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THE INNOVATION POSITION OF FOUR NEIGHBOURING COUNTRIES AND HUNGARY BASED ON THE "EUROPEAN INNOVATION SCOREBOARD"

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ABSTRACT

As we know innovation systems can be distinguished not only at national, but also at global or regional levels, and even in the local networks, industrial corporation groups and clusters of firms. Still, the system needs to be examined at a national level as well, because the national attributes from a given country's viewpoint may have an influence on the development of other levels (Pap and Sitányi, 2007). Although the global-local economic and social processes – taking effect in parallel – resulted in the weakening of the national level in the past two decades, Lundvall (1988) still deems their further analysis important because of the role of the common language and common culture. The author of this article attempts to draw the relative innovation path of the five neighbouring countries of In-Between Europe and also to demonstrate their position on the relative European innovation basis. For this the author has studied the European Innovation Scoreboard, EIS – established at the initiative of the European Union under the Lisbon Strategy – year by year. The comparative method defined and demonstrated in the article in full details can be applied to the demonstration of the relative position of any European blocks of countries or others outside Europe.

Keywords: Innovation, relative European innovation plan

INTRODUCTION

The Organization for Economic Cooperation and Development (OECD) has been developing the system of statistical methodologies, recommendations, and definitions promoting the measurement of innovation and research, development (R&D) since the mid-seventies. A manual-family is the basis of it, and the manuals were named (*OECD*, 1992; *OECD*, 1993; *OECD*, 1995) after the places where they had been accepted (Frascati, Oslo, Canberra).

The EU innovation statistic system and its database – established based on the resolution of the Lisbon Strategy of the European Council (*European Council*, 2000) – are based on the fundamental principles defined in the OECD documents. At the same time the European Council also established the institution of the European Innovation Scoreboard, EIS, which includes the innovation statistical data of the EU Member States, associated countries, candidate countries, Japan and the United States[1].

[1] Because of international comparability and to achieve the set goals in Lisbon by the European Council.

The system has been successful internationally; the preparations of the Italian National Research Council, (CNR-IRPPS) led to the establishment of the Global Innovation Scoreboard, (GIS) system, calculated first in 2006. The innovation performance of the 34 Countries, included in the EIS 2006 report – (25 EU Member States and nine more Countries[2]) – and beyond that 14 other Countries[3] spending the most on R&D were examined (*Archibugi et al.*, 2009, 13. p.). In this global summary, so-called GIS index, the number of indicators was decreased to its third, since some data were not accessible to the extended Countries. Thus in 2008 calculations were made based on 9 EIS-2008 indicators instead of 29 (***EIS***, 2008, 25. p.). Because of the above mentioned reasons in the present article we will dwell upon the EIS system since:

1.) The Global Innovation Scoreboard (GIS) – due to the reduced number of indicators – can show the innovation performance of a given country less accurately;
2.) We have to place our country primarily on the innovation map of Europe, and within it in the southern part of In-Between Europe[4], and to do so the EIS is a suitable base.

MATERIALS AND METHODS

Nowadays it has been generally accepted in relating literature that innovation and the innovation environment, milieu (*Camagni*, 1992) is a social and economic phenomenon, which is hard to be grasped or measured, and something which is also very complex and dependant on numerous factors. This statement is supported by the fact (and the statistical apparatus destined for measuring it since 2000) that the types of data and their collection, the method of comparing and analyzing them have been continuously developing, changing and refining (***EIS***, 2001-2009).

Not only the measurement, but also the institutions requested to collect data, make analyses (*Community Research and Development Information Service – CORDIS*, *Trendchart, Pro Inno Europe, UNU-MERIT*) changed during the nine years of EIS. Data used in the present article were available mostly on the homepages of the listed institutions. At present (July 2009) the Pro Inno Europe, the innovation initiation of the Directorate-General for Enterprise and Industry) is taking care of them. The majority of the summary annual reports, partial analyses, and methodological publications have been carried out by the *Maastricht Economic and Social Research and training centre on Innovation and Technology* (UNU-MERIT) from the very beginning with the help of various partners. A key to the success of EIS is that in the first decade of its history it preserved and still sticks to some of its basic principles passed when the institution was established (*Hollanders and van Cruysen*, 2008).

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[2] Bulgaria, Croatia, Romania, Turkey, Iceland, Norway, Switzerland, the US and Japan

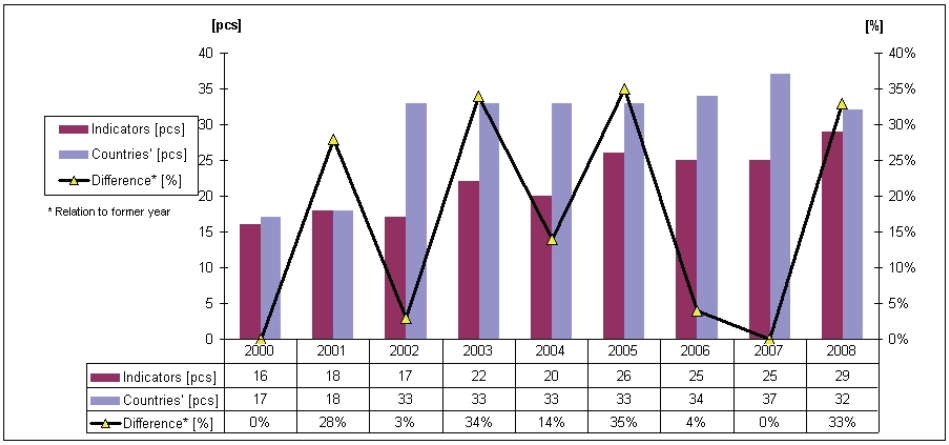
[3] China, Republic of Korea, Canada, Brazil, Australia, Israel, India, Russian Federation, Mexico, Singapore, Hong Kong, Argentina, South Africa, and New Zealand

[4] After *Pándi Lajos* (1995) the geographical strip, the "moving border" of the modern-age Europe, stretching from the Baltic Sea to the Aegean Sea is called In-Between Europe (*Pándi*, 1995).

- *Simplicity:* Only the necessary changes are carried out on innovation indicators, thus they can be compared with previous studies and the number of them could be limited[5] during the years (*Figure 1*).
- *Transparency, publicity:* all results can be recalculated, controlled; not only the annual reports, but also methodologies, calculation methods[6] are available on the Internet;
- *Continuity:* Even if there were significant changes in every 2-3 years, they have never exceeded by 1/3, therefore the data remained comparable, and the trends remained verifiable (*Appendix 1*, *Table 3*)
- Since researchers have been developing the system annually and/or taking new viewpoints into account, we can get the most thorough picture of EIS if we survey the changes, results one after the other by the short summary of the annual changes.

Figure 1

Changes of the EIS indicators and the studied countries, deviations compared to the previous year, 2000-2008



	2000	2001	2002	2003	2004	2005	2006	2007	2008
Indicators [pcs]	16	18	17	22	20	26	25	25	29
Countries' [pcs]	17	18	33	33	33	33	34	37	32
Difference* [%]	0%	28%	3%	34%	14%	35%	4%	0%	33%

Source: Based on *European Innovation Scoreboard*, 2000-2008

European Innovation Scoreboard, 2001

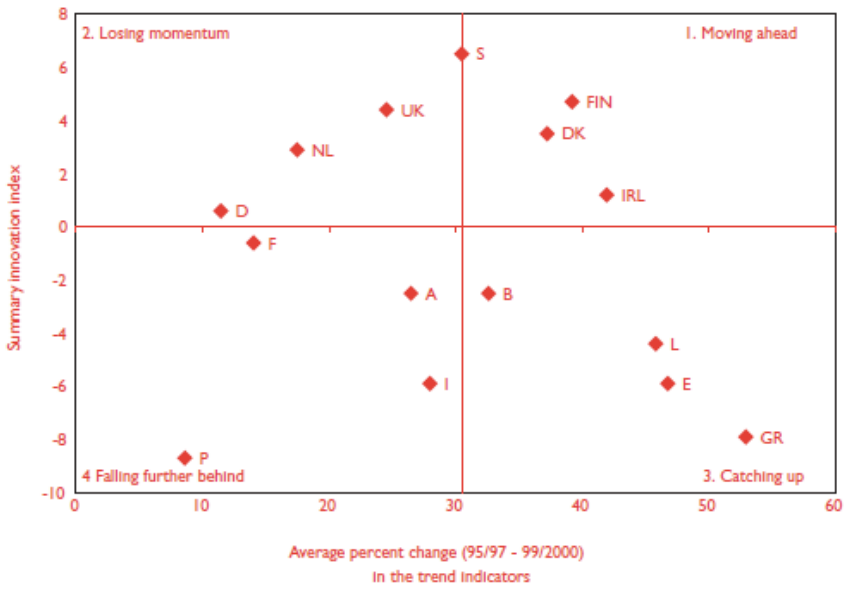
Following the 2000 pilot project the first entire report was published in 2001. The report covered 17 countries, the 15 EU member states, the United States, and Japan. In the first three years of EIS the analyses were carried out jointly by the research workers of UNU-MERIT and the Science and Technology policy research University (SPRU) and were published on the homepage of CORDIS (www.cordis.lu).

[5] For example the FORA Innov. Monitor (*FORA*, 2007) applies more than 170 indicators, most of them developed by itself.

[6] Most of the data are published in Excel format and it also supports calculability.

Figure 2

Summary innovation index and its change in 2001



Source: *European Innovation Scoreboard*, 2001. 12. p.

The indicators were grouped into four categories:

- Human resources;
- Knowledge creation;
- Transmission and adoption of the new knowledge;
- Innovation financing, output and markets.

The Summary Innovation Index (SII) was formed based on 18 innovation indicators (*EIS*, 2001 8. p.). In 2001 "trend indicators" and based on their changes – given in percentage – development directions, *average change in trend indicators* (*CTI*) were defined, from which the determinant trends in innovation performance of the member states were ascertained. According to *Szendrődi* (2003 5. p.) after two years of work this conclusion is rather early.

Even if it is true at that given time, later on the annual value of CTI has become a very significant aspect of examination, one of the main results of the program. The authors already describe the characteristic, synoptic EIS-graph (*Figure 2*), which shows the innovation position of the examined countries plotted against the changes of SII and CTI. A good point is that the position of countries can be assessed "in a blink"; countries with identical characteristics can be seen in one group.

In these years the sources of data originated from Eurostat's data for the previous two years, however, *among the indicators characterizing small and medium entrepreneurs there were five-year-old data* (*EIS*, 2001, 20. p.), therefore conclusions should be drawn carefully.

European Innovation Scoreboard, 2002

In 2002 the examination was extended to three associate[7] and 13 candidate countries[8], thus the studied geographical area grew significantly, extended beyond the borders of EU. The number of countries (33) nearly doubled (*Figure 1*), however, there were only minimal changes (3%) in the 17 indicators and their classification (***EIS***, 2002, 5. p.) compared to the previous year.

- Human resource supporting innovation (5 indicators),
- Creating new knowledge (3 indicators),
- Transmission and adoption of knowledge (3 indicators),
- Innovation financing, output and markets (6 indicators).

Because of the slight change the data could have been comparable with the previous year, however, in the 2002 report the *summary innovation index*, ***SII*** and its growth were not calculated. The exact reason for this was not described – with the exception of the experimental year it occurred only in that year – the reason for this probably is that the indicators were not accessible in all of the countries. Because of this the comparison of innovation performances is difficult, the accurate order could not be set, however, from the partial data it is clear that Hungary together with Slovenia and the Czech Republic was amidst the leaders among the candidate countries from several aspects. The report was completed with six professional dissertations, which are the following:

1.) EU member states and associate countries;
2.) Candidate countries;
3.) EU regions;
4.) Indicators and definitions;
5.) Thematic scoreboard: "Lifelong learning for innovation";
6.) Methodological report.

This practice, which is so useful for other researches as well, has continued in the coming years; namely to publish separate studies on current issues, and make them accessible on the Internet.

European Innovation Scoreboard, 2003

In 2003 the number of indicators grew from 17 to 22, and the method of calculating them has also changed significantly. The complete change compared to 2002 was 34% (*Hollanders and van Cruysen*, 2008). The indicators still weren't accessible in each examined country, therefore only two summary innovation indexes (***SII-1 and SII-2***) were created that year.

- *SII-1:* The index, made of all 22 indicators, is used to calculate the innovation performance of the 15 EU Member States and the associate countries (Iceland, Norway, and Switzerland).

[7] Associate countries: Iceland, Norway, Switzerland

[8] Candidate countries: Bulgaria, Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia and Turkey

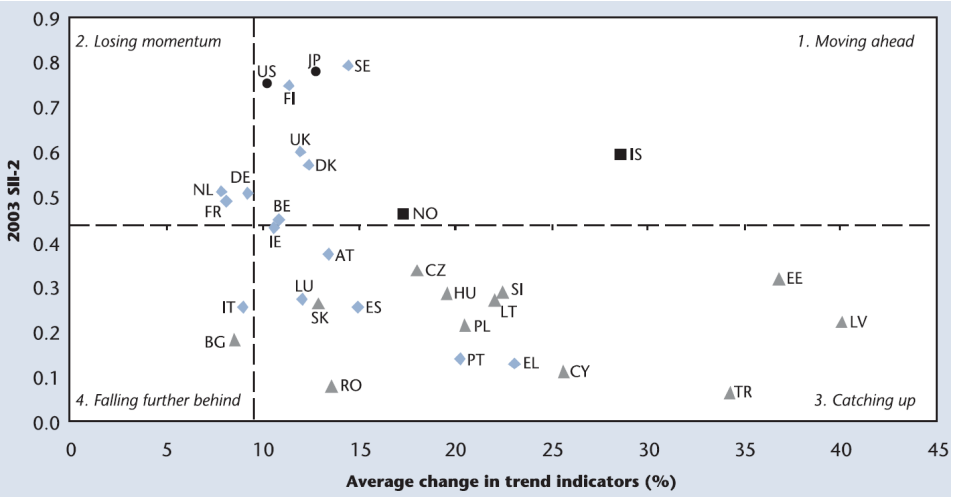
- *SII-2:* It is calculated based on indicators, which are accessible in each country (unfortunately it is just a little bit more than half of all the countries: 12 pieces), which is established for all the 33 countries included in the study.

In the 2003 report it was the first time when the innovation position of the 33 countries was described together plotted against their *summary innovation index* SII-2, Y axis) and their *average Change in Trend Indicators*, CTI, X axis).

According to the 2003 assessment – calculated with the reduced SII-2, based on 12 indicators – Estonia, the Czech Republic, Lithuania, Hungary and Slovenia are the most innovative among the candidate countries (***EIS***, 2003, 11. p.) and as for CTI three countries, Estonia, Latvia and Turkey (Turkey at a very low level though) take the lead in the whole of Europe (*Figure 3*).

Figure 3

Summary innovation index and its change in 2003



Source: *European Innovation Scoreboard*, 2003, 10. p.

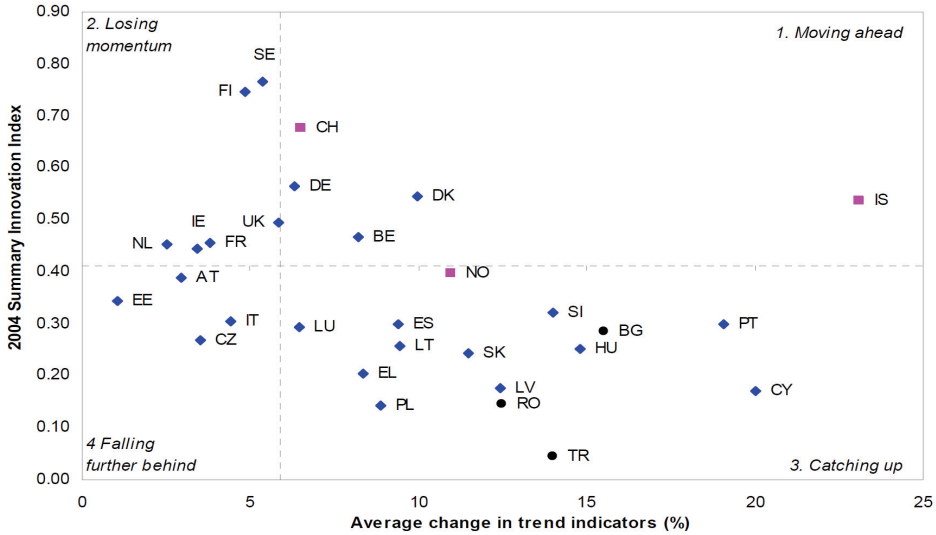
European Innovation Scoreboard, 2004

The number of countries (33) did not change that year, however, their "definition" did because of the ten new EU Member States. Besides the 25 EU Member States, the EIS report showed the innovation performance of Bulgaria, Romania, Turkey, Iceland, Norway, Switzerland, the United States, and Japan. The main indicator groups did not show any changes, but the number of indicators was reduced by 2 to 20 (***EIS***, 2004, 8. p.) in the following classification:

- Human resource supporting innovation (5 indicators),
- Creating new knowledge (4 indicators),
- Transmission and adoption of knowledge (4 indicators),
- Innovation financing, output and markets (7 indicators).

Figure 4

Summary innovation index (SII, Y axis) and its change (%, X axis) in 2004



Source: *European Innovation Scoreboard*, 2004, 10. p.

From the usual EIS figure (*Figure 4*) it is clear that Hungary in the quarter of catching up countries moved from the mid-list towards the leading countries and in terms of "average change" trend indicators Hungary was overtaken only by four countries (Bulgaria, Iceland, Portugal and Cyprus) in Europe.

European Innovation Scoreboard, 2005

In 2005 based on half a decade of experiences of EIS, and in close cooperation with the Joint Research Centre[9] of the European Commission, the number of indicators was increased from 22 to 26. The methodological change was considerably bigger since the number of indicators was not increased by four, but nine new indicators were introduced (*EIS*, 2005, 8. p.) and five redundant indicators, overlapping other indicators were ceased. It can be said it was the time when the method of calculating SII was restructured to the greatest extent in its history, the change was 35% compared to the previous year (*Hollanders and van Cruysen*, 2008).

Considering the period of EIS between 2000 and 2007 most indicators were used in 2005, the summary innovation index describes the innovation performance and its dynamics of each country based on 26 indicators (*Figure 5*). It was the year when the indicators were divided into two main categories, input and output main themes, and within that five qualifying dimensions were created (*Sajeva et al.*, 2005).

[9] Joint Research Centre (JRC), Unit of Econometrics and Statistical Support to Antifraud (ESAF) of the Institute for the Protection and Security of the Citizen (IPSC)

Input indicators[10]:

- Innovation drivers (5 indicators);
- New knowledge, knowledge creation (5 indicators);
- Innovation performance of firms (6 indicators).

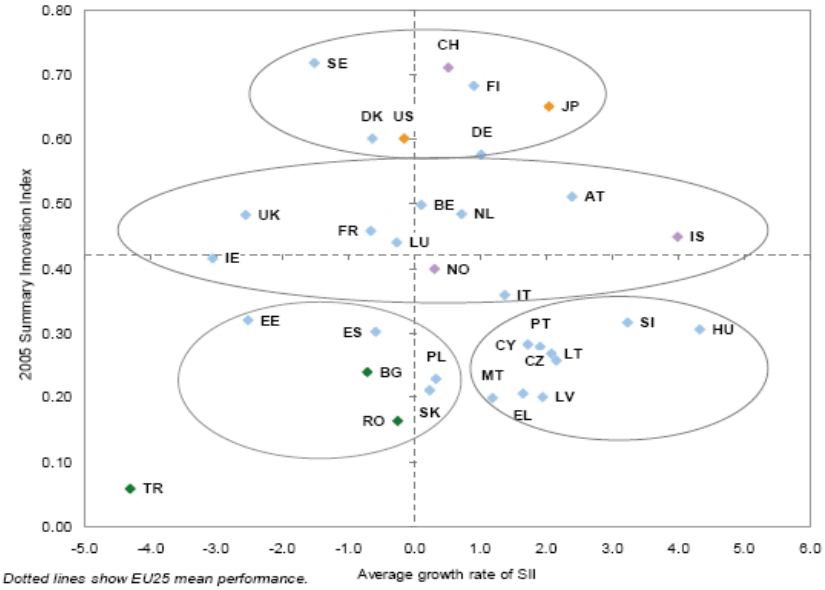
Output indicators[11]:

- Applying innovation (5 indicators);
- Intellectual property (5 indicators).

