

**SZENT ISTVÁN UNIVERSITY  
GÖDÖLLŐ**

**THE MULTI-LEVEL INTERPRETATION OF  
COMPETITIVENESS AND ITS RELATIONS WITH  
INNOVATION**

**DOCTORAL (Ph.D) THESIS**

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Gödöllő  
2014

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Administration PhD School

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# 1. INTRODUCTION

## 1.1 The subject of the dissertation

The subject of the PhD thesis is constituted by the evaluation of the national and business innovation.

The basic thought of the dissertation is that *in the 21<sup>st</sup> century the competitive national economy can only be improved by establishing the conditions of the knowledge-based (innovative) economy*. Knowledge and human capital has a leading role in that process. This is why strengthening competitiveness requires the investments into knowledge, thus we need to spend more on education (sciences), innovation, research and development, like many countries do (for example the Scandinavian countries).

We can come to the conclusion when examining competitiveness that there will always be economic participants, who are forced to face a decline for some reason. The aim of these lesser developed participants is to catch up, but in order to do so they have to be able to answer the questions of what to compete with and how to gain a competitive edge on the global and local markets.

If we consider an economy to be a compound and complex system, it should be even more obvious for us that we cannot accept neither the sharp separation of the competitiveness levels or the sole appreciation of the business or national levels of the competitiveness's interpretation, because the companies' competitiveness determines the situations of the region and the national economy just as much as the national economy determines the companies' performance. For this reason competitiveness can only be examined aggregately, namely through the collective and system approaches of each and every level. The dissertation builds on this spirit and it wishes to prove that *the national and business competitiveness coexist in mutual dependence*, and what's more, only the multidimensional approaches are capable of their interpretation and measurement.

Since competitiveness is a much more complex phenomenon than for instance economic growth, it cannot be expressed with such a simple economic index like GDP. *The truly rich and developing countries pay equal attention to the economy, the society and the natural environment*. In fact these three pillars equally have an effect on how competitive can a national economy be deemed. The collective evaluation of the economic sphere, the social sphere and the ecosphere demands a much more complex evaluation methodology, because the welfare and well-being of the people cannot be determined only by the GDP either.

With the examination of competitiveness we will be able to explain in what fields the economic participants have to experience setbacks and how we can improve our

competitiveness by the development of these fields. The change of the GDP will only be the end consequence of this.

*The subject of this thesis is the interpretation of the essentials and the relationships of competitiveness, both in the national and business levels.* Along with the system approach of competitiveness, it also deals with the domestic companies' performance, and examines to what extent the domestic companies (especially the small and medium enterprises) contribute to the improvement of the national competitiveness.

Researching competitiveness is relevant these days, since the competitive situation is getting more serious, in addition the needs and the economic environment are changing more and more intensely, so the means that provide a competitive edge for a country or an enterprise today might not be success factors tomorrow.

## **1.2 Review of the research goals and the hypothesis**

By writing this dissertation I dedicated myself to draft a diagnosis that can widely define the competitiveness situation of Hungary.

Obviously, if our starting point is that competitiveness is determined collectively by many factors, then this undertaking is unattainable in the length of one dissertation. However, by introducing the studies of the most significant professional organizations (*e.g. World Economic Forum, INSEAD or the Legatum Institute*) and the primary research results we can have a comprehensive picture of what Hungary's competitiveness is like today and what those factors are that can shape and form the performance of a national economy and the welfare of its citizens.

My work particularly *focuses on the competitiveness of the companies and the national economy.* The sectorial, industrial and regional competitiveness are not separate research areas of my thesis, mainly to avoid having a too extensive scope. I would like to emphasize with this dissertation that a more competitive operation requires the participants of the economic life to make some sort of effort. We have to focus on areas that create the opportunity for growth and improvement, so *among other things we need to pay special attention to innovation as well.* The thesis also reveals that *innovation is an indispensable means of improving competitiveness,* and it parallels the national and business competitiveness with the experienced level of the domestic innovation performance accordingly.

During the research I considered the realization of the following objectives to be my primary tasks:

**C<sub>1</sub>: Introducing the interpretation of competitiveness with system approach, identifying and defining the business and national economic competitiveness.**

**C<sub>2</sub>: Evaluating the competitiveness of Hungary, analysing the changes in the Hungarian national economic competitiveness in retrospect of the past decades.**

**C<sub>3</sub>: Demonstrating the relationships between competitiveness and innovation, and the role of innovation in improving competitiveness.**

**C<sub>4</sub>: Creating my own definitions regarding both the national economic and business competitiveness.**

Formulating hypothesis also provided help during my research study to achieve my goals. The research assumptions prompted me to deal with certain areas specifically when writing the dissertation.

Their purpose is to help me make the originally set research goals to be more reasonable, and I wanted to establish the possibility of presenting – along with the list of the used literature and the secondary data collection – the primary research results too. I drafted the hypothesis while processing the professional literature. The scientific and professional materials, plus the researches and studies of the international organizations made me infer that I should set up the following hypothesis in connection with my thesis:

***H<sub>1</sub>: One of the reasons why the competitiveness of Hungary is low today is because we are unable to create an environment for the enterprises that would make it feasible for them to have a more competitive operation.***

***H<sub>2</sub>: One of the most determining reasons of the Hungarian economy's setback in competitiveness resides in the low innovation performance. The innovative ability, the usage of new solutions and the urge to constantly aim for them are all missing from the domestic economy.***

***H<sub>3</sub>: In Hungary the trust between the economic participants is weak, thus the existence of the cooperative forms that would help the innovation are not typical. Without these the innovation performance is even lower, and the productivity does not reach the level either that would be expectable, considering the resources and the capacity of the Hungarian economy.***

## 2. SUBJECT MATTER AND METHOD

### 2.1 The research methods of the goals and the hypothesis

The research method of the first objective is mainly the *processing of the professional literature*, i.e. the elaboration and organization of the accessible materials related to the subject matter. Processing the literature extends to both the works of domestic and foreign experts, and the studies of domestic and international organizations. We have to treat the *notional comparison* of business and national economic competitiveness as a part of the methodology as well.

The research method of the second objective is again the *processing of the professional literature*, and also the *collection, sum up and evaluation of the secondary data* from various economic and competitiveness databases. On top of the basic economic indexes the multidimensional index numbers have special importance too. We have to consider the *comparative evaluations* to be part of the methodology in order to examine the competitiveness situation of the Middle Eastern European countries in correlation with each other

Of the methods chosen for the examination of the third objective we have to highlight the *collection and evaluation of the professional statements and literature* regarding the relationships between competitiveness and innovation. This is augmented by the *secondary data collection* about the situation of innovation, and also by the *comparative evaluation* of the certain countries' innovation performance. *Introducing the primary research results*, which prove the low domestic innovation level and the resulting weaker competitiveness, can be deemed to be part of the methodology.

The fourth objective relies on the results of the previous three and on the establishments of the hypothesis examination. *The hypothesis got into the focus of the survey due to the above objectives*, and they are based on the research of the relating domestic and international literature, its thematic processing and the presentation of my own research results.

The research began with phrasing the objectives. In reference to competitiveness there is a very rich available background of professional literature, and in addition the statistic data has been collected too for the past many years. Apart from these the primary research data has been provided by the INNOTARS research program and my study called "*Open innovation and social capital in Hungary*".

After the collection phase I organized the data, during which I've created the list of the quoted materials and I chose the questions of the surveys that I wanted to evaluate and mention in the dissertation. For the evaluation of the professional

literature the most obvious method was to make comparisons, so I endeavoured to parallel the competitiveness definitions, theories and levels. I tried to choose the questions from the primary research data that related the most to the subject of my thesis. For their examination I used both simple and sophisticated statistical procedures, which made it possible for me later to come to conclusions about the research. The more general suggestions were based on these. The summary of my PhD thesis briefly assesses the content of this study.

## 2.2 Primary research parameters

*The evaluation of the small and medium enterprises is a priority area in the competitiveness researches.* The reason of that is because in Hungary 99.9% of the operating enterprises are small or medium enterprises, which employ two third of the domestic able-to-work population and produce 60% of the GDP.

The researches make it clear for us what kind of competitiveness tools the Hungarian companies choose, and tell us whether they are trying to compete with knowledge, innovation or other means. In light of this the primary surveys are focusing on the domestic micro, small and medium enterprises.

During the Innottars<sup>1</sup> program 1800 companies returned 814 questionnaires that could actually be evaluated (N=814), which is an excellent result considering the general willingness of the Hungarian entrepreneurs to answer<sup>2</sup>.

