translated from Hungarian). The condition of competitiveness in this case is the development of effectiveness strengthening conditions at companies and institutions that enable the growth of the resource productivity on a long term basis (Czakó & Chikán, 2007:3). This definition of general firm-level competitiveness is fused with a conceptual model that enables index creation.

To formulate this new model, background information relating to strategic management and small-company specific business knowledge is needed (see Grant, 1991; Lengnick-Hall, 1992; Peteraf, 1993; McGahan, 1999; Man et al., 2002; Dholakia & Kshetri, 2004; Ray et al., 2004; Aragón-Sánchez & Sánchez-Marín, 2005; Singh et al., 2007), beyond the sample properties. At the SMECI model the configuration theory of Miller has been also utilised (Miller, 1996; Miller & Whitney, 1999) that states that the individual elements can be easily copied one by one, thus the competitiveness is formulised according to the system of internal competences. With this addition, the examination adopts the logic of the core-competence based and resource-based theories (see Penrose, 1959; Rumelt, 1984; Teece, 1984; Wernerfelt, 1984, 1995; Prahalad & Hamel, 1990; Barney, 1991, 1995, 2001; Peteraf, 1993; Collins & Montgomery, 1995; Rugman & Verbeke, 2002; Grant, 1991, 2010).

These above provide the literature fundament and definitional basis of the research into SME competitiveness by Szerb et al. (2014). The approach changed due time – further developed – because the research group considered the characteristics of the empirical observations. Thus the definitions in 2010, 2014 and 2015 match totally in their logic, but they overlap each other only partially. An introduction to the most recent definition to the conceptual model according to the described theories is the following: "The competitiveness of SMEs is determined by the domestic market, the cooperation, the processes of becoming international, the human resources, the offered product/services, the production, the sales methods (marketing), the online presence, the administration and decision making routines and the strategy. These are combined to a system of internal competences. These competences make it possible for the business entity to compete effectively with other companies in offering products and services to the market that have high value for customers". This is the definition of SME competitiveness, which is used in the present article.

The model uses 10 pillars with all together 46 complex variables to gain information. In the pillar of domestic market and competition the model takes into consideration the effects of

geography on sales, the perspectives of the target market, the layers of competition and its intensity, finally those variables are listed that effect the company's ability to react to the change in consumer demand. In the pillar of cooperation those supporting elements are listed that develop corporate growth and innovation, including external links, stability and uniqueness. The pillar of internationalisation lists the variables of export performance, the fulfilment of conditions for sale to foreign customers, and the uniqueness of location. In the pillar of human resources those variables are described which influence leader and employee excellence, also those which describe the human resource management function. The product and product innovation pillar lists the new or improved products, their success in the customer segment, the variables of intellectual property and linked intellectual capital rights, also the uniqueness of these intellectual properties. The pillar of production considers the level of development of the used technology, how modern and efficient it is, its age, the level of production innovation, the sophistication of the production management and quality insurance systems and the use of unique info-communication technology. In the marketing pillar the uniqueness of products and services, the distribution channels, the price range, the marketing communication tools, the features of the marketing methods and the innovation of marketing methods. In the online presence pillar the technical specifics of the corporate website, its services and content. In the pillar of decision making, organisation and administration routines the variables of information management, decision making and administration proceedings are listed. In the strategy pillar the dynamics and direction of change in firm operating range, the capabilities for leadership and entrepreneurship, and the uniqueness of the proactive long term strategy.

The calculation of the competitiveness index (Szerb et al., 2014) uses the following seven point logic:

1. Identification and calculation of the variables
2. normalization of the variables to the <0,1> range
3. calculation of the pillars, according to the average of the normalized variables
4. normalization of the pillars to the <0,1> range
5. transformation of the individual pillar values using the same *k*-th power to get the same pillar averages according to the combined average of the 10 individual pillar averages
6. using the penalty-function, according to the penalty for bottleneck (PFB) methodology (Rappai & Szerb, 2011):

   $$\mathrm{h}_{i,j} = \min y_{i,j} + (1 - e^{-(y_{i,j} - \min y_{i,j})})$$

   where:

   $h_{i,j}$ the modified, after punishment value in case of *j* pillar and *i* firm
   $y_{i,j}$ the normalised value for *j* pillar and *i* firm
   min $y_{i,j}$ the minimal value of $y_{i,j}$ in case of *i* firm
   i = 1, 2,……n = number of firms
   j= 1, 2,…….m= number of pillars
7. calculation of competitiveness index, through addition of the ten adjusted pillar values.

In the methodology of the SMECI, the penalty for bottleneck method (Rappai & Szerb, 2011) is used because of the validity of the configuration theory by Miller. The theoretical background of the method is based on the Theory of Weakest Links and the Theory of Constraints (TOC). According to the TOC theory the performance of the system can be enhanced by the development or liquidation of the weakest link (Goldratt, 1994). This same method is visible in operation, although in other utilisation in the Six Sigma Management method (Stamatis, 2004). Thus in the method the negative effects on competitiveness are visible and validated by a deficit in harmony between the pillars. Harmonisation in this case means that the normalised and the adjusted values of the 10 pillar averages are equal. Among the identified competitiveness pillars the bottlenecks will negatively influence and pull back the pillar values and the competitiveness index. Thus the elimination of bottlenecks is in the core of corporate strategy. Because of the strong correlation between the pillars, developing an already high pillar value can only slightly enhance the firms overall competitiveness. This means that there are huge differences in the resources necessary for the repair/development of the pillars, those which have lower values are harder, those pillars with higher values are easier to make better. One of the main aims of the research was to make the method and theory of competitiveness index applicable in actual decision making. Thus power-transformation was used to eliminate the distortion effect caused by the difference in arithmetic averages of the pillars – before using the penalty function.

The research came to the conclusion, that in general the Hungarian SMEs are uncompetitive and that the governmental benefits and support don't enhance competitiveness, they only incubates the un-competitiveness. In many cases in SMEs nobody speak foreign languages, have no training programs for employees, don't cooperate, have no innovations, no marketing communication, nor online presence; whereas 40% of these same SMEs operate in a highly competitive segment of the industry. According to the research in competitiveness clusters, it can be stated that the distance between the best (most competitive) and worst (least competitive) companies is huge. Although data is available on the sample globally, no analysis is focused on the sector, activity, life-cycle or corporate size. The use of these cross-variables would yield in interesting and unique results. It is important to state that a weak to medium positive correlation has been found between the complex performance indicator and the competitiveness index. The complex performance indicator is comprised from three components that are based on publicly available annual financial reports from the past five years. The components of the performance indicator and the competitiveness index showed inconsistent connections. The structure of the complex performance indicator is the following:

- Sales income growth indicator: The real-income data computed out of the income data in a 5 year term and the inflation data, considering the steepness supposing a linear correlation. Afterwards limiting out-layers (capping) according to the two-sigma principle.
- Yield indicator: The 5 year ROA, ROE, ROS capped data according to the two sigma principle, the average of the adjusted average of yield variables.
- Bankruptcy indicator: According to a neural web (auto multi-player perceptrons) and a SVM (Support Vector Machine – Evolutionary with anova kernel) accuracy result comparison. It has been implemented in a learning sample of 1250 bankrupt and 3900 operating companies. This algorithm is able for bankruptcy forecast.

- To get the equal averages of the component values a transformation was needed using the same *k*-th power according to the combined average of the 3 component averages. The complex performance indicators are calculated from the average of the adjusted component values.

The contradiction is probably caused by the difference of the stock and flow indicators. The comparison of the variables from the quantitative and qualitative information can be problematic, further complicated by the reliability questions of the provided financial data. This can be attached to the tax-minimisation policies at the SMEs, also explained by the potential external economic effects (Szerb et al., 2014).

The limitations of the model have also been described. The social utility, ethical questions, external environment, industrial factors, all are presented as external factors. These fields can highly influence corporate operations and competitiveness, thus the research team is working on solutions to incorporate them into the model.

The actualisation of SMECI

The models accuracy is being developed further from 2014, according to the development of the competitiveness point, the complex performance indicators, and the uncovered unfavourable results of their individual components. It became evident that the performance causing and performance representing indicators based on the annual financial reports cannot be categorically left out, thus the financial variables have been removed from the conceptual model. Furthermore, the practice of gaining public data from the e-beszamolo.im.gov.hu website (Information and Electronic Company Registration Service) has been discontinued, the components of the complex performance indicator have been re-calculated according to the financial data from OPTEN. This change was necessary, because data quality on the Service's website is not verified (Márkus, 2015). According to the assumption if there are errors in the OPTEN database, those can be considered as systematic. At the present article, only the latest, most recent 2015 approach of the SMEs competitiveness research will be described. Regarding the empirical data, the results of the research will be compared with the recalculated results. Thus the methodology of the competitiveness index will be taken as a benchmark and not the already published results.

The methodology and theory of the empirical research

The consequence of the considered theories in the methodology, the SMECI methods at the SME competitiveness – paradoxically – takes and validates the bottleneck effects, usually the competitive disadvantages. The literature review from the resource based approach and the core competence theory, describes the production factors, the resources and capabilities (in short the resources). The competences and core-competences coming from these resources are potentially suitable to create competitive advantage, thus be the source of competitiveness. In this viewpoint the high-performance core-competences are in the focus of the corporate strategy. These competences helps the firm to achieve differentiation or cost leadership, thus it can create and sustain a more profitable position in contrast to its competitors. The functional area that is responsible for the competitive advantage will be in the focus of the

business strategy. These core-competences have to be considered when composing the strategy. According to Porter (2008) it can be extremely harmful if the corporation limits the focus of its strategy to extremely ambitious growth goals. When the number of suppliers, capacities and employees that are active in value creation is growing fast, it can erode the core-competences. The supply chain should be also in focus: beside internal also external integration is necessary along the supply chain (Rosenzweig et al., 2003; Deutsch et al., 2013). This can be synthetized in Figure 1. (the areas in the dashed lines are not further elaborated in the present article).

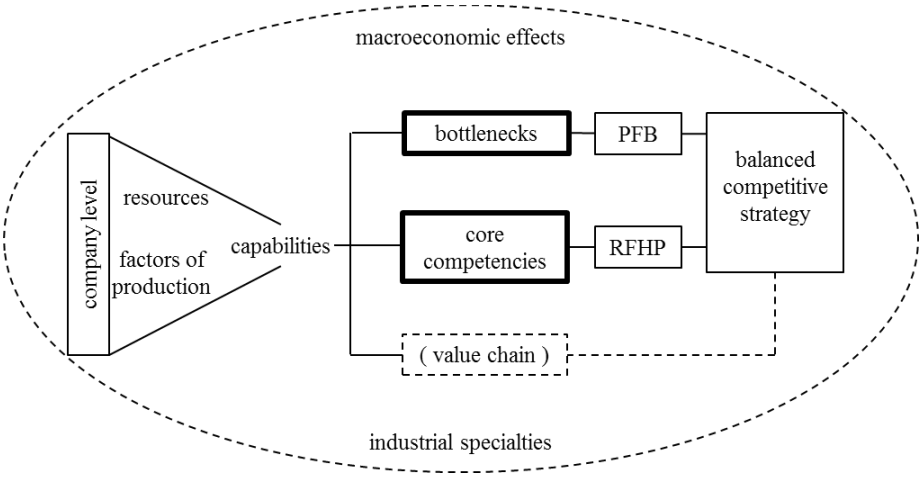

Figure 1. Linking competitive advantages and disadvantages

Source: own work

In those competitive strategies that build both on the theory of competitive advantages and competitive disadvantages, the development of core-competences and the elimination of bottlenecks are equally important. To calculate the effects of the bottlenecks the penalty-function was described. This penalty-function can be used in turn to formulate the following reward-function that shows the positive effects of the high-performance core-competences on the competitiveness:

$$h_{(i),j} = \max y_{(i),j} - (1 - e^{-(\max y_{(i),j} - y_{(i),j})})$$

ahol:

$h_{i,j}$the adjusted value after the reward, at *j* pillar and *i* firm

$y_{i,j}$the normal value at *j* pillar and *i* firm

max y the $y_{i,j}$ maximal value at *i* firm

i = 1, 2,……n = number of firms

j= 1, 2,…….m= number of pillars

With the help of the reward-function a reward for high performance (RFHP) can be given. This RFHP makes the methodology able to research those outstanding core-competences that are usually responsible for competitive advantages, also to examine other related positive effects that influence competitiveness. Because of the mathematical similarity, the results of the two correction techniques are comparable. In the calculation methodology of the competitiveness index, the reward-function should be applied as the 6-th step.

Global results of empirical research

The data warehouse of the competitiveness research has 852 entities. The primary data collection has been conducted in 2013 by the market research and public opinion polling company Szociográf. A small portion (about 6%) of the data has been collected by university students. Table 1. shows the composition of the sample according to firm size cathegories.

Table 1. Composition of the sample

Cases of missing data	**62 pcs**
1-4 person	321 pcs
5-9 person	181 pcs
10-19 person	105 pcs
20-49 person	113 pcs
50-249 person	60 pcs
above 250 person	10 pcs
Total:	852 pcs

Source: own work

The following cases have been removed from the sample: data not attained from SME companies, companies from which missing data reached a critical level, thus the data cannot be analysed. This affected globally 72 firms, although in some specific analysis's additional records needed to be removed. The preparation of the data has been done with Microsoft Excel 2007 (v14), while the analysis has been conducted with IBM SPSS (v20).

The competitiveness index has been calculated according to the 7 steps of the described calculation methodology in two alternative ways: one with the penalty-, and the other with the reward-function. After these processes the correlation was examined between the competitiveness indexes, the complex performance indicator (from the financial data) and the indicator's three components.

Table 2. The competitiveness points, the complex performance indicators and the correlation of their components

Correlations		Complex performance indicator	Revenue growth indicator	Yield index	Bankruptcy index
Competitiveness points - penalty	Pearson Correl.	**0.140**	0.139	0.050	0.097
	Sig. (2-tailed)	0.000	0.000	0.166	0.008
	N (piece)	745	775	773	749
Competitiveness points - reward	Pearson Correl.	**0.148**	0.152	0.070	0.098
	Sig. (2-tailed)	0.000	0.000	0.051	0.007
	N (number)	745	775	773	749
Complex performance indicator	Pearson Correl.	1	0.499	0.676	0.886
	Sig. (2-tailed)		0.000	0.000	0.000
	N (number)	745	745	745	745

Source: own work

According to Table 2. there is no relevant and measurable correlation between the competitiveness values and the financial performance indicator. Because of the present and past failures of the complex performance indicator, an attempt has been made to group and compress the financial data in a different way.

- Financial data hasn't been analysed on a 5 year term, only financial data from 2013 have been utilised. This eliminated the stock-flow problem in the analysis. The derivative financial indicators have been also removed.
- Factor analysis has been implemented. This method reduces data, it shows the linear correlation of financial variables, it shows those factors that have a common essence.
- The generating of the latent variable (financial factor) – according to the internal connection of the variables – had no obstacle. According to the research, the KMO value (with 0.732 value) was above the threshold, the Bartlett-test was also significant. The saved information content was above 50% (51.2%).
- The financial factor holds information about 9 financial variables. These are: number of employees, net sales, operating income, profit after tax, stock of fixed assets, current assets, total assets, equity holdings and liability holdings. This financial factor compresses 3/4s of all the corporate financial data obtained from the OPTEN system.

At this point the correlation of the new financial factor values and the competitiveness indexes can be examined:

Table 3. Correlation of financial factors and the competitiveness points

Correlations		Financial factor
Competitiveness point - penalty	Pearson Correl.	**0.367**
	Sig. (2-tailed)	0.000
	N (number)	761
Competitiveness point - reward	Pearson Correl.	**0.394**
	Sig. (2-tailed)	0.000
	N (number)	761

Source: own work

According to Table 3. the correlation between the financial factors and the competitiveness indexes is much stronger than between the complex performance indicator and the competitiveness values. It is also visible that according to the two alternatives of the competitiveness index calculation, the results with the reward-function were slightly better. This can be a methodological cause since the penalty-function based on the pillar harmonisation, lowers the distances between the pillar values, whereas the reward-function has an opposite effect, it makes the distances bigger. It is known that the correlation is stronger if we are able to explain high standard deviation with high standard deviation, thus it can be assumed that a lower deviation will possibly indicate lower correlation. Taking this into consideration, the results of the two alternative correlation analysis's can be taken as more similar and robust.

From the point of view of a statistician the strength of the revealed correlation is weak. The results of other authors should be also mentioned. In their models the performance variables could be explained by the internal firm-level factors in the following weight (in brackets the percentage of all given explanation is visible): Schmalensee (1985) 0.6% (20.2%); Rumelt (1991) 44.2% (48.2%); Roquebert et al. (1996) 55.0% (65.2%); McGahan és Porter (1997) 31.7% (50.4%); Hawawini et al. (2003) 35.8% (43.9%); Misangyi et al. (2006) 43.8% (51.4%). These authors tried to include other factors above the corporate ones as: industrial, macro-economic, institutional, so that a better explanation of performance trend can be provided.

CONCLUSIONS

The analysis of competitiveness of SMEs is at most important if the goal of policy makers is to generate real sector-development results with optimal resource allocation. These results of these researches should be taken into consideration while making economic- and social policies. Our knowledge is limited in this field, because the bulk of the research is concentrated on the competitiveness on big internationally successful corporations, industries and clusters. In regards to SMEs, the focus is on fast growing gazelles that are responsible for the most of the new workplaces in the business sector. This doesn't substitute the research of

a bigger number of SMEs. The SME researches of Szerb (2010) and Szerb et al. (2014) are aiming at filling the gap. At the same time, their SMECI model at the determination of competitiveness – paradoxically – validates the bottleneck effect that are usually the source of competitive disadvantages. Beside the relevant literature review a methodological alternative was built in this study. This takes into consideration the core-competences in examining competitiveness. The original goal was to enhance the correlation between the competitiveness index and the complex performance indicator, thus making it able to give a better explanation to the financial performance of SMEs. Even with a new financial factor, the competitiveness indicators calculated with the penalty- and reward-functions were able to explain only 40% of the standard deviation of the financial performance. This explanatory power is weak, although it is in line with the explanatory powers of other mentioned researches from the literature review. According to the cited researchers, the industrial factors are influencing the financial performance on a 4-20% basis. These viewpoints have to be incorporated to the research and methodology of Szerb et al. (2014). The correlation of the competitiveness indexes calculated with the penalty- and reward-function and robust, thus according to the present research nor the harmonisation of the pillars, nor the core-competence theory based research can be given a definite priority. In regards to this question as a development direction the following can be defined: deeper, sector, activity, life-cycle, and size based analysis with cross-variable breakdown; accompanied by a sub-sample analysis is needed. This can yield more sophisticated results.

REFERENCES

ACS, Z. J. (2011). High-impact firms: gazelles revisited. In Fritsch, M. (ed.) Handbook of Research on Entrepreneurship and Regional Development: National and Regional Perspectives, 133-174.

ARAGÓN-SÁNCHEZ, A., & SÁNCHEZ-MARÍN, G. (2005). Strategic orientation, management characteristics, and performance: A study of Spanish SMEs. *Journal of Small Business Management, 43(3), 287-308.*

BARNEY, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17(1),* 99-120.

BARNEY, J. B. (1995). Looking inside for competitive advantage. *The Academy of Management Executive, 9(4),* 49-61.

BARNEY, J. B. (2001). Resource-based theories of competitive advantage: A ten-year retrospective on the resource-based view. *Journal of management, 27(6),* 643-650.

CERRATO, D., & DEPPERU, D. (2011). Unbundling the Construct of Firm-Level International Competitiveness: A Conceptual Framework. *Multinational Business Review, 19(4),* 311-331.

CHIKÁN, A. (2006). A vállalati versenyképesség mérése. *Pénzügyi Szemle, 51(1),* 42-56.

COLLIS, D. J., & MONTGOMERY, C. A. (1995). Competing on Resources: Strategy in the 1990s. *Knowledge and Strategy,* 25-40.

CZAKÓ, E., & CHIKÁN, A. (2007). Gazdasági versenyképességünk vállalati nézőpontból – 2004-2006. *Vezetéstudomány, 38(5),* 2-8.

CSIKÁNY, F.-NÉ, & TAKÁCS, I. (2015). A gazellák húzzák a magyar gazdaságot? – avagy a gyorsan növekvő KKV-K jellemzői, hazai helyzetük. *Acta Carolus Robertus, 05(2),* 69-80.

DELGADO, M., KETELS, C., PORTER, M. E., & STERN, S. (2012). *The determinants of national competitiveness* (No. w18249). National Bureau of Economic Research.