Figure 5 shows the position of each country in a coordinates system where the summary innovation index is the vertical axis and the change of index is the horizontal axis. Again the studied countries can be divided into four groups, such as *leaders, average performers, catching up and losing ground* countries (*EIS*, 2005).

Figure 5

Summary innovation index (SII, Y axis)and its change (%, X axis) in 2005



Source: *European Innovation Scoreboard*, 2005

The above statements are remarkable – it is particularly interesting to see the changes, improvements and development policy in the coming years – since 2005 was that particular year when Hungary became the leading country in Europe regarding the average growth rate of the summary innovation index after years of catching up process (*Figure 5*).

[10] On the innovation input side expenses spent on education or R&D expenses can be found.

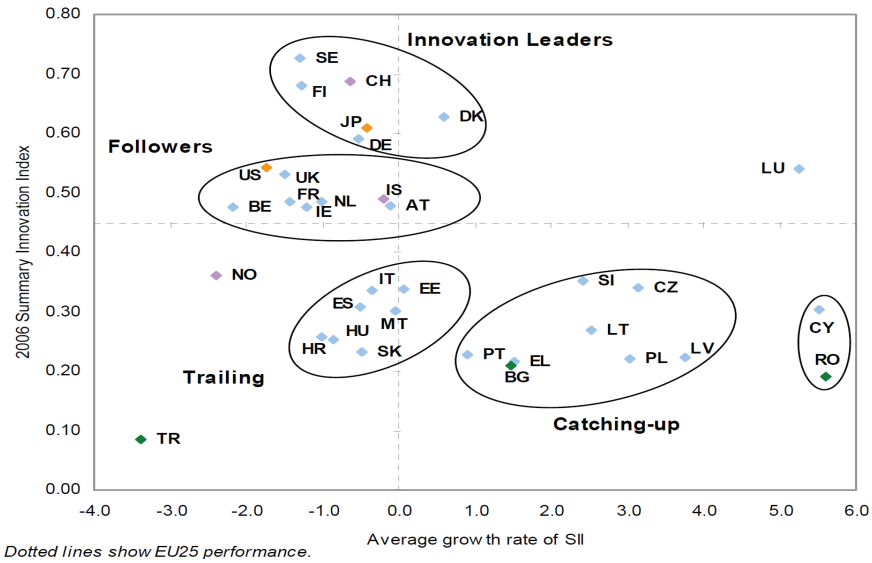
[11] On the innovation output side the number of patents, or the corporate sales coming from new innovative products can be mentioned as examples.

European Innovation Scoreboard, 2006

As you can see at first glance from *Figure 6*, the authors of the EIS report created a fifth group, the "*very rapidly growing group*" besides the usual four groups (leader, follower, catching up, trailing) in 2006. The fifth group was made up of Cyprus, one of the smallest countries of EU and Romania, which has the highest average growth rate in Europe in 2006, although at a very low SII level. Luxembourg, Norway and Turkey do not fit into any of the groups, therefore they remained separate.

Figure 6

Summary innovation index (SII, Y axis) and its change (%, X axis) in 2006



Source: *European Innovation Scoreboard*, 2006, 9, p.

Following the significant modification in the previous year there was only a slight 4% methodological change in 2006 (*Arundel and Hollanders*, 2006). One indicator was ceased, which was responsible for measuring the university R&D investments financed by the business sector. Two indicators were altered, thus the "*input*" side of innovation was measured with 15 characteristics, while its "*output*" was measured with 10; it means a total of 25 indicators. Considering this slight change it is even more striking how significant the change was in terms of the average growth rate of SII (*Figure 5* and *6*, X axis). From the lead Hungary slides back under the EU average, Cyprus and Romania get so far from the other countries that researchers have to form a fifth group.

Since in the case of four countries the number of available indicators is considerably smaller (Turkey 14, Croatia 13, USA 15, and Japan 16), conclusions referring to the relative position of these countries compared to the other countries calculated from these data must be drawn very carefully!

When comparing the countries it was concluded that leading countries do better than their weaker counterparts, especially in the fields of new knowledge and knowledge-creation, innovation performance of firms and intellectual property.

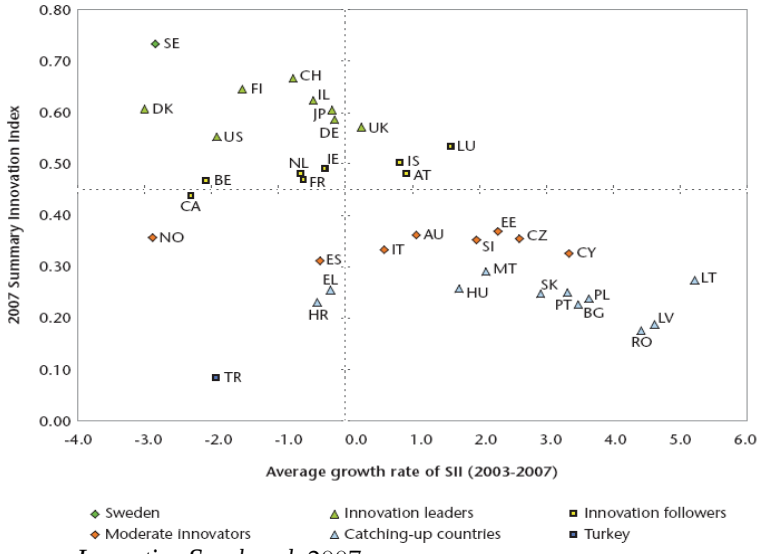
European Innovation Scoreboard, 2007

2007 is the first year in the history of EIS when no changes were made in the system of indicators, in the method of index calculation, therefore data can be well compared with the previous two years – between 2005 and 2006 there was only a minimal, a 4% change – thus progressions can be followed more accurately, without distorting the methodological changes. However, the number of countries was increased by three (Australia, Canada, Israel) to 37, and they returned to the usual classification of four (*leader, follower, moderate, catching-up*). That year the two countries possessing the highest and lowest value of SII (Sweden, Turkey) were not assigned to any groups (*Figure 7*).

The relative hierarchy changed inside, but passing through among groups was very rare between 2002 and 2007. Looking over the figures of the subsequent years it can be said that the innovation leader and the innovation follower groups were getting closer to each other. However, the gap, the separating field between the two "elite groups" and the *moderate* and *catching up countries,* is clearly perceptible and the extent of the gap does not diminish noticeably. The 2007 calculations seem even more reliable since the data of EU Member States, Iceland and Norway were collected uniformly by Eurostat and 90% of them originate from the previous three years (*EIS*, 2007).

Figure 7

Summary innovation index (SII, Y axis) and its change (%, X axis) in 2007



Source: *European Innovation Scoreboard*, 2007

European Innovation Scoreboard, 2008

It has become clear even on the basis of the brief review of eight years between 2000 and 2007 that the EIS report and its methodical instruments were acknowledged sources of measuring innovation performance of innovation tools, methods and countries (or regions in certain years) and an efficient indicator of the SII and CTI. It cannot be withhold though – which is not a surprise in the rapidly changing world of innovation – that EIS has been severely criticised due to its inflexibility to changes and due to that it applies not the most suitable statistical indicators for measuring innovation and leaves out of consideration the differences in economic structure of the increasing number of analysed countries. Recognising these, the researchers modified the EIS methods drastically in 2008 on the basis of collected criticisms and experiences of previous years. The objective was not to change the new methodology within three years. Greater attention is paid to Europe than in previous years; only five non-EU-27 countries are analysed[12]. The number of indicators was increased from 25 to 29, which is not a simple increase in the number of the indicators. Only 15 of them remained unchanged, 9 of them were supervised and other five were newly involved (*Hollanders and van Cruysen*, 2008). Also the grouping of the indicators changed; the previous five innovation dimensions changed to seven; while the two major innovation groups (input/output) were divided into the following three ones:

1.) *Enablers*, which drivers of innovation being external to the firm activities;
2.) *Firm activities*, efforts made by firms in innovation processes;
3.) *Outputs*, which are the results of the firms' innovation related activities.

The EIS underwent several changes over time, mainly in 2003 and 2005, (*Figure 1*) and only 13 indicators were used across all Scoreboards.

The 2008 year reform addresses the following challenges:

- measuring new forms of innovation;
- evaluation of overall innovation performance;
- improving comparability at national, regional and international levels;
- measuring processes and changes over time (*Hollanders and van Cruysen* 2008).

Due to innovation processes getting gradually more complicated, new factors were needed to be considered:

- increasing role of formal and informal networks in knowledge transfer;
- increasing role of service innovations parallel with the increasing share of service sector in economy;
- development of new indicators in order to measure new forms of innovation (open and user innovation, non-R&D innovations) (*Arundel et al.*, 2008).

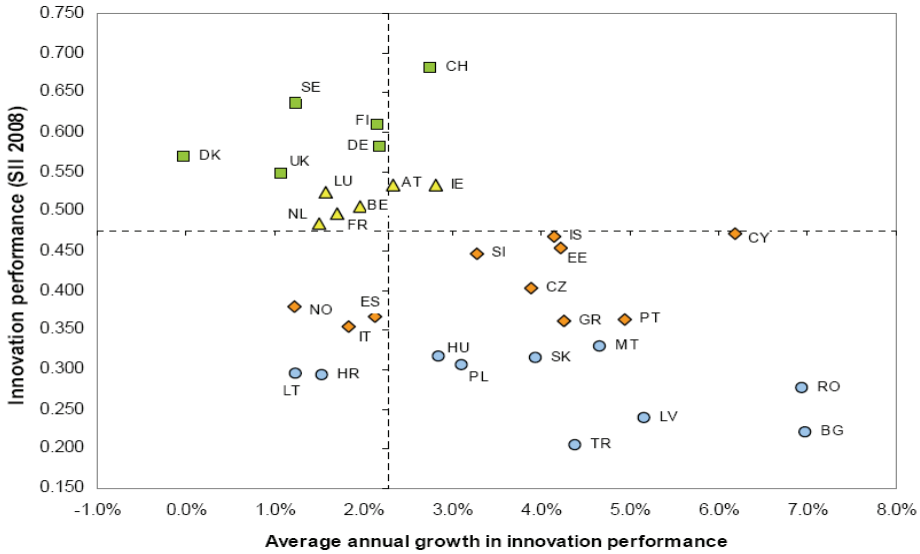
Although the change is higher than 30% similarly to that in 2003 and 2005, the consequence of the measuring method is shown by that the earlier four groups (*innovation leaders, innovation followers, moderate innovators and catching-up countries*) remained almost the same (*Figure 8*) and only three countries changed their

[12] Croatia, Turkey, Iceland, Norway and Switzerland

groups[13]. The gap between the most innovator and the least innovator groups is similarly visible to that in 2007 (***EIS***, 2008, 9. p.).

Figure 8

Summary Innovation Index (SII) and its average annual growth (%) in 2008



Source: *European Innovation Scoreboard*, 2008

General critics on the EIS reports 2001-2007

Apart from the undoubted certainties listed in the EIS reports' analyses and consequences – and reviewed in Point 3 Paragraph 1 and in the current point as well – several evident mistakes can be found as well. EIS researchers were criticised by experts. These can be summarised in the following:

- Methodology is not flexible to changes;
- The methodology lacks an underlying theoretical model that describes the input, transmitting and output parameters of innovation processes;
- It applies not the most suitable statistical indicators for measuring innovation;
- It leaves the differences of economic structures of the increasing number of involved countries out of consideration;
- The five innovation dimensions introduced in 2005 (*Sajeva et al.*, 2005) do not cover several aspects of the innovation processes[14].

[13] Leaders (1) remain the same, Iceland fell into the group 'moderate innovators'(2) from 'followers'(3), while Portugal and Greece stepped into the group 'moderate innovators' (3) from catching up countries(4).

[14] Especially it is relevant for non-tech and non R&D innovations, social-economic conditions and the financing of innovation activities.

Grupp (2006), *van Cruysen and Hollanders* (2008), *and Rammer* (2005) mention further interesting aspects in their work; the following are the most important of them:

- The use of a single composite indicator and of its growth rate leads to the threat that we miss the complexity of the process behind (*Grupp*, 2006). This is proven by the examples of Hungary mentioned above;
- Too many indicators measure innovation in high-tech industries. This would bias innovation performance in favour of those countries with industries specialised in high-tech industries, in particular in high-tech manufacturing;
- Many of the indicators are highly correlated and these indicators may thus capture and measure the same underlying aspect of the innovation process, which would thus create a bias towards these aspects;
- In case of numerous indicators data for countries are either not available or old[15], which runs the risk of comparing the innovation performance across countries fairly;
- A higher value of the indicator does not necessarily reflect a better innovation performance[16]. It is a relating question what is the optimal value for a given indicator resulting in the best innovation performance. In addition, these optimal values may also differ across countries (*Rammer*, 2005).

CONCLUSIONS

The group of analysed countries

The geographic area analysed from the aspect of innovation is primarily Hungary, therefore, those countries and their innovation performance and environment were investigated that are comparable with Hungary in terms of their social, economic and geographic parameters. The author believes that a realistic picture on these South-Eastern European countries can be obtained when their innovation processes are examined in a comparative environment on the basis of data of similar countries. Hence, many common social-economic features influencing the innovation environment of these countries can be found (not diminishing the role of many other economic, historical and mental differences):

- All of these countries are situated on the Southern part of Eastern-Europe;
- They have experienced a socialist planned economy of four decades;
- In the nineties, they tried to catch up with Europe and create the preconditions of EU-accession in an environment continuously undergoing privatisation in ways that are different in details but typical as well for the transitional Eastern-European economy;

[15] Both of them can be illustrated with examples: the first one in the EIS 2006, the second in the EIS 2001 reports.

[16] Such an indicator can be for instance the proportional share of enterprises, which are supported from public funds for innovation purposes.

- These countries joined the EU in 2004[17], their society and economy have become open and they needed to harmonise their legal system with acquis communautaire.

Concluding from the above mentioned, it is advisable to analyse five countries: Bulgaria, Croatia, Hungary, Romania and Slovakia. Of course, it is possible to analyse the relative 'innovation cycle' of any other country group with the help of the method to be described in the following two chapters.

Illustration of processes of many years

Looking at the typical EIS graphs that illustrates the situation of the countries in a way that it is visible 'at first glance', the reader can figure out what innovation cycle the countries underwent. However, it is rather difficult to trace more countries; and a very good visual memory is needed in order to assess these countries' comparative situation that is changing from year to year. In addition, reviewing the summary of the EIS reports – which although is not long in time, but huge due to the continuous changes – will show that the calculations would be very complicated to illustrate the changes on one single graph.

The idea seems to be obvious that it would be good to picture these innovation paths and draw conclusions from it. Instead of abstract data, a graph provides a visible picture on the ways of how the innovation performance was influenced by the government' innovation-related activities, and on how the supporting systems of the national and regional innovation networks operate. This picture may help to dispel misbeliefs, evaluate a real situation and foster good development directions.

Analysts of EIS have partly done it 'officially': the SII index was annually recalculated according to the new methodology retrospectively for five years from year 2006, because these recalculations were done according to the applied methodology in the given year[18], these recalculated SII figures vary from those published in earlier EIS reports. In his analysis the author, presuming that the system of data collection and the way of calculation developed, considered the SII indices calculated for the last time in years, where figures were recalculated.

As the first year was 2002 when the six countries involved in the analysis appeared in the reports, the countries' SII indices in 2002 came from the retrospective recalculation in year 2006, those for 2003 from the EIS Report 2007, and – considering them to be the newest – those between 2004 and 2008 from the EIS Report 2008, as these data were recalculated retrospectively for five years according to the new results and methodology (*Table 1*).

Of course, the fact that the later calculated figures are closer to the reality is an assumption, but – as it will be seen in the following – it is not necessary to accept the 'retrospective calculation method' for the 'relative calculation method', either.

[17] Bulgaria and Romania in 2007, while Croatia is actually listed in the group of candidate countries and their data can be found in the EIS system from 2006. Unfortunately data are not available on Serbia and Bosnia.

[18] For example: "The SII has also been calculated retrospectively using the EIS 2008 methodology for the last five years to enable comparability of results; the SII time series is provided in Annex D" (***EIS***, 2008 p. 8, and p. 58)

Of course, if anyone disagrees with the retrospective calculations, data for any years can be produced by 'relative calculation' from the originally published data (by its nature).

Table 1

Summary Innovation Index for the six involved countries (SII) between 2002 and 2008

Year of calculation	According to EIS-	According to SII-2007	According to EIS-2008				
SII figures	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
BG	0.203	0.201	0.172	0.174	0.178	0.206	0.221
HR	0.262	0.240	0.278	0.286	0.282	0.289	0.293
HU	0.263	0.241	0.266	0.273	0.287	0.305	0.316
RO	0.155	0.156	0.209	0.205	0.223	0.249	0.277
SK	0.236	0.227	0.257	0.273	0.298	0.299	0.314
Min	*0.097*	*0.093*	*0.172*	*0.174*	*0.178*	*0.206*	*0.205*
Max	*0.762*	*0.817*	*0.612*	*0.615*	*0.637*	*0.661*	*0.681*

Source: Based on *European Innovation Scoreboard*, 2006, 2007, 2008; Annex D

For a given year the relative SII can be calculated for ***'i' country*** with the following formula:

$$SII_i^{rel}[\%] = \frac{SII_i - SII_{\min}}{SII_{\max} - SII_{\min}} * 100$$

where SII_{min} is the minimum, SII_{max} is the maximum SII figure and SII_i is the figure for '*i*' country (*Table 2*).

The innovation path of the analysed countries is pictured by the graph of the annual relative SII data (*Figure 9*).

Table 2

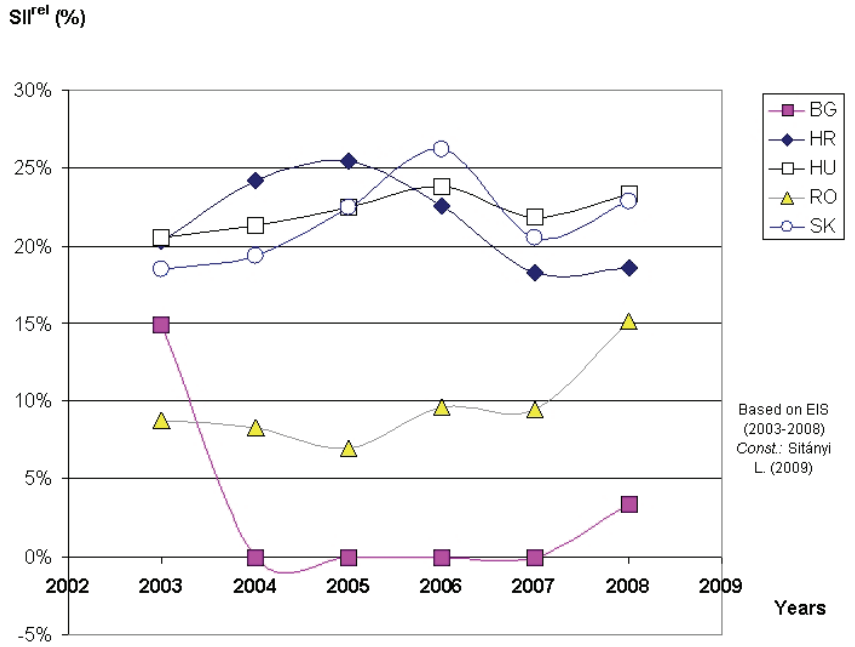
Relative SII (SII^{rel}) for the six involved countries between 2002 and 2008

Range	0.665	0.724	0.440	0.441	0.459	0.456	0.477
SII^{rel}	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
BG	15.96%	14.94%	0.00%	0.00%	0.00%	0.00%	3.44%
HR	24.79%	20.30%	24.15%	25.40%	22.52%	18.27%	18.55%
HU	25.02%	20.48%	21.25%	22.46%	23.78%	21.81%	23.32%
RO	8.73%	8.76%	8.32%	7.00%	9.65%	9.43%	15.18%
SK	20.99%	18.46%	19.35%	22.48%	26.17%	20.54%	22.86%

Source: Based on *Table 1*

Figure 9

Relative innovation performance (SII^{rel}) of the involved five countries between 2002 and 2008



Source: Based on *Table 2*

Figure 9 shows that the innovation performances of the analysed countries are varying in the lower quartile of the European SII level.