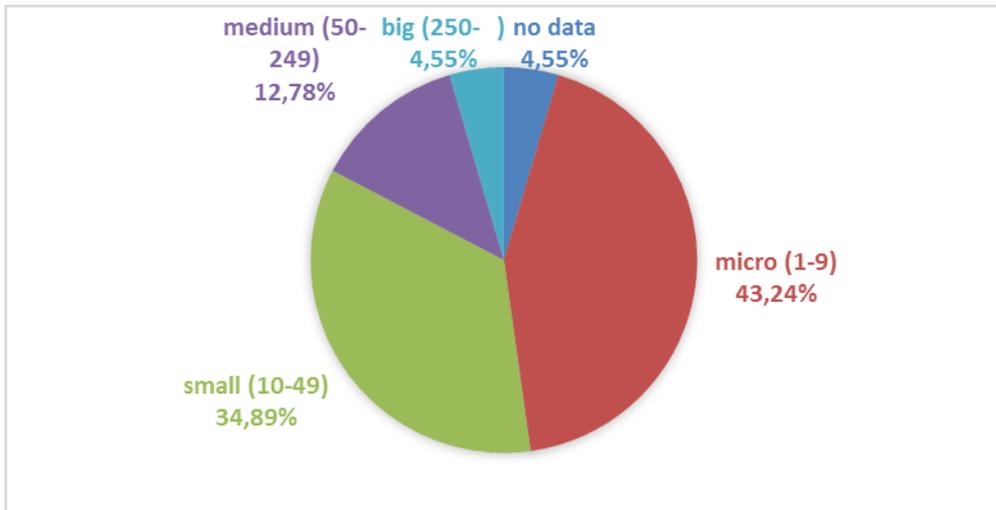
*Willingness to answer =  $(814/1800) * 100 = 45.22\%$*

There were many channels available for the respondents to return the answers. They had the option of sending the questionnaires back through the internet, in a letter, on fax or even personally. There were open questions and matrix-like ones with single or multiple choices as answers. The micro enterprises participated with the biggest number (43.24%) of participants in the questionnaire survey, while the small enterprises formed the second largest base (34.89 %). The big companies had the smallest percentage (4.55%) within the group, so all in all *the survey absolutely managed to focus on the small and medium enterprises.*

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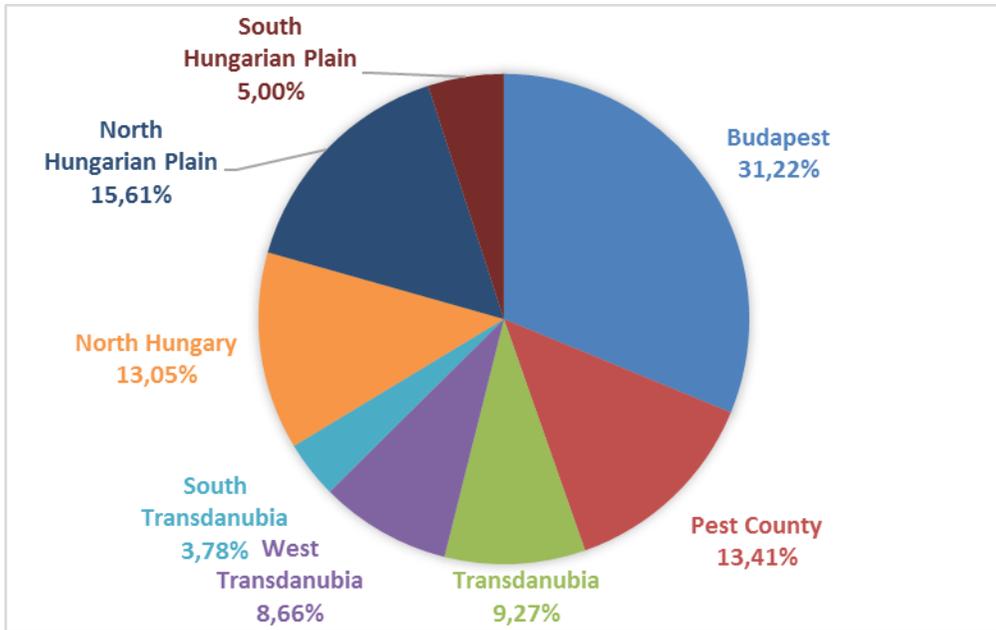
<sup>1</sup> The program was financed by the National Innovation Office

<sup>2</sup> The research study was conducted between 2010 and 2011



**Graph 1.: Breakdown of the enterprises participated in the survey by size**  
 Source: based on the data of the Innotars program, self edited

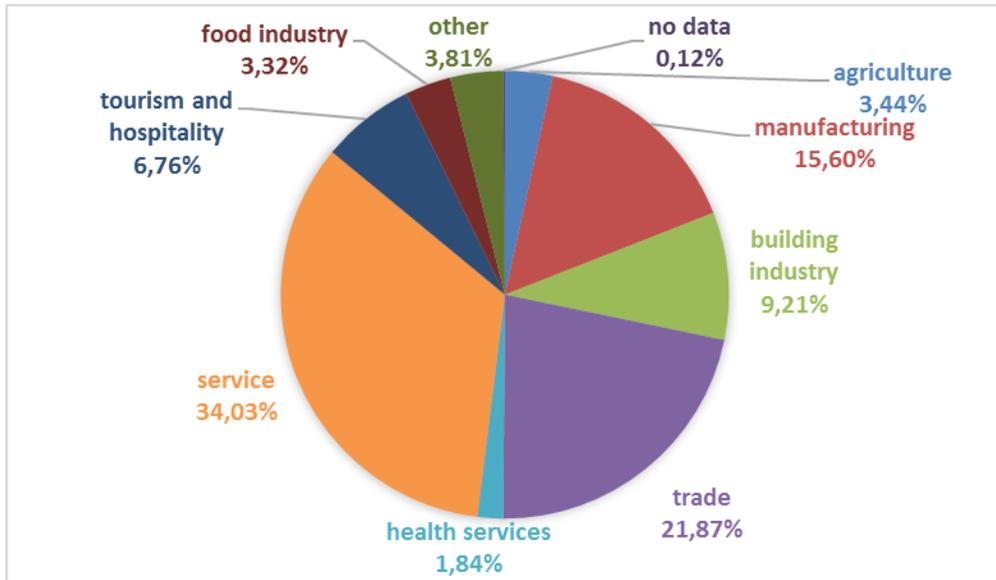
The companies from Budapest had the largest participation rate in the questionnaire survey, which was 31.22% of the whole sample group. At the same time Pest County, Northern Hungary and the Northern Great Plain showed roughly 15% participation rates, while the willingness to answer was relatively smaller in the cases of the enterprises from the Southern Great Plain (5%) and the Southern Transdanubia (3.78%).



**Graph 2.: Breakdown of the companies participated in the survey by region**

Source: based on the data of the Innotars program, self edited

The vast majority of the approached companies operate in the service provider sector (34.03%), and the presence of the commercial and processing industries is also very significant in the sample group. The smallest percentage of the filled questionnaires came back from companies from the food industry, which represents 3.32% of the examined group. I've used basic statistic methods for the evaluation of the questionnaires, and, most importantly, I've *generated base- and chain ratio numbers in order to determine the level of innovation.*



**Graph 3.: Breakdown of the enterprises by activities**

Source: based on the data of the Innotars program, self edited

The Innotars program was involved in my thesis mainly for the reason to *give me a clear picture of the domestic situation of innovation in the form of the primary results too*, since with them it would be possible to examine the hypothesis even deeper.

Its results are completed by the brief survey<sup>3</sup>, which I conducted in the early spring of 2012, also amongst the domestic micro, small and medium enterprises. Its purposes were *to investigate the innovation cooperation of the enterprises, to evaluate the spread of the open innovation and to explore the methods of utilizing knowledge*.