DEUTSCH, N., DRÁVAVÖLGYI, T., & RIDEG, A. (2013). Note on the development of sustainable supply chain strategy. *Chemical Engineering Transactions, 35,* 655-660.

DHOLAKIA, R. R., & KSHETRI, N. (2004). Factors impacting the adoption of the internet among SMEs. *Small Business Economics, 23(4),* 311-322.
EUROPEAN COMISSION (2012, 795 final), Vállalkozás 2020 cselekvési terv – a vállalkozói szellem felélénkítése Európában, Brüsszel
GOLDRATT, E. M. (1994). *The Goal: A Process of Ongoing Improvement*. Great Barrington. MA: North River Press.
GRANT, R. M. (1991). Toward the resource-based theory of competitive advantage: Implications for strategy formulation. *California Management Review Spring, 33(3),* 114-135.
GRANT, R. M. (2010). *Contemporary Strategy Analysis* (7th ed.). John Wiley & Sons Ltd. UK
HAWAWINI, G., SUBRAMANIAN, V., & VERDIN, P. (2003). Is Performance Driven by Industry or Firm-Specific Factors? A New Look at the Evidence, *Strategic Management Journal, 24,* 16.
HENREKSON, M., & JOHANSSON, D. (2010). Gazelles as job creators: a survey and interpretation of the evidence. *Small Business Economics, 35(2),* 227-244.
KÁLLAY, L. (2012). KKV-szektor: versenyképesség, munkahelyteremtés, szerkezetátalakítás. Műhelytanulmány (working paper). Vállalatgazdaságtan Intézet. Budapest.
LENGNICK-HALL, C. A. (1992). Innovation and competitive advantage: What we know and what we need to learn. *Journal of Management, 18 (2),* 399-429.
LENGYEL, I. (2001). Iparági és regionális klaszterek. Tipizálásuk, térbeliségük és fejlesztésük főbb kérdései. *Vezetéstudomány, 32(10),* 19-43.
MAN, T. W. Y., & LAU, T., CHAN, K. F. (2002). The competitiveness of small and Medium enterprises. A conceptualization with focus on entrepreneurial competencies. *Journal of Business Venturing, 17,* 123-142.
MÁRKUS, G. (2015). A számviteli adatokra alapuló pénzügyi mutatók elemzési nehézségei. *Számvitel-adó-könyvvizsgálat*, Megjelenés alatt.
MCGAHAN, A. M. (1999). Competition, Strategy and Business Performance. *California Management Review, 41(3),* 74-101.
MCGAHAN, A. M., & PORTER, M. E.,(1997). How much does industry matter, really?. *Strategic Management Journal, 18,* 15–30.
MILLER, D. (1996). Configurations revisited. *Strategic Management Journal, 17(7).*
MILLER, D., & WHITNEY, J. O. (1999). Beyond strategy: Configuration as a pillar of competitive advantage. *Business Horizons,* 42(3), 5-17.
MISANGYI, V. F., ELMS, H., GRECKHAMER, T., & LEPINE, J. A. (2006). A New Perspective on a Fundamental Debate: A Multilevel Approach to Industry, Corporate and Business Unit Effects. *Strategic Management Journal, 27,* 571–90.
NEMZETGAZDASÁGI TERVEZÉSI HIVATAL (2013), Kis- és középvállalkozások stratégiája 2014-2020, Bp
PENROSE, E. T. (1959). *The Theory of the Growth of the Firm.* Oxford, UK, Oxford University Press.
PETERAF, M. A. (1993). The cornerstones of competitive advantage: A resource-based view. *Strategic management journal, 14(3),* 179-191.
PORTER, M. E. (1998). *On competition*. Boston, Harvard Business School Press.
PRAHALAD, C. K., & HAMEL, G. (1990). The Core Competence of the Corporation. *Harvard Business Review, 68(May-June),* 79-91.
RAPPAI, G., & SZERB, L. (2011). Összetett indexek készítése új módon: a szűk keresztmetszetekért történő büntetés módszere. Közgazdaságtudományi és Regionális Tudományok Intézete, Pécsi Tudományegyetem Közgazdaságtudományi Kar Műhelytenulmányok 2011/1, 2011 március.
RAY, G., & BARNEY, J. B., & MUHANNA, W. A. (2004). Capabilities, business processes, and competitive advantage: choosing the dependent variable in empirical tests of the resource-based view. *Strategic Management Journal, 25(1),* 23–37.
ROQUEBERT, J. A., PHILLIPS, R. L., & WESTFALL, P. A., (1996). Markets vs. Management: What 'Drives' Profitability?. *Strategic Management Journal, 17,* 653–64.
ROSENZWEIG, E. D., ROTH, A. V., & DEAN, J. W. (2003). The influence of an integration strategy on competitive capabilities and business performance: An exploratory study of consumer products manufacturer. *Journal of Operation Management, 21,* 437-456.

RUGMAN, A. M. & VERBEKE, A. (2001). Location, Competitiveness, and the Multinational Enterprise, in: Rugman, A.M., & Brewer, T.L. (eds). *The Oxford Handbook of International Business*. Oxford University Press, Oxford, 146-180.

RUGMAN, A. M., & VERBEKE, A. (2002). Edith Penrose's contribution to the resource-based view of strategic management. *Strategic Management Journal, 23(8),* 769-780.

RUMELT, R. P. (1984). *Towards a strategic theory of the firm*. in: Lamb, R.B. ed, Competitive Strategic Management, Prentice Hall, Englewood Cliffs, New York, 556-570.

RUMELT, R. P., (1991). How much does industry matter?. Strategic *Management Journal,12*, 167–85.

SCHMALENSEE, R., (1985). Do markets differ much?. *American Economic Review, 75,* 341–51.

SINGH, R. K., GARG, S. K., & DESHMUKH, S. G. (2007). Interpretive structural modelling of factors for improving competitiveness of SMEs. *International Journal of Productivity and Quality Management, 2(4),* 423-440.

STAMATIS, D. H. (2004). Six Sigma Fundamentals: A Complete Guide to the System, Methods, and Tools. New York, New York, Productivity Press.

SZERB, L. (2010). A magyar mikro-, kis és középvállalatok versenyképességének mérése és vizsgálata. *Vezetéstudomány, 41(12),* 20-35.

SZERB, L., CSAPI, V., DEUTSCH, N., HORNYÁK, M., HORVÁTH, Á., KRUZSLICZ, F., LÁNYI, B., MÁRKUS, G., RÁCZ, G., RAPPAI, G., RIDEG, A., SZŰCS, P. K., & ULBERT, J. (2014). Mennyire versenyképesek a magyar kisvállalatok? A magyar kisvállalatok (MKKV szektor) versenyképességének egyéni-vállalati szintű mérése és komplex vizsgálata. *Marketing & Menedzsment, XLVIII. évfolyam, 2014/Különs.*, 3-21.

TEECE, D. J. (1984). Economic Analysis and Strategic Management. *California Management Review, 26(3),* 87-110.

TÖRÖK, Á. (1989). Komparatív előnyök, versenyképesség, piacműködés. *Ipargazdasági Szemle, 1989/3,* 23-34.

WANG, H. (2014). Theories for competitive advantage. In: Hasan, H. (eds.). Being practical with theory: a *window into business research*, 33-43.

WERNERFELT, B. (1984). A Resource-Based View of the Firm. *Strategic Management Journal, 5(2),*171-180.

WERNERFELT, B. (1995). The resource-based view of the firm: ten years after. *Strategic Management Journal, 16(3),* 171- 174.

INFLUENTIAL FACTORS OF THE HUNGARIAN TERRITORIAL INCOME

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SUMMARY

The distribution of the Hungarian territorial income is not equal across the local administration units (LAU1). There are huge disparities between the different parts of the country. The most developed territories can be found in the central and north-western part of Hungary, until the least developed ones are there in north-eastern Hungary and in the southern Transdanubian region. Nemes Nagy (1998) in his works emphasizes that the territorial inequalities have several aspects and because of this need complex, more-dimensional analysis. From the beginning of the 2000's several researchers analysed the inequalities from various aspects (for example the four component model of Szakálné (2011) for territorial competitiveness).
The aim of this recent research is to examine those significant factors which have a great influence onto the dispersion of the Hungarian territorial income and create optimal regression function. Because of the wide range of the indicators the use of factor analysis was strongly recommended. According to my former results (Szendi, 2015.) there is a significant medium-strong positive spatial autocorrelation in the case of the Hungarian territorial income at level LAU1. This correlation indicates the existence of spatial regression models.

THEORETICAL BACKGROUND

The analysis of the territorial social-economic inequalities is in central role of interest in Hungary (Obádovics et. al., 2011.).That is why I examined some articles related to the Hungarian territorial inequality research.
According to OTK (Hungarian Territorial Development Concept) "the income inequalities across the counties and regions are permanently growing parallel with the economic development. … The differences are increasing most dynamically between the Western and Eastern counties." (OTK, 1998. p. 1.)
Faluvégi (2000) in his work has examined the development types of the Hungarian micro-regions according nine economical-social indicators. These were: capital of the foreign enterprises per capita, income per capita, growth rate of income per capita, number of functioning economic organisations per 1000 inhabitants, growth rate of the number of functioning economic organisations, unemployment rate, migration per 1000 inhabitants, telephone stations per 1000 inhabitants, cars per 1000 inhabitants. He has made a statement that the dynamically developing territories (according the entire nine examined indicator) can be found mostly by the Budapest-Zalaegerszeg axis (including the micro-regions of the Balaton), the Budapest-Győr, the Budapest-Pécs, and Budapest-Miskolc axis. The relatively underdeveloped ones are there in Borsod-Abaúj-Zemplén, Szabolcs-Szatmár-Bereg and Hajdú-Bihar counties.

Kiss and Németh (2006) has made a statementthat in the distribution of the territorial income there exist great differences; the standard deviation of the Hoover index is significant. In the local administration unit of Tiszaújváros the value of the Hoover index is above 20%.
Hahn (2004) made a complex development analysis in which he examined the influential factors of the territorial development. According to him the most significant factors are the geographical position, foreign direct investment, accessibility of motorways, and the secondary and high school education.
Bakoset. al. (2011) has examined the territorial inequalities as a complex process and has made a statement that the migration and immigration are significant influential factors. Beside this the geographical situation, transport opportunities, infrastructural development and the qualification of the labour force are also important factors.
According to my former results there are some statements to consider in this recent analysis. The first statement is that the highest GDP values can be found along some local administrative unit axes in Hungary (Budapest-Miskolc, Budapest-Győr, Budapest-Szeged, Budapest-Keszthely és Budapest-Pécs). Second, there is a medium strong, positive linear correlation between the GDP and life expectancy, the GDP and the number of cars, and the GDP and the volume of house building. There is a strong positive linear correlation between GDP and education and a negative strong correlation between the GDP and the unemployment rate across the Hungarian local administrative units. The third important statement is that there is a medium strong positive spatial auto correlation across the territories in the case of the territorial income. (Szendi, 2015.)

DATA AND METHODOLOGY

The main goal of this recent research is to analyse the influential factors of the Hungarian territorial income. I made the analysis to the 168 local administration units of Hungary with initially 20 involved indicators. To achieve the results the regression analysis is one of the most frequent used technics. The aim of it is to explain the dispersion of a dependent variable (y) with the use of some explaining factors (x_1, x_2, x_3 …).
The linear regression analysis is based on the Ordinary Least Squares method. According to the assumptions there is a linear connection between the depending variable and the explaining factors, and the dispersion from this can be described with an error term (ε) (Szakálné, 2011.). A linear regression model can be represented in the following form:

$$Y = \beta_0 + \beta_1 x + \varepsilon$$

In this equation the β_0 parameter gives the value of the depending variable in the x=0 point (when all of the explaining factors are zero). The β_1 regression coefficient gives the value of what effect the 1% change of an indicator causes in the value of the dependent variable (in the case when every other factors are stable).
The validity and adoptability of the linear regression model has several assumptions. The explaining variables have to be:

1. independent from each other – multicollinearity (test: VIF indicator),

2. their values are fixed,
3. they do not contain measurement error,
4. they have no correlation with the error term.

For the error term there are also four assumptions to fulfil:

1. its expected value is zero (which fulfils through the Ordinary Least Squares method),
2. its standard deviation is constant – homoscedasticity (Bartlett, Goldfeld-Quandt test),
3. their values are not auto correlated (Durbin-Watson test),
4. their dispersion is normal (histogram and Chi square test).

In the analysis I used the backward method by the selection of the indicators.In the case of multivariate analysis, if there is a complex connection between the indicators (as it was in this recent analysis), it is practical to reduce the number of indicators in some factor variables. The method for this can be the factor analysis. This is a dimension reduction technic which's adoptability has several criteria. First I had to examine if the dates are appropriate to factor analysis. There are three different technics to do that: the correlation matrix analysis (strong correlation is needed with the dependent variable), anti-image matrix (MSA criterion: value above 0,5) and KMO and Bartlett test (most common method; in the case of Bartlett test the significance is important, and by KMO above 0,5 is acceptable). (Sajtos-Mitev, 2006.)

If the dates are adaptable to factor analysis, thanby determining the number of factors there can be used different methods:

1. a priori criterion: initial decision from the factor number,
2. Kaiser criterion: calculates the number of factors according to their eigenvalues (above 1 is needed),
3. variance share method: describes what share of the initial indicators can explain the new created factors,
4. Scree plot: graphic test, which makes decisions also through the eigenvalues.

To the interpretation of the factors there is a need for rotation of the factors. The varimax, quadratic rotation is one of the most frequent used technics, which I also used in my recent research.

If the values of the neighbouring territories are in connection with each other, so there is a spatial auto correlation, than the OLS estimation can give misleading results. In that case the use of spatial regression is strongly suggested. Two main types of the spatial regression are the spatial lag (which operates with spatially lagged dependent variable) and spatial error model (operates with spatially lagged error term) (Varga, 2002.). The general form of the spatial autoregressive model can be described as the following equation (Gerkman-Ahlgren, 2011.):

$$y = X\beta + \rho Wy + u$$
$$u = \lambda Mu + \varepsilon$$

whereρ and$\lambda$are scalarspatial autoregressive parameters. There are two special cases, if $\rho=0$ it is a spatial error model, and if $\lambda=0$ it is a spatial lag model. If both parameters are zero than the results of OLS model are correct. (Gerkman-Ahlgren, 2011.)

The spatial lag model contains spatially lagged dependent variable (W_y), and measures the effect of spatial spill over (Anselin-Bera, 1998.). In this model the neighbouring values of the dependent variable have direct effects onto the dependent variable. The general form of spatial lag model:

$$y = \rho W y + X\beta + \varepsilon$$

whereρ (rho) measures the value of the spatial dependency. The positive or negative sign of the rho gives the direction of the influence. If the rho is positive than the territories which neighbours have very high GDP, will also have higher GDP values. (Anselin, 2001.)
In the spatial error model the spatial dependency is also observable but in the case of the error term. It examines the spatial errors, for example missing values. The general form of spatial error model:

$$y = X\beta + u$$
$$u = \lambda W u + \varepsilon$$

whereλ (lambda) is the indicator of the spatially auto correlated error term. If the value of λ is not zero then there is a dependency by the error term across the territories.(Anselin, 2001.)
To decide which model is significant, the use of Lagrange Multiplier test is needed. The significance of the LM-lag and Robust LM-lag tests suggest the validity of spatial lag model, while the significance of the LM-error and Robust LM-error tests suggest the validity of spatial error model. The decision tree of spatial regression can be seen on following Figure 1.

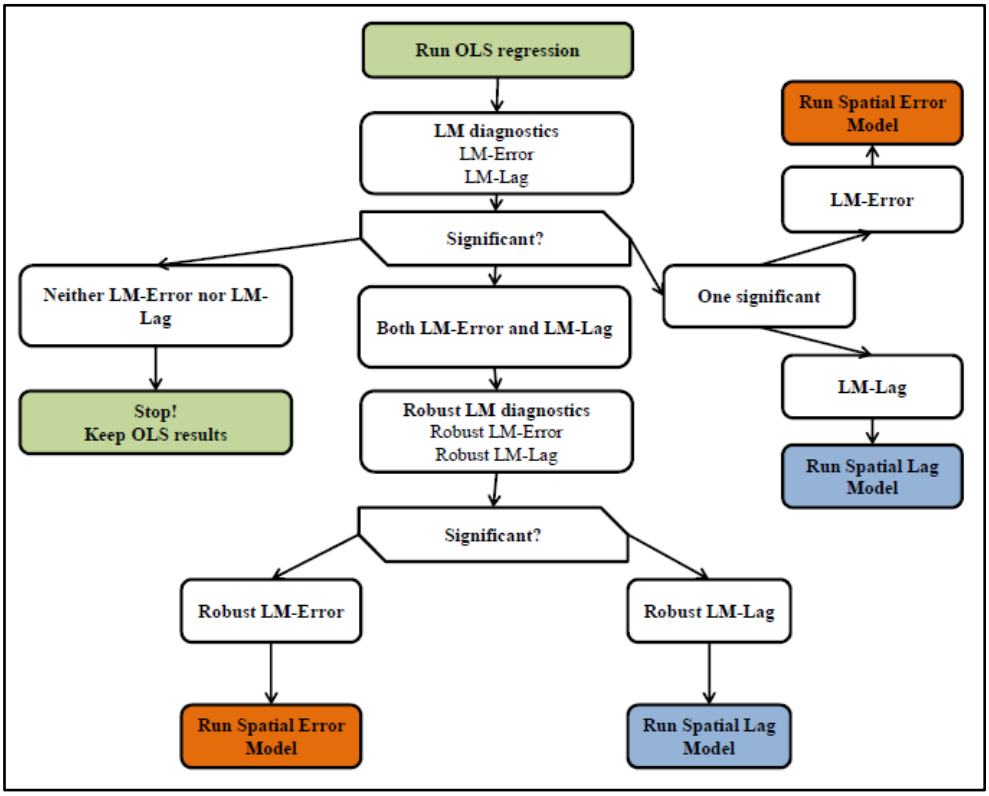

Figure 1. Spatial regression decision tree
Source: author's own calculation according to Anselin (2005)

RESULTS OF MY ANALYSIS

To examine the influential factors of the Hungarian territorial income, first I have built a database of variables which I supposed that can make an influence onto the income distribution. The data sources of my research were the dates of the Hungarian Central Statistical Office, the TEIR database and the Census data of 2011. Initially I have put 20 indicators into the analysis:

- life expectancy by birth,
- educational attainment,
- functioning hospital beds per 1000 persons,
- cars per 1000 persons,
- ground-space of new built housesper 1000 persons,
- unemployment rate,
- traffic accidents on public roads per 1000 persons,
- number of reg. crimes per 1000 persons,
- number of functioning enterprises in the processing industry per 1000 persons,
- number of functioning enterprises employing 10-19 persons per 1000 persons,
- number of functioning enterprises employing 1-9 persons per 1000 persons,
- number of functioning enterprises employing 250-499 persons per 1000 persons,
- number of functioning enterprises employing above 500 persons per 1000 persons,
- number of commercial quarters per 1000 persons,
- number of guest nights per 1000 persons,
- from the inhabitants transferred waste per 1000 persons,
- migration per 1000 persons,
- immigration per 1000 persons,
- number of live births per 1000 persons,
- number of death per 1000 persons,
- number of marriages per 1000 persons.

In the regression analysis I have tested the initial criteria of the error term and the explanatory variables, and have made a statement that in the model the expected value of the error term is zero, its standard deviation is stable (homoscedasticity criterion). The values of the error term are not autocorrelated (tested by Durbin-Watson test). But in the case of the explanatory variables there exists several times disturbing multicollinearity (according to the VIF indicator). Because of this there was a need of dimension reduction.

By the dimension reduction I used a factor analysis. From the database I put out the most correlating four indicators (traffic accidents on public roads per 1000 persons, number of functioning enterprises in the processing industry per 1000 persons, number of functioning enterprises employing 10-19 persons per 1000 persons, and number of functioning enterprises employing 1-9 persons per 1000 persons), and I have checked if the factor analysis can be carried out. The applied methods were the Kaiser-Meyer-Olkin test, the Bartlett test and the anti-image matrix. The basic hypothesis, that there must be at least a 10 times difference

between the number of indicators and the number of territories, was realized (168 territories/ 16 indicators = 10,5).

Table 1. KMO and Bartlett test

Kaiser-Meyer-Olkin test		0,764
Bartlett's Test	Chi square	1718,981
	degree of freedom	136
	significance	0,000

Source: author's own calculation

According to the results the factor analysis can be carried out, hence the value of the KMO is 0,764 (which is higher than the 0,5 goalpost), and the significance level of the Bartlett test is zero (Table 1.) The covariance and correlation of the anti-image matrix also underlines the factor analysis (the MSA criterion was realized). I made the analysis with one of the most frequent used method, the Principal components. The eigenvalues, and also the explained variance have suggested a five factor solution (Figure 2.).