Unfortunately, the average CTI indicators (Change Trend Indicators) were not calculated retrospectively according to the new methodology; but the method of 'relative calculation' can be used here as well – similarly to the case of SII and according to the following formula:

$$CTI_i^{rel}[\%] = \frac{CTI_i - CTI_{\min}}{CTI_{\max} - CTI_{\min}} * 100$$

where CTI_{min} is the minimum, CTI_{max} is the maximum CTI figure and CTI_i is the figure for ***'i'*** country (*Table 3*).

The 'relative change of trend indicator' of the analysed countries (*Table 4*) is pictured by the graph of the annual relative CTI (CTI^{rel}) data (*Figure 10*), which show greater variation than SII paths.

The multi-year changes of SII and CTI graphs published in EIS reports can be illustrated in a way that the position of each country is marked in each year in a rectangle of a "*relative plane*'. The four boundary lines of this rectangle are assigned by the *highest and lowest figures of the two dimensions, the SII and the CTI indices*. The relative position of the countries can be specified compared to these figures. By

laying these layers on top of each other and by linking the points assigning the position of the countries we can draw up the "innovation path' of the countries within the relative SII-CTI plan (*Figure 11*).

Table 3

Innovation trend indicators in the involved six countries (CTI^{rel}) between 2003 and 2008

CTI	2003	2004	2005	2006	2007	2008
BG	8.60%	15.50%	-0.71	0.26	3.48	6.98%
HR	-	-	-	-0.20	-0.42	1.53%
HU	19.40%	14.80%	4.32	-0.22	1.69	2.85%
RO	13.60%	12.50%	-0.25	0.95	4.42	6.95%
SI	22.40%	14.00%	3.23	0.72	1.96	3.28%
SK	12.90%	11.50%	0.24	-0.29	2.91	3.94%
Max.	*40.00%*	*23.10%*	*4.32*	*2.11*	*5.23*	*6.98%*
Min.	*8.20%*	*1.00%*	*-4.31*	*-0.95*	*-3.01*	*0.00%*

Source: Based on *EIS*, 2003-2008

Table 4

Relative change of innovation trend indicators of six countries (CTI^{rel}) between 2003 and 2008

Range	0,318	0,221	8,631	3,064	8,235	0,070
CTI^{rel}	2003	2004	2005	2006	2007	2008
BG	1.26%	65.61%	41.73%	39.57%	78.84%	100.00%
HR	-	-	-	24.50%	31.41%	21.97%
HU	35.22%	62.44%	100.00%	23.83%	57.06%	40.86%
RO	16.98%	52.04%	47.10%	62.08%	90.24%	99.54%
SI	44.65%	58.82%	87.45%	54.59%	60.28%	46.97%
SK	14.78%	47.51%	52.73%	21.44%	71.92%	56.50%

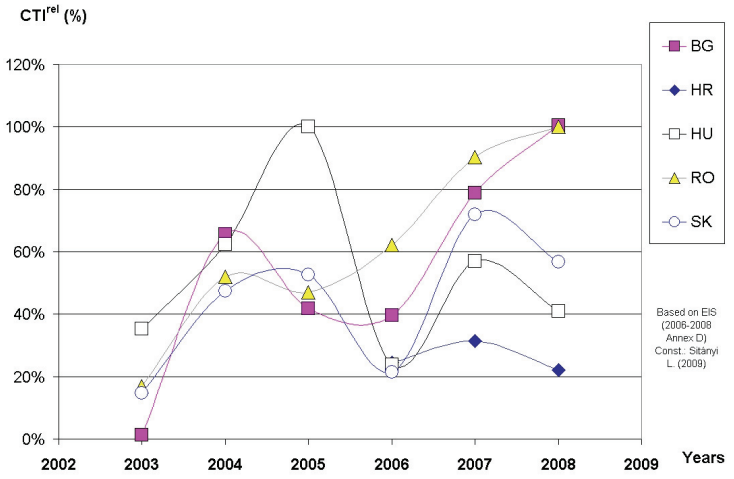
Source**:** Based on *Table 3*

Comparative development paths of innovation

As it can be seen in case of Hungary and Slovakia in *Figure 9* and especially in *Figure 10*, these curves show wavering performance without any obvious directions. After a relatively better starting position there cannot be seen any development even in comparison with Bulgaria and Romania that lag far behind the EU average.

Figure 10

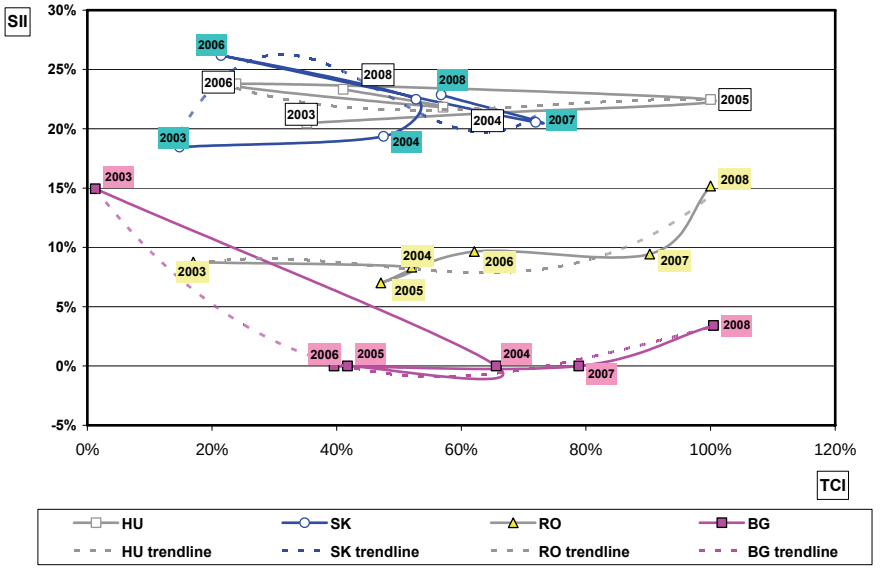
Relative change of innovation trend indicators of five countries (CTI^{rel}) between 2003 and 2008



Source: Based on *Table 4*

Figure 11

Innovation paths and third order trend lines of four countries in the relative SII (SII^{rel}) – CTI (CTI^{rel}) plan between 2003 and 2008



Source: Based on *Table 2* and *Table 4*

This can be seen well when the figures[19] of the four countries are illustrated in the relative SII-CTI (*Figure 11*). The similarity of the paths of Hungary and Slovakia is eye-catching, which paths do not show development and 'turn back into themselves'. It is especially well visible when the comparison is made to the development paths of Romania and Bulgaria, where a well defined development starting from 2005 can be seen – although from a much lower level. The following deals with the conclusions and recommendations on the basis of the facts published in the EIS reports.

REFERENCES

Archibugi, D., Denni, M., Filippetti, A. (2009): The Global Innovation Scoreboard 2008: The Dynamics of the Innovative Performances of Countries. Italian National Research Council, [online] <URL: http://www.proinno-europe.eu/index.cfm?fuseaction=page.display&topicID=5&parentID=51> [07.12.2009] 51 p.

Arundel, A., Hollanders, H. (2006): Trend Chart Methodology Report: Searching the forest for the trees: "Missing' indicators of innovation. Maastricht Economic Research Institute on Innovation and Technology [online] <URL: http://www.proinno-europe.eu/doc/eis_2006_methodology_report_missing_indicators.pdf> [08.04.2009] 27 p.

Arundel, A., Bordoy, C., Kanerva, M. (2008): Neglected innovators: How do innovative firms that do not perform R&D innovate? Results of an analysis of the Innobarometer 2007 survey No. 215, INNO Metrics 2007 report, European Commission, DG Enterprise, Brussels, 38 p.

Camagni, P.R. (1992): The concept of innovative milieu and its relevance for public policies in European lagging regions. Paper, presented at the 4th World Congress of RSA, Palma de Mallorca

van Cruysen, A., Hollanders, H. (2008): Rethinking the European Innovation Scoreboard: A New Methodology for 2008-2010. Maastricht Economic and social Research and training centre on Innovation and Technology (UNU-MERIT), Inno Metrics, Maastricht, [online] <URL: http://www.proinno-europe.eu/index.cfm?fuseaction=page.display&topicID=437&parentID=51#> [07.12.2009.] 43. p.

European Innovation Scoreboard, EIS (2001): European Commission, Enterprise Directorate-General, Innovation Directorate, Communication and Awareness Unit. Luxembourg, [online] <URL: http://www.proinno-europe.eu/index.cfm?fuseaction=page.display&topicID=5&parentID=51> [07.12.2009.] 42 p.

European Innovation Scoreboard, EIS (2002): European Commission, Enterprise Directorate-General, Innovation Directorate, Communication and Awareness Unit. Luxembourg, 30 p.

European Innovation Scoreboard, EIS (2003): European Commission, Enterprise Directorate-General, Communication and Awareness Unit. Luxembourg, 37 p.

[19] Croatia is left out of the comparison because its CTI index has been available since only year 2006.

European Innovation Scoreboard, EIS (2004): Comparative Analysis of Innovation Performance. Commission Staff Working Paper, European Commission, Luxembourg, 46 p.

European Innovation Scoreboard, EIS (2005): Comparative Analysis of Innovation Performance. Commission Staff Working Paper, European Commission, Luxembourg, 46 p.

European Innovation Scoreboard, EIS (2006): Comparative Analysis of Innovation Performance. Maastricht Economic Research Institute on Innovation and Technology (MERIT) and the Joint Research Centre (JRC, Institute for the Protection and Security of the Citizen) of the European Commission, Luxembourg, 46 p.

European Innovation Scoreboard EIS (2007): Comparative Analysis of Innovation Performance. European Commission, Directorate-General for Enterprise and Industry, Office for Official Publications of the European Communities, Luxembourg, 60 p.

European Innovation Scoreboard, EIS (2008): Comparative Analysis of Innovation Performance. Maastricht Economic Research Institute on Innovation and Technology (UNU-MERIT), Luxembourg, 58 p.

European Council (2000): Presidency Conclusions 'Lisbon Strategy', Lisbon, [online] <URL: http://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/ec/00100-r1.en0.htm> [07.12.2009.] 26 p.

FORA (2007): Innovation Monitor 2007. Danish Enterprise and Construction Authority's Division for Research and Analysis, Copenhagen, 225 p.

Grupp, H. (2006): How robust are composite innovation indicators for evaluating the performance of national innovation systems? University of Karlsruhe and Fraunhofer Institute for Systems and Innovation Research, Karlsruhe

Hollanders, H. (2006): European Regional Innovation Scoreboard. Maastricht Economic and social Research and training centre on Innovation and Technology (MERIT) Luxembourg, 41 p.

OECD (1992): Oslo Manual – Proposed Guidelines for Collecting and Interpreting Technological Innovation Data. Paris

OECD (1993): Frascati Manual – The Measurement of Scientific and Technological Activities. Proposed Standard Practice for Surveys of Research and Experimental Development. Paris

OECD (1995.): Canberra Manual – The Measurement of Human Resources devoted to S&T. OECD GD(95)77, Paris

Pap N., Sitányi L. (2007): The Role of Innovation in the Area Development. (In Hung.) László M., Pap N. (szerk.): Bevezetés a terület- és településfejlesztésbe, Lomart, Pécs, 115-139. p.

Rammer, C. (2005): Comments on EIS Improvements for 2005. Centre for European Economic Research (ZEW), Mannheim,

Sajeva, M. at al. (2005): Methodology Report on European Innovation Scoreboard. European Commission, Enterprise Directorate-General, JRC and MERIT, Luxembourg, 71 p.

Sitányi L. (2008): Competitiveness of Carpathian-Balkan Countries Based on Innovation Milieu. (In Hung.) Reményi P., Szebényi A. (szerk.): V. magyar politikai földrajzi konferencia: A nagy terek politikai földrajza, PTE TTK Földrajzi Intézet, Pécs, 445-459 p.

Szendrődi L. (2003): Annual Report about Science and Technology. (In Hung.) Oktatási Minisztérium Kutatás-fejlesztési Helyettes Államtitkárság, Brüsszel, 54 p.

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Annex 1

Country abbreviations

AT	Austria	FI	Finland	NL	Netherlands
AU	Australia	FR	France	NO	Norway
BE	Belgium	HR	Croatia	PL	Poland
BG	Bulgaria	HU	Hungary	PT	Portugal
CA	Canada	IE	Ireland	RO	Romania
CH	Switzerland	IL	Israel	SE	Sweden
CY	Cyprus	IS	Iceland	SI	Slovenia
CZ	Czech Republic	IT	Italy	SK	Slovakia
DE	Germany	JP	Japan	TR	Turkey
DK	Denmark	LT	Lithuania	UK	United Kingdom
EE	Estonia	LU	Luxembourg	US	United States
EL	Greece	LV	Latvia		
ES	Spain	MT	Malta		

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ENVIRONMENT-PURPOSED AIMS WITHIN THE FRAMEWORK OF THE NEW HUNGARY DEVELOPMENT PLAN

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ABSTRACT

The environment protection got more attention in the last few years. The New Hungary Development Plan (shortly: NHDP) 2007-2013 has a detached operational program for environment-purposes. In the period between 2007-2013 approximately 8.000 billion HUF can be called down as not refundable subsidy in the framework of NHDP. The aim of this study is to present and analyse the priorities and programs, and the utilisation of the supports within the Environment and Energy Operational Program (EEOP). Every 22nd HUF was paid out for environment and energy modernisation or development in the last three years. It is a gladsome tendency that people and companies pay more attention to environment consciousness, but the financial means utilised for this purpose are still very low. It is also regrettable that only one-third of the submitted tenders was accepted by the National Development Agency.
(Keywords: European Union, New Hungary Development Plan, Environment and Energy Operational Programme, National Strategic Reference Framework of Hungary 2007–2013)

INTRODUCTION

Between 2007 and 2013, Hungary got a possibility to develop and re-align the country from almost HUF 8.000 billion. This enormous amount of money comes from European taxpayers, through the European Union's development fund of EUR 22.4 billion and funds available for rural development. This is a never returning opportunity to launch a catch up to the developed West-European countries, and strengthen the Hungarian economy and the existing potentials in the Central-European Region. In 2007 the Government defined the way of development in the National Strategic Reference Framework of Hungary 2007–2013. In this document they chose the employment and growth as title words for the upcoming seven years.

The NHDP has six main priorities which are cross-linked and have impact on each other. One of these priorities is the environment development. The aim of this study is to analyse the representation of the environmental objectives within the framework of the NHDP.

"The priority of environmental and energy developments is aimed at the achievement of objectives defined in the horizontal policy of sustainability. The priority contributes to the achievement of the long term growth objective by reducing influences damaging the environment, by preserving the natural

environment that forms the basis of growth, and with prevention, efficiency as well as an integrated approach to complex problems.

According to the respective guideline of the CSG Europe and its regions should be made more attractive places to invest and work in by strengthening the synergies between environmental protection and growth, and by less intensive use of traditional energy sources. From an environmental point of view, serving economic growth means the promotion of preventive measures in the long term. However, these measures can have a proper impact only if "end-of-pipe" solutions are adequately widespread so as to tackle environmental burdens that are inevitably caused by social and economic activities. As regards preventive environmental protection, Hungary's commitments determined in the Treaty of Accession are the starting point from which sustainable use of the environment can be reached by strengthening environmentally efficient production and consumption structures.

The strategy in the NHDP is based on the above described principle, thus our main goal is to build up the missing elements of the environmental infrastructure, but at the same time we also strive to give impetus to the spread of preventive environmental solutions in the field of both production and consumption. The following intervention groups serve the environmental and energy developments:

Developments improving the environment, the elements of which include:

- Achieving healthy and clean settlements including:
  - waste management,
  - waste water management,
  - improvement of drinking water quality;
- Wise management of our waters including: protection against floods,
- Protection of the quality and quantity of our waters, prevention of further pollution of waters (protection of water bodies of high importance, water aquifer protection, recultivation of waste deposits and environmental remediation), state measures of WFD implementation,
- Wise management of our natural assets;
- Promotion of sustainable production and consumption habits, raising the awareness of environmental and climate issues;
- Regional dimensions of environment developments. Environment-friendly energy developments, the planned tools of which are:
  - the promotion of developments aimed at energy efficiency and saving,
  - the production and utilization of renewable energy.

The objectives of the sustainable use of the environment are to be realized in line with the priorities of the Community Strategic Guidelines and the 6th Environment Protection Action Programme of the European Union…" (*NDA*, 2007).

MATERIALS AND METHODS

For the analysis I used the official homepage and database of the New Hungary Development Plan. It presents data about the NHDP and its results. Researcher can search and organize the data presented by the webpage, in many different views. For

this comparative analysis I used the actual statistics of the operational programmes and priorities which were presented on the 6th November 2010. The above mentioned statistical database is only available on the Hungarian sites, in Hungarian.

I used the ***TÉRKÉPTÁR*** data source as well, which is a special geographical information system (shortly: GIS) of the National Development Agency (shortly: NDA) to represent the statistics and data related to NHDP on the map of Hungary at very different levels. The presented data can be displayed at country, regional, county or micro-region levels as well.

To prepare this comparative analysis I used general and descriptive statistical methods such as mean, variance, differences, etc. The analysis and the graphs were created with the Microsoft Office 2007 program.

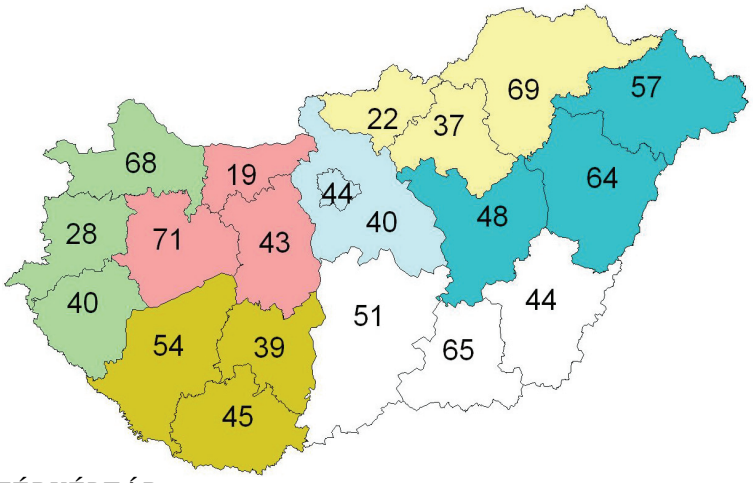
RESULTS AND DISCUSSION

In my analysis I wanted to observe how the environmental project proposals were distributed between the counties. In average 47.4 project were implemented between 2007-2010 in each Counties.

Figure 1 represents the distribution of environment project proposals projects in Hungary. It was surprising that not Budapest or Pest County has applied to the most environment related project, but Veszprém, Borsod-Abaúj-Zemplén and Győr-Moson-Sopron had it. The fewest projects in environmental theme were implemented in Komárom-Esztergom, Nógrád and Vas Counties. These counties have generally low economical potential, which can impact the low participation rates in EEOP.

Figure 1

Environmental project proposals projects among counties, Hungary, 2007-2010



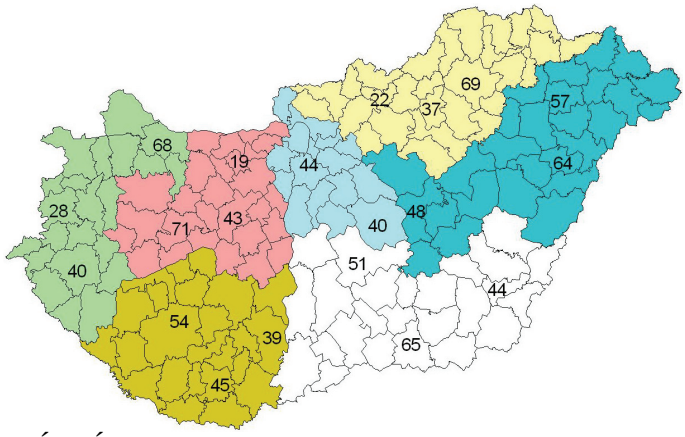
Source: ***TÉRKÉPTÁR***, 2010

After the above mentioned surprising data, I was wondering how the projects were divided on micro-regional level. The results were not so unexpected. All of the projects were implemented in the micro-region which includes the county seat as shown on *Figure 2*. This could be foretell, because only these counties have enough economic power to take part in economical developments and projects. The purposed environmental investments cost huge money, originates only a few workplaces and financial return takes decades.