College students helped me to conduct the study, during which the questionnaire was sent to 3,000 enterprises through various internet channels. As a result hundred and fifty-two questionnaires were returned that we could process, which was not that bad considering the short survey period (three months)<sup>4</sup>. Willingness to respond =  $(152/3000) * 100 = 5.06\%$

During the research I tried to keep it in mind that the survey should extend to the micro, small and medium enterprises. (Table 1)

<sup>3</sup> The open innovation and the social capital at the domestic micro, small and medium enterprises

<sup>4</sup> January - March 2012

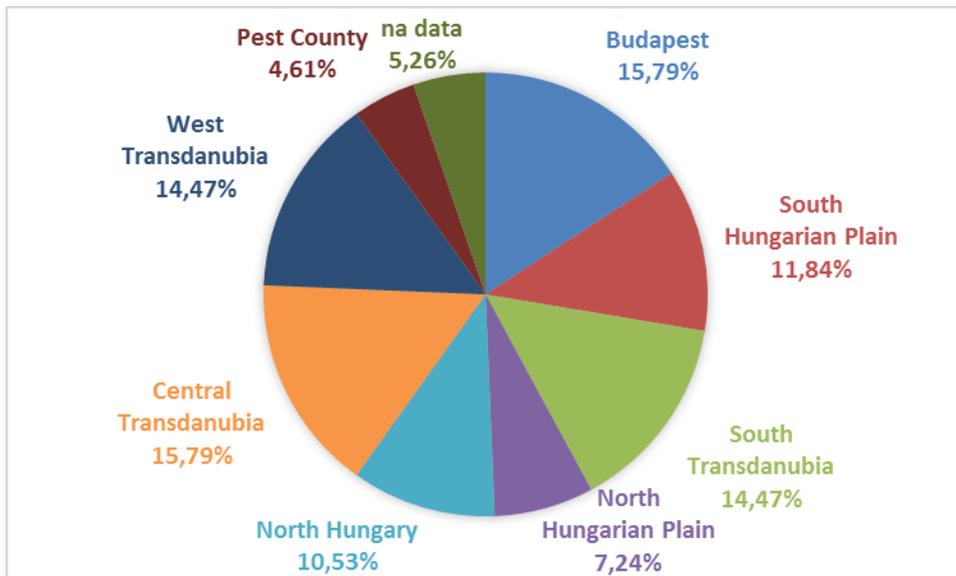
Table 1.

**Breakdown of the companies participated in the open innovation study by size**

types of the answers	1-9 people	10-49 people	50-249 people	over 250 people	no employees	no answer
number of the answers	94	38	8	1	7	4

Source: based on my own research, self edited

The enterprises filled the questionnaire from every region almost equally. Four of the regions – Budapest, Southern-Transdanubia, Central Transdanubia and Northern-Transdanubia – had a response percentage of close to 15%. The least answers came from County Pest. Within the Central Hungary Region County Pest and Budapest have been separated, filtering the unreasonable centralization in the capital out.



Graph 4.: Breakdown of the companies participated in the survey by region

Source: based on my own research, self edited

Both *basic statistics and more complex examinations* were made for the evaluation of the questionnaire of the research called “The open innovation and the social capital at the domestic micro, small and medium enterprises”.

In the case of the *qualitative criteria* I have correlated the number of answers given to a certain question, whereas at the multiple choice tests I have correlated the *rate of the different answers* to the total number of the possible answers.

Beside these evaluations by one criterion I have conducted a few *relationship examinations* as well, most of the time with the help of  *Crosstab queries*. To verify

the relationship between the criteria I have taken the significance level of the *Chi square test* as a basis. If its value is under 0,05 then the associational connection can be deemed as statistically acceptable.

During the statistical analysis I have also been looking for the answer to the questions of which economic participant is more important for the enterprises when doing innovations, what type of relationships (inner or outer) they have, and what kind of impact the corruption and the low trust level (social capital) had on them. So I chose the questions, which could be rated by the enterprises on a scale from one to five, and it gave me the opportunity to sort them into principal component factors by doing a *factor analysis*.

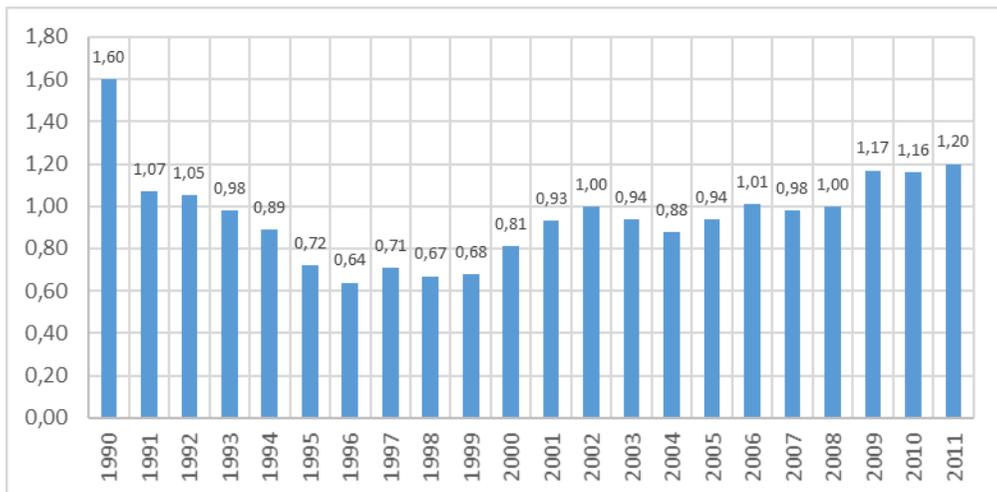
I have done every examination with the *SPSS 19 statistical program package*, and I have placed the tables that prove the calculations in the appendix of the dissertation.

### 3. RESULTS

In the H<sub>1</sub> hypothesis I presumed that one of the reasons why *competitiveness is low these days is that the business environment is not suitable for the enterprises.*

The vicious cycle of the underdevelopment shows that if productivity is low in a country and there are no innovative sectors producing high added values, which on the whole is going to lead to the decrease of the macro incomes, and through that to the shrinking of the economy. This is the process that I tend to see in Hungary, since *our companies do not have the kind of competitiveness bases, with which the business and national economic competitiveness could substantially be stronger.*

It manifests not only in the economy but in the society as well, because the lower level of competitiveness has an effect on the growth of the standard of living too. These thoughts have been confirmed by international organizations like for example the World Economic Forum, the IMD, the Legatum Institute, the World Bank, the Transparency International, etc. The PhD thesis widely used the professional opinions of these international organizations, and it refers to the deficiencies that can be considered as the primary reasons for the Hungarian setback in competitiveness. A reason like that is for instance the *low rate of the R&D expenditures*, to which even the Central Statistics Office draws attention.



**Graph 5.: The rate of the R&D expenditures in the % of the GDP in Hungary, 1990-2011**

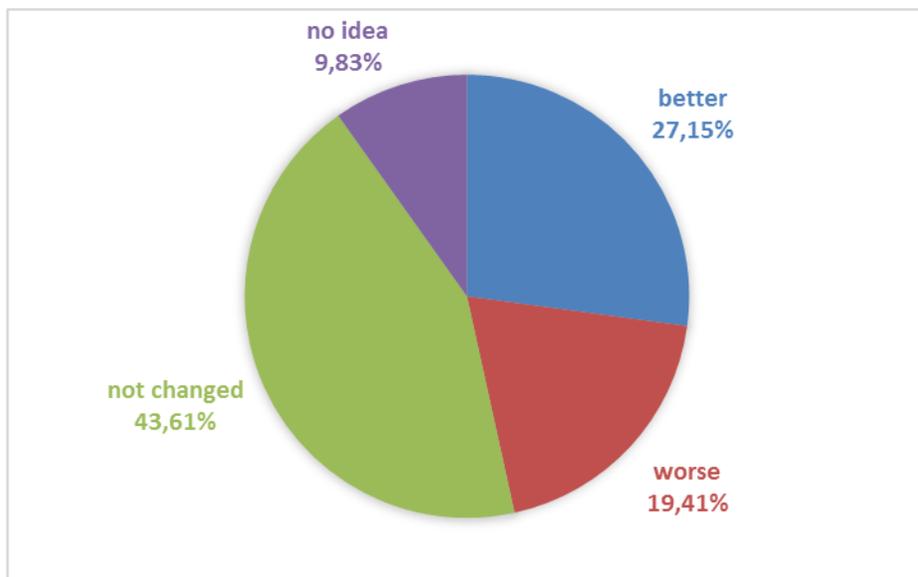
Source: based on the data of the Central Statistics Office, self edited

During the Innотars research I have come to the conclusion that this business environment helps neither the management nor the innovation itself, so after all it is

not surprising that we do not perform exceptionally well with respect to the innovation (or the R&D) either.