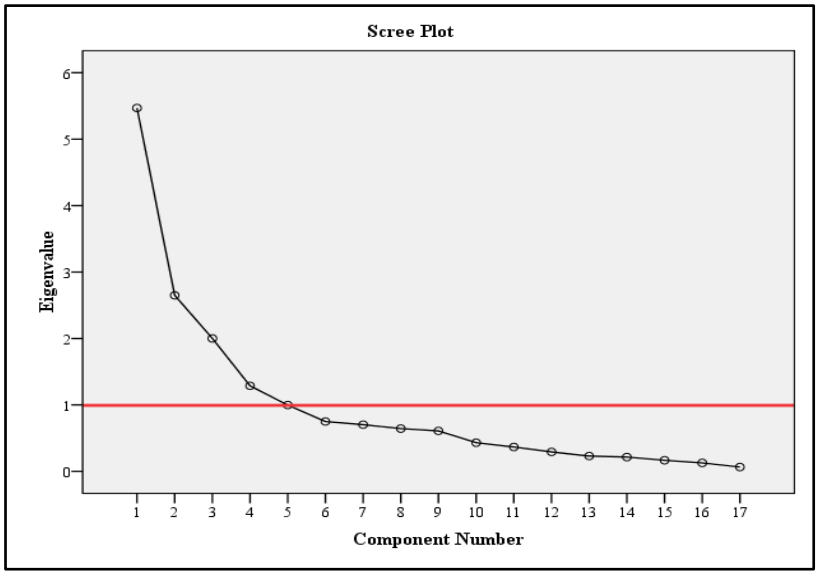

Figure 2. Number of factors based on the eigenvalues
Source: author's own calculation

To calculate the 5 factors I used the Varimax quadratic transformation method. The 5 factors determine 72,96% of the indicators variance (Table 2.). According the rotated component matrix I have calculated the following 5 factors, in which names I used the most dominant indicators.

1. **factor:***life quality* (unemployment rate, cars per 1000 persons, life expectancy by birth, number of marriages per 1000 persons, ground-space of new built housesper 1000 persons, educational attainment),
2. **factor:***tourism* (number of commercial quarters per 1000 persons,number of guest nights per 1000 persons, from the inhabitants transferred waste per 1000 persons),

3. **factor:***economic environment* (number of functioning enterprises employing 250-499 persons per 1000 persons,number of functioning enterprises employing above 500 persons per 1000 persons, functioning hospital beds per 1000 persons, number of reg. crimes per 1000 persons),
4. **factor:***migration* (migration per 1000 persons,immigration per 1000 persons),
5. **factor:***natural reproduction* (number of live births per 1000 persons,number of death per 1000 persons).

Table 2. Explained variance

Total explained variance						
	Initial eigenvalues			Rotated eigenvalues		
Component	Sum	In % of variance	Total %	Sum	In % of variance	Total %
1	5,469	32,171	32,171	4,243	24,960	24,960
2	2,649	15,585	47,756	2,403	14,133	39,093
3	2,001	11,768	59,524	2,108	12,398	51,491
4	1,287	7,571	67,095	1,874	11,023	62,514
5	0,997	5,868	72,962	1,776	10,448	**72,962**
6	0,750	4,410	77,372			
7	0,702	4,132	81,504			
8	0,644	3,786	85,290			
9	0,609	3,581	88,870			
10	0,431	2,535	91,406			
11	0,367	2,156	93,562			
12	0,292	1,720	95,282			
13	0,229	1,350	96,632			
14	0,214	1,262	97,893			
15	0,167	0,980	98,873			
16	0,127	0,747	99,620			
17	0,065	0,380	100,000			
Principal components method.						

Source: author's own calculation

I made the regression analysis of the Hungarian territorial per capita income using the above mentioned five factors. The regression function fulfils the requirements of the error term and explaining variables, there is no disturbing multicollinearity. According the Durbin-Watson test the error term is not auto correlated, and the significance of F statistic proves the reliability of the model. (Table 3.)

Table 3. Dates of the model, ANOVA and coefficients

Model	R	R^2	Corrected R^2	Standard error	Durbin-Watson
1	0,844[a]	0,713	0,704	156,94509	1,898

	Sum of squared	degree of freedom	F-statistic	Significance
Regression	9962287,9	5	80,890	,000[a]
Residuals	4014977,2	163		
Total	1,398E7	168		

a. Explaining variables: constant, natural reproduction, migration, economic environment, tourism, life quality factors

b. Depending variable: territorial income

	Unstandardized coefficients		Collinearity	
	B	Standard error	Tolerance	VIF
constant	1603,675	12,073		
life quality	215,925	12,109	1,000	1,000
tourism	-6,514	12,109	1,000	1,000
economic environment	78,873	12,109	1,000	1,000
migration	15,359	12,109	1,000	1,000
natural reproduction	78,590	12,109	1,000	1,000

Source: author's own calculation

Beside these the model also fulfils the requirements of the normality, which is represented on Figure 3.

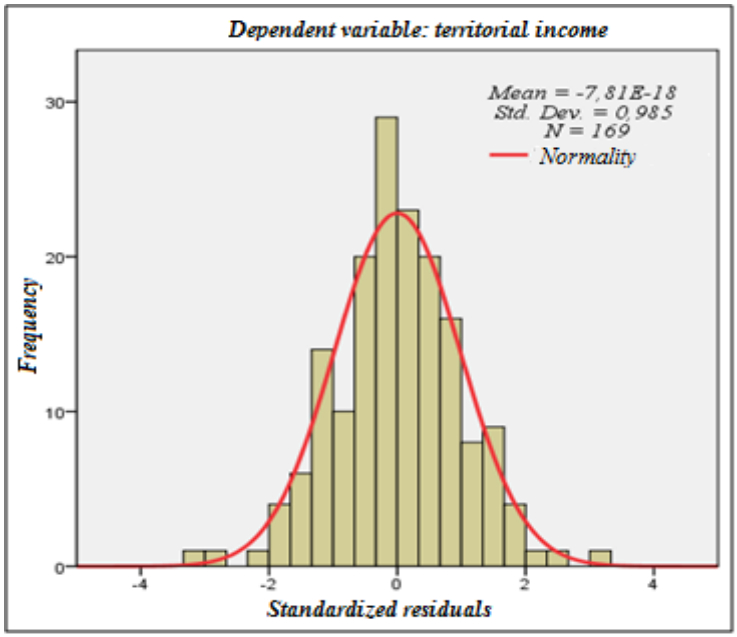

Figure 3. Normality of the territorial income
Source: author's own calculation

The optimal regression function can be determined by the following equation:

$$Y = 1603,675 + 215,925X_1 - 6,514X_2 + 78,873X_3 + 15,359X_4 + 78,59X_5$$

It means that if every factors are zero, then the territorial income per capita is 1603,675 thousand Forint. If the life quality indicator increases by 1% then the territorial income per capita will be increasing also, with 215,9 thousand Forint (in the case when every other factors remain stable). As an effect to the increase of the economic environment and the natural reproduction factor the territorial income will be growing with about 78 thousand Forints. The positive effect of migration is relatively lower, while the tourism factor makes a negative effect onto the territorial income per capita.

According the five factors the following Figure 4.can be described. In the case of life quality factor there is a developed northern - north-western zone. Beside this there is observable a highly developed Budapest - Győr – Sopron, Budapest – Szeged, Budapest – Pécs, Budapest – Miskolc axis, and also the micro-regions of the Balaton area show this characteristics.

In the case of tourism factor the micro-regions of the most visited tourism attractions appear like hot spots in the space. For example the dominance of the Balaton-area, Tokaj-Hegyalja, Eger, Debrecen, Székesfehérvár and Szombathely is huge.

The factor map of the economic environment is more heterogenic, the most developed territories can be found in the area of the county centres and in the bigger towns which are centres of greater enterprises.

According to the results of migration factor two main paths can be described. First there are huge values near the country borders, where both directions of the migrationare observable. In the case of Northern Hungarian and Southern Transdanubian small villages the migration is relatively dominant. The case of the Budapest agglomeration shows the tendencies of suburbanisation.

By the natural reproduction factor the highest values can be found in the Budapest agglomeration and the northern – north-eastern part of the country.

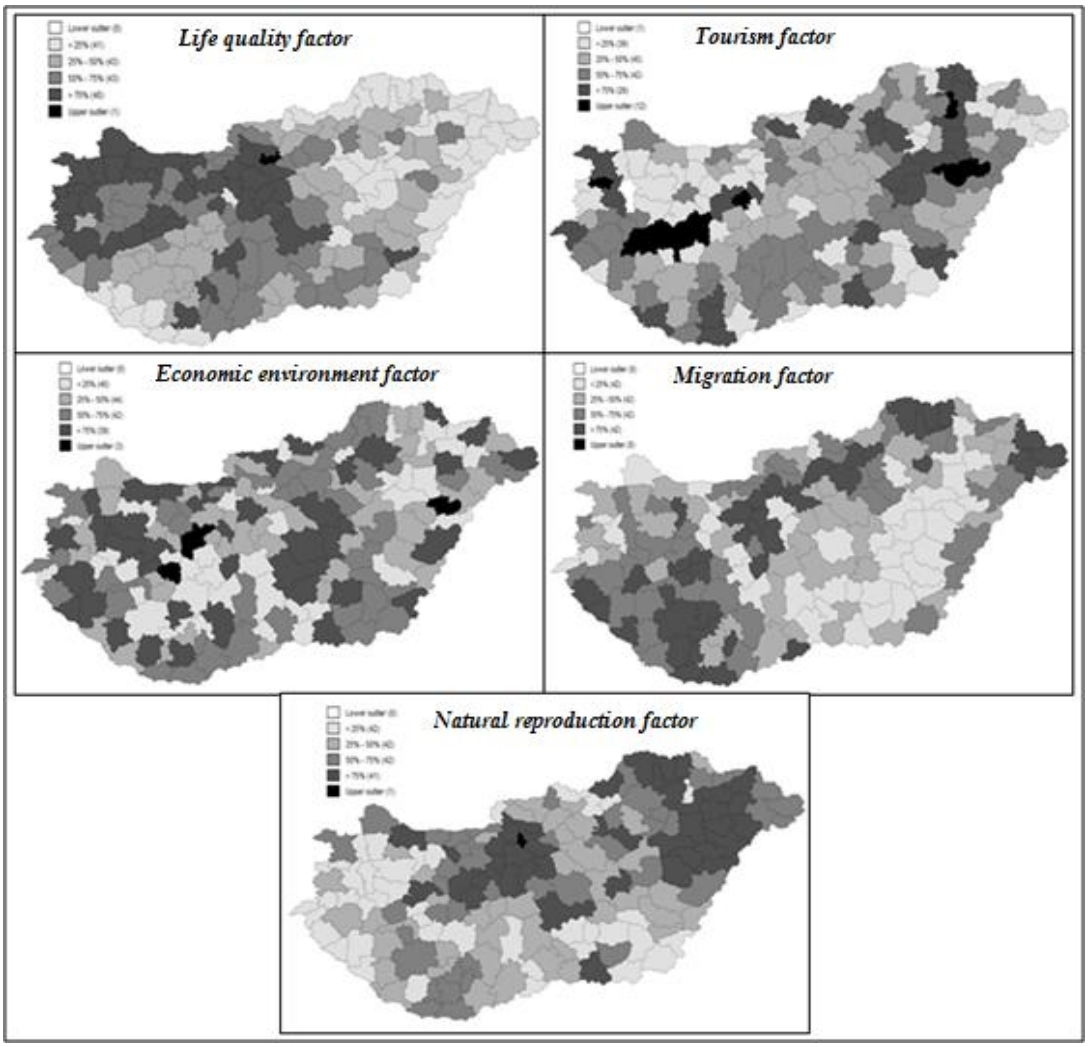

Figure 4. Factor maps related to the Hungarian territorial income
Source: author's own calculation

The spatial effects can play important role also by the regression analysis that is why I examined the role of neighbourhood effects in the case of territorial income. By the classic OLS (Ordinary Least Squares) regression I have built the neighbourhood matrix into the model to examine the validity of spatial models. My question was whetherone of the spatial models (spatial lag – lagged value of the dependent variable or spatial error – lagged error term) is validin the case of Hungarian territorial income. The parameters of spatial regression are summarized by the following Table 4.

Table 4. Spatial regression test – Hungarian territorial income

Test	Moran I/ degree of freedom	Value	Significance
Moran I	0,3747	8,4344	0,0000
Lagrange Multiplier (lag)	1	51,9052	0,0000
Robust LM (lag)	1	7,9929	0,0047
Lagrange Multiplier (error)	1	60,5130	0,0000
Robust LM (error)	1	16,6006	0,00004
Lagrange Multiplier (SARMA)	2	68,5058	0,0000

Source: author's own calculation

According the above both of the LM spatial lag and error models are significant, so the validity of spatial model can be proved. The type of the spatial regression is determined by the significance of Robust LM tests (spatial regression decision tree, Figure 1.).
As both of the Robust LM tests are significant, I have chosen the model with higher significance level. According to this in this case of the Hungarian territorial income the spatial error model can be verified, which contains a lagged error term. I made the analysis of the spatial error model, and got the following results compared to the OLS.

Table 5. Results of OLS and spatial error model – Hungarian territorial income

Coefficients	OLS	Spatial error
constant	1603,675**	1607,922**
life quality	215,925**	197,21**
tourism	-6,514	20,72
economic environment	78,873**	82,94**
migration	15,359	-4,39
natural reproduction	78,590**	42,81**
Lambda	-	0,7276**
R^2	72,96	82,66
Akaikecriterion	2182,59	2119,88
Schwarz criterion	2201,33	2138,62

** significant (p<0,001)
Source: author's own calculation

The spatial error model can better explain the dispersion of the Hungarian territorial income compared to the OLS, because the explanatory power of the spatial error model is 82,66%, while the OLS only 72,96%. (Table 5.)In the spatial error model the value of the Akaike and Schwarz information criterion is lower which also underlines the validity of the model.
According to the spatial error model the territorial income is higher compared to the OLS (1608 thousand Forint) in the case if every other factors are zero. The 1 % increase of the life quality factor has a positive effect on the income, it increases the income by 197,21 thousand Forints. The tourism, economic environment, and natural reproduction factors make positive effects on the income while the change of the migration factor causes a decrease in the income (which is more closed to the reality). The coefficient of the spatial error term (lambda) is 0,7276 which means that it has a significant, positive effect. The spatial error model can be described as follows:

$$\boldsymbol{Y = 1607,922 + 197,21X_1 + 20,72X_2 + 82,94X_3 - 4,39X_4 + 42,81X_5 + \varepsilon}$$
$$\boldsymbol{\varepsilon = 0,7276\, W\varepsilon + \xi}$$

whereε is the error term, W matrix of the neighbourhood connections, andξvector of uncorrelated error terms.

CONCLUSION

In my recent research I have examined the influential factors of the Hungarian territorial income. As a result of the analysis I have calculated a model where the distribution of the territorial income is explained by five complex factors and in the model also the spatial connections have significant effects.The five influential factors are life quality, tourism, economic environment, migration and natural reproduction. It is remarkable that by most of the factors there is observable a highly developed Budapest - Győr – Sopron, Budapest – Szeged, Budapest – Pécs, Budapest – Miskolc axis. Beside this also the micro-regions of the Balaton area show great development tendencies.In the case if every influential factors are zero than the value of the territorial income is 1608 thousand Forint. The greatest positive effect makes the life expectancy factor onto the income distribution, while the only one factor which has negative effect is the migration. In the case of the Hungarian income the spatial error model can be proved. This model can explain through the above mentioned factors more than 82% of the Hungarian territorial income distribution.The coefficient of the spatial error term (lambda) is 0,7276 which indicates significant, positive effect.

LIMITATION

Further on I would like to expand this research to other countries (for example Germany), to analyse the most influential factors of territorial GDP. In my opinion to adopt the model for other countries it has some limitations. First, the applied indicators are varying across countries, and time periods. The indictors of this model are fitted only for the Hungarian territorial income in 2011. Other limitation can be found in the applied database; hence the availability of the indicators at territorial level is very limited. (Probably there are other significant variables influencing the territorial income, but the dates availability is not ensured.) The third relevant limitation can be found in the methodology of the spatial regression, because I suppose that the border regions of the neighbouring countries might have an influence onto the results of regression, so a cross-regional map would be useful. So before expanding the model it is important to analyse these limitations.

REFERENCES

ANSELIN L. (2001): SpatialEconometrics*Acompaniontotheoreticaleconometrics*, pp. 310-330.

ANSELIN L. (2005): *ExploringSpatial Data withGeoDaTM: A Workbook*Center forSpatiallyIntegratedSocial Science

ANSELIN L. &BERAA. K. (1998): SpatialdependenceinLinearRegressionModelswith an IntroductiontoSpatialEconometrics*Statisticstextbooks and monographs*, Vol. 155., pp. 237-290.

BAKOS N., HIDAS ZS. &KEZÁNA. (2011): Területi különbségek Magyarországon A főbb társadalmi és gazdasági folyamatok az ezredforduló után *Területi Statisztika*, Vol. 1.(51.)., Nr. 4., pp. 335-357.

FALUVÉGI A. (2000): *A magyar kistérségek fejlettségi különbségei*Előadás a Magyar Statisztikai Társaság Területi Statisztikai Szakosztálya Vándorülésén, Balatonöszöd.

GERKMAN L. &AHLGREN N. (2011): *PracticalProposalsforSpecifyingk-NearestNeighboursWeightsMatrices*HankenSchool of Economics, WorkingPapers 555.
HAHN CS. (2004): A térségi fejlődést befolyásoló tényezők Magyarországon *Területi Statisztika*, Vol. 6., pp. 544-563.
KISS J. P. & NÉMETH N. (2006): *Fejlettség és egyenlőtlenségek, Magyarország megyéinek és kistérségeinek esete* Budapesti Munkagazdaságtani Füzetek, BWP – 2006/8
NEMES NAGY J. (1998): *A tér a társadalomkutatásban*Hilscher Rezső Szociálpolitikai Egyesület, Budapest.
OBÁDOVICSCS.,BRUDER E. & KULCSÁR L. (2011): A gazdasági és szociális helyzet területi egyenlőtlenségei a vidéki Magyarországon – hasonlóságok és eltérések *Gazdaság és Társadalom* 2011/2.
ORSZÁGOS TERÜLETFEJLESZTÉSI KONCEPCIÓ (1998)
SAJTOS L. &MITEVA. (2006): *SPSS Kutatási és adatelemzési kézikönyv*Alinea Kiadó, Budapest
SZAKÁLNÉ K. I. (2011): A gazdasági aktivitástérbeli eloszlásának vizsgálati lehetőségei*Statisztikai Szemle*, vol. 89. (1), pp. 77-100.
SZENDI DÓRA: Az életminőség, mint komplex indikátor területi differenciái a német és magyar gazdaság esetében; Fiatal Regionalisták IX. Konferenciája, Győr, 2015. – *underpublishing*
VARGA A. (2002): Térökonometria*Statisztikai szemle,* 80. évf. 4. sz., pp. 354–370.

KNOWLEDGE MANAGEMENT AND VALUE CREATION

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SUMMARY

Understanding the role of knowledge-based processes is one of the key elements to correctly interpret the possible value chains within the organisations. The current research's aim is to introduce a pragmatic approach about how to manage knowledge effectively. As a general introduction the related standards and best practices will be introduced. After gaining a common understanding about the domain, a holistic framework is collated.
100 company representatives (Hungarians and non-Hungarians) were asked about the followings: process management, knowledge management, strategy and their connection with value creation. The respondents provided a summary about their own attitude and their organisation's current status. Evaluating the standards against the answers allows a detailed gap analysis what covers both the technical and the human aspects. Although the exploration of the knowledge management is complex, especially from this point of view, the results may provide a coherent composition of the crucial factors already at preliminary stage.
Collecting the components helps with indicating the relevance of the domain, and shows those sub-areas what require more attention by pinpointing the possible value creating opportunities or barriers. The research has dual-purpose: it presents the theoretical background and it gives a practical guideline.