Until the end of November 2010, from the approximately 54.000 applications which were registered, only 3.605 were handed in to the Environment and Energy Operational Programme. This means the 6.64% of the all projects. The number and rate of the supported EEOP projects shows bit worse results. Only the 5.26% of the supported projects was handed in to the EEOP. About 60% of the handed in applications to EEOP was disclaimed by the NDA.

Figure 2

Environmental project proposals among micro-regions, Hungary, 2007-2010



Source: *TÉRKÉPTÁR*, 2010

I wanted to observe how the handed in and supported projects were divided within the framework of Environment and Energy Operational Programme between the different priorities and actions. The Environment and Energy Operational Programme consists of eight priorities and 28 actions. In my opinion the first six priorities are the most important from the aspect of environment protection in short- and long-term too.

Figure 3 illustrates very well, how the supported applications are divided between the eight priorities. The distribution of the applications was really astonishing. The 7th and 8th priorities give the 31% of supported applications in EEOP; however these two priorities are principally just administrative actions, to prepare the delivery of the first six priorities. These actions do not results real environmental protection investments neither in short, nor in long-term. The first five priorities

are instrumental in doing environmental protection and rehabilitation, the 6th priority of EEOP is focusing on maintainable lifestyle and consumption, measures reflecting the principle of preventive environmental protection involve among others, the following:

- promoting the organisation of private and community production and services on an industrial ecologic base;
- spreading the best possible eco-efficient and environment-friendly technologies and techniques;
- supporting and spreading sustainable consumption habits, action patterns, model projects;
- developing environment-friendly attitudes.

The EEOP 1-5 which are focusing on realisation of new and forward-looking methods and technologies represents just the 44.12% of the total supported projects. This is a really depressing result. In my opinion it has to be much higher because of two reasons. On the one hand these projects will protect our environment and through the environment they will protect the Globe as a whole, and on the other hand, these investments generate workplaces. The aims of these priorities are the:

- *Healthy and clean settlements* (EEOP-1);
- *Good management of waters* (EEOP-2.);
- *Good management of natural values* (EEOP-3);
- *Increased utilisation of renewable energy sources* (EEOP-4) and
- *Efficient energy utilisation* (EEOP-5).

Comparing the number of the project proposals applications with the number of the supported proposals and the number of contracts is shown on *Figure 3*. It represents spectacularly that only the fragment of the received proposals were supported by the NDA, but almost all of the supported applications were contracted. The 8th priority within the EEOP is the only one which has 100% support. It has ten actions, which were dedicated aims to the Managing Authorities (shortly: MA) and to the Intermediate Bodies (shortly: IB).

In average 38.8% of the received proposals were supported, but in the case of the EEOP-1 and EEOP-5 the level of support is only 26%. The 5th priority's (Efficient energy utilisation) target to influence the structure of energy sources, develop tools enabling energy saving and efficient energy utilisation in both the production and the consumer spheres. It contains the building-energetic developments, which is more than 75% of the 1.102 piece of handed in proposals. The low rate of support is because the incompleteness of the proposals, or the insufficient level of the financial commitment.

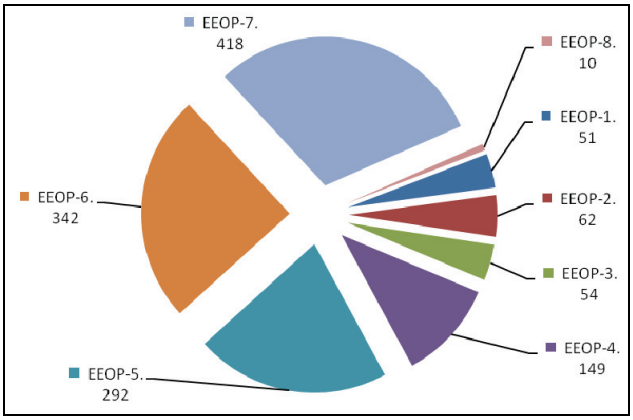
Comparing the result shown on *Figures 4 and 5* a really interesting and surprising consequence can be observed. The supported applications of EEOP-1 and EEOP-2 consist only the 8% of the summary supported competitions, but means the 81,27% of the required amount of aims in the supported applications.

By these two priorities the level of the supported amount is over 50%, however the number of supported projects are only 26%. This means, that the supported

projects belong to higher budget level. The EEOP-1 (Healthy and clean settlements) focuses on the implementation of urban environmental public services, environmental infrastructure developments and direct environmental protection and damage prevention using opportunities of comprehensive environmental management and planning, applying cost-efficient solutions.

Figure 3

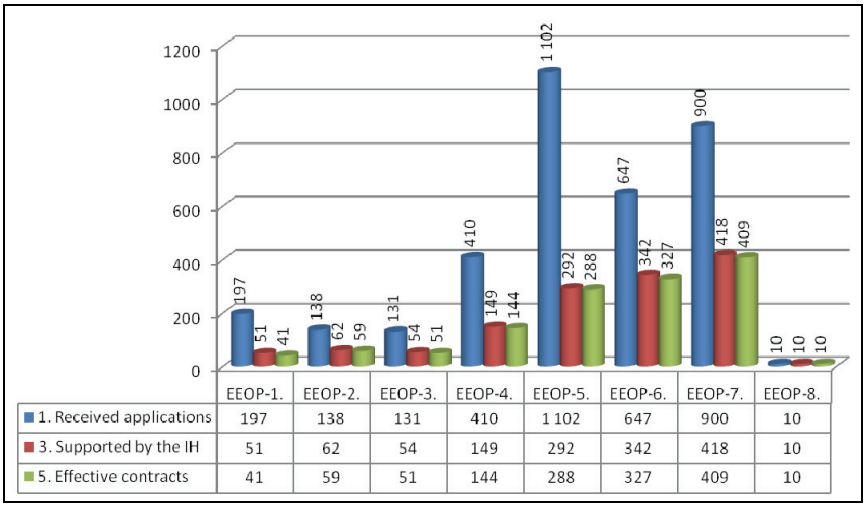
Number of supported EEOP proposals between 2007-2010



Source: Based on *www.nfu.hu*, 2010

Figure 4

Number of received, supported and contracted EEOP project proposals, 2007-2010

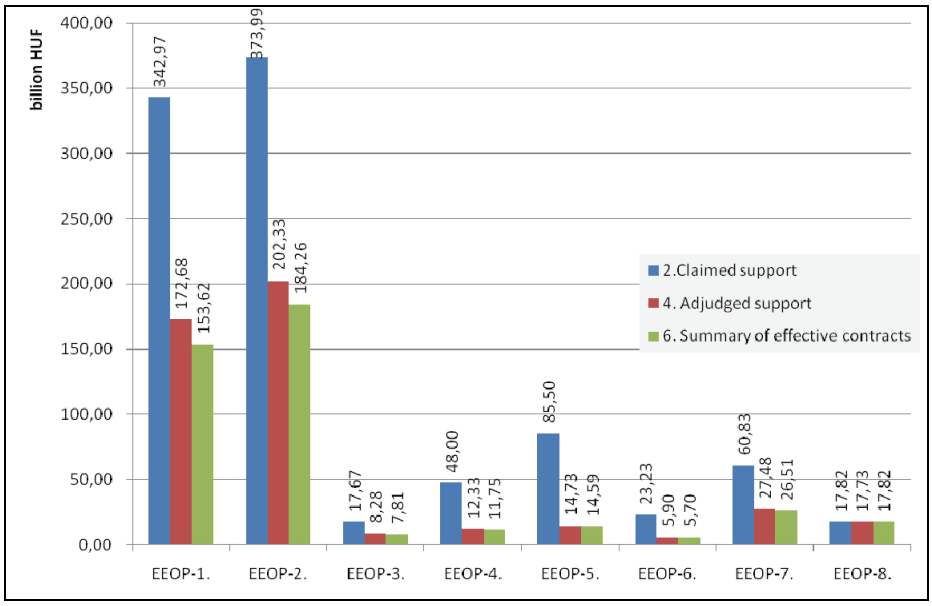


	EEOP-1.	EEOP-2.	EEOP-3.	EEOP-4.	EEOP-5.	EEOP-6.	EEOP-7.	EEOP-8.
1. Received applications	197	138	131	410	1 102	647	900	10
3. Supported by the IH	51	62	54	149	292	342	418	10
5. Effective contracts	41	59	51	144	288	327	409	10

Source: Based on *www.nfu.hu*, 2010

Figure 5

Amount of claimed, adjudged and contracted project proposals EEOP applications, 2007-2010



Source: Based on *www.nfu.hu*, 2010

The EEOP-2 (Good management of waters) connects to EEOP-1. Its aim to prevent natural, economic and cultural values in Hungary, the prevention of floods and other damages related to water is. Besides protection against water damage another important task is to achieve the good ecological status of waters. River basin management and integrated water use measures serving this objective encompass measures prescribed by the Water Framework Directive (monitoring, protection of the quality and quantity of our waters) (*NDA*, 2007).

By the other six priorities the adjudged support is only 17-47%, except the 8th priority (Technical Assistance) because the adjudged amount is 99,5% there, but the contracted value is the 100% of the required one. It is possible that there is an error in the database because of rounding. The adjudged amount in EEOP-5 was expectable in sight of the results shown on the previous graph.

CONCLUSIONS

The distribution of claimed and adjudged support is out of proportion. Most of the proposals were handed in to the 5th, 6th and 7th priorities, however the highest amount of aim required in the framework of the first two priorities.

The huge difference between the submitted in and supported project proposals shows a serious problem. The applicants can not present enough financial

commitment or the submitted technical documentation was not in line with the MA. The other reason of the low supporting rate could be the wrong handed in the project proposals. Many projects fail because the incomplete proposals too. The rules of applying to the NDA for the financial support of the European Union are strict and more often than not complicated.

The distribution of support is consistent on county level but very concentrated on micro-regional level. All of the financial incentives are concentrated to county seats however on countryside there is also an urgent need in EU co-financed support to environment protection and increasing utilisation of renewable energy sources.

REFERENCES

EMÍR – Open Public Information. (In Hung.) [online] <URL: http://emir.nfu.hu/nd/kozvel/?link=umft_1_1> [06.11.2010.]

National Development Agency (2007): National Strategic Reference Framework of Hungary 2007–2013. [online] <URL: http://www.nfu.hu/download/16836/80825_UMFT_angol_4_teljes.pdf> [06.11.2010.] 126-132. p.

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SOME SOCIO-ECONOMIC ASPECTS OF REGIONAL DEVELOPMENT AT THE LAKE BALATON

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ABSTRACT

Lake Balaton is among the most important touristic destinations in Hungary. During the last decades the attractiveness of the Lake has been decreasing considerably. This fact can be explained by exogenous factors (re-organisation of system of Hungarian tourism, decreasing domestic purchasing power, improved accessibility of further destinations) but – at the same time-the lack of strategy and of long-range planning can be considered as important causes of failures. The aim of the current article is to analyse the key actors and their strategies around the Lake. The understanding the structure of net of actors and their interest is an important starting point for determination of basic directions of development on base of consensus-seeking. The most important lesson of the analysis, that the Balaton-tourism should be approached as a complex and dynamic system, which should be adapted to the changing demands.
(Keywords: decision support systems, social bargaining)

INTRODUCTION

Balaton is the largest see in Central Europe, its length is 77km, its wide is between 1.3-14.0km (in average 7.8km), and its surface is 594km^2. There are numerous specific aspects of the Balaton geographic region from point of view of history, natural geography, flora and fauna (*Mourato*, 1998), but the most important fact from our point of view is the role of Balaton in Hungarian tourism.

The Lake is the target of 13% of total foreign touristic arrivals to Hungary. Share of Balaton in domestic tourism, estimated on base of guest-nights is 23% (*Hungarian Tourism ZRt*, 2010). During the last decades there were numerous debates on possibilities of development of tourism around Balaton. According to the study of Hungarian Court of Auditors there had been spent between 1990 and 2007 more than half milliard HUF (ca. 2 million Euros) from the state budget to different studies on development of the tourism at lake Balaton (*Báger et al.*, 2008). The only practically realised result of these studies was the introduction of the so-called Balaton Card system. The Hungarian literature of economic geography and regional planning is abundant in concepts on development of the tourism at Lake Balaton. One of the most important lessons of these scientific analyses were the

highlighting of importance of system-based approach to this complex of questions (*Somogyi et al*., 2002).

The aim of current article is the determination of the most important forces, shaping the system of tourism at Lake Balaton, and the possibilities of formation of a coalition between different social forces with purpose of development of touristic attractiveness of the Lake.

MATERIALS AND METHODS

The basic paradigms of analysis were the institutional theory (*Berger and Luckmann*, 1966), principle-agent theory (*Eisenhardt*, 1989) and the strategic planning.

Our research has been consisted of two phases. In first phase we have determined the set of key actors, playing a role in development of tourism at Lake Balaton, in second one we have estimated the direct influence-relations between the actors (actor-actor matrices), and in the third one we have estimated the matrix between the actors and the different goals.

Based on these two input–matrices with help of a semi-quantitative analysis it had been carried out an analysis of relations between the actors, and actors and goals (*Godet*, 1996).

According to the basic theory of so-called "French school of strategy" the different social systems can be considered as an arena, in which different groups of participants (the so-called actors) take part with purpose of enforcement of their specific interests (*Godet*, 2000). In opinion of Godet if one can relative adequately simplify the actors and the most characteristic features of their systems of interests, then there is a possibility of analysis the chances of different actors to realise their goals. The method of systematic analysis of social bargaining can be modelled by so-called MACTOR modelling, an acronym for Matrix of Alliances and Conflicts: Tactics, Objectives and Recommendations (*Durance*, 2008). One of the key concept of the model, is that the possibilities of actors to influence other actors are determined by their potential to pressure another actors directly or indirectly with purpose of affect their behaviour. The influence of an actor (A) on an another actor (C), is the sum of the direct and indirect influences of actor A on actor C.

The quantification of mutual influences can be characterised by a rectangular matrix. Cells of matrix – *per definitionem* – reflect the intensity of influence of actor in row on actor in column (*Bendahan et al.*, 2004). The intensity of direct influence on an actor to another was measured on a 0-4 scale, from no influence to absolute influence, determining the existence of the respective actor.

Matrix of direct and indirect influences (MIDI [1]), can be quantified for each par of actors as a sum of direct and indirect influences.

$$\mathrm{MIDI}_{a,b} = \mathrm{MID}_{a,b} + \sum_c \left(\min\left(\mathrm{MID}_{a,c}, \mathrm{MID}_{c,b}\right)\right) \qquad [1]$$

In this way of each and every actor can be determined the vector in influences (Ia) and dependences (Da) by equations [2] and [3].

$$\mathrm{I}_a = \sum_b \left(\mathrm{MIDI}_{a,b}\right) - \mathrm{MIDI}_{a,a} \qquad [2]$$

$$D_a = \sum_b \left(MIDI_{b,a}\right) - MIDI_{a,a} \quad [3]$$

Based on these indicators a normalised value can be determined for each of actors. [4].

$$r_a = \left(\frac{\left(I_a - MIDI_{a,a}\right)}{\sum_a \left(I_a\right)} \right) \cdot \left(\frac{I_a}{\left(I_a + D_a\right)} \right) \quad [4]$$

Using the r_a vector one can define the matrix of influence-possibilities of each of actors for different issues. [5].

The importance of different goals from point of view of each actor has been expressed by Matrix of Actor-Object (MAO). In this matrix the importance and attitudes of different goals from point of view of different actors were quantified on a -4 …+4 scale, where the -4 denoted the high importance and total negation of the given goal, and the +4 denotes the high importance and total support.

$$3MAO_{a,i} = 2MAO_{a,i} \cdot r_a \quad [5]$$

The 3MAO matrix is the basis of most of the analyses proposed by method of analysis. Indeed, a number of important values are directly drawn from the 3MAO matrix. This is the case of the mobilization coefficient [6], showing how much the different actors are involved in the situation, but also of the agreement [7] and disagreement [8] coefficients, which indicate how controversial are the different issues.

$$Mob_a = \sum_i \left|3MAO_{a,i}\right| \quad [6]$$

$$Ag_i = \sum_a \left(3MAO_{a,i} \cdot \left(3MAO_{a,i} > 0\right)\right) \quad [7]$$

$$Disag_i = \sum_a \left(3MAO_{a,i} \cdot \left(3MAO_{a,i} < 0\right)\right) \quad [8]$$

Furthermore, the 3MAO matrix is used to obtain the convergence matrix (3CAA [9]) and divergence matrix (3DAA [10]). For each couple of actors, these matrixes show how much they agree (respectively disagree) on salient and controlled issues.

$$3CAA_{a,b} = \frac{1}{2} \cdot \sum_i \left(\left(\left|3MAO_{a,i}\right| + \left|3MAO_{b,i}\right| \right) \cdot \left(3MAO_{a,i} \cdot 3MAO_{b,i} > 0\right) \right) \quad [9]$$

$$3DAA_{a,b} = \frac{1}{2} \cdot \sum_i \left(\left(\left|3MAO_{a,i}\right| + \left|3MAO_{b,i}\right| \right) \cdot \left(3MAO_{a,i} \cdot 3MAO_{b,i} < 0\right) \right) \quad [10]$$

Finally, the ambivalence coefficient [11] can be calculated for each actor, giving an indication of their expected stability in their potential alliances.

$$3EQi = 1 - \left[\frac{\left(\sum_k \left\| 3CAAi,k \right| - \left| 3DAAi,k \right\| \right)}{\left(\sum_k \left\| 3CAAi,k \right| + \left| 3DAAi,k \right\| \right)} \right] \quad [11]$$

The operationalisation of the methodology was as follows: in first phase we have collected the set of possible actors and the set of possible goals, based on a series of interviews with tourism-specialists in the region. In second phase of investigation in a workshop with participation of seven specialists we have determined the values of

the input matrices. The values of matrices have been estimated on a consensus-seeking way.

RESULTS

In first phase of investigations the key actors and their strategies have been determined. The set of the most important actors is summarised in *Table 1*.

Table 1

The key actors of tourism development at Lake Balaton (random order)

County municipalities
Ministry of Finance
Municipalities around Lake Balaton
Non-residents at Lake Balaton
Residents at Lake Balaton
Local small and medium size enterprises related to the tourism
Hungarian government
Financial investors

Analysing this set it is obvious, that the specialists wanted to differentiate between the general policy of Hungarian government and the relatively short-time strategy of financial considerations of Ministry of Finance. Under Hungarian conditions, the county-level municipalities have a relatively low importance of regional planning and public administration. In opinion of *Jenei* and *Szalai* (2002) de-centralisation of public administration the key requirements are the stable and democratic constitutional background, the efficient municipal finance system and the well – functioning public administration. Currently the Hungarian constitution is under public debate, and the financial conditions of local municipalities are relatively unfavourable. The share of local municipality expenditures in GDP shows a decreasing tendency. In 1994 this share was 17.2% in 2008 12.3%. There are two basic types of the population around the lake: the residents and the non-residents. The non –resident population consists of people, having weekend houses or cottages at the border of the lake (*Járosi*, 2006). In the latest years there is an increasing tendency of migration of intellectuals from Budapest or small-bourgeois from Western-Europe to into the villages, situating more fare from the lake. This differentiation seemed to be necessary to express the different attitudes to the local problems. For example the development of infrastructure for education and health-care services are much more important for local residents, than for non-residents. At the same time, e.g. the improvement of accessibility of villages is extremely important for both types of the population.

The financial investors form a specific category. They are not necessarily tourism-specific investors. It should be noted that in some parts of Balaton there are considerable industrial production capacities (Nitrokémia Zrt. Industrial Park) too.

The set of potential goals of different actors is summarised in *Table 2*.