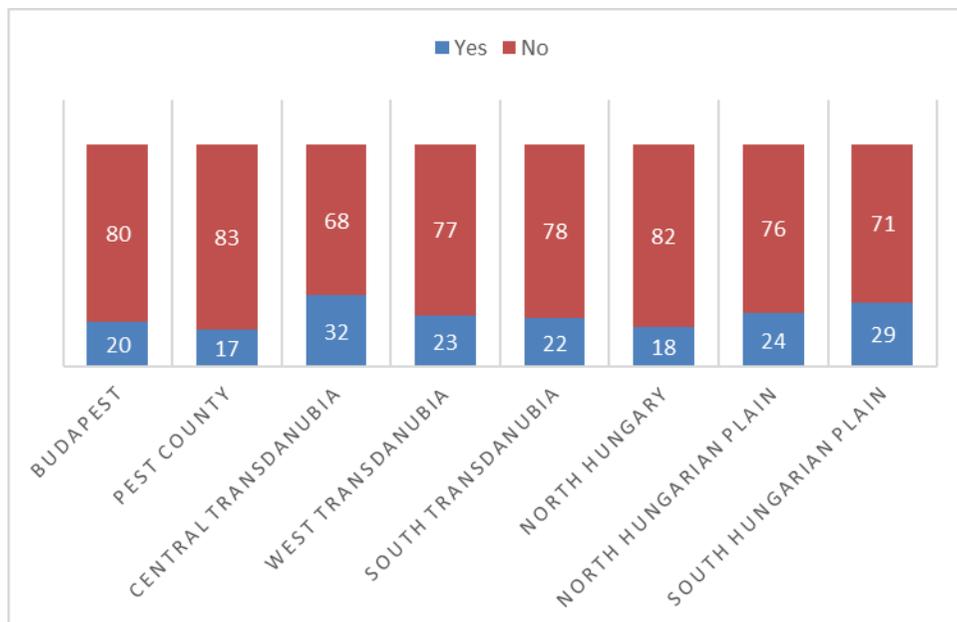
***Even joining the European Union could not make things better***, as it turns out from the characteristics of the answers. ***According to the largest percentage of the enterprises filling the questionnaire the innovation situation have not changed***, while 19.41% of them says that the conditions for implementing innovations are worse today than before we joined the EU. (Graph 6.)

It is also an interesting result that only 9.43% of the companies participating in the survey have comprehensive information about the EU allowances for supporting the SMEs. 45.82% of them have some information, 30% does not know about these opportunities, while 15.6% will not apply for such resources. 0.25% of the respondents did not answer this question. (N=814)



**Graph 6.: The situation of innovation since joining the EU**  
Source: based on the data of the INNOTARS program, self edited

***Joining the European Union has been conducive mostly to the innovation of the large companies and the small enterprises.*** We will get an even more negative picture if we examine in which regions the enterprises can grab the opportunities provided by the EU for implementing innovations. The outcome of the survey tells us that the enterprises of the Central-Transdanubia and the Southern Great Plain have been able to do this with the best result, while in County Pest and Northern Hungary the companies are able to attach the EU opportunities to their innovation processes the least of all.

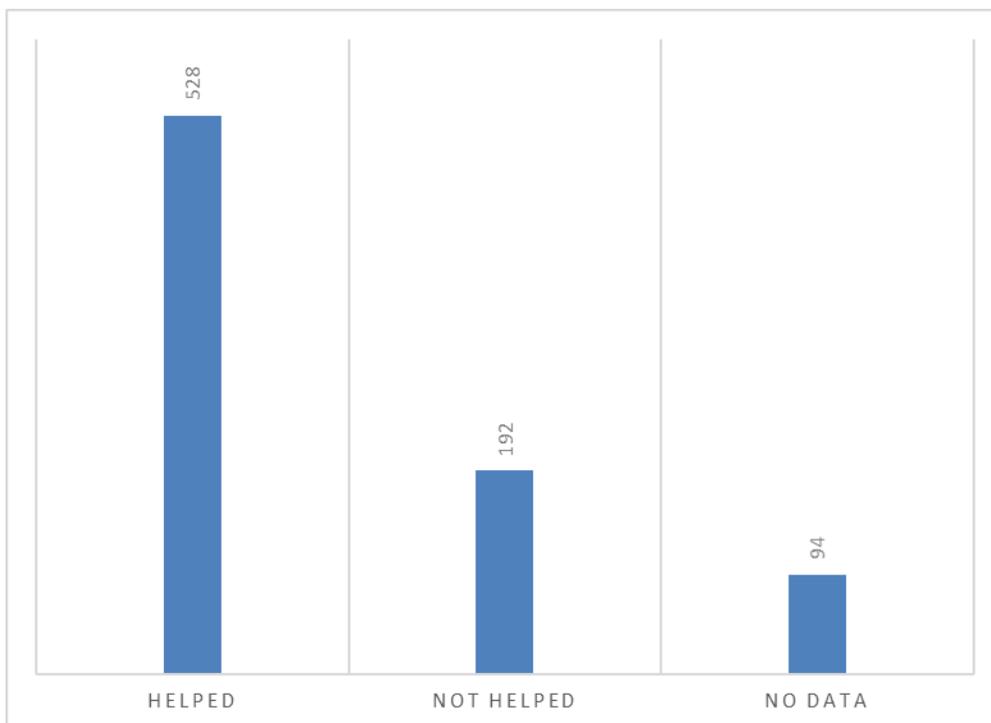


**Graph 7.: Can the company take advantage of the EU opportunities for its innovation?  
(by region, %)**

Source: based on the data of the INNOTARS program, self edited

*The entrepreneur-friendly business environment also manifests in how much the enterprises are able to react to the unfavourable economic processes, and what kind of conditions they have for this.*

The economic crisis had a negative effect on the vast majority of the companies participating in the survey. According to 64.86% of the companies in the sample group the crisis slows the innovation down, and only 23.58% says it actually helps it. The latter enterprises must be the ones that do not look at the crisis as a problem or an emergency situation, but on the contrary, they think of it as an opportunity. It brings us the opportunity to implement something new in the operation or the management.



**Graph 8.: The effect of the crisis on innovation according to the companies participating in the survey**

Source: based on the data of the INNOTARS program, self edited

The study of the Economic Intelligence Unit<sup>5</sup> reveals that the tax environment can be a very significant problem for the small and medium enterprises even in the developed countries. The enterprises participating in the Innotars program also tell us that *the innovation process is held back by the tax environment the most*. In the hierarchy of the hampering reasons the **financial problems** are the second (56.76%), which is in close relation to the excessive rate of the payable corporate tax. The *availability difficulties of the allowances/tenders* and the *rate of return of the investments* (45.58%) both have a significant negative effect (46.93%). According to the companies the best way would be for the economic policy to help improving the innovation activities of the companies or making it easier for them, if they used a more favourable tax system (85.14%) and less bureaucracy (67.44%). Apart from these many companies consider it to be important putting an end to corruption and implementing a more favourable payment scheme.

In the research of open innovation and social capital the enterprises confirm that *one of the reasons why the enterprising environment is bad in Hungary is that the*

<sup>5</sup> Economic Intelligence Unit (2012): Developed versus emerging economies

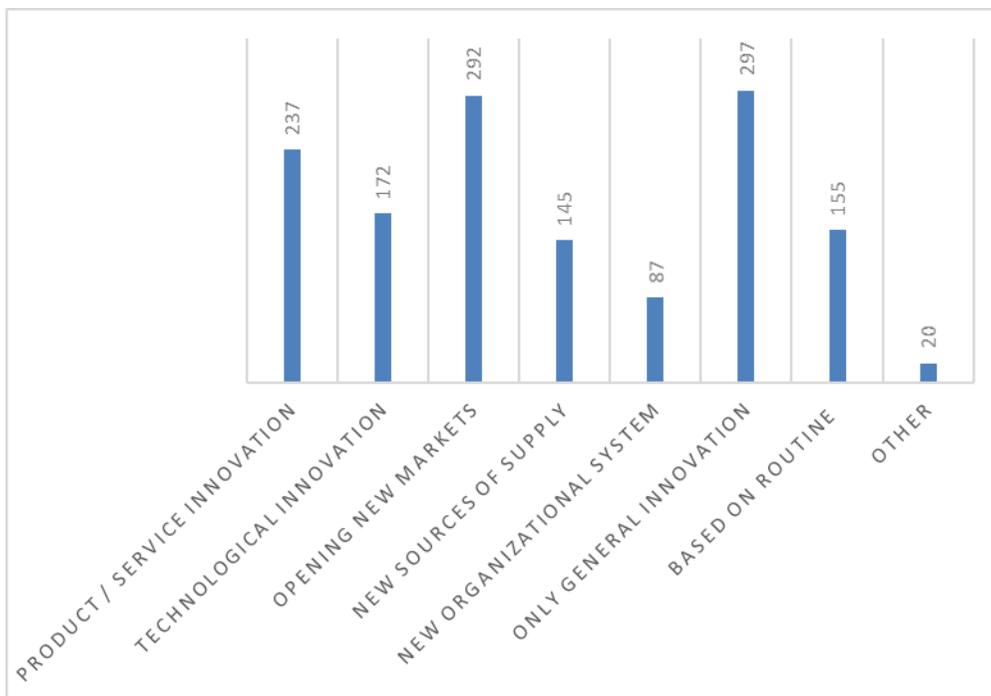
*trust level of the economic participants is very low*, and without that we will have a much smaller chance to fight for example corruption and the chain of debts. The relevant question of the questionnaire related to the research was: How do you characterize trust between business partners in the domestic economic relationships of the companies? The entrepreneurs had to rate it on a scale from one to five, where one meant the minimal trust level and five equalled maximum trust. 135 of the 152 enterprises filling the questionnaire gave moderate or poor rating, which tells a lot about the state of the enterprising environment in Hungary.