PROBLEM STATEMENT

Before stating the problems to be analysed, it is clarified what is the specific scope and what are the supporting definitions.
The knowledge-intensive organisations can be distinguished from traditional industrial organisations. Alvesson (2001) points out that the knowledge-intensive organisations are those organisations where the overwhelming part of the work is of intellectual nature and where qualified employees form the major part of the workforce. According to Nurmi (1998) these types of organisations transform what they know into knowledge products and services for their customers. However research and development activities (Lee, 1999) are also taken into account as representing the profile with the highest impact, the current research covers mainly just service providers.
The 'complete' knowledge is added up from the two main types of knowledge: the explicit and the tacit (Polányi, 1966). The explicit knowledge can be documented, codified; it can be stored in digital systems and its transfer is possible. The tacit knowledge is what people carry in their mind, it is difficult to be assessed and evaluated, its transfer is not possible and its processesare not transparent. There are some approaches (Nonaka, 1994) what reveal the substantial steps in the whole phenomenon as a "social learning process" but still it is not easy to provide a measurable framework.

The effective knowledge management means in the current research something more like a cultural attitude towards the knowledge resources and the relevant business processes, it means that the resource managers and workers are aware of the business objectives and the available resources, both of the human and non-human sides, and they are able to construct a relevant connection amongst them. Or at least they try to establish the grounds what are the basis for the possible value-channels within organisations. So the effective knowledge management means not a simplified measuring system, but a holistic view, since the quantitative indicators are usually ad hoc and rare (Smits & de Moor, 2004).

The author is looking for the answers for the following questions on the long term:

1. Can the organisational knowledge be evaluated?
2. Can the applicability of the knowledge management be defined?
3. Can the optimal level of the knowledge management be determined?

The knowledge management's domain is very complex,during the research the goal is to maintain the holistic view, and to provide traceable and demonstrable evidences to support the original aim of the research.

The applicability could cover multiple dimensions at the same time, the surrounding environment, the corporate's culture, the size of the business entities, the sector in what they are active, the nature of the business problems, and the structure of the business processes and automatisation level of the processes could be all the parts of the research. Since the combination of all the elements can create an interminable set, the – from research's perspective – relevant elements will compose the frame.

The optimisation is in operations research the selection of the best element from a set of alternatives. The outcome of the research should give some general findings about how to translate the on-going business processes into a measurable and yielding management practice in order to create value for the organisation.

In the next chapter the methodology of the research is introduced.

RESEARCH METHOD

During the organisational research the most common way is to use quantitative or qualitative research (Balaton &Dobák, 1991).

The quantitative research quantifies data and tries to give a generalized result on a specific topic, usually a large number of cases represent the specific population. The data collection mechanism might be based on interviews, questionnaires. Its findings are descriptive based on statistical methods. It can be used to recommend a final answer or a decision. (Babbie, 2003a)

The qualitative research tries to develop an understanding about a specific domain, it tries to uncover hidden relationships by generating the common grounds for later quantitative researches. The sample size is usually not representative. Collecting this kind of data is not that structured as in the case of quantitative research, but rather unstructured, applicable form is more a discussion or depth interview what provides non-statistical data. Its outcome is exploratory, the findings can be used to outline the base for further discussion and quantitative analysis. (Babbie, 2003b)

From practical approach it might be also valid to use the adequate combination of the upper methods, since the same question might be analysed from different perspectives. The methodological triangulation (Balaton &Dobák, 1991) allows the followings:

- "…simultaneous application of various qualitative procedures,
- simultaneous application of various quantitative procedures,
- combination of quantitative and qualitative methods."

In the present research both of the methods are relevant, a specific combination of them will be used.

In general the researches' intend is either to set up a new theory or to validate/argue/confute on an already alive one. The current research's aim is to build up a new theory with the help of already existing theories, practices and a specifically designed research framework.
The logical build-up of the research should be also mentioned, because it impels the line of the research. Two main directions are available: the inductive and the deductive approach. The main difference is that the inductive approach is aimed to generate a new theory, the deductive's to test a theory.
The inductive approach (Figure 1.) starts with collecting the relevant data, then, if it meets the requirements, the next step might come to identify patterns what later on can be developed in a theory, it supports the exploratory research (Babbie, 2003c).

Figure 1. - Inductive research
Source: Babbie (2003c)

The research is basically inductive, the explorative direction is the priority, because at the end a theory-set will be set up, but there are some deductive approaches during the validator steps. A combination of quantitative and qualitative methods is used, too. Multiple data sources (evidences), theories and methods are used to get confirmation about the consistency of the examined phenomenon. As a possible future step the research will be completed with interviews in order to get validation.
In practice the results of 100 questionnaires are analysed, the sample is not representative, but the amount of answers can give already a reliable source for establishing a more mature framework for the later steps. Actually the feasibility of the research had to be taken also into account, because even with the help of computer-aided technologies the research needed more working hours than expected. Most of the answer givers come from business entities where there is supportive information and communication technology (ICT) environment, the work's complexity is middle and the knowledge intensity is also on middle level, not high-tech. The geographic focus of the research is dual: 49 business entities are Hungarians, the others are non-Hungarians, they are mainly from the more developed Western-European countries, however it is not yet deeply analysed.
In the next chapter the research's content is introduced.

RESEARCH

The evaluation and assessing of the knowledge management is a complex task even in the case of small business entities with low number of possible interactions. In case of larger sizes the task's complexity grows, especially if there are more functions involved.
In this research the supportive background is built on standards and best practices (Table 1.). The conformance to these is the base of interpreting the results of the questionnaires.
The following standards are related to the domainISO 9001 (ISO, 2015a), ISO 20000 (ISO, 2015b) and ISO 27001 (ISO, 2015c).
Best practices and methods were also considered during the phrasing of the questionnaires, the research relies mainly on the followings:CMMI® for Services (CMMI, 2010), Six Sigma (Kubiak&Benbow, 2013, Munro et al., 2013),ITIL® V3 (ITIL, 2007) and COBIT®5 (COBIT5, 2012). The sources are from international origin, they are widely accepted amongst knowledge-intensive business entities.

Table 1. Applied standards and methodologies, best practices

Domain	Standards	Methodologies and best practices
Knowledge Management (Quality)	ISO 9001 - Quality (ISO, 2015a)	CMMI®-SVC - Maturity Model (CMMI, 2010)
Process Management	ISO 20000 - Service (ISO, 2015b)	Six Sigma – Process (Kubiak&Benbow, 2013, Munro et al., 2013) ITIL® - Service (ITIL, 2007)
Risk Management, Security	ISO 27001 – Security (ISO, 2015c)	COBIT®5 - IT Governance (COBIT5, 2012)

Source: own collection (2015)

In the following sub-points a short introduction and the relevance of the given methods are presented.

Standards

The used standards are developed by the International Organization for Standardization. These standards can be used directly (even on international level) or could be tailored as per the domestic requirements and local demands. The most important benefit of using these standards is that it can significantly raise the awareness of cooperating business entities about the processes. In the coming three sub-points the most relevant standards are shortly shown.

ISO 20000

The ISO 20000 is meant for the service management systems, it specifies the service providers' requirement for design, transition, delivery and improvement of services.

It can be used for both the service providers and the service buyers, users, since it can give a consistent framework about the service supply chain and about measurement. The ISO 20000 does not specify everything in details, but it gives advices about designing the processes.

From the knowledge management aspect the 4.4 chapter is the most relevant since it covers the resource management.

This standard is commonly used in ICT service management.

ISO 9001

The ISO 9001 standards is about how to adopt a quality management system on strategic level. Its main focus is to provide a consistent framework for the business in order to meet the customer needs. It clearly defines the general requirements, the documentation requirements, the management responsibilities, the resource management and the realisation of them. In addition the measurement and improvement opportunities are also stated. This type of logical path is used in every ISO standard.

In case of ISO 9001 one of the most important part is the '6.2 Human resources' part in what the competence, training and awareness related requirements are set. Also it is stated that there is a requirement to maintain evidences within the system.

ISO 27001

The ISO 27001 is for organisations what would like to keep information assets secure. It basically covers the requirements of risk management, security awareness and business continuity management.

The structure of this standard is similar to the two others, the common thing is that their logical path is similar, requirements are set for responsibilities and managing, but the content is here risk-related. The '5.2 Resource Management' is basically the same as in the former case, just the domain differs.

All the ISO standards follow the same logic, all of them have relevant connections with knowledge management, especially through resource management.

In the next sub-chapter the relevant methodologies and best practices are shortly introduced.

Methodologies and best practices

Table 1.follows the thinking of the author, the table is not deeply stratified, but on this level it was not yet the goal. It is just a basic collection of the most relevant background standards and methods. The above mentioned standards can be completed with the following practices.

Six Sigma

The Six Sigma is a set of tools in order to achieve maintainable process improvements within the organisations. It is mainly based on quantified data and derivated statistical approaches. Its main focus is to have a measurable and quantifiable result rather than assumptions.
Measuring the systems based on data is common and logical. What in this case very important is, since it is about knowledge management, that this methodology has so-called Subject Matter Experts (SME). SMEs are those individuals who have the highest experience level within the organisation, they can enable others to perform better.
Six Sigma has of course other very relevant aspects, but this had to be highlighted now.

ITIL – Service Management

The Information Technology Infrastructure Library (ITIL) is a practice set for information technology service management (ITSM). Its primary goal is to get aligned the business objective with the provided services.
In case of ITIL the knowledge management's goal is to improve the effective sharing of knowledge. This practice handles the knowledge management on strategic level, the most important for this is to get closed the identified knowledge gaps as soon as possible, so the effective knowledge transfer is one of the most important processes.

CMMI

The Capability Maturity Model Integration (CMMI) models are best practice collections what might help the organisations to improve their processes. Since the answers of the research came from the service sector, the CMMI for Services is used, however the knowledge management is a general process area for every CMMI domain, so the approach is unified.
The CMMI for Services is a very complex practice set, it defines generic goals and specific goals what should be followed by the business entities. The generic goals are those goals what is a necessity in every case and every domain, knowledge management is handled on this level, it means it does not depend on the domains, but it is generic. The general process (GP) 2.5 'Train People' and GP 3.2 'Collect Process Related Experiences' were relevant for the questionnaire.

COBIT

The Control Objective for Information and Related Technology (COBIT) is a framework for information technology management and governance. Its focus is on risk management, but ensuring compliance to requirements and managing security related domains is also covered.
Delak (2015) used COBIT5 for evaluating processes from knowledge management perspective for the enabling processes, for assurance and process assessing. Two main domains were used 'Manage Human Resources' and 'Manage Knowledge'. Outcomes about handling the processes in real life and work products were used for analysis. The work

products are those evidences what justify that the specific process steps were done. This approach is really close to the author's.

The above described standards and methodologies are quite wide and not exactly knowledge specific, but every of them has relevant connections with it. The common outcomes of the above approaches were used for the questionnaires as the main source of input during the design.
In the next chapter the preliminary results will be introduced.

PRELIMINARY RESULTS

In this point the processed results are shown, but first an overview comes about the participating companies. Most of the companies are active (with the proviso that a company can be active in more domains) on knowledge intensive fields, so the shown background is applicable(for the classification the United Nations's international standards was used.)
In Table 2.the company sizes can be found, distinguished are the Non-Hungarian and Hungarian companies.

Table 2. Company size

Company size(nr. of entities)	**All companies (100 entities)**	**Non-Hungarian companies (51 entities)**	**Hungarian companies (49 entities)**
Large-sized enterprise	69	34	35
Medium-sized enterprise	19	13	6
Small-sized enterprise	7	0	7
Micro-sized enterprise	5	4	1

Source: own collection (2015)

The company representatives (Hungarians and non-Hungarians) were asked about process management, knowledge management and their connection with value creation. Since the questionnaire had more than 100 questions, just some important and interesting results are highlighted (Table 3.), the results are not converted to percentages on purpose, since the sample size is 100 (so the interpretation might be quite easy even at first look).

Table 3. Preliminary results

Domain (nr. of corresponding answers)	**All companies (100 entities)**	**Non-Hungarian companies (51 entities)**	**Hungarian companies (49 entities)**
1 Business process management			
1.1 Overlapping amongst the roles	80	39	41
1.2 Authority issues	83	47	36
1.3 Ability to find the competent person	84	44	42
1.4 Ability to find the competent role	76	37	39
1.5 Issues with understanding common terms	86	49	37
2 Knowledge management			
2.1 Knowledge sharing difficulties	54	24	30
2.2 Ability to find knowledge bearer	61	31	30
2.2.1 Ability to find competent roles and persons	21	14	7
2.2.2 Ability to find competent person	26	14	12
2.2.3 Ability to find competent role	14	3	11
2.3 Competence map	66	44	22
2.3.1 Substitute knowledge elements	60	39	21
2.3.2 Complementary knowledge elements	41	24	17
2.3.3 Critical knowledge elements	51	34	17
2.3.4 Competitive advantage-related knowledge elements	55	39	16
2.3.5 Rare, unique knowledge elements	42	27	15

Source: own collection (2015)

The process management part as a critical success factor in knowledge management shows that the roles have overlapping. It means that the responsibility and the accountability are not proper. It is also highlighted that there might be authority issues (83%) amongst the roles.
However the associates within the organisations know where, whom to turn, they are able to find the competent persons and the roles.
Regarding the internal communication it has to be also mentioned that there are issues with the common understanding, since the common terms can be understood differently (86%).
Since the business process management is the main point to measure the system at all, these results are quite important, because if the role distinguishing and the common understanding is not proper that means the measurement baselines are not proper. However the associates are able to find the competent roles and persons. So even if the processes are not properly set, they are still able to work and reach their goal.

From the knowledge management perspective the knowledge transfer, knowledge sharing is in foreground. Approximately in half of the cases there are at least temporary difficulties with knowledge sharing, from the sharer's point of perspective. From the other side, the ability to

find the knowledge bearer, ‘owner’ shows a higher rating, that goes better. It is worthy to mention that the associates can find the competent knowledge bearer person sooner than the role itself, this is similar to the case of the business process management.
The other focus point was to examine whether the business entities follow-up the current status of the available resources.
Two-third of the companies has some kind of databases in what they follow the competences, especially the substitute and competitive advantage-related knowledge elements are tracked. The complementary, critical and unique knowledge elements are of less importance.
Having a high awareness about the substitute knowledge elements might mean that the companies have business continuity orientation, since this can be a source for a living backup system (this statement will be analysed in the next step of the research).
At this level the geographical characteristic of the data is not analysed, it is showed just for presenting that there might be some serious differences, mainly because of the cultural settings.

The original goal of the research is to have measured the value. For value creation the knowledge management is the intended instrument.
At this early stage of the research can be seen that the organisations are not maintained properly from business administration perspective. The basic guidelines and recommendations of the standards and methodologies are not in place, however the companies are still able respond the customer requirements, since they can self-tune themselves and are able to renew.
The human and non-human systems can cope with most of the business problems, this might be because the organisations have a not documented complementary organic life beside the stored enterprise processes.

The research has still potential in it, since just the most important enabling elements were highlighted.
For the further steps the realised value of the business entities and the knowledge awareness should be taken also into account (Figure 2.). For the knowledge awareness the above introduced standards and methodologies will be used. If it will be evidenced that the knowledge awareness has a direct connection with creating value then the next step can come.

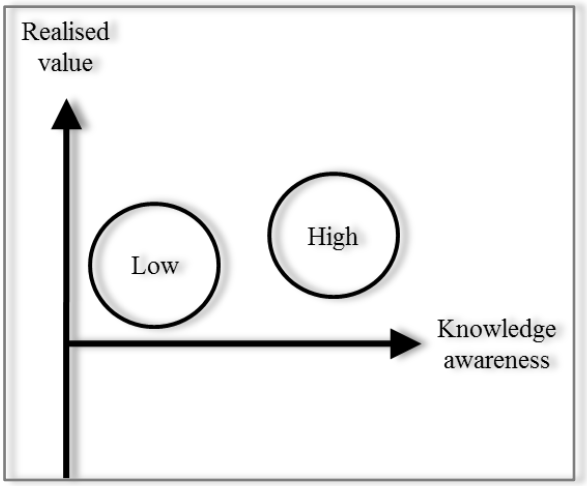

Figure 2. Relation of Realised value and Knowledge awareness
Source: own (2015)

As shown on the previous figure (2.), the realised value might be not just positive, but negative. On Figure 3.it is shown that once the knowledge awareness is set, the knowledge level can be measured (requirements and resources). If the knowledge awareness can be properly measured, that means that the organisational knowledge can be evaluated, and the knowledge management's applicability can be defined.

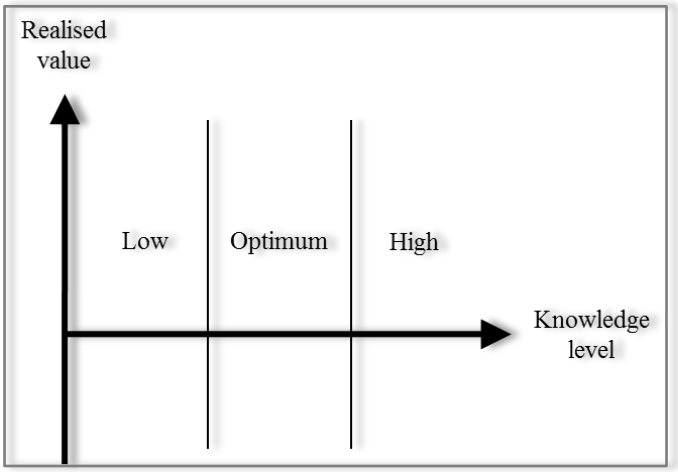

Figure 3. Relation of Realised value and Knowledge level
Source: own (2015)

If the applicability can be defined then the knowledge management optimum can be determined. The knowledge level might be low, when the requirements are not met, or high when the requirements can be met and there is additional extra resource within the system. The optimum level is between these two, but for determining this, it is required to have the knowledge awareness processes set.
In the next point the conclusions are aggregated.

CONCLUSIONS

Summarizing the main findings it can be stated that the knowledge management has some difficulties to be measured properly. On the top of this it can be seen (based on the answers of the questionnaires) that there are problems both with the business process management and knowledge management practice, at least from the point of documentation. The responsibilities are not well defined, the processes are not proper and there are some serious issues with understanding the common language within the environment.

From the knowledge management aspect the competence maps are not properly maintained and there are difficulties with the knowledge sharing, again from documentation perspective.However the organisations are working.

The key outcome of this research is that there must be a documented, codified system, and beside that an organic one. The further steps of the research will keep this latter challenge in scope, but will be limited to the earlier one, the coming steps will rely especially on the shown standards and methodologies.

REFERENCES

ALVESSON, M. (2001): Knowledge work, ambiguity, image and identity. Human Relations 54 (7), 863.

BABBIE, E. (2003a): The Practice of Social Research. Budapest: BalassiKiadó, 411-474.

BABBIE, E. (2003b): The Practice of Social Research. Budapest: BalassiKiadó, 315-349.

BABBIE, E. (2003c): The Practice of Social Research. Budapest: BalassiKiadó, 4-5.

BALATON, K.&DOBÁK, M. (1991): Mennyiségiésminőségimódszerekazempirikusszervezetkutatásban. In: Antal-Mokos, Z. et al. (edited) Módszertanigyűjtemény a vezetésésszervezéstárgyhoz, Budapest: AulaKiadó.

COBIT5 (2012). A Business Framework for the Governance and Management of Enterprise IT. ISACA. Accessed: 2015-Jul-10.
http://www.isaca.org/COBIT/Pages/COBIT-5-Framework-product-page.aspx

CMMI (2010): CMMI for Services, Version 1.3. Carnegie Mellon. Accessed: 2015-Jul-1 http://www.sei.cmu.edu/reports/10tr034.pdf

DELAK, B. (2015): How to Evaluate Knowledge and Knowledge Management in the Organization Using COBIT 5. ISACA Journal 2015 (3), 19-23.

ISO (2015a): ISO 9001 - Quality management systems – Requirements. Geneva: ISO.

ISO (2015b): ISO 20000 - Information technology - Service management. Geneva: ISO.

ISO (2015c): ISO 27001 - Information technology - Security techniques - Information security management systems – Requirements. Geneva: ISO.

ITIL (2007): ITIL®The Official Introduction to the ITIL Service Lifecycle. London: The Stationary Office, Office of Government Commerce.

KUBIAK, T. M. &BENBOW, D. W. (2013): The Certified Six Sigma Black Belt Handbook.New Delhi: American Society of Quality, Pearson.

LEE, S-H. (1999): Taxonomy of HRM policies of knowledge-based firms: A resource-based explanation. International Journal of Innovation Management 3 (4), 379-395.

MUNRO, R. A. ET AL. (2013): The Certified Six Sigma Green Belt Handbook.New Delhi: American Society of Quality, Pearson.

NONAKA, I. (1994): A Dynamic Theory of Organizational Knowledge Creation. Organization Science 5 (1), 19.