Table 2

Set of potential goals of investors (random order)

Development of tourism-related infrastructure
Development of non-tourism-related infrastructure
Maximalisation of tax-revenues of state budget
Maximalisation of tax-revenues of budget of municipalities
Sustainability of ecologic environment
Maximalisation of development resources
Development of non-tourism related economic investments
Development of quality (mass) tourism
Development of quantity tourism

In second phase we have estimated the possibilities of influence of different actors on each other (*Table 3*).

After this phase, the attitude of actors towards the different goals had been determined (*Table 4*).

Table 3

Matrix of mutual influences
(the cells of the matrix indicate the estimated importance of actor in row on the corresponding actor in column on a 0-4 interval scale)

Actors	**County municipalities**	**Ministry of Finance**	**Municipalities around Lake Balaton**	**Non-residents at Lake Balaton**	**Residents at Lake Balaton**	**Local small and medium size enterprises related to the tourism**	**Hungarian government**	**Financial investors**
County municipalities	0	1	1	0	1	2	1	1
Ministry of Finance	3		3	2	2	3	1	2
Municipalities around Lake Balaton	2	0		2	3	2	0	3
Non-residents at Lake Balaton	0	0	1		1	1	2	0
Residents at Lake Balaton	2	0	4	1		3	2	0
Local small and medium size enterprises related to the tourism	1	0	2	1	2		1	1
Hungarian government	2	3	2	1	1	2		2
Financial investors	2	1	3	1	1	3	2	

Table 4

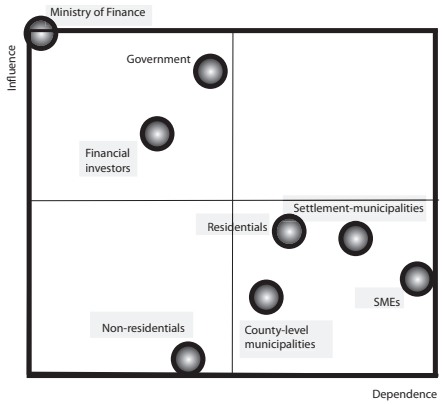
Matrix of relation of actors to the different goals (the cells of the matrix indicate the estimated importance of actor in row on the corresponding actor in column)

Actors	Development goals								
	development of tourism-related infrastructure	development of non-tourism-related infrastructure	maximalisation of tax-revenues of state budget	maximalisation of tax-revenues of budget of municipalities	sustainability of ecologic environment	maximalisation of development resources	development of non-tourism related economic investments	development of quality (mass) tourism	development of quantity tourism
County municipalities	2	1	1	1	-2	2	4	1	1
Ministry of Finance	1	0	0	4	-4	0	1	2	0
Municipalities around Lake Balaton	4	4	4	-4	4	3	4	3	3
Non-residents at Lake Balaton	0	2	1	1	-3	3	1	-2	1
Residents at Lake Balaton	4	3	4	-4	2	4	3	3	3
Local small and medium size enterprises related to the tourism	3	4	3	-4	2	3	4	-3	3
Hungarian government	2	2	1	4	4	2	1	1	1
Financial investors	1	4	1	-4	-3	1	2	-2	1

By application of MACTOR method in first phase of investigation we have determined the matrix of dependences and influences (Eq. [2] and [3]). The graphical representation influences and dependences are summarised in *Figure 1.*

Figure 1

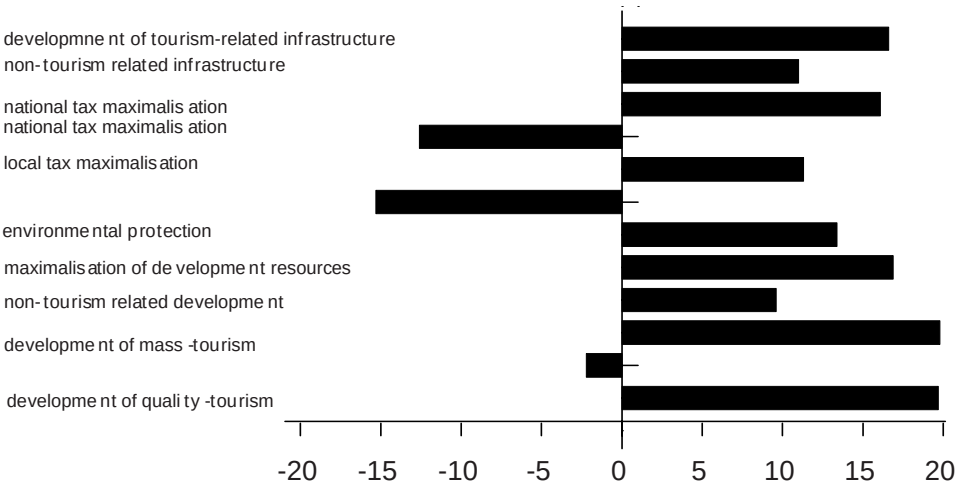
Matrix of influences and dependences of actors



Analysing the *Figure 1* it is obvious, that the influence of the Financial conditions are extremely high, at the same time the dependence of small-and medium size service providers as well as the local municipalities is relatively low, paired with a high level of dependence. In case of the population there is a considerable difference between the residents and non-residents. Traditionally, a considerable part of the Hungarian middle-and upper middle class had weekend-houses at the Lake Balaton. This fact underlines the importance of searching the possibilities for a more balanced representation of interest of this important group of local actors. The position of county municipalities is an extremely sensitive problem. On one hand, the role and place of county-municipalities is a highly debated issue in the Hungarian public administration. Their influence is relatively low, and – at the same time – they should play an important role in planning and realisation of regional processes. From this point of view, it is an extremely critical fact that villages and towns around Balaton belong to three different counties (Veszprém, Somogy and Zala). The concentration of regional public administrative units into regions (regional planning and statistical units) did not solve this problem, because the surrounding of Balaton belong even under this conditions to three different regions. A possible compromise could be the improvement of functioning of some parallel organs (e.g. Balaton Regional Tourism Committee) (*Figure 2*).

Figure 2

The support of different goals, calculated on base of Eq. 5.



It is obvious, that in some cases there were antagonistic contradictions between the different goals of different actors.

Some goals, e.g. the creation of workplaces, development of tourism infrastructure and increasing of resources for development can be considered as widely acceptable ones, enjoying a wide-range social support (*Figure 2*). Another

sources, e.g. maximalisation of local taxes considerably divides the actors. The same is true for the local development resources.

The graph of influences and dependencies highlights the extremely high importance of financial organs and the central government. At the same time it is obvious, that the second most important actor in this game, the central government has hardly any coherent concept on tourism development. An obvious proof of this fact is that during the last three decades the organisational structure of the tourism has been changed practically in every two years.

The calculation of convergence of different actors from point of view of different goals shows a considerable deviation. Analysing the Fig. it is obvious, that there are considerable differences between the goals of actors. There are extremely high differences in goals of the most influential actors, and under these conditions one can't expect any converging tendencies.

CONCLUSIONS

The MACTOR analysis has been proven a suitable method for the determination of socio-economic forces, shaping the tourism-landscape at Lake Balaton. The results highlight numerous contradictions. The most important of these are as follows:

1. The defence of interest of non-residents is an open – ended question, however – parallel with decreasing of industrial and agricultural activities in the region-their role will be increasing.
2. It would be essential to fortify the role of non-governmental organisations in the Balaton-region. These could play an important role in preservation and better utilisation of natural and cultural heritage of the region.
3. The most influential decision-making factor seems to be the political will of the central government, but this actor has not been able to formulate and carry over an adequate strategy for tourism. There are numerous examples of the uncertainty of the state regulation of the tourism:
   a. lack of a coherent tourism legislation;
   b. frequent re-organisation of the institutional structure of the governmental coordination of tourism;
   c. volatile economic environment for tourism-related service provider enterprises.
4. The county-level municipalities are not able to follow any long-term tourism-development strategy, supported by the majority of the county-assembly, because the majority of the population in these countries lives relatively far (more than 30 km) from the lake. That's why the focussing of the material sources for regional development is only a question of secondary importance, compared to another problems. In Hungarian popular press and politics the establishment of a "Balaton region" is an old problem, but – to be realistic – the re-organisation of the regional structure of Hungary seems to be problematic, and the "Balaton-region" by its size would be too small, compared by another regions (*Nemes*, 1997). At the same time, the organisation a Balaton-county

could be a reasonable way, based on socio-economic similarities of different settlements and the strong local identity.

5. The involvement of monetary resources for the development seems to be key factors, around which a wide-range coalition could be organised. This necessitates a well – defined strategy. The pillars of this strategy should be the as follows:
   a. Widening of the scope of offer of tourism; this means, that in a modern socio-economic environment the bathing and swimming in the lake fall short compared to the demands.
   b. Increasing the lengths of the season. This is an old and neuralgic problem of the tourism development in Hungary. The realisation of the ambitions highlights the tight cooperation of each and every stakeholder around the Lake.
   c. The Balaton, as a touristic destination should be re-positioned in mind of consumers not only as a Lake, offering the possibility of bathing, but as a complex of touristic attractions, joining to sustainable tourism.

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REFERENCES

Bágер, G., Pulay, G. (2008): Costs, justification and efficiency of Balaton Region-related studies in years after the system changing. (In Hung.) Budapest, Állami Számvevőszék, Fejlesztési és Módszertani Intézet, 150. p.

Bendahan, S., Camponovo, G., Pigneur, Y. (2004): Multi-issue actor analysis: Tools and models for assessing technology environments. In: Journal of Decision Systems, 13. 2. 223-253. p.

Berger, P., Luckmann L. (1966): The Social Construction of Reality. New York, Doubleday, 450. p.

Dacin, M. T., Goodstein, J. (2002): Institutional theory and institutional change: introduction to the special research forum. In: Academy of Management Journal, 45. 1. 45-47. p.

Durance, P., Godet, M. (2008): The future territorial. (In French) Paris, Lipsor-Le Cercle des Entrepreneurs du Futur, 254. p.

Eisenhardt, K. (1989): Agency theory: An assessment and review. In: Academy of Management Review, 14. 1. 57-74. p.

Godet, M. (1996): Actors' moves and strategies: The mactor method: An air transport case study. In: Futures, 23. 6. 605-622. p.

Godet, M. (2000): Toolbox for scenario planning. In: Glenn, J.C., Gordon, T.J. (Eds.) Futures research methodology-Version 3.0. Washington, UN-The Millennium Project.

Hannan, M.T., Freeman J.H. (1984): Structural inertia and organisational change. American Sociological Review, 49. 2. 149-164. p.

Hungarian Tourism Ltd. (2010): Tourism in Hungary. Budapest, Hungarian Tourism, 86. p.

Járosi, K. (2006): To go into an another world – tourists for adventure tourism in Hungary. In: Régió, 13. 3. 116-140. p.

Jenei, G. (2002): Modernizing local governance in a transitional nation: evaluation the Hungarian experience. In: Public Management Review, 43. 3. 367–386. p.

Mourato, S. (1998): Economic valuation in transition economies: an application of contingent valuation to Lake Balaton in Hungary. In: Acutt, M., Mason. P. (Eds.) Environmental valuation, economic policy, and sustainability, Oxford, Elgar, 15-34. p.

Nemes Nagy, J. (1997): Regions and regionalism. In: Educatio, 3. 4. 407-423. p.

Somogyi, S., Novković, N., Kajári, K. (2002): Methodology of the science (In Hung.) Keszthely, VE Georgikon Mezőgazdaságtudományi Kar, Gyakorlati, Szervezési, Vezetési Tanszék, 1–308. p.

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THE RELATIONSHIP BETWEEN GENERAL ECONOMIC CYCLE AND THE REAL ESTATE CYCLE

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ABSTRACT

The economic cycle is the natural fluctuation of the economy between periods of expansion (growth) and contraction (recession). Factors such as gross domestic product (GDP), interest rates, levels of employment and consumer spending can help to determine the current stage of the economic cycle. The recognition of the cycle's importance together with an increasing industry focus on real estate has caused investors and portfolio managers to place increased emphasis on the strategic and decision making implications of real estate cycle theory and analysis. Real estate business activity shows a very high correlation to the general economic events and cycles. Cycles are a major determinant of success or failure because of their pervasive and dynamic impacts on real estate returns, risks and investment value over time – impacts that should not be ignored or over-simplified. The real estate cycle is very similar to the general economic cycle, however it usually follows with about a year delay. The adage "timing is everything" is especially applicable to real estate development.
Keywords: business, cycle, economic, investment, real estate

INTRODUCTION

This paper demonstrates that the major economic cycle affects the real estate cycle and different types of real estate can have a different cyclicality. I had four objectives in this work. Firstly, to prove that there is a high correlation between the economical cycle and the real estate cycle. Secondly, to demonstrate empirically that different property types might have different cyclic behaviour. Thirdly, to illustrate that market agents could make mistakes in forecasting in where they only analyze trends from the past instead of utilizing market research data as well. Finally, the adage "timing is everything" is especially applicable to real estate development.

MATERIALS AND METHODS

In the first instance I investigated both the Hungarian and International macroeconomic and microeconomic literature relating to major economical cycles and real estate cycles, which I analyzed with reference to personal knowledge. Besides emphasizing the theoretical disciplines of the topic I collected market data from the different property management and property advisor companies regarding the real estate business and its submarkets. Where possible I used market data for a five year period. In addition to this I used extensive personal experience and knowledge – eight years in the property industry – to strengthen to my research.

RESULTS AND DISCUSSION

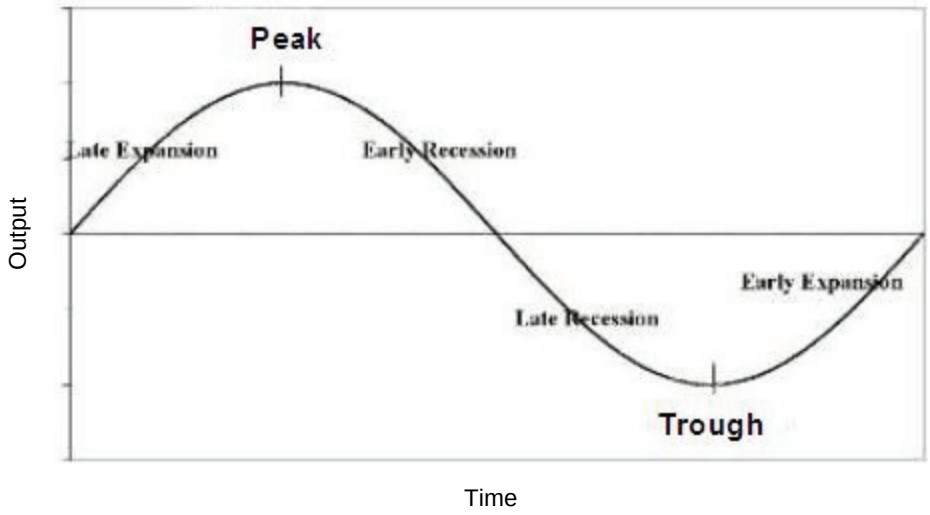
Major Economic Cycles

National output in the economy does not rise or fall at a uniform rate. Our economy experiences a regular trade or business cycle where the rate of growth of production, incomes and spending fluctuates over time. Statisticians calculate annual and quarterly movements in national output and these are then tracked to measure the cyclical movement of the economy. The concept of Economic Cycles, which are sometimes referred to as Business Cycles, is a theory that attempts to explain changes in economic activity that vary from a long term growth trend as observed in a developed market economy. Factors considered in defining an economic cycle include growth of GDP, household income, employment rates, etc. According to Samuelson-Nordhaus capitalism is basically the history of expansions and recessions (*Figure 1* and *Figure 2*). They argue that one of the main tasks of the macroeconomic is to explain economic cycles (*Molnár*, 1993).

According to *Bodie*, *Kane and Marcus* (2005, 630. p.) the economic cycle is the natural fluctuation of the economy between periods of expansion (growth) and contraction (recession). Factors such as gross domestic product (GDP), interest rates, levels of employment and consumer spending can help to determine the current stage of the economic cycle. An economy is deemed to be in the expansion stage of the economic cycle when gross domestic product (GDP) is rapidly increasing. When real output falls or when the growth of output is below its long run trend rate – then economic recession exists.

Figure 1

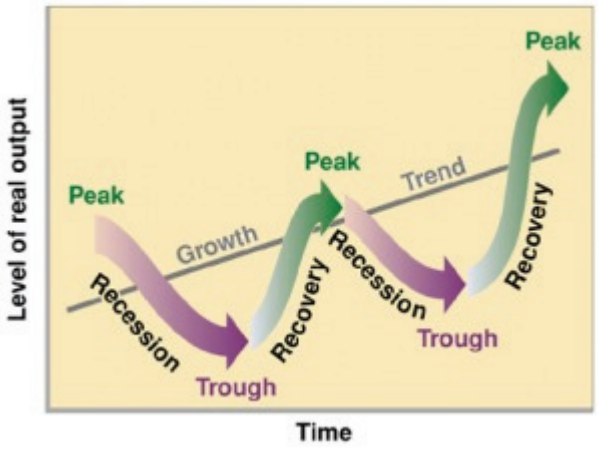
General Economic Cycle 1



Source: *Tracy*, 2006

Figure 2

General Economic Cycle 2



Source: *SMC Global Blog*, 2009

According to economic analysts the following are the main characteristics of an economic recession:

- Consumer prices fall back suddenly, stocks of cars and other non-perishable consumer goods increase rapidly, and there is a declining aggregate demand, results from businesses and enterprises reducing their output. Following on from this GDP begins to decrease and finally the net result is that volume of investments decrease as well.
- Demand for labour force fall, unemployment rises.
- As the output reduces, inflation slows down, demand for basic commodity and their prices fall (wages and service prices usually do not move down, but increase slower in recession).
- Business confidence and profits fall sharply, rate of exchange on stock market begin hedge-hopping earlier (*Samuelson and Nordhaus*, 2003, 423. p.).

Samuelson and Nordhaus (2003) and *Molnár* (1993) agree that sings of expansion are mirroring the process written above.

Real Estate Cycles

Real estate cycles have been a significant underlying reason for the financial successes and failures of real estate investments throughout history. Cycles are a major determinant of success or failure because of their pervasive and dynamic impacts on real estate returns, risks and investment value over time – impacts that should not be ignored or over-simplified. The Hungarian real estate business does not have as long a history as the USA's, but it is developing continuously. The recognition of the cycle's importance together with a growing industry focus on real estate has forced investors and portfolio managers to place increased emphasis on

the strategic and decision making implications of real estate cycle theory and analysis. However Wesley Mitchell established the theoretical foundation for and practical evidence of cyclical economic activity in the United States in 1927 and Homer Hoyt investigated the relationship between real estate finance and real estate investments disciplines in the 1930s. Despite its early importance in the general business and land economics literature, real estate cycles have been largely ignored or discounted by real estate academics and practitioners until recent years. While limited research studies are currently available on real estate cycles in a global decision-making context, researchers are focusing more attention on global cycle considerations because of increasing commitments by investors to real estate in other countries. Also, researchers and investors recognize that investment and portfolio returns and risks are increasingly being influenced by international economic events and flows of investment funds (*Pyhrr et al.*, 1999, 8. p.).

The Relevancy of Cycles (or Ignoring Cycles)

To provide a context for consideration of real estate cycles it is helpful to recognize that cycles in nature are everywhere and independent. Basically "a cycle is a sequence of events that repeat". Changes in the physical environment, in turn, affect human behaviour and economic activity. Human behaviour and economic activity affects supply and demand forces in the real estate markets, which in turn affect the financial performance of properties through changes in the rents, vacancy rates, operating and capital expenses and capitalization rates. There are two schools of thought on the question "Are real estate cycles relevant?" The "first school" argues that real estates cycles are not relevant and therefore can be ignored, the „second school" argues that real estate cycles are very relevant and should be carefully studied by analysts and investors (*Pyhrr et al.*, 1999, 9. p.).