The poor business environment can be determined not only from the works of the international organizations, but from the primary results of the research as well. ***This environment does not make it possible for the companies to implement high level innovations***, so basically the second hypothesis derives from the first.

According to my H<sub>2</sub> hypothesis one of the most determining reasons for the Hungarian economy's setback in competitiveness resides in the weak innovation performance. Many international organizations refer to the weak domestic competitiveness in their scientific works. The biggest similarity between the opinions and statements is that they always mark Hungary with the adjectives "poor" or "catching up" regarding the innovation performance. The OECD for instance talks about the absence of the innovative SME sector, but the studies of the World Economic Forum, the IMD, the IMF, the European Commission, the OECD, the Legatum Institute, the ILO, the INSEAD, the WIPO and the Economist Intelligence Unit also provide evidence of the low innovation level.

***The entrepreneurs normally stick to the usual solutions, they are afraid trying new things and do not dare to take risks.*** This can be affected by the inappropriate enterprising environment, the unpredictable economic policy and the turbulent macro environmental technicalities (among other different factors).

The results of the Innotars program (N=814) prove that ***at 43,87% of the approached companies there was no innovation activity at all in the past ten-fifteen years***, while approximately half of the companies (55.53%) have classifiable innovation activities. ***Currently at 297 companies there is no definite innovation***, they only make smaller developments (36.48%), and significant number of the enterprises make such decisions ***by routine or spontaneity*** (19.04%) too. The most typical innovations at the companies are the product innovations and opening new markets. Nearly 65% of the enterprises marked these two types of innovation. On the other hand new business models, marketing innovations or technological developments are being implemented by less of them.



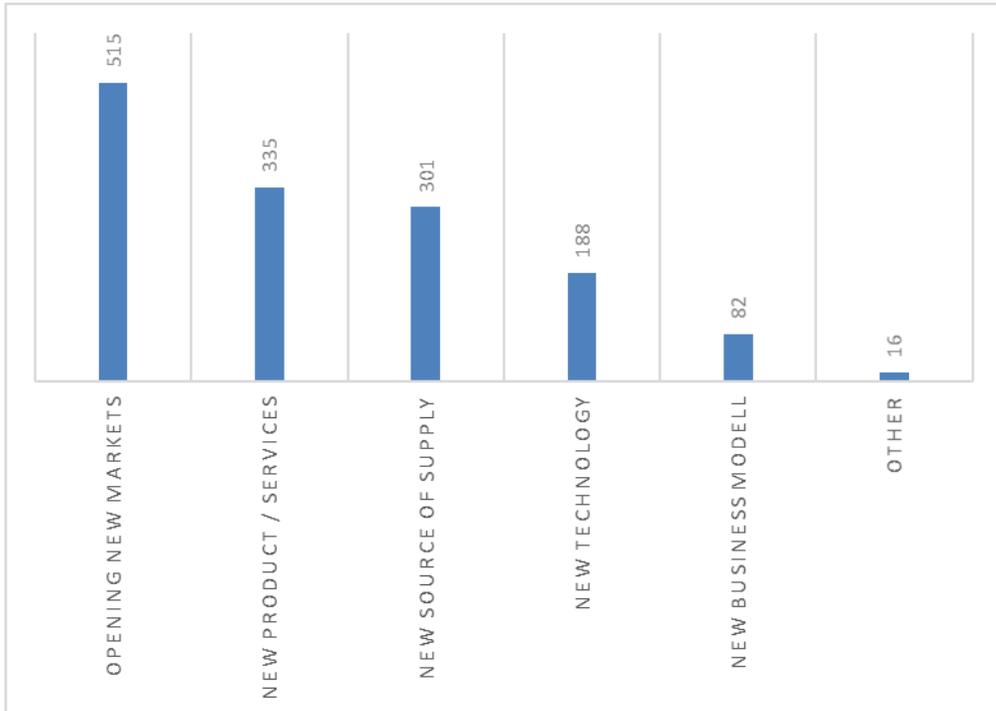
**Graph 9.: The presence of the separate innovations at the examined enterprises**

Source: based on the data of the INNOTARS program, self edited

According to 63.27% of the companies trade grows as a result of innovation, so for the sake of the profit growth it would definitely be worth starting innovation processes. 57.99% of the executives see connection between the competitiveness of the enterprise and the current level of competitiveness. The domestic enterprises believe that innovation could help improving profitability, reducing costs or increasing the market share, however almost none of them talked about how innovation could be one of the means for creating values or offer help for satisfying the consumers' needs (or improving the quality) on a higher level. The SMEs participating in the survey know exactly that there would be a lot of arrears to make up in the field of innovation in order to have a more competitive operation. The executives say that their enterprises need innovations, but most of them think it would mean new products, new services or opening new markets. Not many enterprises admit that they need to develop a new and more effective organization, implement new management methods, use new marketing tools, improve knowledge, etc.

The Hungarian companies want to meet the customer requirements more and more, but they only recognize the new products or new services as its means, and for strengthening competitiveness they also deem opening to new markets necessary. According to 515 of the approached 814 enterprises they need the opening to new markets the most. 335 entrepreneurs say that they should bring new products or new

services to the market, which is only 41.15% of the ones replied. Much less respondents highlighted the new technology or creating a new organization in that context. While in the globalized world the most competitive companies base their operation on knowledge-based technology and radical technological innovations, only 23.11% of the approached enterprises said they needed to develop new technologies.



**Graph 10.: What kind of innovation would be important for the successful operation of the company?**

Source: based on the data of the INNOTARS program, self edited

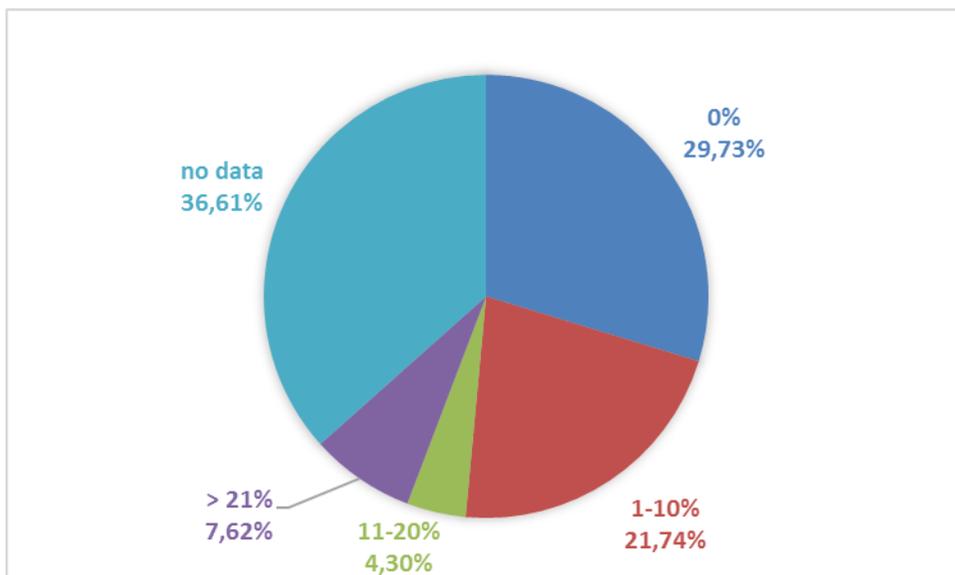
*The rate of the employees working in the R&D<sup>6</sup> sector is low, along with the expenditures as of turnover spent on R&D.* Although 38.33% of the respondents spend 1-10% of their turnover on R&D, it is not clear whether these answers are closer to 1% or 10%. (Graph 11.)