NURMI, R. (1998): Knowledge-intensive firms. Business Horizons 41 (3), 26-32.

POLÁNYI, M. (1966): The Tacit Dimension. New York: Doubleday & Company Inc., 3-26.

SMITS, M.& DE MOOR, A.(2004): Effective Knowledge Management in Knowledge-Intensive Organizations. Tilburg: Tilburg University. Accessed: 2015-Jul-1
www2.warwick.ac.uk/fac/soc/wbs/conf/olkc/archive/h-3_smits.pdf

SUSTAINABLE CONSUMPTION AND CONSUMER ATTITUDE IN HUNGARY IN THE LIGHT OF AN INTERNATIONAL RESEARCH

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SUMMARY

Environmental innovations are investigated from several point of view by the literature. However, it is common that the magisterial, state regulators' effect, or occasionally their restrictive function come to the front. In this study, I rather emphasize the attitude of consumers that is important for companies, which try to meet the latest requirements and follow actual trends. In the focus of the research, beyond a general environmental attitude enquiry, are such rediscovered trends as zero waste aspirations, eco-friendly packaging and plastic free packaging materials and solutions. I measure the latter environmentally friendly manifestations' notoriety, and also residential evaluations and their willingness to take action. I take other needs and restrictive factors also into consideration. I examine the results in the light of previous similar researches, trying to resolve contradictions.
I present an excellent indicator too, that is able to measure the environmental impact of individual consumer behavior patterns. This is the so called Consumer Greendex, an index, which is generated by a complex algorithm of 18 countries and within 18 thousand costumers' lifestyle, consumer behavior and special buyer's decisions. It can provide a comprehensive picture of the sustainable consumer situation in the examined countries which includes Hungary as well.

INTRODUCTION

Environmental innovations, which have a great role in sustainable consumption's development are investigated from several point of view by the literature. However, it is common that the magisterial, state regulators' effect, or occasionally their restrictive function come to the front. In this study, I rather emphasize the attitude of consumers that is important for companies, which try to meet the latest requirements and follow actual trends. There are for example such emerging, lately rediscovered trends as zero waste aspirations, or preferring eco-friendly packaging that in my opinion need attention, because of their potential demand.
Namely, a really big number of trading units are opening in Europe and in the world that are aiming eco-conscious costumers, applying special business conceptions, which take environmental issues into consideration. Such conception is the bulk shopping model, that eliminates most of the package cost; or even the spreading online department stores exclusively designed for this environmentally conscious target group, and both of these needs to be connected with an actual consumer value judgment, to be successful.
One of the aim of the article is to present an excellent indicator that is able to manifest the environmental impact of the consuming behavioral patterns of an individual. This is a so-called consumer Greendex, an index, generated using a complex algorithm. It can be useful to measure one's Greendex score to know, whether the person is likely to be attentive regarding environmental innovations or not. The index examines 18 countries' 18 consumers' lifestyle,

consumer behavior and those special decisions of a buyer from 2008 that are the most influential to the environmental impact. It is developed by the National Geographic/Globescan contains the means of the different countries with the average values of the individuals. Because of the extensive set of questions, the Greendex can show motivational effects and perceptions including cultural differences, so that it can provide a comprehensive overview to the situation of sustainable consumption throughout the examined countries, involving Hungary.

Methodology of the Greendex survey

The original 2008 survey questionnaire, much of which was used for tracking purposes in 2009, 2010, 2012, and 2014 was developed based in part on a qualitative survey of experts addressing what they believe are important actions for individuals to take in terms of sustainable consumption. These experts are professionals who have demonstrated an outstanding commitment to advancing global sustainability in their positions as leaders of relevant sustainable development organizations—typically think tanks, academic research institutions, major NGOs, and consultancies.

Interviews were conducted by telephone, although a small number of interviews were completed electronically to facilitate communication across time zones and language barriers. The interviews took place between September 10 and October 2, 2007. This project component was not repeated in subsequent years, as the results were intended to provide a long-term perspective.

The National Geographic/GlobeScanGreendex findings result from an international consumer survey conducted between March 25 and May 6, 2014. Approximately one thousand adult consumers, age 18 and older, completed this online survey in each of 18 countries. The countries included in the survey are:

Argentina, Australia, Brazil, Canada, China, France, Germany, Hungary, India, Japan, Mexico, Russia, South Africa, South Korea, Spain, Sweden, Great Britain, United States.

The survey was quantitative in nature and included questions on food source and consumption, transportation, energy use, waste disposal, purchase of environmentally friendly products, and attitudes and opinions toward a variety of related issues.

The Greendex measures consumer behavior and material lifestyle according to 65 different variables. Using many variables avoids skews that can occur within a smaller set of variables. Structurally, the Greendex is a meta-index composed of four subindices: housing, transportation, food, and consumption of goods.

Each respondent earns a score that reflects the environmental impact of his or her consumption patterns. Points are awarded or subtracted for specific forms of consumer behavior, resulting in a score out of a maximum total for each respondent (Greendex 2014).

This Greendex score were consequently high in Hungary in all the four years' results (2009, 2010, 2012, 2014), and Hungary was one of those four countries, which score has increased on the largest scale, since the first survey, together with India, Spain and Germany. That is why I found the study worth for further research in the aspect of Hungary. This is the other main objective of the article witch is going to be more explorative in nature.

My previous supposition about Hungarian consumer's eco-conscious behavior was worse, based on my previous research. Then (Tóth,2014) I found among 258 recipients, that an average Hungarian costumer thinks that it is important to take the environment into consideration, but while purchasing, and during everyday behavior they are not that dedicated into this issue. To receive a more accurate view of consuming practices in the country I decided to conduct a research in Hungary, and precisely I was inquisitive among those, who were interested about environmental questions, or among those, who claimed, that their lifestyle was eco-friendly.

Methodology of the concentrated survey:

The empirical research was conducted online and by personal interviews with the help of a questionnaire form. Questions were answered by Hungarians over 18 years. The quantitative research was performed by the following methodology:
Hungarians over 18 years created the basic population of the inquiry. Personal and online interviews were carried out, therefore I did not add any sampling frame to the basic population. Regarding the sampling method I applied concentrated sampling out of the non-random sampling techniques. The size of the sample was 107 persons. Confidence level of the sample was 95,0%, while its precision level was ±6,1 percentage points. Collecting information has taken place online and in a personal way with questionnaires. The query occurred between 7-20th September2015., as it was planned.

Table 1. Composition of the sample

Demographic variables	Versionscriteria
Sex	Male: 9,0%; Female: 91,0%
Age	18-30 év: 47,6%; 31-45 év: 44,8%; 46-60 év: 4,8%; 60 év felett: 2,9%
The number of people living in the same household	1 person: 10,3%; 2 persons: 39,3%; 3 persons: 21,5%; 4 persons: 20,6%; 5 or more persons: 5,5%
Profession	Housewife: 9%; Manager: 4%; Entrepeneur: 4%; Pensioner: 1%; Unemployed: 2%; Employee: 63,4%; Student: 11,9%; Other: 5%
Highest degree	Általános iskola: 0%; Vocationalschool, trade school: 1,9%; Highschoolgraduation: 26,7%; Highscoolpostgraduatecourse: 2,9%; Diploma: 68,6%; Academicdegree: 0%
Total net income of the household	Less than100 000Ft: 11,5%; 100-200 000Ft: 24,0%; 200-300 000Ft: 35,6%; more than300 000Ft: 28,8%
Type of settlement	Countyseat: 49,0%; City: 22,1%; Town: 9,6%; Township, village: 19,2%
County	Bács-Kiskun: 1,9%; Baranya: 1%; Békés: 3,9%; B.A.Z.: 13,6%; Csongrád: 2,9%; Fejér: 1,9%;

Demographic variables	Versionscriteria
	Győr-Moson-Sopron: 1,9%; Hajdú-Bihar: 4,9%; Heves: 6,8%; Jász-Nagykun-Szolnok: 0%; Komárom-Esztergom: 4,9%; Nógrád: 1,0%; Pest: 47,6%; Somogy: 2,9%; Szabolcs-Szatmár-Bereg: 1,0%; Tolna: 0%; Vas: 2,9%; Veszprém: 1%; Zala:0%

The composition of the sample meets the results of previous researches regarding highest degree, income of the household and sex, since most frequently higher educated women with higher income are acceptant for environmental problems (Kerekes, 2001). My preconception was, that among ordinary costumers in the global inquiry environmentally conscious behavior and practice is less frequent and less typical compared to a concentrated sample's results in my own survey. This thesis was proved to be mostly true by the answers.

A) Food

1. Locally grown food

The international results showed that Hungarians consume locally grown food "Several times per week" in a higher proportion (44%) compared to the total (37%). The category "Once per week" (Hungarians: 18%; Total: 20%) and "Daily" had fairly similar results (Hungarians 15%; Total 18%).

Compared to the results of national survey, in the concentrated survey I examined the categories, which are considered to be more environmentally frendly. These categories were: "Daily"; "Several times per week" and "Once per week". The concentrated survey has similar outcome than the previous international one, since the category "Several times per week" has the highest value (46,2%), even higher then among ordinary Hungarian consumers (44%). The latter situation can be seen in the case of the category "Daily" as well (22,6%).

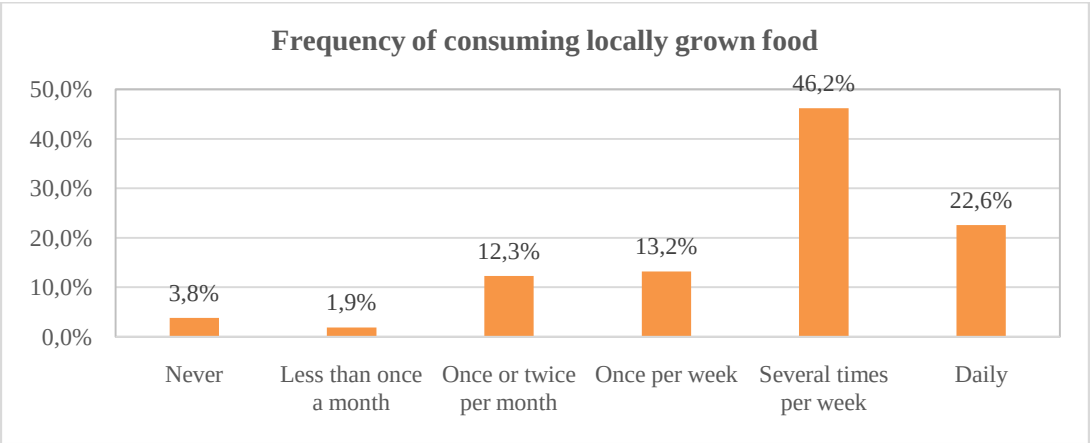

Figure 1. Concentratedsurvey (2015)
Source: Ownedition

2. Beef

Hungarians are among the least frequent consumers of beef (Daily: 1%) of the 18 groups surveyed internationally. Only Indian consumers eat less beef (65% answered never), but their cultural initiatives are well known in this question.
Compared to the results of the international survey, in the concentrated survey here I also examined the categories, which are considered to be more environmentally frendly. These categories were: “Never”;“Less than once a month”, and “ Once or twice per month”. Taking a look at these answers I only found one category, in which the percentage is higher in the international survey (among ordinary hungarian consumers) than among concentrated answers. This was the third option (Once or twice per month), where I got 20,8% of the answers compared to the international survey, where 30% of the answering hungarians marked this frequency.

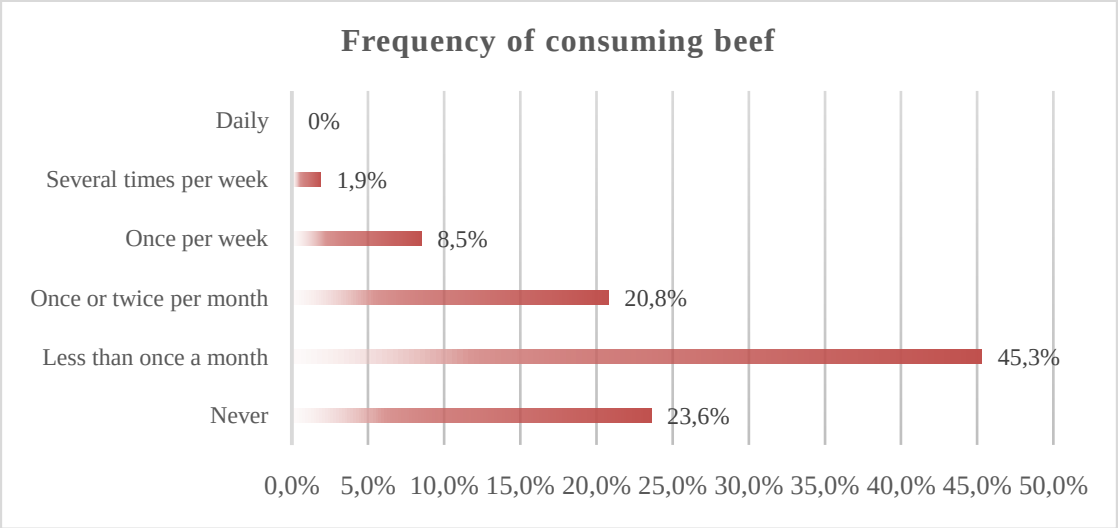

Figure 2. Concentrated survey (2015)
Source: Own edition

Justifying the statement of answerers being more environmentally conscious choosing the above mentioned categories I can refer McMichael et al. (2007) who made researches that has proved the following: people should radically reduce the amount of meat consumption in order to mitigate the effects of climate change.Considering the fact, that in my research not all types of meat consumption was examined among eco-conscious consumers; if an adult ate daily 90g meat, then, without substitution, present ecological footprint[7]/person would decrease by 17,5%.

[7]Ecological footprint: The index-number of environmental impact, a territory, which is able to support a defined human population on a limited living standard. It shows how many hectares of ecologically productive nature needed to the production of energy, the built-up areas and the consumer’s goods; to the occlusion of waste, which is generated during production. (Mózner, 2012)

3. Fish and Seafood

Hungarians are among the least frequent consumers of fish and seafood of the 18 groups surveyed internationally. There was not 1% of the recipients (among 1000 interviewed Hungarians), who marked the category "Daily". The international survey's results show that Hungarians marked in the largest degree that they eat fish and seafood "Once or twice per month" (33%) and "Less than once a month" (31%).
My concentrated examination has led to similar results, interviewed costumers also marked the "Once or twice per month" (36,8%) and"Less than once a month" (38,7%) options in the highest proportion. These percentages are a little bit higher, than in the international results, as it already could be seen previously.

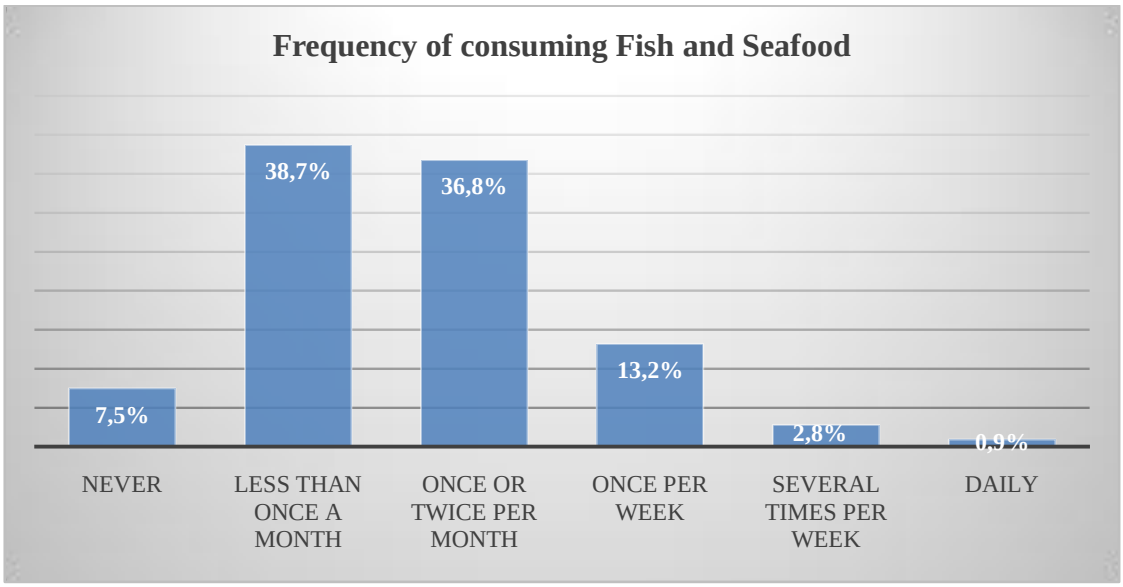

Figure 3. Concentrated survey (2015)
Source: Own edition

4. Fruits and Vegetables

37% of hungarians consume fruits and vegetables "Daily" according to the international survey. Also a high proportion of the interviewed (45%) answered, that they consume fruits and vegetables "Several times per week".
In the concentrated survey the category "Daily" leads to high with 63,2%, while the category "Several times per week" is not as frequently marked as among average hungarians, in spite of this, the percentage is still considered to be high (24,5%).

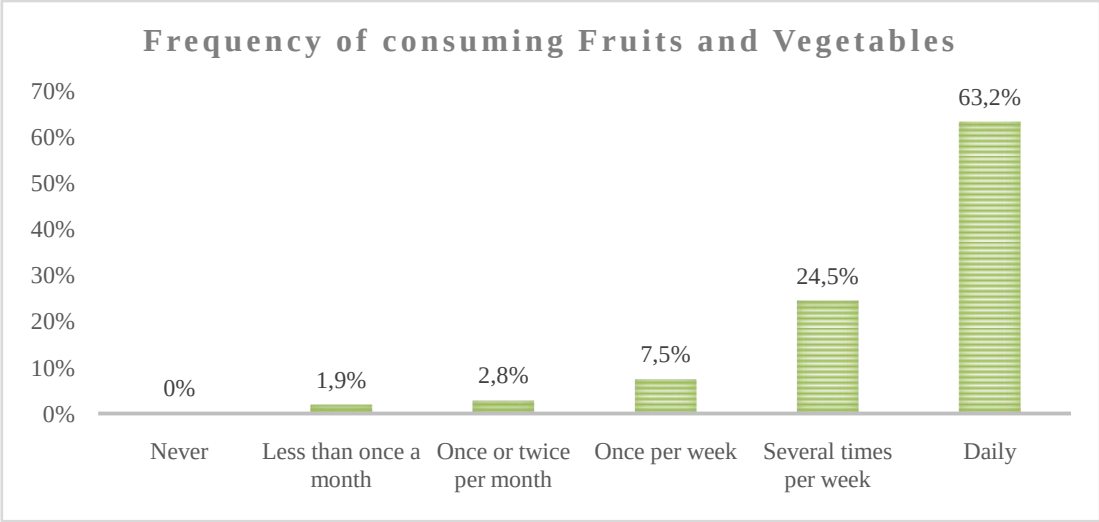

Figure 4. Concentrated survey (2015)
Source: Own edition

The positive effect of consuming fruits and vegetables daily has beenshown. If we substitute the reduced amount of meat consumption with consuming fruits or vegetables, thevalue of theaverageecologicalfootprintcan be reducedby 3,8%. (Vetőné, 2014)

5. Bottled Water

32% of average consumers in Hungary drink bottled water daily, as results showed in the Greendex survey, while among those, who care about the environment this category has reached lower percentage (17,9%), and the most frequently marked category is the „Less than once a month" with as high value as 27,4%. Among average hungarian consumers this value reaches only 15%.