Over the past thirty-five years of research on the subject, authors have recounted numerous reasons and arguments on the irrelevancy of the cycles. I support the „second school" but summarize below 16 reasons and arguments collected by Pyhrr-Roulac-Born as to why real estate cycles are not relevant or can be ignored (*Pyhrr et al.*, 1999, p. 10):

1. Little academic interest in cycles, not many academics are interested in research on real estate cycles, therefore, cycles must not be very relevant
2. Modern financial and portfolio theory does not explicitly address cycles, therefore, cycles must not be very relevant
3. Cycles cannot be measured
4. Economic forces are random in nature, thus cannot be forecasted of modelled
5. Real estate markets are efficient, knowledge about cycles cannot be used to increase the returns of a portfolio or reduce a risk
6. Diversification eliminates cycle effects
7. Long-hold approach eliminates cycle effects
8. Cycle strategy gains are offset by costs
9. Lack of evidence about economic cycle impacts, little is known about the effects of economic cycles on cash-flow variables – rents, vacancy rates, operating and capital expenses, capitalization rates

10. Cycle model specification is difficult
11. Inadequate data, adequate and accurate market data is not available
12. Lack of investor interest in cycles
13. Simplicity and lower cost of trend analysis
14. Tradition, traditional investors are slow to change their perception of the investment environment and investment evaluation techniques
15. "Go with the flow" investors just do what their peers in the industry do, mavericks are not generally acceptable in bureaucratic institutional environments
16. "No crystal ball", most portfolio models are based on historical data inputs. In contrast, cycle decision models require the analyst to input forecast data. (forecasting is a high-risk business)

Considering that the cycle activity is very important in the real estate business, I have summarized below the contribution of knowledge of the "second school".

Distinction between Macroeconomic and Microeconomic Literature

Macroeconomic cycle studies are defined here as those whose primary cycle focus or emphasis is at national, international or regional levels. The general business cycle, inflation cycles, currency cycles, population and employment cycles, and technology cycles are of cycles that are generally classified under the macroeconomic category. Demand cycles, supply cycles, occupancy cycles, long and short cycles at regional or national levels are also considerations in macroeconomic cycles.

Macroeconomic conclusions

Nikolai Kondratieff started to research the cycles in the national economy in the 1920s. He noticed that since the start of the industrial revolution capitalist economies experienced long waves of growth and contraction. These long waves became known later as the "Kondratieff Wave". They consist of a twenty-five to thirty-five year wave of increasing prosperity and living standards and are followed by a decade or more of depression and falling living standards, which makes a fairly regular forty-five to sixty year cycle period. Another early pioneer of long real estate cycle research was Roy Wenzlick who published one of the first real estate periodicals. He charted long cycles of housing transactions from 1795 through 1973 in USA level and concluded that the average length of the long cycle was eighteen and one-third years. This topic was investigated by Mitchell in 1927. Dauten and Valentine expanded on Mitchell's theoretical base and included macroeconomic theory to help explain economic cycles in 1974. In 1983 More updated Mitchell's work and included extensive theoretical and empirical treatise on business cycles and inflation in the national economy. More recently this question was searched by Chatterjee in 1999.

The relationship between the *national economy and real property* has been investigated by many researchers. In 1935 Burns compiled the first authoritative summary and analysis using the mass of economic data collected by government agencies and private parties concerning the long construction cycles. Grebler and Burns analyzed total construction, public construction, private construction and

residential property construction over the period from 1950 to 1978 and found six cycles in residential construction and four cycles in nonresidential construction in the U.S. They also found that peaks in GNP lead the peak in the construction cycle by about eleven months. They and later Brown also found that there is a high correlation between economic cycles and real estate performance. *Prichett* analyzed the impact of the national economy on cycles in investment grade real estate during the period from 1967 to 1982 to understand which key real estate cash-flow variables indicated the change in the cycle phase. He concluded following:

1.) Demand leads supply as the construction cycle rises to a peak but lags supply as the cycle falls to trough.
2.) The best indicator of the cycle phase is vacancy rate.

He found that usually vacancy rates reach high levels during the recession phase of the cycle, declining during the expansion phase, and then reaching a low point as the peak of the construction cycle is approached. Hekmann in 1985 then Kling and McCue in 1987 considered the influences that macroeconomic factors have on office construction. Down's work in 1993 concluded that differences in equilibrium vacancy rates in different markets are due to fundamental differences in market supply and demand conditions in those markets. He argues that, because some markets contain a higher proportion of rapidly growing firms, or are experiencing more rapid population growth, dynamic markets will have higher vacancy rates than static markets. He also validated the linkage between real estate cycles and general economic cycles. In 1993 *Roulac* argued his perspective view of a twenty-five year real estate business cycle. He evaluated real estate markets influenced by economy, office demand, office construction, property values, volume of transactions, capital for real estate, investor interest and tax climate factors (*Pyhrr et al.*, 1999).
Earlier real estate research evaluated market behaviour based on a homogenous national market. More recent analyses explore inter-market distinctions and linkages between macroeconomic variables and real estate market variables. These cases are related to *macro real estate cycles*. A number of studies found a direct linkage between office employment changes and both supply and demand variables and noted that supply responds more quickly than demand. Many studies carried out in the 1990s have all documented long-run cyclic movements in office rents, construction and vacancy that do not match the more frequent macro-economy fluctuations. In 1996 Clayton studied the Canadian property cycle and developed a time series vector autoregressive (VAR) model to study the linkages between economic or business cycles (measured by cycles in GDP growth) and real estate cycles (measured by cycles in aggregated total real estate returns for all property types), the effects of market cycles on pricing and property income and the implications for buy-and-sell decisions. The study results suggest that commercial property prices might be "forecastable" and major market movements (cycles) may be detectable in advance (*Pyhrr et al*., 1999).

In short all researchers agreed that economic factors are cyclical, cash flow variables (rents, vacancies, capitalization rates) are cyclical and real estate performance (rates of return) is cyclical at national and regional levels. However the arguments regarding the duration of the real estate cycle are different. As will be

seen, the usefulness of cycle modelling increase as we move from macro-to more micro-level analysis at the metropolitan area and property location levels.

Microeconomic Literature

In recent years, several research's have analyzed the effects of cyclical economic factors on real estate investment performance at the metropolitan area, submarket and property levels. Born in 1984 developed cycle theory which considered that inflation has a significant impact on real estate returns. Apgar in 1986 suggested using a strategic framework to avoid missing important economic factors. The suggested strategy included key factors relating to property type, entrepreneurial involvement, investment strategy, investment structure, target market and ultimately, target properties. Rodino one year later connected Agpar's strategic framework with market data and stressed that market research is the key to satisfactory analytical results. He also suggested that supply, demand, economic base and investor factors should be considered. Corgel and Gay evaluated the potential for regional investment diversification and found significant differences in the economic vitality of the thirty largest metropolitan areas in the U.S. in 1987. Mueller and Laposa investigated the cyclical movements of fifty-two office markets around the U.S. in 1994 and found that there were differences between markets and that by examining the duration, amplitude and timing of the market cycle. At the micro as well as macro level real estate literature supports the theory that real estate markets are cyclical, cash flow variables (e.g. rents, vacancies, capitalization rates) are cyclical and real estate values and returns, risks are cyclical (*Pyhrr et al.*, 1999).

As concluded, virtually every phenomenon in social affairs, political economy, business and real estate is cyclical in nature. However, most investors and analysts incorrectly view such phenomena as „trends", not cycles. Because of this most investors capitalize the present economic situation into perpetuity when forecasting the future, acting as if the current trends (whatever they are) will continue forever. As a result many investors do the wrong thing at the wrong time over the cycle, buying high (during the boom) and selling low (during the bust), following the "herd instinct" and doing what the crowd is doing. These investors are victims of their own experience.

Summarizing the above, there are some strategic implications of cycles by *Pyhrr, Roulac and Born* (1999) for investors and portfolio managers which should be followed to get the most out of the cycles and investment success:

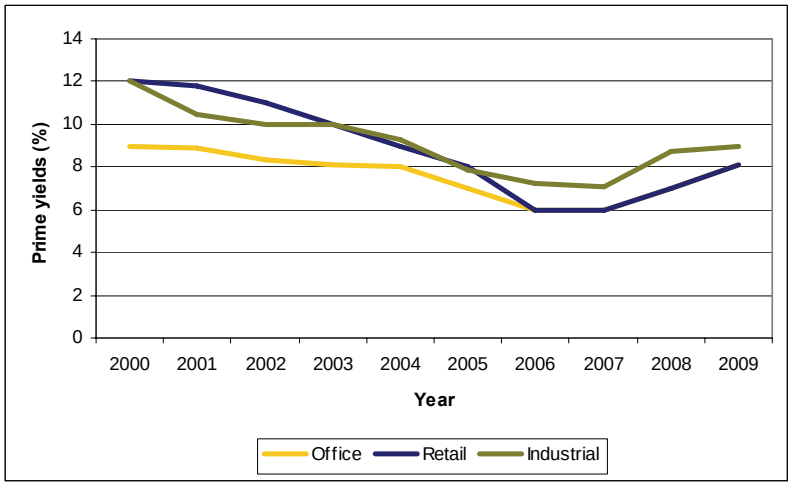
1.) The impact of cycles on real estate performance and wealth is dramatic.
2.) The basic strategy is to buy at the bottom of a cycle and sell at the top.
3.) Cycles affect an investor's acquisition and disposition strategies, and the optimal holding period of each investment.
4.) Depending on the cycle projections made, the investor will develop different optimal strategies for leverage, lease structures, capital expenditure plans and operating policies.
5.) Analyst must alter the nature and scope of their market research and types of data that needs to be collected and analyzed.
6.) Analysts must restructure their cash flow models used to evaluate projects and portfolios.

7.) Cycles affect the types of properties purchased and the countries, states, cities and submarkets where investments are made, diversification of the portfolio is useful.
8.) Investors must change their view of the world, move away from trends and herd mentality.

The above mentioned are true not only for the U.S. but also for Hungary and its real estate market. Hungary's real estate sector has a cyclical activity and shows differences between its submarkets (office, retail, industrial). *Figure 3* presents that yields on submarkets are not exactly the same, but there are similarities in their movement and shape.

Figure 3

Property Yields in Hungary between 2000-2009



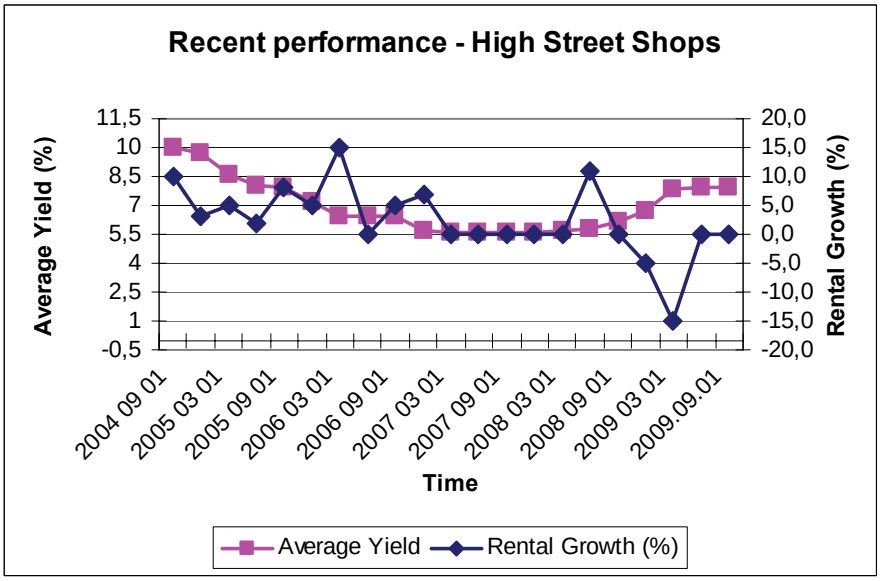
Source: *DTZ*, 2009

Figures 4, *5* and *6* confirm the theory mentioned earlier. They show the average yields and the rental growth for the past five years between 2004 and 2009. It is clearly visible that the rental growth on the submarkets moved on a wide scale in the studied period. Whilst the rents on high street (due to the actual financial crisis) showed a 15% reduction in the first half of 2008, office rents stared to move down only in 2009 and the drop was only 2-3%. However rent on the industrial real estate market reacted to the crisis at the same time as the retail submarket but the fallback was lower than there.

The next two figures (*Figure 7* and *Figure 8*) apply to Hungary and also support the theory. Vacancy rates regarding the two submarkets show a slight variation confirming the opinion of the economist and researchers – including myself – who argues that the different submarkets are affected by the same economical activities. In this work I do not deal in detail with regions or countries but there can be found many similarities and differences among them and their submarkets (*Figure 9*).

Figure 4

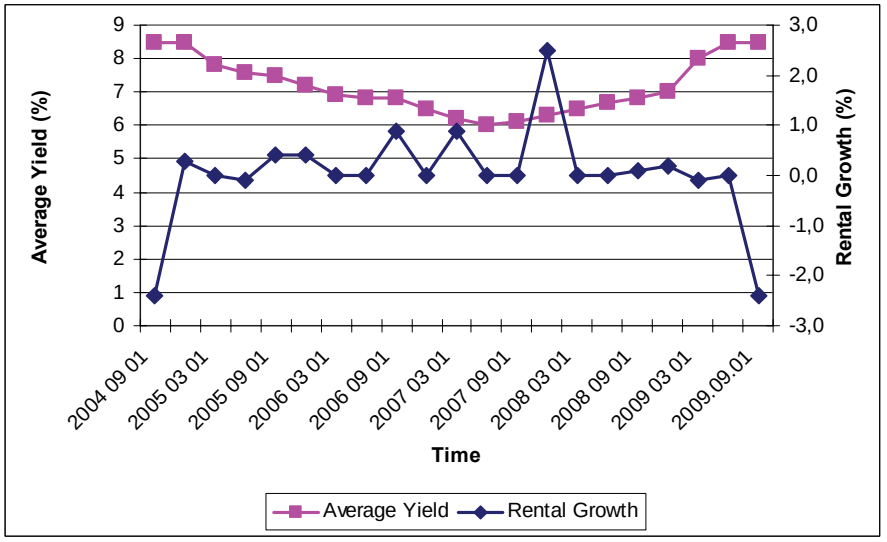
Recent Performance – high street shops between 2004-2009



Source: *Cushman and Wakefield*, 2009

Figure 5

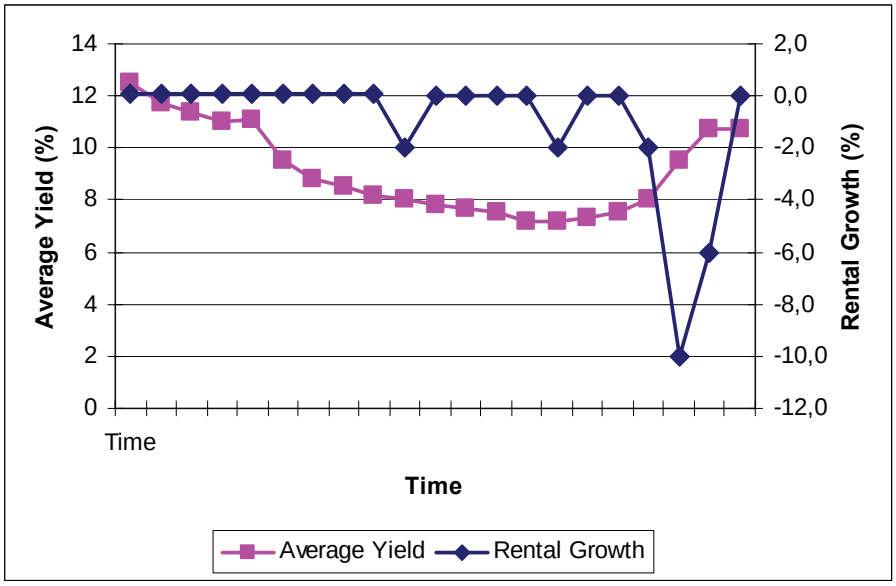
Recent performance – offices between 2004-2009



Source: *Cushman and Wakefield*, 2009

Figure 6

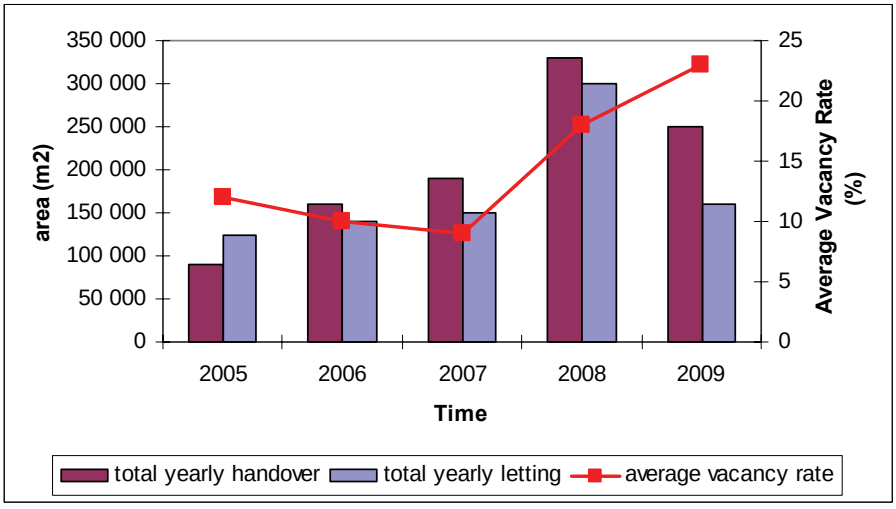
Recent performance – industrial properties between 2004-2009



Source: *Cushman and Wakefield*, 2009

Figure 7

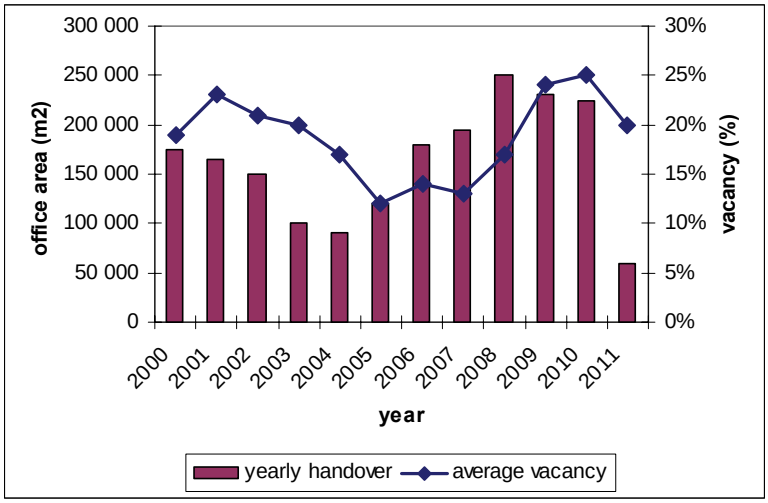
Industrial properties – Market Activity between 2005 - 2009



Source: *Eston*, 2010

Figure 8

Office Properties – Market Activity between 2005-2009



Source: *Eston*, 2010

Figure 9

Retail Market Rent and Yield Levels Europe 2009

	Rental Growth (yr to Sep 09)				Yield levels (Q3 2009)			
	Shopping Centers	Shop Units	Retail W/Houses	Trend	Shopping Centers	Shop Units	Retail W/Houses	Trend - All Sector
Austria	1,0	0,0	0,0	→	6,10	4,70	5,75	→
Belgium	0,3	-0,3	-2,3	→	5,50	5,25	6,50	→
Bulgaria	-11,1	-21,9	n/a	↘	10,50	9,00	n/a	↗
Czech Republic	-4,6	-7,2	-2,4	↘	7,00	7,00	8,25	↗
Denmark	-13,6	-5,9	-4,2	↘	6,00	5,00	7,25	↗
Finland	-7,6	-16,1	-10,5	↘	6,25	6,50	7,50	→
Frence	-10,2	0,0	-4,7	↘	5,50	5,00	7,25	→
Germany	0,0	2,1	0,0	→	5,40	4,20	7,60	→
Greece	-18,2	-19,4	18,2	↘	6,50	5,80	6,50	↗
Hungary	-21,2	-20,0	-5,6	↘	7,50	7,75	8,50	↗
Ireland	-12,8	-20,4	-37,1	↓	7,50	6,30	7,50	↑
Italy	-5,7	-2,6	-13,0	↘	6,50	5,00	6,75	→
Luxembourg	n/a	0,0	n/a	→	n/a	5,75	n/a	→
Netherlands	-2,0	-2,0	-8,8	↘	7,00	5,25	7,75	→
Norway	0,0	-13,8	0,0	↘	6,50	6,00	8,75	→
Poland	-16,4	-3,9	-2,9	↘	7,75	9,50	8,50	↘
Portugal	-1,7	-1,0	-12,5	→	6,50	6,75	7,75	→
Romania	-33,3	-42,7	0,0	↘	9,00	9,25	9,00	↗
Russia	-29,2	-33,0	-21,4	↘	13,00	n/a	14,00	→
Slovakia	0,0	-37,5	-3,1	↘	7,75	7,75	8,50	↗
Spain	0,0	-0,9	0,0	→	6,25	5,50	7,50	→
Sweden	-1,7	-6,3	-5,6	↘	5,75	5,75	6,50	→
Switzerland	-7,9	0,0	0,0	→	5,50	4,50	5,25	→
Turkey	-21,8	-17,9	-32,3	↘	9,50	8,75	10,50	→
Ukraine	-39,4	-40,5	n/a	↓	14,00	17,00	n/a	↗
UK	-6,4	-9,8	-29,5	↘	6,75	5,00	5,75	↓

Source: *Cushman and Wakefield*, 2009

The relationship between general business cycles and the real estate cycle

Recently it has became popular to invest in the real estate business. According to András Szalay land is in short supply. This could mean that land prices will continuously increase over time and the value of the property will continue to increase. However this is not true since we already know that reality works cyclical. Real estate business activity shows a very high correlation to the general economic events and cycles. The real estate cycle is very similar to the general economic cycle, however usually follows that by about a year later (*Soós*, 2005, 223. p.).