What is more important is that 21.5% of the companies do not spend on R&D at all, while 31.08% of them did not give information to this question<sup>7</sup>. The vast majority of the companies, almost two-third of them, do the R&D activities on their own (65.11%). Roughly one-tenth of the approached enterprises cooperate with research

<sup>6</sup> R&D: research and development

<sup>7</sup> So presumably more than 50% of the respondents do not spend on research and development

institutes or advisory companies in order to materialize the innovations. This result perfectly illustrates the low level of the university-industry partnerships.



**Graph 11.: The rate of the employees working in the R&D sector at the companies participating in the survey**

Source: based on the data of the INNOTARS program, self edited

I am convinced that without innovations and developments we will never be able to be on a growth path. We have to support innovation not only because that is what the developed countries compete with or because today it is trendy to deal with innovation.

***Innovation and the continuous novelty create the possibility of a better life, more modern and more effective means, and products and services of higher value.*** The endeavour for the novelty must appear in every field of our lives, since only the new things are able to replace the old and out of date solutions. This is what moves the development forward. The development of humanity is basically a process of using continuous innovations and better ideas, so we can truly say that the economic participants who refuse to try new things can fall behind in the developmental race.

***The Hungarian economy is weak in innovation, which means we are weak in the constant fight for achieving better results, and after all for increasing the satisfaction and the standard of living.*** The example of the Scandinavian countries proves that the innovation expenditures are not money out of the window, but rather investments in the future. We have to think longer terms and build on the abilities that enable us to make radical innovations. However, we will not be able to do this without innovations and economy-building partnerships. My third hypothesis also

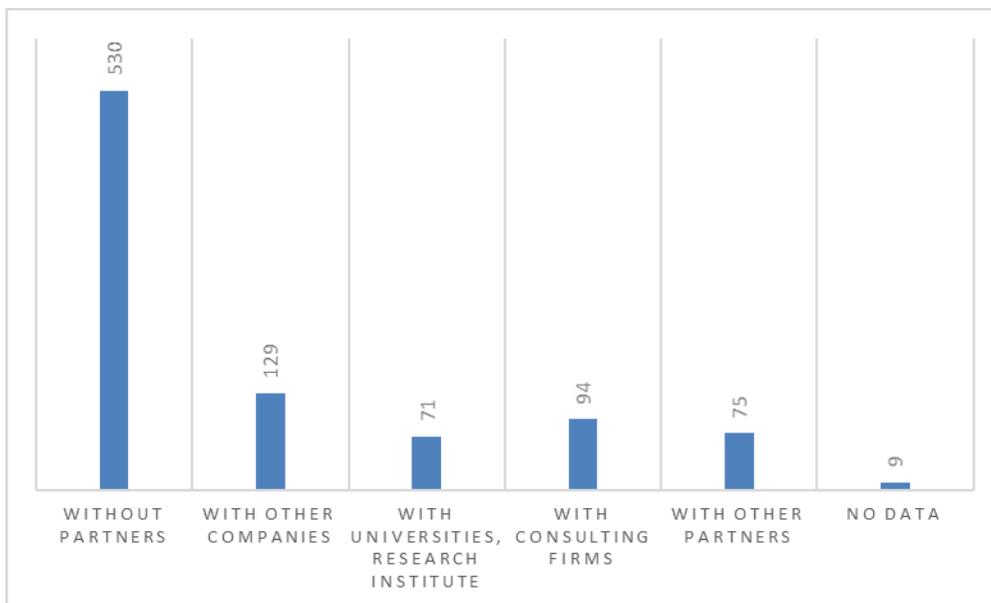
draws attention to this: *the trust between the domestic participants is low, so they do not cooperate with each other and in the end it determines the innovation performance as well.*

***The role of the economic partnerships for recovery is becoming more and more emphasized, since these days the companies are forming the most various kinds of partnerships instead of competing on the markets on their own.*** Satisfying the customers' needs on a higher level requires the companies to create a more intense and closer system of relationships with the customers.

Many drew attention to the role of cooperation in helping innovation and improving competitiveness. We can start this list with – among other famous researchers – Michael Porter or Geert Hofstede, but international organizations also joined them and stressed the importance of cooperation (e.g. World Economic Forum, IMD, Legatum Institute, European Commission, OECD).

The results of the Innotars program point out that ***only small percentage of the enterprises possess existing relationships with universities and colleges.*** They mostly cooperate with their executives and only casually establish relationships with other participants. The vast majority of the companies do their R&D activities by themselves and do not look consciously for help or outer relationships to carry them into effect.

The companies participating in the research explain the absence of cooperation in the economic recovery with the low level of trust and high level of corruption, although they are only able to see potential solutions in general. They suggest a more active involvement from the government and more direct economic policy in both strengthening the level of trust and fighting corruption, while on the other hand they cannot name specific means.



**Graph 12.: How do the enterprises do the R&D activities?**

Source: based on the data of the INNOTARS program, self edited

However, the lack of trust is present not only in the relationships between the economic participants. One of the questions on the questionnaire of the research called “The open innovation” applied to find out if the enterprises can trust the politicians and their promises regarding the economic recovery. The matter of improving the SMEs comes up in every political cycle from time to time. The problem is that to this day they have been unable to produce an action plan that could effectively help the operation of the domestic SMEs and their innovation activities. Nothing proves it better than the opinion of the SMEs’ executives about the strategy of the domestic economic policy involving the small enterprises. The executives participating in the survey rated the governmental activities that were aiming to help the development of the SMEs on a scale from one to five, where five meant reliability and satisfaction while one was expressing the complete absence of trust in the politicians and in the development of the SME sector. The evaluations reveal that 152 enterprises are *very displeased with the activities of the previous governments for the development of enterprise and they do not trust the promises* the politicians make in respect of the SMEs development. In the case of 97 companies we can talk about a *minimal trust*, while 30 companies reported poor and 14 showed a moderate level of trust at the same time. There were only 11 enterprises in the sample group that have faith in the governmental economic policy. The statistical average of the results was 1.61, which inevitably shows the desperation of the enterprises.

***If uncertainty and the lack of trust is typical of an economy, then the prospects for the future will also be unfavourable,*** as we won’t be able to identify a clear policy

regarding the strategy and development of the national economy and the enterprises. In situations like that the unrest of the people might increase and their performance will go down.

According to the results of the research called “The open innovation and the social capital” *two-third of the enterprises participating in the survey seldom cooperate with external participants, or do not cooperate with them at all.*

A significant majority of the enterprises say that partnerships could help in the innovation processes or in creating values. They add up to 69% of the approached enterprises, while 20% of them cannot see any connections between the successfulness of the innovation and the willingness to cooperate. The greater proportion of the enterprises thinks that *partnerships could improve the innovation performance, but these incentives get suffocated in their early stages by the corruption and the lack of trust.*

The development of a knowledge-based economy demands from the participants to be able and ready to share their knowledge and expertise with each other. This kind of effort works excellently in the Scandinavian countries (Finland, Sweden, Norway), where the cooperation of the industries and the universities produced nice results in innovation too. This philosophy is still a grey area for the Hungarian executives, and very few companies have actual relationships with universities and research institutes. 61% of the questioned enterprises do not have relationships with universities or research institutes, and only 31% of them turn consciously to external participants in order to implement innovations (8% did not give information in this respect).

75% of the enterprises participating in the survey are not members of clusters or business incubators. Only 23% said something about the membership. On the other hand, the Hungarian enterprises are behind with regard to the knowledge about the open innovation as well, since 69% of the approached enterprises do not even know what open innovation is, and without that it must indeed be hard to see the importance of the cooperation. Only 20% of the enterprises participating in the survey said that they knew the open innovation business model, and also knew how to interpret and define it.

The concurrent examination of several criteria can be done by making crosstabs with the help of the SPSS program package. In one of the examination points I was looking for a correlation between the knowledge about the open innovation and the frequency of establishing partnerships. The crosstab evaluation reveals that even the ones who know the concept of the open innovation do not cooperate more frequently with external participants, so the pure fact of knowing the term does not mean automatically that they use the idea.