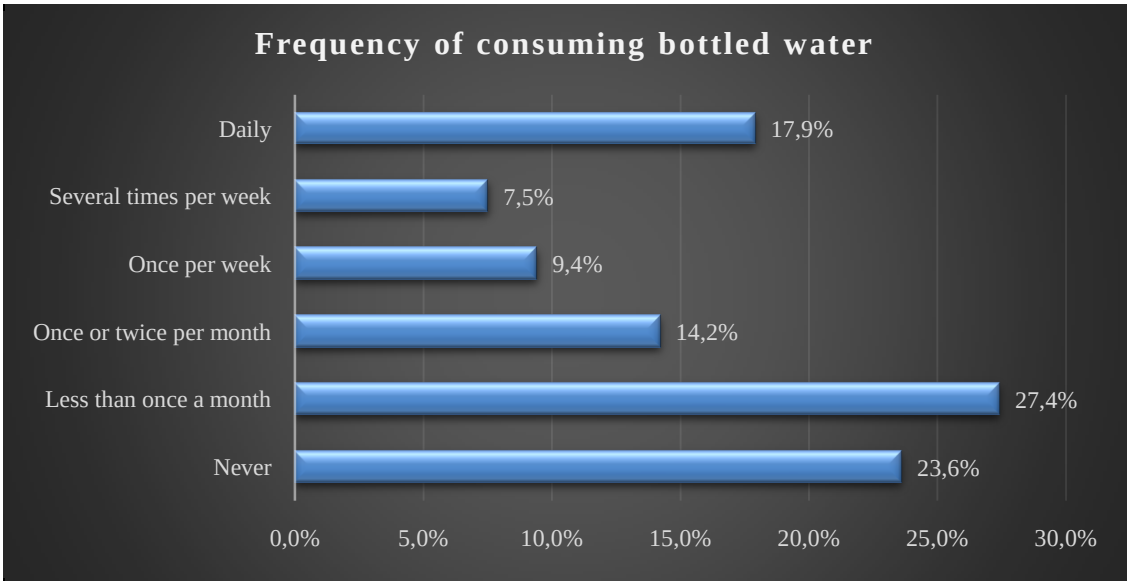

Figure 5. Concentrated survey (2015)
Source: Own edition

B) Housing

1. Air conditioning

Hungarians are among the least likely of the consumers of the 18 countries surveyed to have air conditioners in their homes, stated the international survey (Total: 45%; Hungarians: 14%) and the results of the concentrated survey testify, that also among eco-conscious consumers, the percentage is low (17%) in possessing this type of appliance.

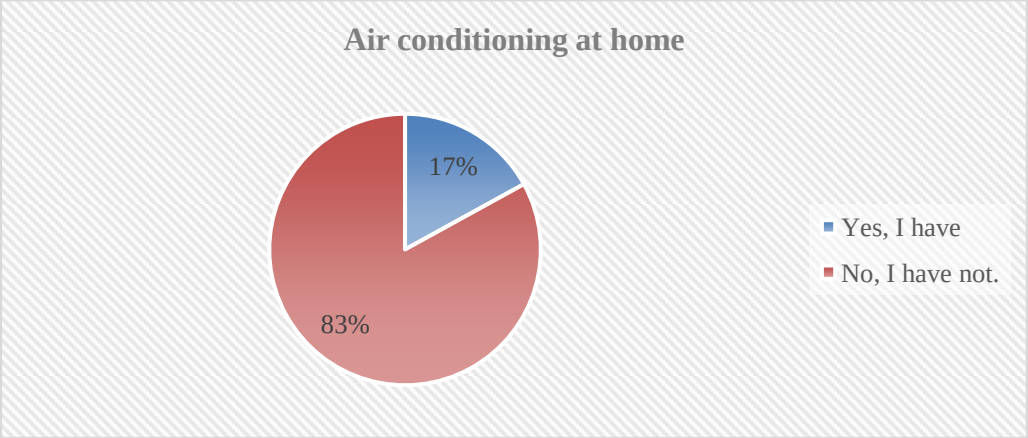

Figure 6. Concentrated survey (2015)
Source: Own edition

2. Green electricity

Compared to the other consumers surveyed, Hungarians are the least likely to purchase „green" electricity (Total: 20%; Hungarians: 5%). In great harmony with this statement, my research also justified this, since merely 2,8% of the interviewed answered yes to this question.

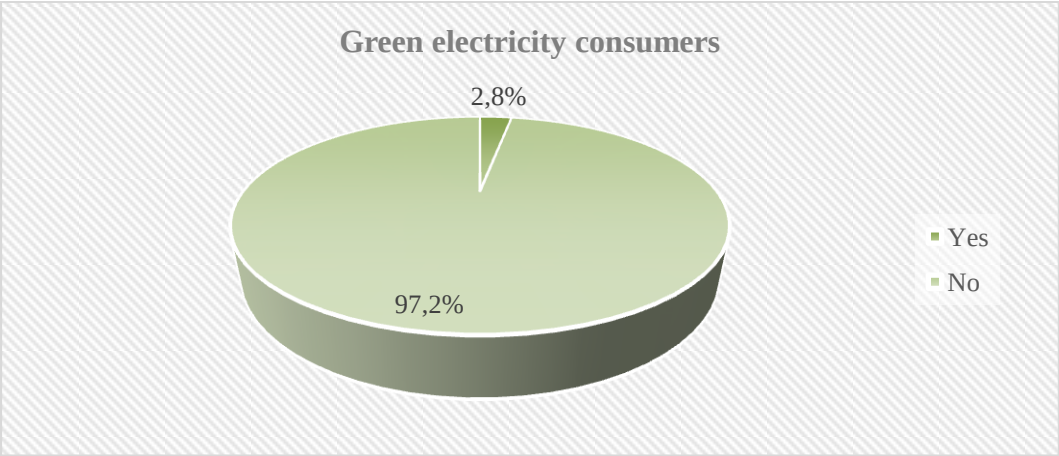

Figure 7. Concentrated survey (2015)
Source: Own edition

3. Minimizing fresh water usage

The Greendex survey revealed that in the past few years hungarians have become signifcantly more likely to minimize their use of fresh water. In 2014 54% of Hungarians stated that they were trying to minimize their fresh water usage often or all of the time. Compared to this the outcome of my research suggest that also among conscious consumers it is an aspiration to minimize their fresh water usage.

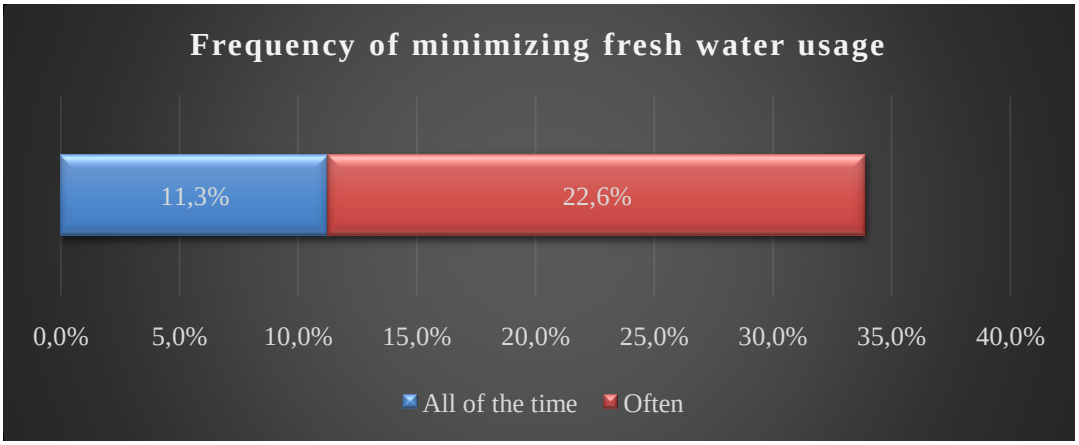

Figure 8. Concentrated survey (2015)
Source: own edition

C) Questions regarding buyer's decision (Goods)

1. Repair or replace?

The examined 18 countries' total percentage value of those who answered 4 (Agree) is the same as the hungarian answers' proportion (35%) in the Greendex survey.Taking the 5 (Strongly agree) answers into consideration, the hungarian result is higher (33%) than the overall outcome (27%). However, the concentrated survey shows even higher values in these two relevant categories (Agree:38,7%; Strongly agree: 43,4%)

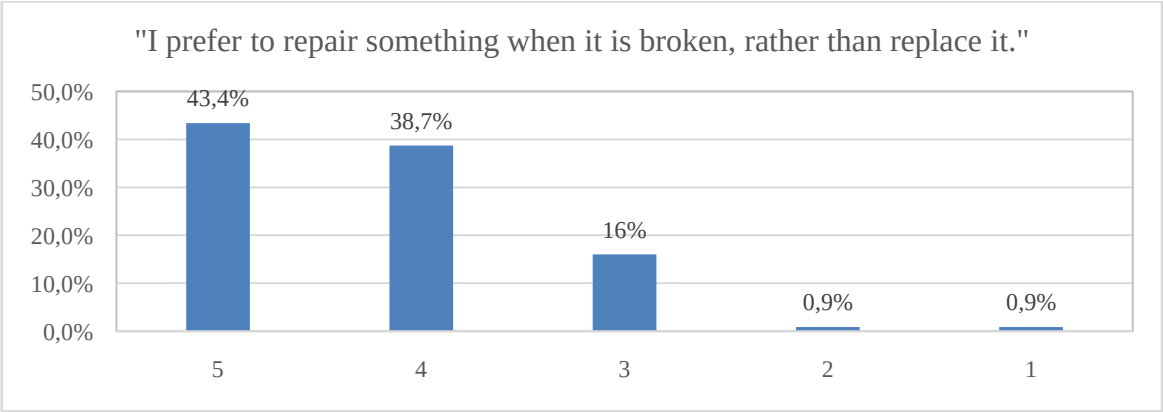

Figure 9. Concentrated survey (2015)
Source: Own edition

2. Used or brand new?

The Greendex survey revealed, that there has been an increase since 2009 in the proportion of Hungarians, who prefer to buy things “used” or pre-owned rather than brand new. Because of the increasing market share of the so called second-hand stores in the country, I have seen justified this trend. I was highly inquisitive about the attitude of my interviewed eco-conscious consumers on this issue, knowing that average costumers answered mostly 3 to this question (33%), as well as Hungarians (35%). Interestingly, the category of 3 (Moderately agree) has been marked by most eco-conscious answerers too.

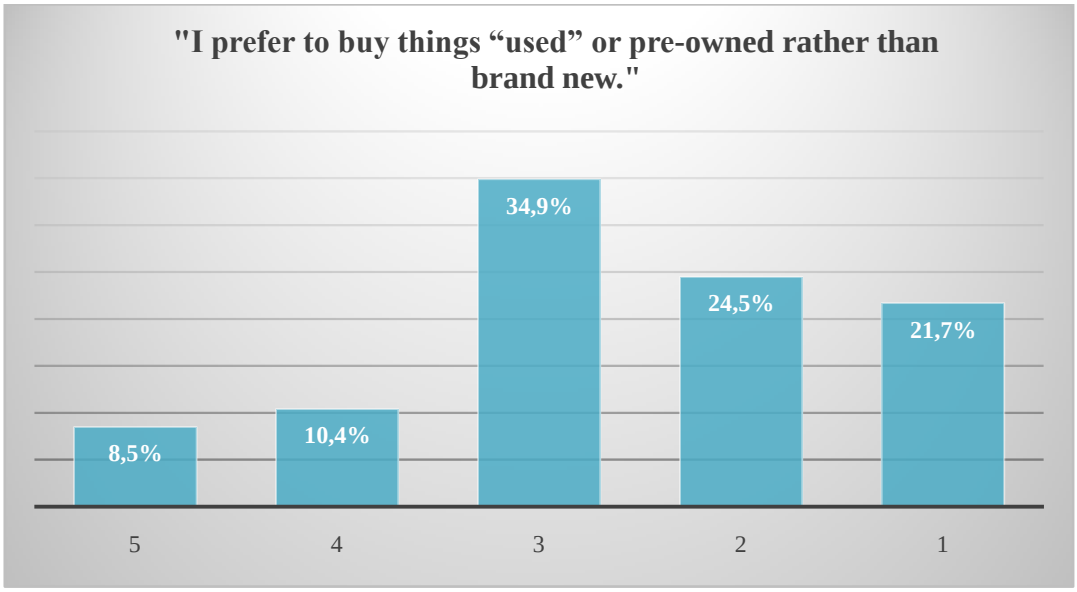

Figure 10. Concentrated survey (2015)

Source: Own edition

3. Use own bag in store/market

The Greendex research stated that Hungarians were among the most likely of the 18 groups surveyed to use their own bag for shopping (Total: 60%; Hungarians:72%).
However, the survey has also revealed that hangarians are the least likely to avoid excessive packaging (Total: 40%; Hungarians: 26%).
In the concentrated sample the results are rather convincing regarding my preconception of the values being higher than among ordinary buyers. Both of the questions appear with higher percentage proportions on diagram 11.

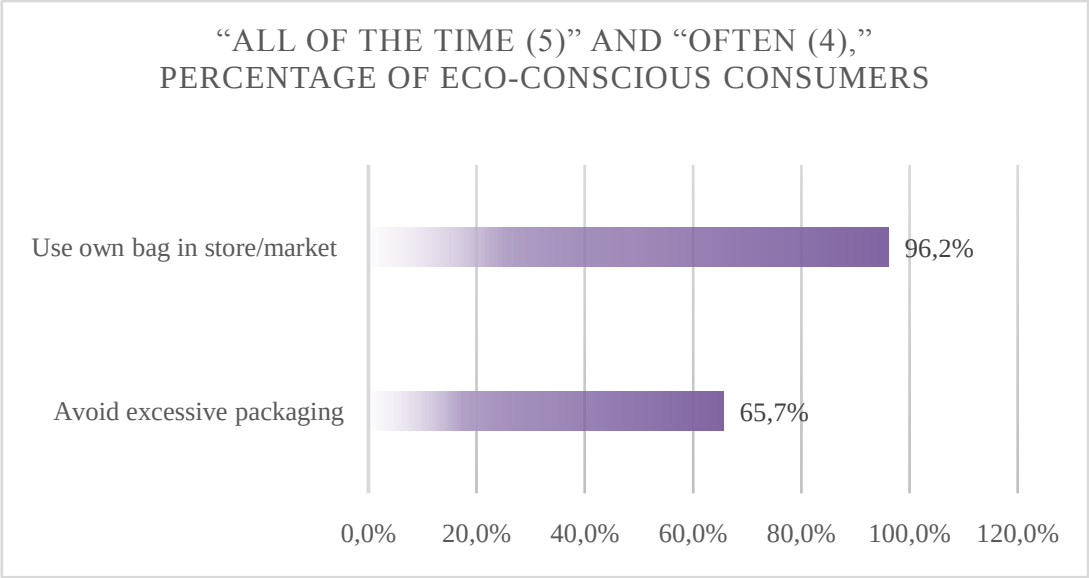

Figure 11. Concentrated survey (2015)
Source: Own edition

D) Transportation

1. Driving alone in a car or truck

In comparison to other consumers interviewed in the international survey, Hungarians had the lowest frequency of driving alone in a car or truck. Compared to the examined 18 countries hungarian results were slightly higher in the categories of „At least once a month" (Total: 6%; Hungarians: 9%), „A few times per year" (Total: 5%; Hungarians: 11%), „Once a year or less (Total: 3%; Hungarians: 5%)" and „Never" (Total: 29%; Hungarians: 40%). In contrast with these, the values were a bit lower among average Hungarians compared to other countries respondents in the „At least once a week" (Total: 19%; Hungarians: 16%), or also in the „Every day or most days" (Total: 37%; Hungarians: 17%) categories.

The interviewed conscious consumers' answers percentage proportion is outstanding (41,5%) in the category of „Never". However, a noticeable amount of consumers (18,9%) marked the option „At least once a week" as well.

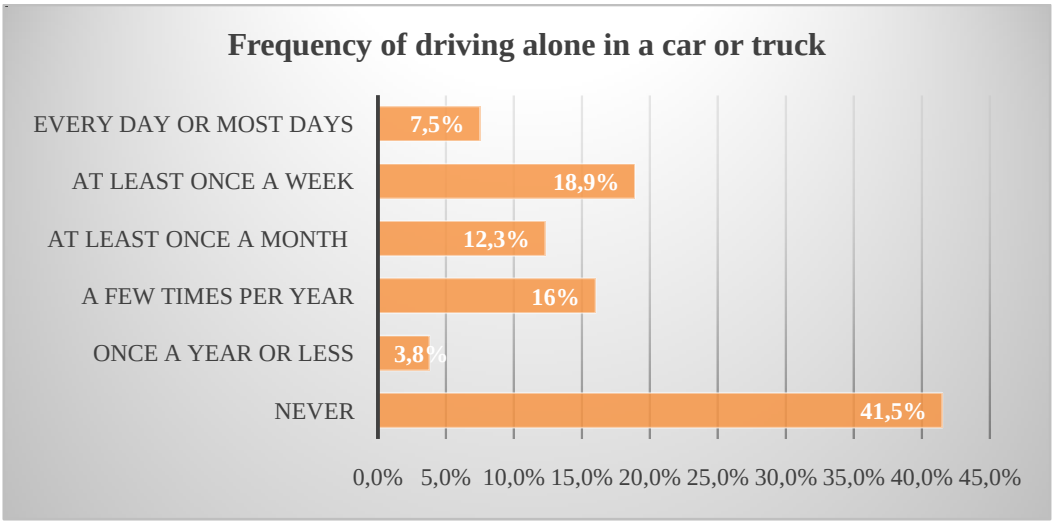

Figure 12. Concentrated survey (2015)

Source: Own edition

2. Using local public transportation

Our nations representativesare among the most frequent daily users of local public transportation, the research of 2014 stated. The most prominent values could be associated with the categories of „Every day, or most days" (Total: 24%; Hungarians: 35%), and „Never" (Total: 18%; Hungarians: 7%). This statement though does not prove that this habit has become practice because of environmental purposes.

However, among environmentally conscious consumers the exceptionally high percentage of those (51,9%), who claim they use local public transportation every or most days could be associated with environmental purposes among others. However, that should be justified by further examinations.

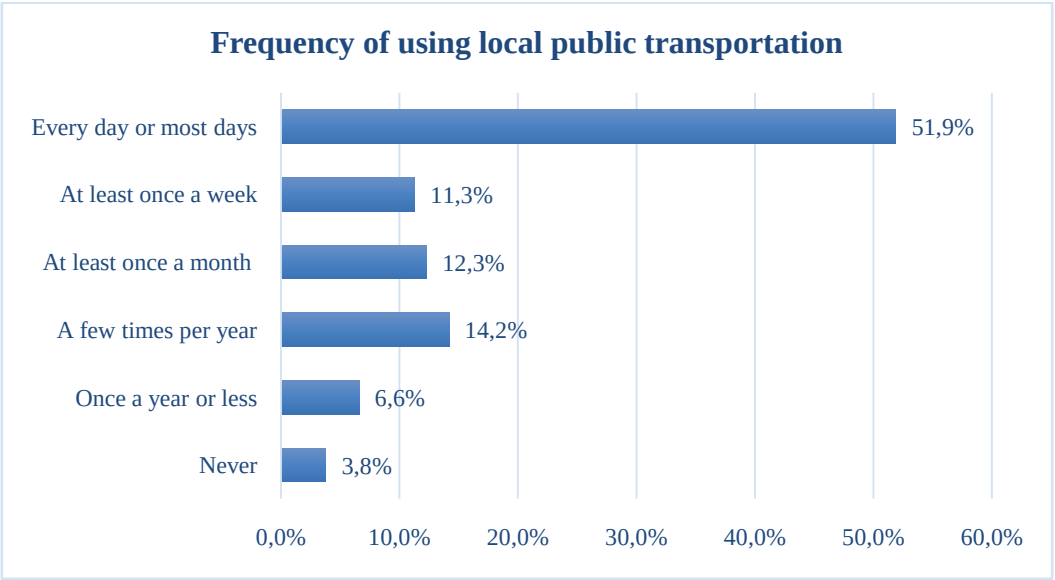

Diagram 13. Concentrated survey (2015)

Source: Own edition

3. Using airplanes

In the category of never using airplanes the international research yielded the highest proportion of answers (56%) by hungarians (Total: 36%). The category „Once a year or less" earned the second highest amount of percentages (35%), although this value is already lower than the total of the 18 countries (39%).
Environmentally friendly people of this years' survey has opted the same two categories in the highest proportion. The answers in most case (except the category „Never") probably contain roads that are nowadays not reasonable to take other way than by plane. This thesis of course might also be true in the case of ordinary travelers. Further research needed to be able to see the motivations clear.