Phases and Characteristic of the Real Estate Cycle

Szalay's and Mueller's explanations' for the real estate cycle are the same and following:

There are four phases (*Figure 10*):

1. Recovery
2. Expansion
3. Hypersupply
4. Recession

Phase I: Recovery at the bottom of a cycle, the marketplace is in a state of oversupply from previous new construction or negative demand growth. At this bottom point occupancy is at its trough. As excess space is absorbed, vacancy rates fall and rental rates stabilize and even begin to increase. Eventually, the market reaches its long-term occupancy average where rental growth is equal to inflation.

Phase II: Expansion, demand growth countries at increasing levels, creating a need for additional space. As vacancy rates fall, rents begin to rise rapidly, pushing rents to cost-feasible levels. At this stage, demand is still rising faster than supply, and there is a lag in the provision of new space. Demand and supply are in equilibrium at the peak occupancy point of the cycle.

Phase III: Hypersupply commences after peak/ equilibrium point when supply is growing faster than demand. When more space is delivered than demanded, rental growth slows and eventually construction slows or stops. Once the long-term occupancy average passed, the market falls into Phase IV.

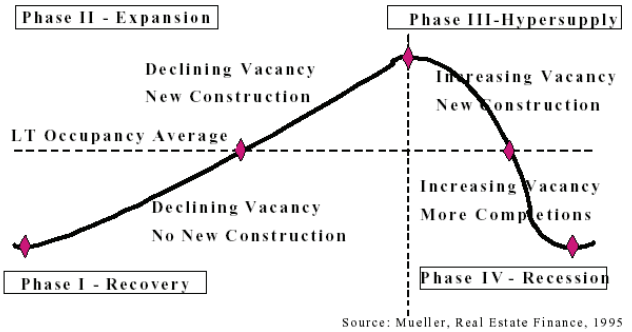
Phase IV: Recession begins as the market moves past the long-term occupancy average with high supply growth and low or negative demand growth. The extent of the down cycle is determined by the difference between supply growth and demand growth. The cycle eventually reaches bottom as new construction and completions slow or as demand begins to grow faster than new supply added to the marketplace (*Soós*, 2005; *Peiser and Frej*, 2003).

András Szalay and Glenn Mueller explain economic cyclicality in the following way. Hypersupply always leads to recession. A recovery occurs when real national output picks up from the trough reached at the low point of the recession. The pace of recovery depends in part on how quickly aggregate demand starts to rise after the economic downturn. In boom conditions, output and employment are both expanding and the level of aggregate demand for goods and services is very high. Typically, businesses use the opportunity of a boom to raise output and also widen

their profit margins. A slowdown occurs when the rate of growth decelerates – but national output is still rising. If the economy continues to grow (albeit at a slower rate) without falling into outright recession, this is known as a soft-landing. A recession means a fall in the level of real national output (i.e. a period when the rate of economic growth is negative). National output declines are leading to a contraction in employment, incomes and profits. When real GDP reaches a low point at the end of the recession, the economy has reached the trough - economic recovery is imminent (*Soós*, 2005).

Figure 10

The Real Estate Cycle



Source: *Peiser and Frej*, 2003

The adage "timing is everything" is especially applicable to real estate development. The importance of real estate cycles cannot be overemphasized according to *Preiser and Frej* (2003). Like other large, capital-intensive purchases, real estate is highly sensitive to changes in interest rates. Income or commercial properties (office, industrial, retail space and apartments) provide insufficient cash flow to be financed when interest rates move above certain levels. When rates are high, buyers tend to wait for them to come back down before buying a property. The development industry is further affected by high interest rates because development firms typically are smaller than most corporate bank customers. When money is scare, lenders tend to prefer their non-real estate customers. Even very sound projects can be difficult to finance because lenders fear the unknown development risk. The supply as well the demand side moves up and down. Lenders often appear to exhibit a herd mentality, all seeming to prefer the same type of product or geographic area at the same time. In Dallas, for example, during the boom in the early 1980s when money was plentiful for office buildings, some lenders began to fear that the market was being overbuilt, and money was shifted from office buildings to retail centers. From 1983 to 1986 almost every shopping center in Dallas that was older that 15 years was renovated. But as suddenly the money was turned on, it was turned off, as lenders across the country shared their concerns about the Dallas retail market. Selecting the right time to enter development is

crucial. A project launched early in the positive cycle means less competition for the developer. During the early stage of the development cycle, land is cheaper, terms are softer, and there is less market risk.

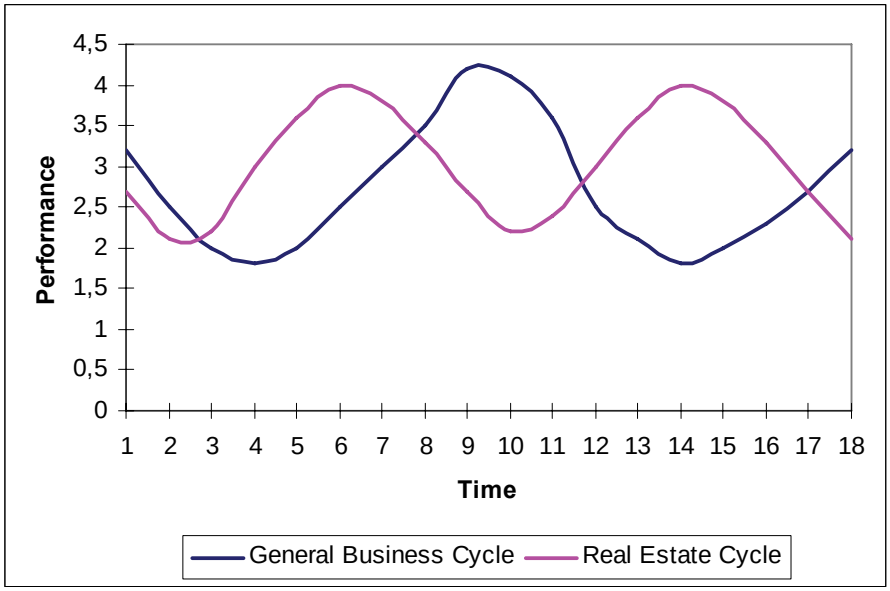
The "Real Estate Cycle Metology" report of Price Waterhouse Coopers in 1999 summarized the six key factors which determinate six phases:

1. Demand
2. Supply
3. Vacancy rate
4. Rental growth
5. Capitalization rate
6. Investors profit

Many economists consider commercial real estate cycles to be a mirror reflection of the economy. András Szalay and Glenn Mueller agree that commercial real estate is a cyclical industry because its demand side affected by economic cycles and supply historically lags demand. They both found that peaks in general business cycles are followed by peaks in real estate cycles with about a year delay. *Figure 11* shows this tendency. It follows that the real estate business is calm. The real estate business responds slowly to the general economic effects since it is a long-term investment. This characteristic of the property business makes it able to lengthen the "new construction" or welfare period, but the recession throws it back more than the other sectors (*Mueller*, 2006).

Figure 11

Relationship between the General Business Cycle and the Real Estate Cycle



The question of the real estate "bubble" keeps the researchers mind both in Hungary and worldwide occupied. There are bubbles in the economy, these are classes of assets whose prices inflate like air in an expanding balloon and then collapse. The basic case is usually land speculation. During an economic boom, at first the growing demand for real estate is met by reducing vacancies. But then new real estate is constructed and rent and land values rise. Speculators notice this and buy land expecting to sell at higher prices later. This speculative demand, added to the demand for use, carries land prices so high that investments in enterprise become unprofitable. Land becomes priced for expected future uses, rather than present-day uses. Very simple, market players don't consider that trends do not last forever. When the bubble busts, it is very dangerous since it affects financial markets directly (*Soós*, 2005).

Are general business and real estate cycles avoidable?

According to *Samuelson and Nordhaus* (2003, 431. p.)view the development of macroeconomic showed the governments what they can do to avoid recession and keep from financial crises.

However I really appreciate Samuelson and Nordhaus view and work, I answer this question with a citation of Arthur M. Okun's "The Political Economy of Prosperity":

> *„Recently it is recognized, that recessions are generally avertable alike as air catastrophes, but unlike as hurricanes. However we did not manage completely to get rid of airplane accidents and is not clear yet, whether we have the wisdom or ability to eliminate recessions. Danger is still there. The forces which generate recessions again and again are waiting behind the scenes and are just waiting for the keyword."* (*Samuelson and Nordhaus*, 2003, 431. p.)

CONCLUSIONS

Real estate cycles have a significant impact on the financial success and failures of real estate investments because their pervasive and dynamic impacts on real estate returns, risks and investment values. Because of this recognition, investors and portfolio managers in the future should place increased emphasis on the identification, analysis and decision-making implications of real estate cycles. It is proved that there is a high correlation between the economical cycle and the real estate cycle. The work demonstrates that different property types might have different cyclic behavior. It also shows that timing is very important to real estate development.

REFERENCES

Bodie, Z., Kane, A., Marcus, A.J. (2005): Investments. (In Hung.) Budapest : Aula, 619-654. p.

Cushman & Wakefield (2009): European Retail Report. December 2009

Cushman & Wakefield (2009): Industrial Marketbeat Snapshot. Q3 2009

DTZ (2009): Property Times Hungary. Q4 2009 (2010.02.15)

Eston (2010): Market Report. 2010. 1.
Gaál, Cs. (2006): Real Estate Bubbles. (In Hung.) In: Világgazdaság, 2006.09.05. [online] URL: http://www.vg.hu/index.php?apps=cikk&cikk=139497 [07.03.2010.]
Molnár, J. (Ed., 1993): Economics. (In Hung.) Budapest, Mezőgazdasági Szaktudás, 117-122. p.
Mueller, G. R. (2006): Testimony of Glenn R. Mueler, Before the Subcommittee on Financial Institutions and Consumer Credit of the Committee on Financial Services United States House of Representatives: Real Estate Space Market Cycles. 24. p.
Peiser, R.B., Frej A.B. (2003): Professional Real Estate Development. Washington D.C., ULI-the Urban Land Institute, Managing the Development Process, 13-25. p.
Price Waterhouse Coopers (1999): Emerging Trends in Real Estate. Special Report, Real Estate Cycle Metology, 23-24. p.
Pyhrr, S.A., Roulac, S.E., Born, W.L. (1999): Real Estate Cycles and Their Strategic Implications for Investors and Portfolio managers in the Global Economy. In: Journal of Real Estate Research, 18. 1. 7-68. p.
Samuelson, P.A., Nordhaus, W.D. (2003): .Economics. (In Hung.) Budapest : KJK–KERSZÖV, 421-450. p.
SMC Global Blog (2009): Industry Life Cycle. [online] <URL: http://smcinvestment.files.wordpress.com/2009/07/business-cycle-graph-better1.jpg?w=300&h=226> [27.06.2010.]
Soós, J. (Ed., 2005): Real Estate Economics. (In Hung.) Budapest : KJK-KERSZÖV, 221-258 p.
Tracy, T. (2006): Commodities: A New Addition to Client Portfolios. In: Wealth Management Commentary 13. 1. [online] <URL: http://www.aspiriant.com/library/insight/06q1/images/Business%20Cycle%20Graph%20for%20TGT%27s%20article.jpg> [27.06.2010.]

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TO EXPAND A NETWORK, OR NEITHER – THIS HERE THE QUESTION

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ABSTRACT

In the past six years banks in Hungary had branch opening fever. Due to this fever and the series of bank fusions remedial process started at Hungary's "under-banked" territories and the current structure of the country's banking market has been developed (5-6 strong universal banks, 10-12 medium-sized banks). Fierce competition has been taken place among the banks to get customers and to conquer the market. The competition implies a serious struggle that banks try to overcome on one hand by branch expansion and by efficiency improvement on the other. Competition constitutes considerable challenges for financial institutions even in normal cases, not to mention a global financial and economic crisis that has been lasting for almost 3 years.
Keywords: bank, crisis, bank branch, branch opening

INTRODUCTION

Basically, the primary goal of a bank is to satisfy customers' needs as widely as possible, that inspires banks to constantly grow their organizations which manifests mainly in branch openings in the best available places and to get their products to the customers through other easily accessible sales channels. However, the current global financial and economic crisis makes banks even more cautious and uncertain. For us outsiders it might seem that so far the crisis had a minor effect on banks in Hungary as we daily encounter advertisements of banking products that confirm banks' organizational growth. But this is not reality. The branch opening process is preceded by prolonged planning and preparatory works. It is understandable that since the processes have already been at implementation phase when the crisis reached Hungary and because of only temporary turnover reduction banks would give up their network expansion conceptions only after serious consideration.

MATERIALS AND METHOD

The first and the second part of the paper are based mainly on literary works. In the third part it shows how the number of the main banks' branches changed with the method of comparative analysis and exact numbers.

Formation of the Bank Definition – Hungarian Versus English Example

If we wanted to determine the definition of the bank we should search for it extensively in the works of the last period. A nearly 50 year-old book titled

Banküzemtan written by *Szász* gives an interesting starting point. In this work the author defines the notion of the bank as follows: "We think a bank is a plant who professionally use and provide loans on its own account and whose special economic organization makes it able to make money" (*Szász*, 1947, 3. p.). The definition is not accurate enough anymore to describe the roles of today's banks but the fact is that in the last years Hungarian economists did not really bother with determining the definition of the bank, most of them used the expressions of bank and financial institution or banking and financial institutional activities as synonyms. If they still separated them economists followed that general principle that says bank is that which is able to money creation, financial institution is that which is not. Namely, banks keep current accounts for customers, from whom prompt transfer can be accomplished; financial institutions in contrast do not keep this kind of accounts. The unambiguous definition for the activity of banks and financial institutions was created only when the Financial Institutions Act of 1991 entered into force. This Act was the first to define financial institutional activity on the basis of which different financial institutions were defined. Understanding financial institutional activities (deposit collection, lending, keeping of accounts, borrowing, etc.) we can see that the banks' activity of dealing with money intermediation has an impact on every level of the society as there is no such company or household that would not have a connection to any bank.

Similarly that of England where there was no unified bank definition until the approval of the Banking Law of 1979 practically those financial institutions were considered as banks that were under the control of the Bank of England. However, the English Banking Law of 1979 neither defined banks exactly, but it rather drafted criteria of working capital cost and that the Bank of England should recognize financial institutions (whatever was written in the course books, a bank was considered a bank if it was recognized by the Bank of England).

In 1987 another Banking Law was entered into force according to which banks had to acquire the permission of the Bank of England to pursue its activities. This Law laid down the exact definition of the banks as those were considered banks that provided banking functions (e.g. payment transactions, deposit collection, granting overdrafts and other credits, currency and foreign exchange operations).

As the financial system developed, banks started to provide additional and more diverse functions. The above-mentioned traditional banking functions, in addition to the modern banking has become increasingly more widespread, and now there are other non-banking services provided to their customers (such as leasing, factoring, asset management, investment funds, etc.) (*Ligeti*, 2003).

Efficiency Measurement of Banks as Financial Institution

Definitions above do not mention organizations by chance as banks are established consciously by people where colleagues work to achieve a common aim (profit, gains). This certain aim is intended to be achieved together thus all the work in the organization is regulated for this purpose and tasks are shared in accordance with it. In these tracking systems efficiency and effectiveness are very important i.e. how

efficient the organization is in reaching its aim and how effectively it is able to mobilize its recourses for this purpose (*Jávor*, 1993).

We have to decide what efficiency definition is to be used in connection with measuring efficiency. Basically, we can use three economic efficiency notions: cost efficiency, profit efficiency and the so-called alternative profit efficiency.

Cost efficiency

Cost efficiency qualifies the use of the available resources, i.e. it shows how near the costs of a given bank are to the optimum cost level in the course of producing output under certain conditions.

Profit efficiency

The standard or in other words the profit efficiency measures how near the gains of a given bank are to the profit maximum available under given input and output prices.

Alternative profit efficiency

Alternative profit efficiency shows how near the profit of a given bank is to the maximum if instead of the price the level of the output is given.

Reasons for different efficiencies

The banks' varying efficiencies can have many reasons. It can arise from the difference in their sizes, their variant scope of business, management defaults or we can mention many other factors independent of the management. However, efficiency can be improved by the development of information technology or by branch expansion for instance.

Changes in the banking sector by the development of information technology can significantly alter the structure of the retail banking market. One of such technologies is the ATM (*Automatic Teller Machine*) – commonly known as the bank machine, that gradually replace the traditional bank branches regarding money withdrawal, payment and account balance checking. About one third of the ATM's are installed outside branches. Besides ATMs the number of *EFTPOS* (*Electronic Funds Transfers at the Point of Sale*) terminals has been rapidly increasing, the use of credit and debit cards is more and more common and Home banking i.e. internet and computer based banking services has also started to develop significantly. These new sales channels result in cost reduction for the banks as customers use the bank system for the banking services with their own previously purchased devices. Through applying information technologies banks' turnover has undergone remarkable changes (*Kondrát*, 1998).

Structure of the Domestic Bank Market

Presumably this also contributed to the changes in the activities of our financial institutions which took place prior to Hungary's accession to the European Union on 1st May 2004. Foreign-owned banks entering the market after the EU accession gradually take control of the existing banks and as a result the structure of the market is rearranged and the exposure as well as the dependence to international

competition intensifies. In the last few years similarly to Western Europe a number of bank fusions took place (ABN-Amro and K&H; BACA and Hypobank; Postabank and Erste Bank; MKB and Konzumbank; CIB and Inter-Európa Bank) which resulted in the commencement of Hungary's "under-banked" territories' remediation. The market structure change calls forth *5-6 strong universal[1] banks leading the Hungarian market, while the number of middle-sized banks stabilise at 10-12.* Large commercial banks are in constant competition for getting new customers and to conquer the market though the fight for possessing the places behind the market leader in domestic retail banking (OTP Bank Plc.) is also considerable.

Rivalry among banks can in point of fact be considered as a sort of competitive environment which is quite similar to the method delineated in Michael Porter's book titled Competitive Strategy (*Faulkner and Bowman*, 1999). Although Porter put forth his method to analyse the structure of an industry or a market segment but in a wider sense banks also operate in such competitive environment. Advertisements, special lending actions, advertising campaigns – just to mention a few – are all factors that indicate the intensity of competitive behaviour.

Trends in the number of branches 2004-2010

Due to this fact, the majority of the financial institutions of Hungary have been in branch opening fever over the last six years. In the gradation of branch number (based on the actual data of 2008) OTP bank is the leader, K&H bank operates the second largest network, Erste bank is the third, Raiffeisen is the fourth and CIB is the fifth. This sequence is expected to remain unchanged in the next few years as OTP bank owning the largest branch network is still going to possess at least twice as much branch than K&H bank. However, banks running behind OTP intend to catch up on the retail banking market by dynamic branch expansion (*Table 1*).