In the next examination point I was trying to find the answer for the following question: do the companies that know the concept of open innovation work together with universities and research institutes more often? According to the crosstab evaluation the answer is definitely yes. I ignored the answers “I don’t know” during the evaluations. The result shows that the companies that know about the open

innovation approach have a bigger cooperation rate (15 out of 29 companies, which is 51.72%), while in the case of the ones who do not know this business model the cooperation rate is only 29.29%. The open innovation would certainly be more intense in Hungary too, if the entrepreneurs' way of thinking moved in that direction. *The realization must become stronger that with this kind of cooperative relationships the efficiency of the operation could be lifted to a much higher level.*

Table 2.

**Crosstab evaluation (open innovation \* relationships with universities)**

**Do you know the term 'open innovation'? \* Relationships with universities and research institutes?**

		Relationships with universities and research institutes?		Total
		yes	no	
Do you know the term 'open innovation'?	yes	15	14	29
	no	29	70	99
Total		44	84	128

Source: based on my own research, self edited

It can be stated with the help of the Chi<sup>2</sup> test that the connection between the two variables is statistically significant, since the significance value of the Chi<sup>2</sup> test statistic did not exceed 0.05!

I have been using the Cramer's V for evaluating the tightness of the connection. Its value varies from 0 to 1, and the closer it is to one the stronger the relationship is. In this case the Cramer's V was 0.198, which suggests the existence of a weak relationship.

The knowledge about the open innovation concept and about its advantages would assume that the domestic entrepreneurs will take part more intensely in such initiatives that can potentially help improving innovation or competitiveness. The companies that know the open innovation business model do not join clusters or business incubators more often either.

I have found a statistically provable connection between trust and relying on external participants. The value of the Chi square test statistic is below 0.05, so it is below the cut-off value, while the value of the Cramer's V implies the presence of a weak relationship. The companies where the level of trust is moderate or lower are not likely to turn to external participants. According to most of the companies participating in the survey the level of trust between business partners is moderate or low, and the same refers to their partnership management as well.

There is a definite relationship between the opinions of the companies about trust and corruption. Most of the companies believe that corruption is dominant in the domestic environment, and they gave me the same answer when I asked them about the reasons of the weak social capital. I have discovered the connection in the statistical sense too, since the value of the Chi square test was below the statistically

acceptable 0.05. The Cramer's V indicating the strength of the relationship showed an unexpectedly weak connection, as considering the results of Table 3 I was expecting a much stronger existence of the relationship between the two. The connection still stands, even if its level was determined to be lower by the statistical methods.

Table 3.

**Crosstab evaluation (trust \* existence of corruption)**

		Trust between business partners * Presence of corruption in the economy					Total
		How much is corruption present in the economy? Rate it on a scale from one to five, where 1: not typical at all, 5: significantly dominant					
		1.00	2.00	3.00	4.00	5.00	
Trust between business partners	low	1	1	4	6	20	32
	weak	0	2	4	23	22	51
	moderate	0	2	10	20	20	52
	acceptable	0	4	1	6	4	15
Total		1	9	19	55	66	150

Source: based on my own research, self edited

In the questionnaire survey the executives of the enterprises gave ratings to the questions on a scale from one to five. Hierarchical clustering did not prove to be a viable method for the analysis of these questions, because the certain cases meant anonym<sup>8</sup> executives. So I have decided to use the factor analysis for the statistical evaluation, the help of which I have been trying to find the answer to how I can merge all the information contained by the chosen questions (and also the enterprises) into lesser variables. Three components have been developed during the factor analysis.

Those enterprises got into the first component that deemed the trust between business partners weak, and gave similar ratings to how keenly they share their ideas with each other. **I called this factor the factor of distrust.**

The second component contained the variables that came up in respect of the inner relationships, so the answers belong to this group on the basis of building on the abilities of the employees, team work and inner knowledge sharing. Although these companies can definitely see that strengthening relationships is necessary, they rather orient it to the inside and not to the outside. **I gave the name “turning inward” to this factor,** referring to the orientation to the inside.

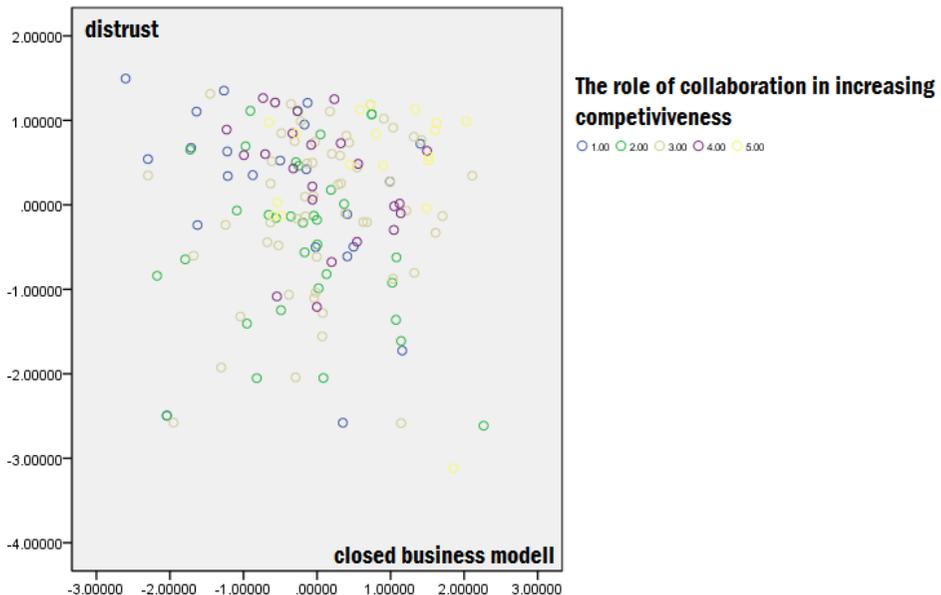
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<sup>8</sup> However, many enterprises have chosen to put their names on the questionnaires

The remaining two variables, namely the building on outer participants and the presence of corruption are forming the third component. Not surprisingly the two variables will have an opposite effect on each other, since the more the enterprises detect corruption, the less they are going to cooperate. I have the assumption that the enterprises from this component will not build their operation on partnerships due to the high level of corruption, so I **called this component the factor of defence**.

The three main components of the factor analysis perfectly demonstrate the reason for the Hungarian economic participants' low cooperation willingness.

The following graph can summarize the essential message of the factor analysis the best. The question was for which kind of companies the cooperation has a more important role. The picture shows that by the companies where cooperation has an important role (yellow) the lack of trust is on a lower level, and they also rely on both internal and external participants at the same time, however the rate of the latter one is not equally high at all the participants. So establishing relationships depends on how a company can (want to) be open and how favourable the conditions of the local economy (business environment) are.



**Graph 13.: The role of distrust and turning inward versus cooperation**  
Source: self edited, SPSS output

## 4. CONCLUSIONS, SUGGESTIONS

It becomes clear from the processed professional literature that **there is no universally accepted definition for the determination of competitiveness**. The more we deal with the problem, the more complex and more sophisticated things we can identify as the sources of competitiveness.

In my opinion there will probably never be a uniformly accepted definition, since everybody sees the sources and levels of competitiveness in different things, or interpret them differently, thus there will not be much chance for the establishment of a definition like that in the future either.

Competitiveness is such a state-of-the-economy index that expresses the simultaneous availability/effect of several factors, and its actual presence or absence causes major differences between the economic participants. The subject matter is extremely complex, and this complexity can be proved by the multidimensional index numbers, despite the fact that even this methodology is not 100% reliable.

Before writing my thesis I have worded three hypothesis, which I have evaluated with the help of the secondary research, the primary data collection and the processing of the professional literature. ***All three hypothesis proved to be true***, since neither the international organizations nor the primary data could effectively rebut any of my assumptions.

It became unambiguous for me during the conducted researches, evaluations and comparisons that our backwardness in innovation is causing serious problems.

While in the developed world innovative and knowledge-based companies, and what is more, networks are competing with each other, Hungary has not been able to catch up to the Western European countries, and this significantly makes our competitiveness worse. This is why I must suggest strengthening the innovative approach and improving the economic strategic significance of the innovation.

***The alternative of becoming an innovation and knowledge-based economy is available for Hungary too.*** So we have to endeavour to move forward from the group of moderate innovators to at least the group of innovation followers.

***We have to build on our existing strengths.*** More intense investments would be necessary in education, from the primary education to the higher education. The enterprises need the establishment of such a business environment that encourages entrepreneurship and increases the beneficial effects of the enterprises on the market. For this the social capital and the trust must get stronger, and also the economic policy and the entrepreneurial community have to find each other again, because without the appropriate (long term) economic strategy we will have a lesser chance to develop.