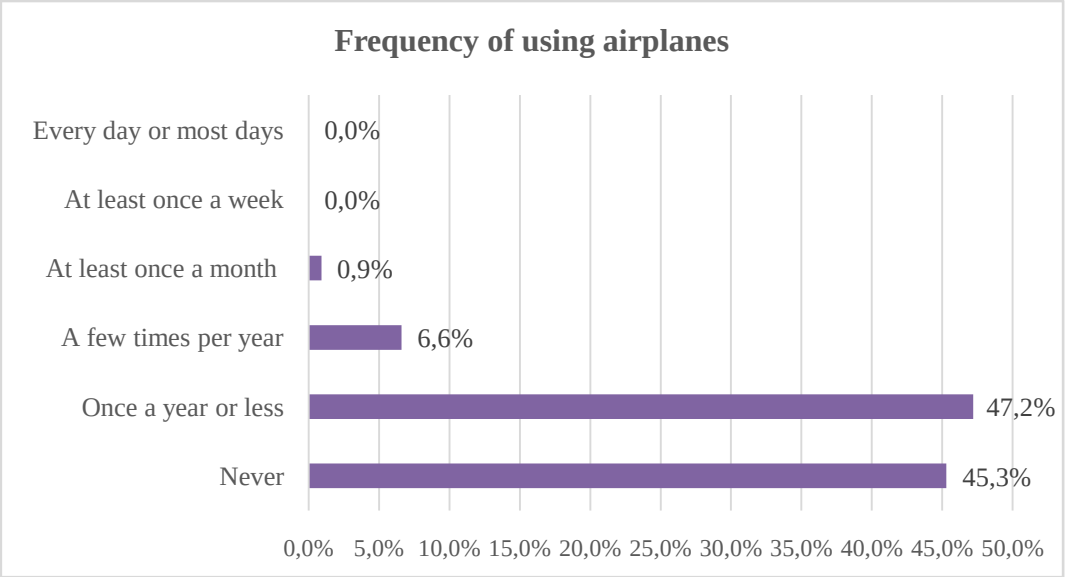

Figure 14. Concentrated survey (2015)
Source: Own edition

SUMMARY AND DIRECTIONS OF FURTHER RESEARCH

In my opinion, my research in this year has taken a number of really interesting results, that would be useful to continue and examine more thorougly. I think that the fact of opening a new package free trading unit in Budapest this autumn shows, that the environmental trends are present in Hungary and those companies, who are not willing to follow the newest requirements raised by potential buyers, might not be able to develop in the near future. There are already such practices abroad, that gives extra credit (green points) for bringing own bag while shopping.This not only attracts eco-conscious buyers, but also encourages average costumers for shopping a more sustainable way. Therefore this policy not only has an educational role, but also works as a purchase incentive marketing techniqe, which is effective for the companies' benefit. As a package free shop, soon this example could be put into practice in Hungary as well.

That is the reason why I find further research useful, especially to explore the correlations between most of the findings, to be able to draw a correct conclusion regarding costumers' attitude, behavior and requirements. For example, why does it important for my respondants to bring their own bag for shopping, and why does the excessive packaging not so much a problem for them? Also it would be interesting to reveal people's motivations regarding their eating habit, preferencesin connection with homeappliances and in connection with the use of certain transportation forms.I plan to examine eco-conscious behaviour among younger consumers (younger than 18) too, since subsequent years' shopping habit is mostly based on juvenile years' experiences and habits. Children do not just nowconstitute a significant market, they also represent future market of most products and services. (Erdei, 2010) I also would like to explore the environmental knowledge of this age group, in order to be able to draw a conclusion of their potential future behavior.

REFERENCES

Erdei (2010): The impact of televisionadvertisingforchildren of parents shopping habits.Thesis. Budapest.

SÁNDOR KEREKES ET AL (2001): Environmental dimensions of sustainable consumption, Volume of studies, Aula Kiadó Kft, Budapest.

MCMICHAEL, A.J. – POWLES, J.W. – BUTLER, C.D. – UAUY, R. (2007): Food, livestock production, energy, climate change and health. Lancet, 370(9594). In: ZsófiaMóznerVetőné: Sustainablefoodconsumption? – Opportunitiestoreducetheecologicalfootprint of theHungarianpopulation. Vezetéstudomány / Budapest Management Review, 45 (7-8). pp. 2-14

MÓZNERVETŐNÉZS (2014): (Sustainablefoodconsumption? – Opportunitiestoreducetheecologicalfootprint of theHungarianpopulation). Vezetéstudomány / Budapest Management Review, 45 (7-8). pp. 2-14

MÓZNER ZS (2012): Analysis of theenvironmentalimpact of international trade withthehelp of usingcarbonfootprint. In: Sándor Kerekes and MáriaCsutora (2012): Sustainableconsumption? Trends and possibilitiesin Hungary, OTKA 68647 research, AULA Kiadó, Budapest.

TÓTH O. (2014): Analysis of environmental consciousness of consumers and local products marketing in the light of the NAUTILUS Fenntartható Életmód Klaszter's activity. Master Thesis, University of Miskolc, Marketing Institute.

Greendex 2014: http://environment.nationalgeographic.com/environment/greendex/
Downloaded:2015.07.26

COMPARATIVE ANALYSIS OF RENEWABLE ENERGY SOURCES IN THE CASE OF HUNGARY AND THE BALTIC COUNTRIES

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SUMMARY

The biggest task of 21st century to satisfy the growing energy need of the Earth, to reduce the emission of the pollutants that cause the climate change and the realization of "green economy" for the implementation of sustainable development. r Recently one of the main objective is to reduce the energy dependence both of the European Union, and also our country's
Therefore the eco-efficiency and utilisation of renewable resources is increasingly important, especially as geothermal, hydrothermal, solar and wind. These issues relate to my doctoral research because it is concentrated on the theme of this eco-efficiency and the green economy.
My earlier studies spotted on Hungary, but I would like to supplement it with an international comparisons., The examined countries are the Baltic Member States. The Baltic States — had joined to the European Union in that same time (2004) as Hungary, but they made from the early economic disadvantages, an advantage of it, and they introduced the euro and they undergone a significant transformation.
This article is looking forward the answer to this economic transformation and development how do they rich the advantage, in what way and extent will it appear on the countries' environmental processes and the direction of the future development.
Finally, I am examining the countries' energy usage, the role and importance of renewable energy sources and the emission of GHG.

INTRODUCTION - THE CONCEPT OF ECO-EFFICIENCY

The state of the environment is constantly changing and forming. Partly because of the continuous or repeated geomorphological and biosphere-raising events, partly due to the effects of socio- and economic activities (Bulla, 2008).

Nowadays, those questions become a global problem, which are connected to how return the environment to the human activity, how to deal with the Earth's infinite resources, are there arrest or irreversible processes in the environmental field (Tihanyi-Csete, 2012). In the concept of sustainable development we determine there is a close relationship between the economic development and the state of the environment, so the economic policy and the enviromental policy can not be treated separately from each other (Katonáné, 2004). This is reflected in the sutainability prism model in Figure 1 below.

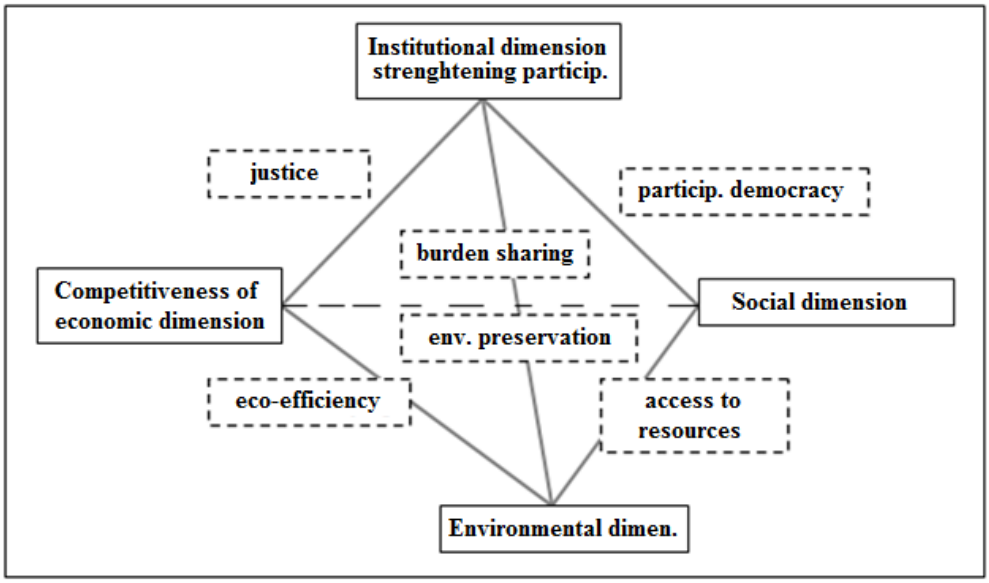

Figure 1. Sustainability prism modell
Source: Own compilation according to Valentin – Spangenberg, 2000

The authors linked the four dimensions of sustainability and emphasized the connections between them (Imreh-Tóth, 2012) . The sustainability is being discussed today, the central theme is how to reduce the environmental impacts of emissions per unit, which means how to increase the eco-efficiency of production (Bajmóczy-Málovics, 2011).

The theory of eco-efficiency makes an attempt to link the environmental and the economic theory (ecological and economical) (Harangozó, 2008). According to theWBCSD[8] definition, eco-efficency means the following. "Eco-efficiency is achieved by the delivery of competitivelypriced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout the life-cycle to a level at least in line with the Earth's estimated carrying capacity." In short, it is concerned with creating more value with less impact.

A WBCSD–UNEP[9] guide identifies seven success factors that are needed to achieve the eco-efficiency:

- Reduce the material intensity of goods and services;
- Reducing the energy intensity of goods and services;
- Reduction of the toxic emissions;
- Increase the recyclability of materials;
- Maximizing the sustainable use of renewable resources;
- Increase the durability of the used materials (and therefore products)
- Increase the proportion of goods produced in the services.

[8]WBCSD (1996): Eco-Efficient Leadership – For Improved Economic and Environmental Performance 4.o. http://oldwww.wbcsd.org/DocRoot/DlFMcUZj32ZOMj5xNMXq/eeleadership.pdf Letöltve 2015-08-30 18:49
[9]WBCSD, UNEP (1996): Eco-Efficiency and Cleaner Production – Charting the Course to Sustainability 4.o. http://oldwww.wbcsd.org/DocRoot/aFQps2TRHhw5tFsl5oZP/eecleanerprod.pdf Letöltve 2015-08-30 18:50

However we can conclude, the basic processes of the environmental impacts are not changed despite of the efforts. Unfortunately, the consumption growth is still offsets the eco-efficiency. People have access to the cheaper products due to the lower material and energy consumption, therefore they purchase more income, and it is increasing overall the use of natural resources. This pehonemnon is called rebound effect (Kerekes, 2006).
I agree with the statement, that the main fault of the eco-efficiency concept is that it contains several components, not thinking in process or system. In my literature search I found that in connection with the eco-efficiency the major researches are concentrate on the business sector or the energy sector.
I believe and also confirmed from the previous research that if not fitted our production and consumption system to the production and consumption system of nature, we dropped wounds on it and we reducing the essential capacity of it. I we are integrated into this system, the sustainability of the system is changing along with the sustainability with the environment (Green Economy, 2010).

ECO-EFFICIENCY MEASUREMENT

The eco-efficiency measurement has standard monetary and economic indicators (Table 1). The eco-efficiency can be measured with:

- Economic values (weight of products sold - ESA);
- Environmental indicators (material, energy consumption, emissions);
- Eco-efficiency ratios (energy demand; net value/used material; net value/ used energy; net value/GHG) (Tóthné, 2006).

The basic requirement is that the used informations are scientifically justified, well-measured and appropriate from the environmental view, and applied globally and in business (Tóthné, 2006).

Table 1. Measurement of eco-efficiency

Economic value	Environmental features	Eco-efficiency ratios
Weight of the sold products	Energy demand	Mass of sold product / energy demand
	Used materials	Mass of sold product/used material
	Used water	Mass of sold product/greenhouse gas
Net value	GHG emissions	Net value/ material
Gross value	Ozone-depleting emissions	Net value/energy
	Landfilled waste	Net value/ greenhouse gas

Source: own compilation according to Tóthné, 2006

Here we must underline the importance of separation indicators[10] and its role. It shows the rate of change in the environmentally and economically important variable in the context of cause and effect. We can quantifying the connections between the environmental impacts and environmental pressures (Szabó, 2009).

For the calculation of eco-efficiency ratio is required the MFA (Material Flow Analysis), the main indicators are summerized in Table 2. The MFA is considered at the same time:

- The new conceptual scheme;
- The new accounting system;
- New management tool;
- Be able to describe the natural and man-made material streams (Karcagi-Kovats, 2011).

Table 2. The MFA indicators

Imput	Output	Consumption
DE (domestic extraction)	**DPO** (domestic processed output to nature)	**DMC** (domestic material consumption) = DMI - export
DMI (direct material imput) = DE + import	**TDO** (total domestic output)	**TMC** (total material consumption) = TMR + export– import ± balance of the indirect flows connected to imports
TMI (total material input) = DMI + unused domestic extraction	**DMO** (domestic material output) = DPO + export	**PTB** (physical trade balance) = import - export
TMR (total material requirement) = TMI + Indirect flows connected to imports	**TMO** (total material output) = TDO + import	**NAS** (net additiontostock) = DMC-DPO

Source: Own compilation based on Karcagi-Kováts 2011

COMPARATIVE ANALYSIS OF THE ECO-EFFICIENCY IN THE BALTIC COUNTRIES AND IN HUNGARY

The indicators from the Table 2 have an important role to formulate more precisely the relationship between the ecological and socio-economic system, furthermore give a quantitative description and forms a link between the growth of wellfare and the physical growth (decoupling) (Herczeg, 2008). To increase the eco-efficiency should be reduce the material intensity of the economic/social processes.

In this article I will concentrate on the economic and the environmental features of the countries. The eco-efficient ratios will be in my further research.

[10]The environmental indicators were developed for the monitoring of the sustainable development (OECD 2001). They presented the separation of the economic growth and the environmental load of it.
Source: OECD Environmental Indicators 2001 TOWARDS SUSTAINABLE DEVELOPMENT
http://www.oecd.org/site/worldforum/33703867.pdf

Economic analysis

First of all I would like to examine the most important economic datas, of course I start with the GDP/ inhabitant. Figure 2. clearly shows that the global economic crisis pull back the countries but in the last few years the GDP values are increasing. Estonia has the highest values and Hungary has the lowest.

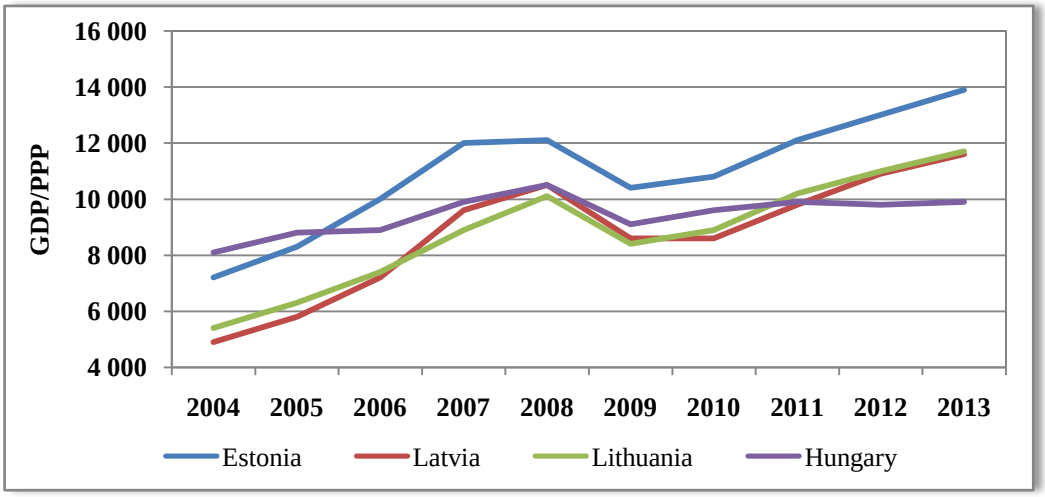

Figure 2. GDP at market prices (Euro/inhabitant)

Source: own compilation based on the Eurostat database

The resource productivity is calculated by divinding the value of the GDP with the domestic material consumption (DMC). The DMC directly measures the amount of material goods in the economy. Definition of it: the annual amount of the produced materials in the given economic region, increasing with the material import and decreasing with the material export. It is important to note that it means the domestic consumption not the final consumption. The domestic consumption not include the hidden material flows which connected to the raw materials and the import and export of goods.

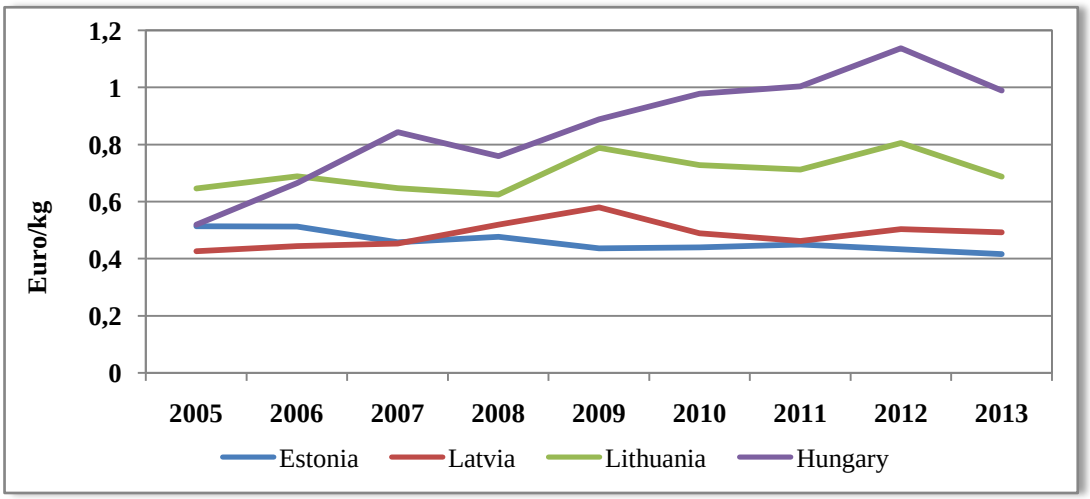

Figure 3. Resource productivity between 2005 and 2013

Source: own compilation based on the Eurostat database

In Figure 3 we identify that the resource productivity is decreasing in the last few years, the highest decrease was in Hungary, and in general the trend are the same both countries.
After the resource productivity I would like to examine the domestic material consumption (DMC) for each Baltic county and Hungary. It is expressed in tonnes per capita. The DMC is defined as the total amount of material directly used in an economy and equals direct material input (DMI) minus exports. DMI measures the direct input of materials for the use in the economy. DMI equals domestic extraction (DE) plus imports. It is important because of the Table 2, where I introduce the DMI indicator.

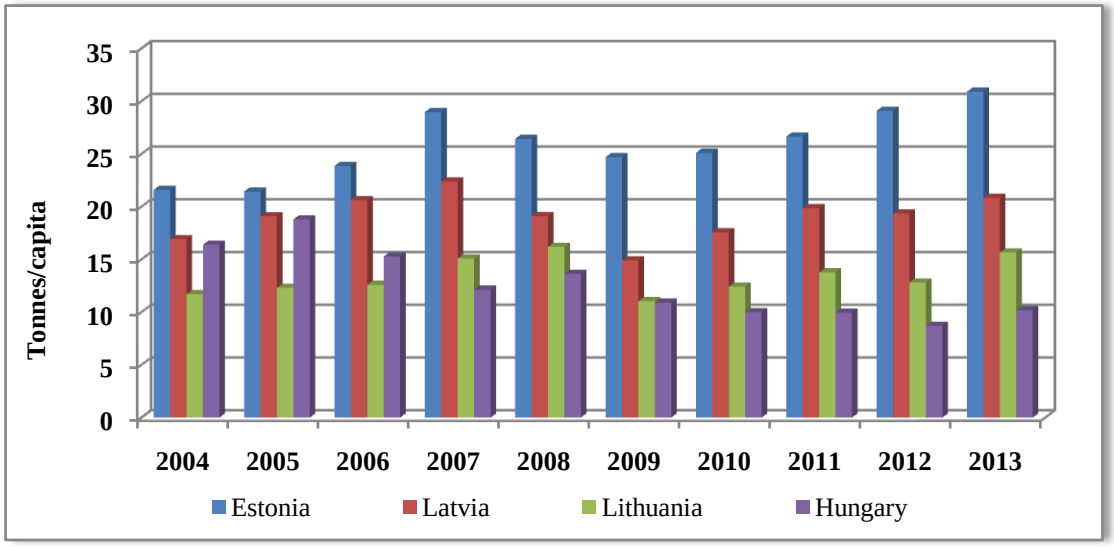

Figure 4. DMI between 2004 and 2013 in the Baltic countries and in Hungary
Source: own compilation based on Eurostat database

I think it is important to mentioned the energy taxes. Energy tax is a surcharge on fossil fuels such as oil, coal and natural gas. The purpose of an energy tax is to give businesses and consumers an incentive to use alternative energy sources, for example solar or wind power, and to raise revenue for the government in order to finance public spending.