## 5. UNCONVENTIONAL RESEARCH RESULTS

E<sub>1</sub>: I have ascertained on the basis of the macroeconomic indexes and the multidimensional index numbers (World Economic Forum global competitiveness index, IMD Competitiveness Yearbook, Legatum Institute prosperity index, European Competitiveness Report 2020) that the competitiveness of Hungary is continuously getting worse, and the growth of the GDP per capita does not reflect the true level of our economic development. The main macroeconomic indexes calculated by me (public debt, budget deficit, inflation rate, unemployment, poverty index, etc.) inevitably prove the difficult conditions of the enterprises, the low innovation level, the insufficient health service, the downsizing of education, the high public debt, the corruption and many other factors waiting for a solution.

E<sub>2</sub>: The research results tell us that Hungary did not choose the means well that were intended to keep us in the competition in the 21<sup>st</sup> century. The Scandinavian Countries established a long term innovative and knowledge-based economic strategy for 20-30 years, on which they systematically based their economic development decisions. On the other hand in Hungary we have just begun to establish such a strategic concept.

E<sub>3</sub>: During my researches I have found that competitiveness or innovation is also determined by factors that have not got much attention yet. One of these is the state of the social capital, which is becoming the subject of several international organizations' examination. The state of the society determines the state of the economy just as much as economy determines the state of society, so competitiveness must be strengthened by the improvement of both. The social capital and the level of trust is captured in the entrepreneurial performances and in innovation as well, so the inadequate rate of the former one results in a weaker innovation potential, and after all in a weaker competitiveness. It is safe to say in the possession of the survey results that the low level of innovation is typical in Hungary not only because of the lack of money, but also because there are no modern organizational forms such as regional clusters, strategic partnerships, incubators to improve the competitiveness position of the company, etc. These organizational forms could substantially help the enterprises to remain in the competition and to strengthen their competitiveness. Currently it is a big problem that the Hungarian entrepreneurs show less willingness to be an active part of cooperation like these.

E<sub>4</sub>: In view of the research results I drew the conclusion that the business environment in Hungary is not entrepreneur-friendly enough, and ultimately this does have an effect on how innovative the domestic companies can be. The evaluation of the enterprise-supporting business environment is detectable in the methodology of every single multidimensional competitiveness index number

(global competitiveness index, prosperity index, IMD Competitiveness Yearbook, INSEAD Global Innovation Index, European Commission Innovation Scoreboard, etc.). I have established that in the more competitive countries the enterprises are able to operate under better conditions, which, after all, determines the level of their national competitiveness.

E<sub>5</sub>: I came to the conclusion in light of the results of the dissertation that the domestic competitiveness problems largely coincide to the international problems in this regard. The competitiveness rate of Hungary is low because we have been unable to help the development of the economic rationality<sup>9</sup> on a national level (inappropriate business environment, low social economy and trust) and the potentials of the individuals and the enterprises are unable to serve the improvement of competitiveness (the innovation performance of the companies, the willingness to develop and the rate of creativity are all low, and knowledge cannot find its true role in Hungary).

E<sub>6</sub>: On the basis of the results and the processed sources of the professional literature I have created my own competitiveness definitions for the national and business levels, which are trying to express the substantial message of competitiveness while keeping the system approach in mind.

#### *NATIONAL ECONOMIC COMPETITIVENESS*

*Competitiveness on a national level means all the economic strategic actions (even on a long term) that enables the economic participants to enforce the economic rationality, and also enables the members of the society to make use of their resources in the most effective way for the sake of the long term development.*

#### *BUSINESS COMPETITIVENESS*

*The competitiveness of the economic participants refers to all the abilities and skills in their possession, which they can successively use in the service of creating values on every level. The existence of the abilities and skills determines the potential competitive edges and the opportunity to satisfy the needs on a higher level than before. Business competitiveness depends on how the enterprises can adapt to the changed circumstances, what kind of special abilities they have and whether they constantly try to achieve better results.*

In my opinion competitiveness is such an economic and social index that tells us how serious the endeavour and the commitment of the economic participants is for making life better, improving the standard of living and creating more values.

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<sup>9</sup> Economic rationality means every goal or act that aims for achieving better economic results and avoiding bad conditions.

## 6. PUBLICATIONS ABOUT THE SUBJECT OF THE THESIS

### Scientific Magazines

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1. János Varga: *Competitiveness of enterprises in the globalized world and the impact of localization*. ISSN 2068-3537 JEBR Journal of Economics and Business Research, Aurel Vlaicu University, Arad, 2010, p. 152-169.
2. János Varga: *Permanency or continuity? – A relation between innovation and technological development*. ISSN 2068-3537 JEBR Journal of Economics and Business Research, Aurel Vlaicu University, Arad, 2011. p. 56-70.
3. János Varga - Morvai Róbert: *Innovation in supply chains*. ISSN: 1309-8047 International Journal of Business and Management Studies, Vol 3, No 1, 2011 p. 319-331.
4. János Varga: *Knowledge-management in the Hungarian economy*. ISSN 2068-3537 JEBR Journal of Economics and Business Research, Volume XIX, No. 2/2013 Aurel Vlaicu University, Arad, 2013. p. 81-98.

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2. János Varga: *Relationship between innovation and technological development in the operation of the domestic small and medium enterprises*. Section of management and entrepreneurial sciences, supply chain management and logistics. Day of Hungarian Science. 12<sup>th</sup> November 2010. College of Dunaújváros, Dunaújváros, 2010. (CD Edition) 11 pages
3. János Varga: *New management horizons in the changing economic environmen - corporate governance by the management of knowledge*.

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4. János Varga - Róbert Morvai: *Unconventional competitive edges in the dynamically changing economic environment: the most effective means of crisis and change management in the globalized world*. Youth section I. ISBN 978-615-5192-01-2 6<sup>th</sup> Erdei Ferenc Scientific Conference, 25-26<sup>th</sup> August 2011., Kecskemét College, Kecskemét, 2011. p. 28-34.
5. Róbert Morvai - János Varga: *Partnerships in the domestic FMCG/food supply chains*. Poster section. ISBN 978-615-5192-01-2 6<sup>th</sup> Erdei Ferenc Scientific Conference, 25-26<sup>th</sup> August 2011., Kecskemét College, Kecskemét, 2011. p. 419-424.
6. János Varga - Róbert Morvai: *The competitiveness-forming role of innovation in the supply chains and in the national economy*. ISBN 978-606-8052-52-6, Economic and business challenges in the Carpathian Basin. 6-7<sup>th</sup> May 2011 Sapiientia Hungarian University of Transylvania, Miercurea Ciuc, 2011. p. 44-56.
7. János Varga: *The role of the social capital and innovation in competitiveness*. Management section. ISBN 978-606-8052-52-6 Entrepreneurial and economic trends in the Carpathian Basin, 20-22<sup>nd</sup> April 2012, Sapiientia Hungarian University of Transylvania, Miercurea Ciuc, 2012. 11 pages
8. János Varga: *The relationships between the entrepreneur-friendly business environment and competitiveness*, Exploring Science, Széchenyi István University Doctoral School of Regional and Economic Sciences, Kautz Gyula Faculty of Economics, 16<sup>th</sup> May 2013. Győr. Electronic issue. ISBN: 978-963-508-632-0, 8 pages
9. János Varga: *Prosperity, competitiveness and social welfare in Hungary*, Economic and Management Scientific Conference „Environmentally concerned economy and management” Kecskemét College, College Faculty of Horticulture. Kecskemét 5<sup>th</sup> September 2013. ISBN 978-615-5192-20-3 p. 120-125.
10. Anett Szabó - János Varga: *Economic Revitalization, exporting ability and innovation in the Central Transdanubia Region*, Economic and Management Scientific Conference „Environmentally concerned economy and management” Kecskemét College, College Faculty of

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7. János Varga: *The role of entrepreneurial environment in the fight against economic crisis in the EU*. Business Systems Laboratory 2<sup>nd</sup> International Symposium Systems thinking for a sustainable economy. Advancements in economic and managerial theory and practice. Universitas Mercatorum. Rome 23-24 January 2014. ISBN 9788890824203 (CD Edition) 6 pages

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2. Magdolna Csath (edit.) - Istvánné Éger, Gizella Kontó, Csilla Mile, Ágnes Schattman, László Takács, Tóth-Bordásné Ildikó Marosi, János Varga, Katalin Végh: *Final report of the study "Examination of the influencing and attendant factors in the domestic SMEs"*, ISBN 978-615-5075-02-5, Kodolányi János University, Department of Management Studies, Székesfehérvár, 2011, p. 17-127.