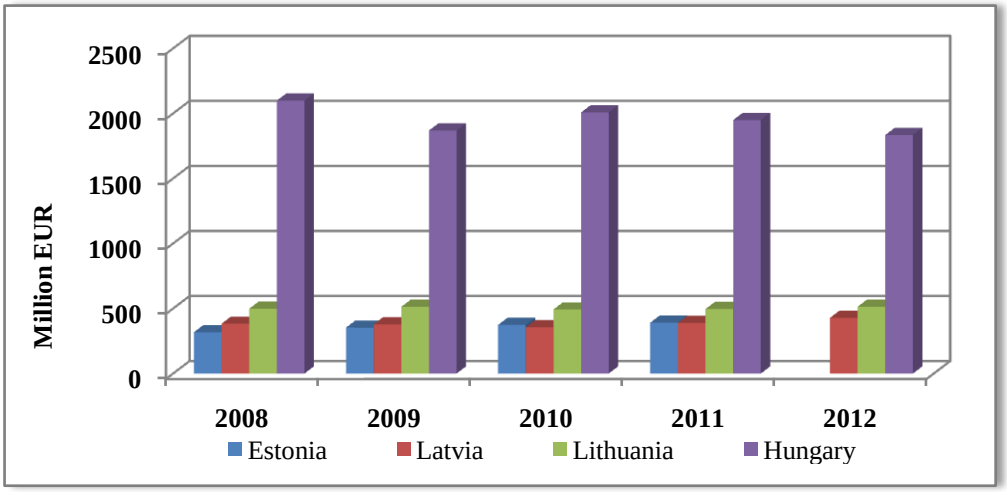

Figure 5. Energy taxes in the Baltic countries and in Hungary
Source: own compilation based on Eurostat database

Some countries believe energy taxes are necessary to reduce the greenhouse gas emissions that are theorized to cause global warming. Opponents of energy taxes warn of their unintended consequences, like an increase in the price of virtually everything that will reduce individuals' and families' disposable income. The energy taxes are the highest in Hungary, almost more than four times higher (1800 million EUR) than the Baltic countries.

Environmental analysis

As I mentioned I focus the economic and the environmental indicators in my paper. My research topic is the ecoefficiency and the green economy. I also deal with the renewable resources so the first indicator which I examine is the renewable sources in the four countries.

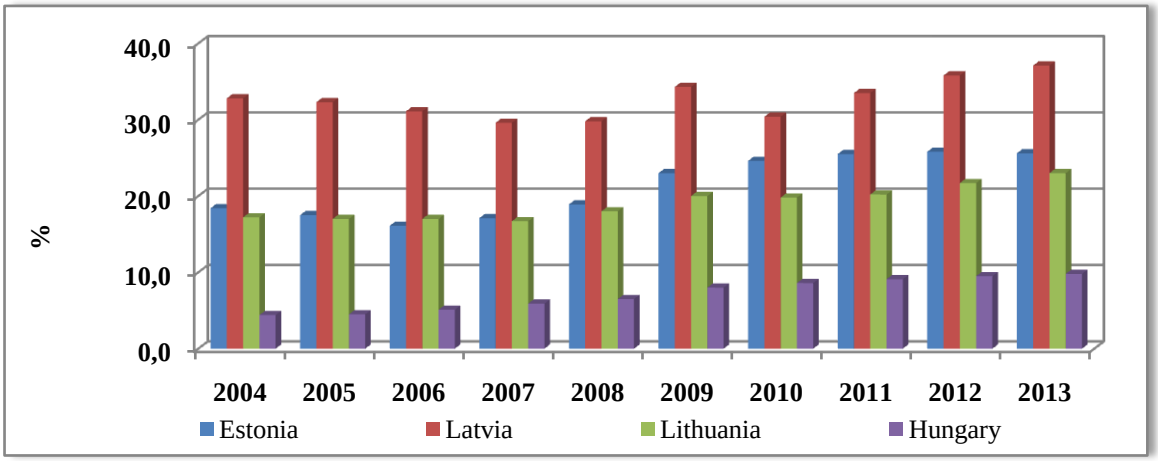

Figure 6. Share of renewable energy in gross final energy consumption
Source: own compilation based on Eurostat database

As we see, the shares are increasing in the countries but the highest value is in Latvia, more than 35%. Hungary has the lowest values, in 2013 the share of the renewable energy was only 9 percent.

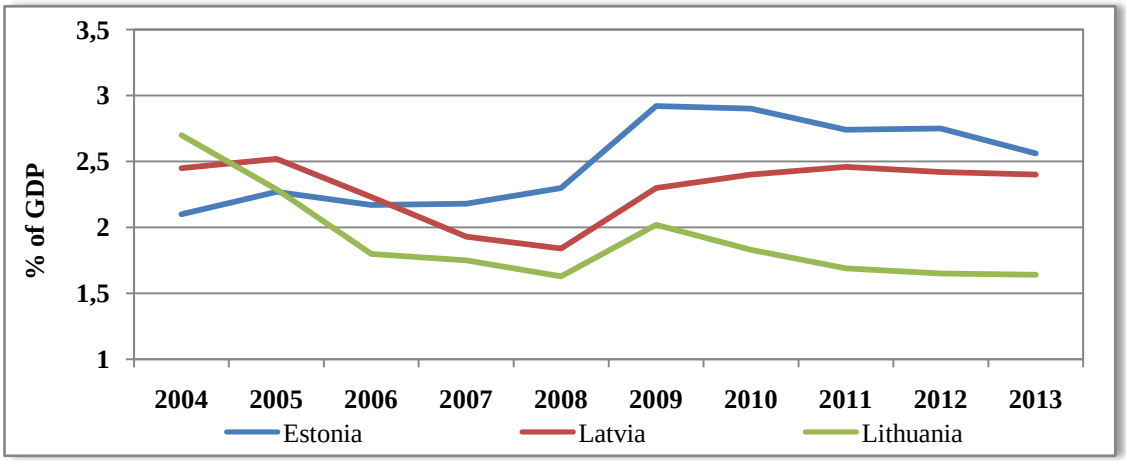

Figure 7. Environmental tax revenues
Source: own compilation based on Eurostat database

One of the aim of the environmental tax revenue is to encourage effective policy making. The environmental tax revenues is shown in the Figure 7. It was calculated the percent of the GDP. It represented only the Baltic countries, because of Hungary hasn't got any datas. In the last few years both countries have decreased the environmental tax revenues.

Also important Figure is the Figure 8. It shows that the Baltic countries have less GHG emissions than Hungary and the trends are stagneted in the Baltic countries. Hungary has decrease the GHG emissions with more than 15 million tonnes.

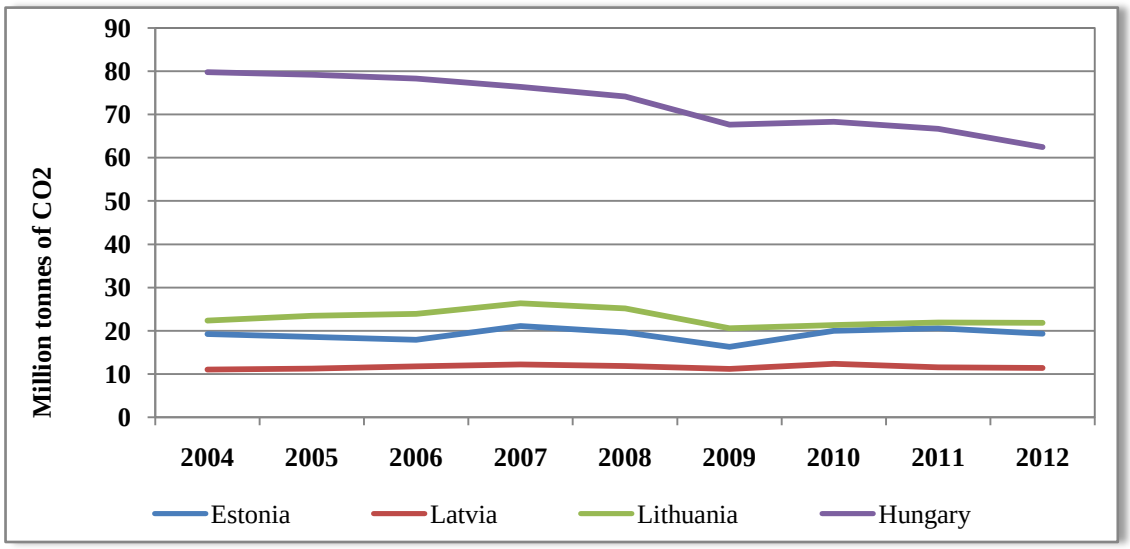

Figure 8. Greenhouse gas emissions between 2004 and 2012 (source: EEA)
Source: own compilation based on Eurostat database

In the Figure 9 I show the amount of waste per capita.

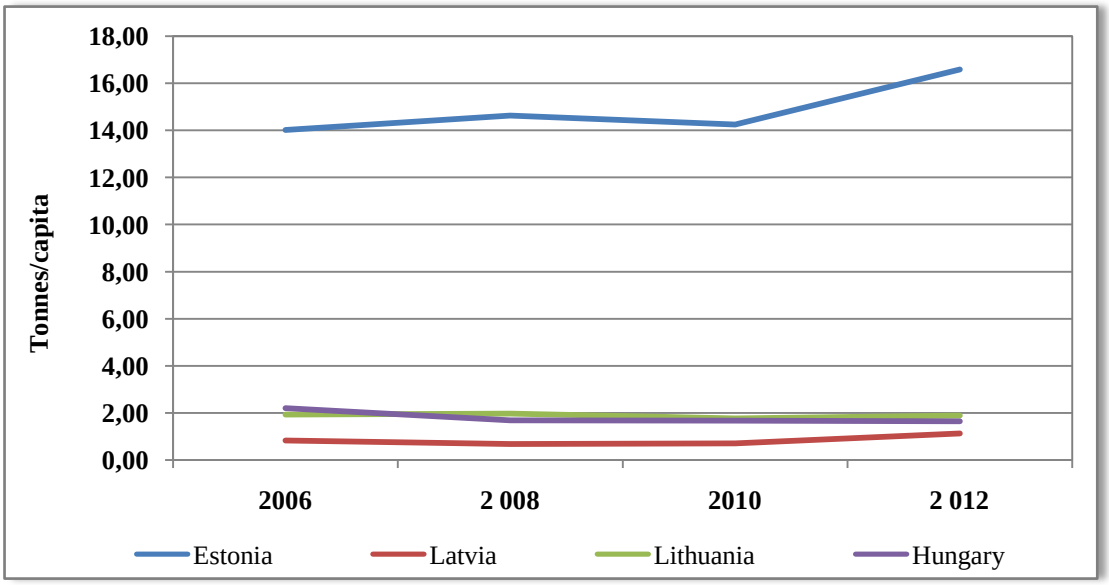

Figure 9. The amount of waste per capita between 2006 and 2012
Source: own compilation based on Eurostat database

The figure clearly shows that Estonia has the highest amount of waste, it is more than 16 tonnes/capita and it is rising, while the other countries has only 2 or 3 tonnes/capita.

I also want to compare the ecological footprints of these countries. This graphtracks the per-personEcological Footprintandbiocapacityin the choosen 4 countries since 1961. Both are measured inglobal hectares.
Biocapacity per person varies each year with ecosystem management, agricultural practices (such as fertilizer use and irrigation), ecosystem degradation, and weather, and population size.
Footprint per person varies with consumption amounts and production efficiency. Where a dotted line is shown, interpolation estimates have been used in place of highly unlikely outliers in the results. While most input data for the Footprint accounts come from UN statistical sources, the quality of country results varies. The quality of the assessment is scored on a 1-6scale.

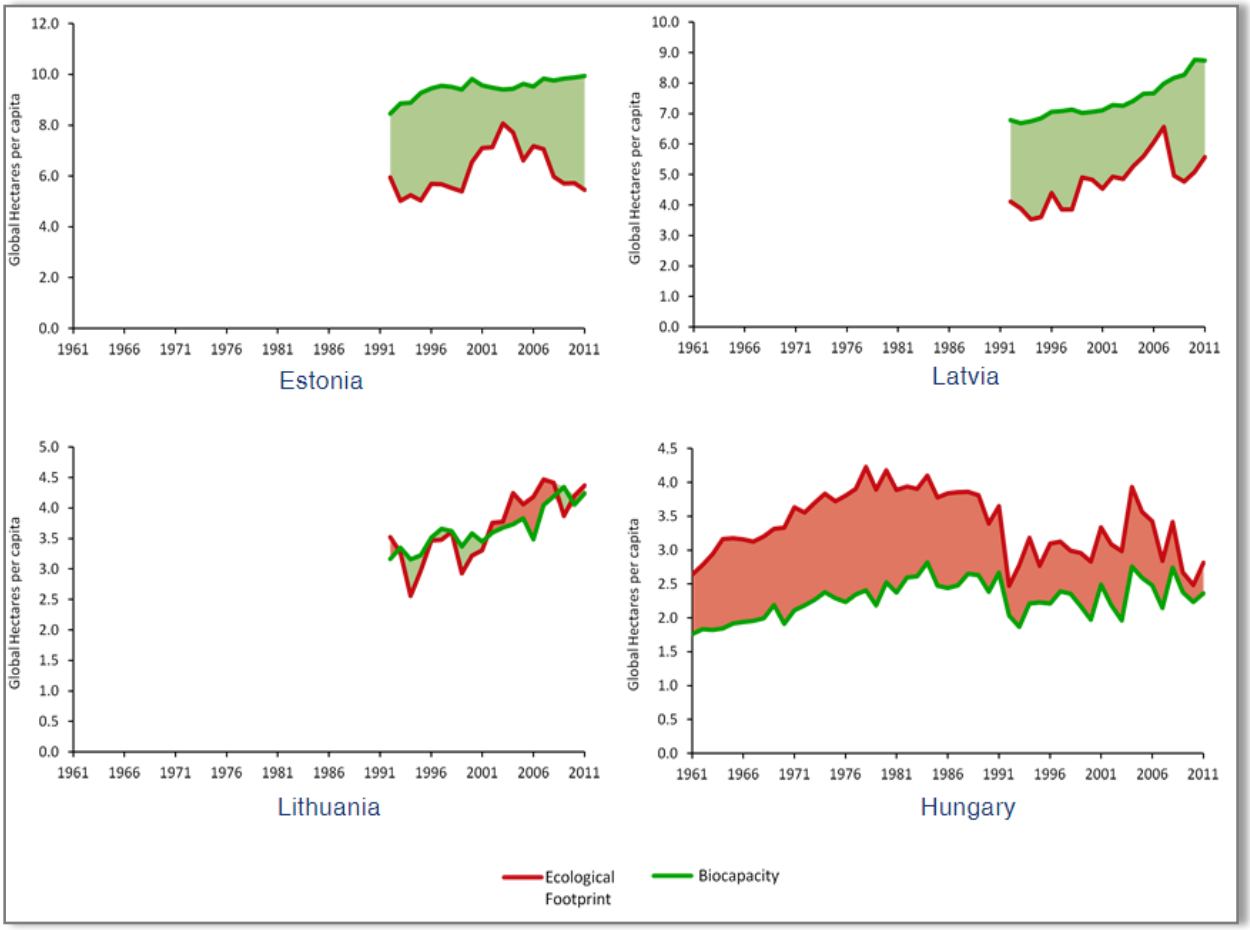

Figure 10. Ecological footprint
Source: own compilation based on footprintnetwork.org

OWN EXPERIENCES DURING THE RESEARCH

The application fields of the indicators are still in particularly controversial because of the availability of the necessary datas, the reliability of the statistical datas and the availability of the datas are also highly variable.

During my research I compare the Baltic countries and Hungary. The datas and the figures shows that there are many similarity between the countries but some point, in:

- resource productivity,
- DMI,
- energy taxes,
- GHG emissions,
- amount of waste,
- ecological footprint.

I agree with the statement that in the system boundries are not clearly defined between the economic and the environmental sector in the eco-efficiency approach and it is making difficult to determine what is considered an adverse environmental effect or even useful by-product of the life cycle stages (Hukkinen, 2003, Csutora – Kerekes, 2004, Harangozó 2008).

In my article I concentrated the environmental and the economical features (Table 1) of the countries which can help me to summarize in my future research the eco-efficiency ratios and make calculations in the chosen countries, which are the Baltic countries and Hungary.

REFERENCES

BAJMÓCZY Z - MÁLOVICS GY (2011): Az ökológiai hatékonyságot növelő innovációk hatása a fenntarthatóságra Közgazdasági Szemle, LVIII. évf., 2011. október 890–904. o.

BULLA M (2008): Környezetállapot-értékelés, Magyarország környezeti állapota, monitorozás 2008. 9.o.

CSUTORA M. – KEREKES S. (2004): A környezetbarát vállalatirányítás eszközei. KJK-KERSZÖV Jogi és Üzleti Kiadó, Budapest

DALY H. (2013): A further critique of growth economics. *Ecological Economics* 88., 20–24. http://www.sfu.ca/~poitras/Daly_Economic.pdf Letöltve 2015-09-05 23:40

DUMONT, A., MAYOR, B., LÓPEZ-GUNN, E. (2013): Is the rebound effect or Jevons paradox a useful concept for a better management of water resources? Insights from the irrigation modernisation process in Spain. *Aquatic Procedia* 1., 64 – 76. http://ac.els-cdn.com/S2214241X13000072/1-s2.0-S2214241X13000072-main.pdf?_tid=f8c742f6-5416-11e5-92e0-00000aab0f27&acdnat=1441489514_4d1164afd6eae006e4a698f0771e8680 Letöltve 2015-09-05 23:44

HARANGOZÓ G(2008): A környezeti teljesítményértékelés módszerei, Vezetéstudomány XXXIX. évfolyam 2008. 2.szám 38-50.o. http://mek.oszk.hu/04600/04602/04602.pdf Letöltve 2015-08-16 21:22

HERCZEG M. (2008): Anyagáramok elemzése a társadalmi és ipari metabolizmus különböző szintjein, PhD értekezés, Budapest, 2008, Letöltve: 2015. 09.14.23:42.

HUKKINEN, J. (2003): Ecological Economics, 2003, p. 11–27.

IMREH-TÓTH M (2012): Új irányzatok a fenntarthatósági indikátorok területén, in: Bajmócy Zoltán – Lengyel Imre – Málovics György (szerk.) 2012: Regionális innovációs képesség, versenyképesség és fenntarthatóság. JATEPress, Szeged, 318-335. o.

KARCAGI-KOVÁTS A. (2011): Mivel mérjük a fenntarthatóságot? Doktori értekezés, 2011. 22-23.o. Letöltve: 2014. 05. 31. 12:50.

KATONÁNÉ KOVÁCS J (2002): Környezeti mutatók, agrár környezeti mutatók

KEREKES S (2006): A fenntarthatóság közgazdaságtani értelmezése, Stratégiai kutatások – Magyarország 2015, 2006, Fenntartható fejlődés Magyarországon 196-212.o. Letöltve 2015-03-02 00:08
OECD Environmental Indicators 2001 TOWARDS SUSTAINABLE DEVELOPMENT http://www.oecd.org/site/worldforum/33703867.pdf, Letöltve 2015. 09. 08.23:45.
SZABÓ E. (2009): A környezeti mutatók képzésének alapelvei és alkalmazásának lehetőségei, Doktori értekezés, 2009, Budapest. Letöltve: 2011. 02. 03. 23:07.
TIHANYI L -CSETE J (2012): A CO2 lánc – CO2 leválasztása, szállítása, tárolásaMűszaki Földtudományi Közlemények, 83. kötet, 1. szám (2012), pp. 221–235.
TÓTHNÉ SZITA K (2006): A gazdasági és környezeti hatékonyságnövelés trendjei VI. Magyar Jövőkutatási Konferencia Győr 2006 Konferencia kötet, 237-246-o
VALENTIN, A. – SPANGENBERG, J. H. (2000): A guide to community sustainability indicators. Environmental Impact Assessment Review, 20, pp. 381–392.
WBCSD (1996): Eco-Efficient Leadership – For Improved Economic and Environmental Performance http://oldwww.wbcsd.org/DocRoot/DlFMcUZj32ZOMj5xNMXq/eeleadership.pdf Letöltve 2015-08-30 18:49
WBCSD, UNEP (1996): Eco-Efficiency and Cleaner Production – Charting the Course to Sustainability http://oldwww.wbcsd.org/DocRoot/aFQps2TRHhw5tFsl5oZP/eecleanerprod.pdf Letöltve 2015-08-30 18:50
www.date.hu/acta-agraria/2004-13/katonane.pdf Letöltve 2015-08-29 *17:03*
www.greencapital.hu/dokumentumok/100513/Zöldgazdaság.pdf Letöltve 2015-08-28
ZÖLD GAZDASÁG, A gazdaság zöldítése Magyarországon 2010 Bp. 39-43 o.

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