Commercial banks' branch opening fever was not typical only to Hungary or in countries of Eastern Europe; for instance, the number of branches in the United Sates of America has increased in spite of the widespread internet usage as half of the transactions and about three-quarters of sales still take place in branches which indicates that people prefer going to branches to advanced technologies.

Grouping of banks by their branch networks

Hungarian financial institutions can be divided into three groups according to their branch networks – earlier said by *Király*, vice-president of National Bank of Hungary. In her opinion the first group involves the largest branch network operator OTP bank that inherited a remarkable nationwide network from the

[1] Universal banks provide diverse financial services for customers; they operate more economically than other financial institutions due to their diversified activities, extent and diversification of their operations. Some authors say their activities beyond the traditional trade activities, the brokerage, the (short term) lending, the transaction of payments traffic. While others engage in operations as securities, and securities guaranteed issue. And in addition, there are those that consider non-financial companies holding shares in, or trading with derivatives and insurance, also includes the concept of universality (*Ligeti*, 2003). Simply that means investment bankings.

period before the change of regime. The second group involves those financial institutions that were formed by the merger of several financial institutions and their branch networks, e.g. Erste and K&H bank. All other banks belong to the third group. The expert says that the sequence will not change for long but any rearrangement might happen within the groups.

Table 1

Branch number of major banks at year ends

Bank	Years						
	2004	2005	2006	2007	2008	2009	2010
	actual	actual	actual	actual	actual	actual*	actual*
Allianz Bank***	0	0	5	17	41	60	80
Budapest Bank***	58	75	92	110	106	115	115
CIB Bank	58	77	98	105	150	165	180
Citibank***	23	23	23	23	26	23	23
Erste Bank	139	160	182	196	204	211	216
Inter-Európa Bank**	30	32	36	35	0	0	0
K&H Bank****	153	158	168	203	260	318	318
MKB Bank	50	52	67	74	81	97	107
OTP Bank****	427	408	408	409	403	420	420
Raiffeisen Bank	72	98	120	135	162	181	200
UniCredit Bank	38	51	74	81	127	122	122
Volksbank	27	30	39	46	70	76	91
Total:	1075	1164	1312	1434	1630	1788	1872

Source: *Financial institutions*

** As data of 2009 have not been published yet these are forecasts of the banks' unofficial perspectives; ** Inter-Európa Bank merged with CIB bank in 2007; *** Bank did not provide forecast for 2009 and 2010; **** Bank did not provide forecast for 2010*

Network developments, changes

More frequently can we hear news about branch openings / branch expansions / branch refurbishments and increasing number of branches and bank machines (ATM) are set up in the cities in the vicinity of our homes. This all suggest the end of the branch opening processes which were preceded by a prolonged planning and implementation phase.

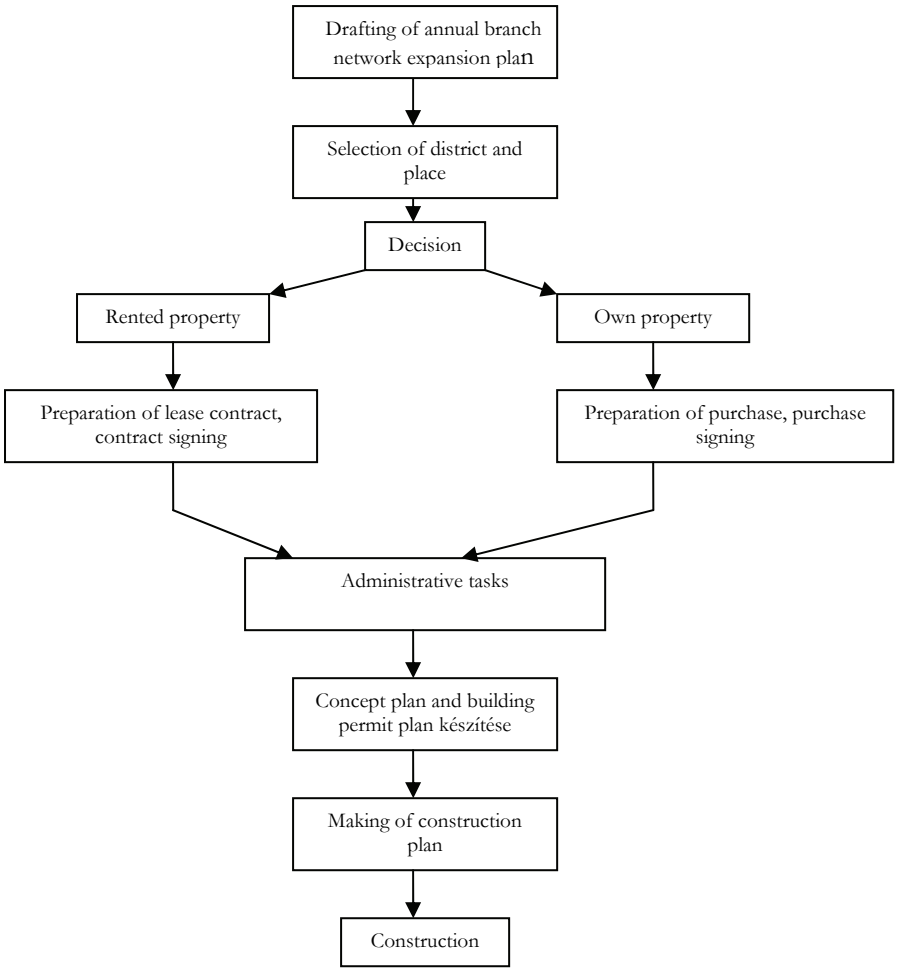
The process of branch opening

Opening a branch takes almost one year and it is usually implemented through a project work and it starts with the drafting of the annual branch network expansion plan. This is followed by the selection of the district or place where the branch is to be established. Then the commercial bank should decide whether it would like to rent or perhaps own the place. If it is rented the bank and the owner of the place

have to enter into a lease contract, otherwise the bank needs to manage the preparation of the purchase and the related procedures. After the contract signing concept plans and a building permit plan should be prepared. When these are approved construction plans are drafted then the construction works begin. In the last phase of the construction work (but before the handover of the branch) the branch's devices, equipments and cash supply have to be ensured. After the handover date the related marketing activity starts and the necessary notifications for the authorities proceed (*Figure 1*).

Figure 1

The process of branch opening



(*Note*: "Construction" likely indicates new building, buying or leasing there is not need for this.)

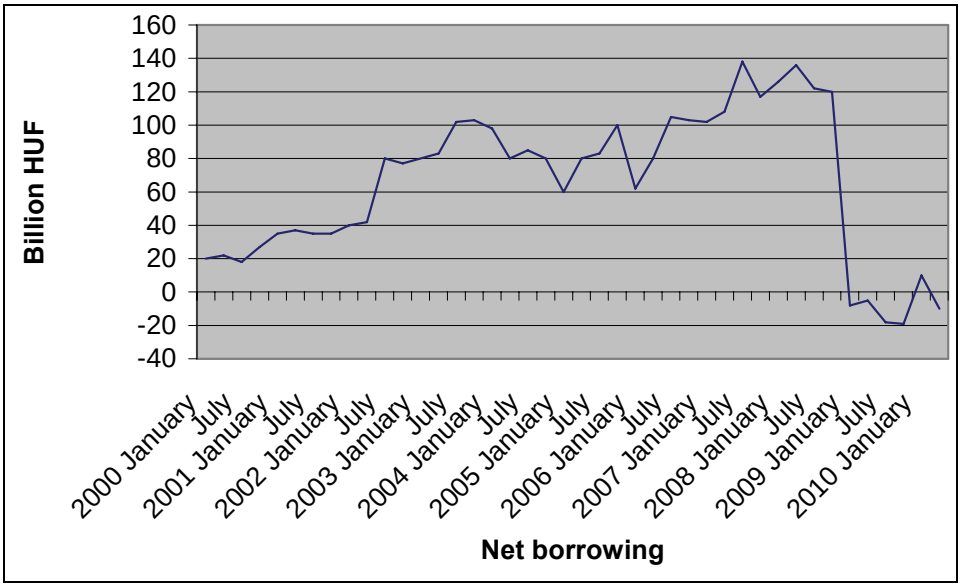
Perhaps the most difficult point of the process is to select the appropriate district, zone and the exact place. It matters heavily whether the selected area is settled by competitors or it is a so-called "virgin" territory that the bank would like to introduce to the public. A good decision based selection can help the bank to satisfy the customers' needs the widest possible and at the same time the bank might reduce its arrears in the retail sector too.

CONCLUSIONS

Branch opening fever seemed unstoppable until the burst of the crisis. From July 2008 the borrowing capacity of the retail segment significantly reduced (*Figure 2*); however, until then customer needs of the retail sector and the sharp increase in demand for housing loan inspired financial institutions to open branches.

Figure 2

Net borrowing of household sector



Source: Based on *MNB* data, 2010

As a consequence the majority of the financial institutions supported qualitative expansion so that they planned their branch openings at the busiest points of the city or its region. For this reason new branch openings were preferred primarily in Budapest and in the richer surroundings as well as in the county seats. Bank experts say the Hungarian market was not that saturated as the Western European ones or the American was that is why there were places for establishing new branches.

However, the international financial and economic crisis made banks even more cautious and uncertain. Some of them have already modified their conceptions

concerning branch opening, others probably reconsider their expansion strategy nowadays.

But how can more and more branches open while employees are dismissed because of the crisis? Well, banks lay out their branch opening plans and timings years in advance that might be slowed down by the crisis but it does not stop completely. Even in the time of the crisis banks continuously search for potentials where such a bank can be opened that returns the invested capital in a longer term. Series of negotiations that began months before could by now result in the commencement of the opening process, thus none of the banks will retreat due to the temporarily decreased turnover caused by the crisis and they will give up their conception of network expansion only after serious consideration.

Overall, mass branch closing is not typical, moreover the number of branches in 2009 somewhat even increased despite the fact that almost 2000 jobs were terminated due to the crisis. It is rather the transformation and the appreciation of branches that can be felt as customers use electronic channels for routine banking transactions more often and branches specialize at financial advisory and/or selling new types of products. Although the number of clients who complete transactions in the branches decrease due to the users of electronic channels they are replaced by those who are interested in new products thus a more complete and national coverage of branch network is essential to be able to serve interested customers at an appropriate level. Regarding the desirable network size the number of "hundred" is considered the magic border on the basis of information supplied by banks.

REFERENCES

Anonym (2006): More dynamically install ATM-et the banks, than drawer. (In Hung.) [online] <URL: http://www.sg.hu/cikkek/49032/dinamikusabban_telepitenek_atm_et_a_bankok_mint_fiokot> [06.12.2006]

Anonym (2006): Banks in competition of branch installation. (In Hung.) [online] <URL: http://www.origo.hu/archivum/20060713fioknyitasi.html> [19.05.2007]

Faulkner, D., Bowman, C. (Eds., 1999): Competitive Strategy. (In Hung.) Budapest : Panem, 48-64. p.

Jávor, I. (Ed.) (1993): The mental systems of the organization sociology. (In Hung.) Budapest : Nemzeti Tankönyvkiadó.

Kondrát, Zs. (1998): The increase of the bank efficiency. (In Hung.) In: Bankvilág, 1. 11-32. p.

Ligeti, S. (Ed., 2003): Studies of bank operation. (In Hung.) Budapest : Tanszék Pénzügyi Tanácsadó és Szolgáltató Kft., 20-41. p.

Szász, A. (1947): Studies of bank operation. (In Hung.) Budapest : TÉBE. 3. p.

Várhegyi, É. (2002): Banking world in Hungary. (In Hung.) Budapest : Helikon.

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COOPERATION – A SPECIAL SURVIVAL STRATEGY FOR ECONOMIC ORGANIZATIONS IN THE BIOTECH-PHARMACEUTICAL INDUSTRY

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ABSTRACT

Medical biotechnology is used by two main types of companies. First, large companies, such as large pharmaceutical companies ("big pharma"), which draw on a long history in the given field and develop into more and more innovative biotechnology users. Second, modern biotechnological companies, from which the above mentioned large companies purchase knowledge, projects or services. In terms of developing and spreading technology, small biotech companies often play an important mediating role between science and industry. They provide technology-platforms, knowledge, services for larger companies, such as international pharmaceutical companies or enterprises in the food processing industry. The volume and complexity of biotech and pharmaceutical projects grew in relation to the amount of available information and acquired knowledge. This placed further emphasis on cooperations, and sharing of costs and risk. Due to the risk associated with biotechnology, the complexity of and adherence to rules and the amount of funds, companies were forced to cooperate. First, the necessary monetary tools are available only at the largest companies. Second, the necessary competencies are often missing, because no matter whether a smaller company is market leader in R+D, when it still does not have the necessary experience for production, not even the knowledge for clinical testing. As a consequence, cooperation is necessary to fill these gaps.
Keywords: red biotech, high uncertainty, biopharma strategies, cooperation)

INTRODUCTION

Biotechnology, just like other new and dynamically growing branches of industry, is undergoing very rapid changes. This is a very high risk – high benefit industry, and R+D phases often require several hundred millions of dollars. Participants seek to minimize and share uncertainties and risks. A possible solution for this is to promote cooperations. Thus, on one hand, biotech companies with specific knowledge become importers of knowledge for big pharmaceutical companies, while on the other hand, they receive share of the great companies' profit. Unique features and advantages of these cooperations may prevail, which can lead to further specifications.

THE WAY BIOTECH AND PHARMACEUTICAL COMPANIES DEPEND ON EACH OTHER

Medical biotechnology is used by two main types of companies. First, large companies, such as large pharmaceutical companies ("big pharma"), which draw on a long history in the given field and develop into more and more innovative biotechnology users. Second, modern biotechnological companies, from which the above mentioned large companies purchase knowledge, projects or services.

As for revenue and the number of employees, it is mainly the large companies that control the biotechnology industry. This, however, does not lead to strict adherence to traditions and the conservation of power relations. As a matter of fact, in terms of knowledge and the number of innovative projects, the mass of small biotech companies has the advantage.

In terms of developing and spreading technology, small biotech companies often play an important mediating role between science and industry. They provide technology-platforms, knowledge, services for larger companies, such as international pharmaceutical companies or enterprises in the food processing industry. Their products can be potential pharmaceuticals, new targets, diagnostic kits, or simply specific knowledge. Biotech companies use their networks to mediate knowledge between the scientific sphere and their own customers. These networks endeavour to find cutting edge research opportunities which are fit for commercial use.

Many biotech companies were founded in the 70s and 80s. They sought to become completely vertical companies, encompassing everything from R+D to production and sales. They focused their strategies on developing pharmaceuticals for previously non-curable or hard curable, but relatively common diseases. Examples for them are Genentech and Amgen, which were successful enough to become independent, that is, to encompass all the fields from research to sales. These companies brought new trends in their innovation strategies. Previously they used only closed innovation. The previously stated companies took to cooperating and used different business models. Accordingly, they developed a different organizational structure and a different organizational culture. These changed their position and behaviour towards their competitors. They marketed (sold, licensed) some protected technologies, which they themselves had developed, this way they helped their competitors to a certain extent, but helped their own markets to form at the same time, furthermore, they could spend their revenue on developing new technologies.

At first companies lacked two factors that kept them from reaching their goals: the lack of funds and experienced managers. It is precisely these two things, however, that are needed (in addition to technology) for a company to grow from a spin-off enterprise to a large pharmaceutical company. The classic pharmaceutical companies, enjoying their peak at the time, already possessed these resources. Some of them purchased biotech companies, while others were not open to biotechnology in terms of investment and cooperation (*Murray*, 2002).

In the 90s emphasis was shifted to pharma-biotechnology. That time it was less problematic to involve cooperating partners and capital, mainly in the USA.

The volume and complexity of biotech and pharmaceutical projects grew in relation to the amount of available information and acquired knowledge. This placed further emphasis on cooperations, and sharing of costs and risk.

Recently, biotech companies entered the early phases of research, selling their products, ideas and results to pharmaceutical producers (***Mark and Smith***, 2003). These companies were small. Therefore they could not even think about producing their own product. Selling their knowledge was something they could realize. Many of them went bankrupt, were not successful, but there were those that survived this early phase.

Large pharmaceutical companies usually purchase finished molecules, before or after the 2nd clinical phase from the small biotech companies. This means that with the technological development is already some win-win situation realized this way. Big companies reduce their risks, which however still remained considerable, even in this phase, but at the same time the cooperation with the smalls allow small biotech companies to prosper. New forms, new players were formed. CMO units (contracted place of production) for example, CRO organizations (contracted research unit), consulting and service companies. In other words the organizations share the risk, the same way they share the work and the income.

Figure 1 shows the risk sharing process (arrows were added by author). By their nature, completely new biotechnological projects, aiming at radical innovation, originally fall into the "suicide box". They are characterized by high market and technological uncertainty. In a given situation, a small biotech company, since it has no other choice, working out the right technology, sells it to the larger pharmaceutical company. From the point of views of the big company, the technological uncertainty is reduced considerably, since it is purchasing a technology that has been proven to work. (The technology is over the proof of the concept phase) The market uncertainty remains now to solve, which can be assessed and estimated by the purchaser. Another extreme case is when a small innovative company tries to become a supplier for one of the large market players. Trying to meet its needs, perhaps even relocating closer to the purchaser, is thus reducing market uncertainty for both parties. Thus the reason for cooperation is to decrease at least one, but preferably both (marked by dashed arrow) uncertainties. By sharing the associated risks, the organizations will not be able to reach the small innovation level, as this is not the goal of the cooperation. But at least they can decrease risk somewhat.

Due to the risk associated with biotechnology, the complexity of and adherence to rules and the amount of funds, companies were forced to cooperate. First, the necessary monetary tools are available only at the largest companies. Second, the necessary competencies are often missing, because no matter whether a smaller company is market leader in R+D, when it still does not have the necessary experience for production, not even the knowledge for clinical testing. As a consequence, cooperation is necessary to fill these gaps.

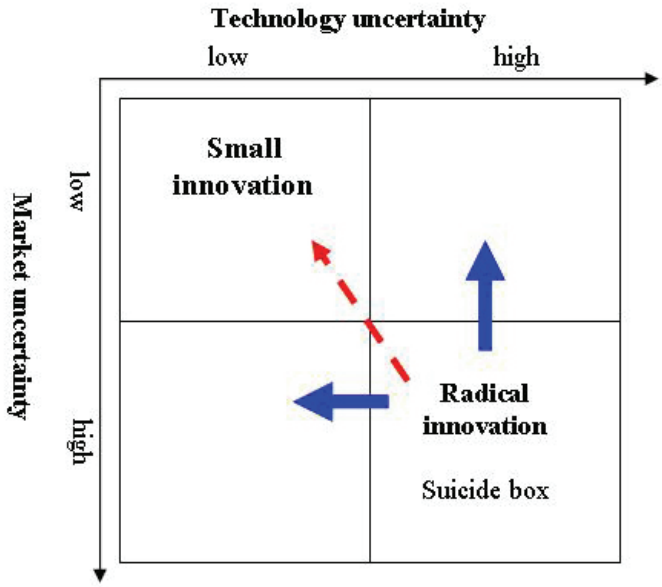
At the same time, the other perspective is sharing the uncertainties. They may be technology, market, regulation or competition related. The latter reflects on the segments of all the other risks, since the rapid development of China, South Korea

and India is clearly visible. The advantage against these new participants can only be quality and knowledge, precisely the areas where China and India are developing rapidly, while maintaining the seemingly natural price advantage. Europe and the USA can only compete with these products if they do not count on price advantage, but on therapeutic advantage. That is, they produce a newer, better molecule. However, this larger added intellectual value implies larger risks on behalf of technology, market and registration. These tendencies are also catalysts of cooperation.

It is precisely these different, yet interrelated risks that make pharmaceutical biotechnology complex. Complex processes and instability necessitate cooperation. Instabilities are cross-linked, they have effects on each other, they can even strengthen or weaken each other. An example for strengthening is the technological uncertainty of producing a new molecule, and the following registration and legalization processes.

Figure 1

2-dimensional uncertainties



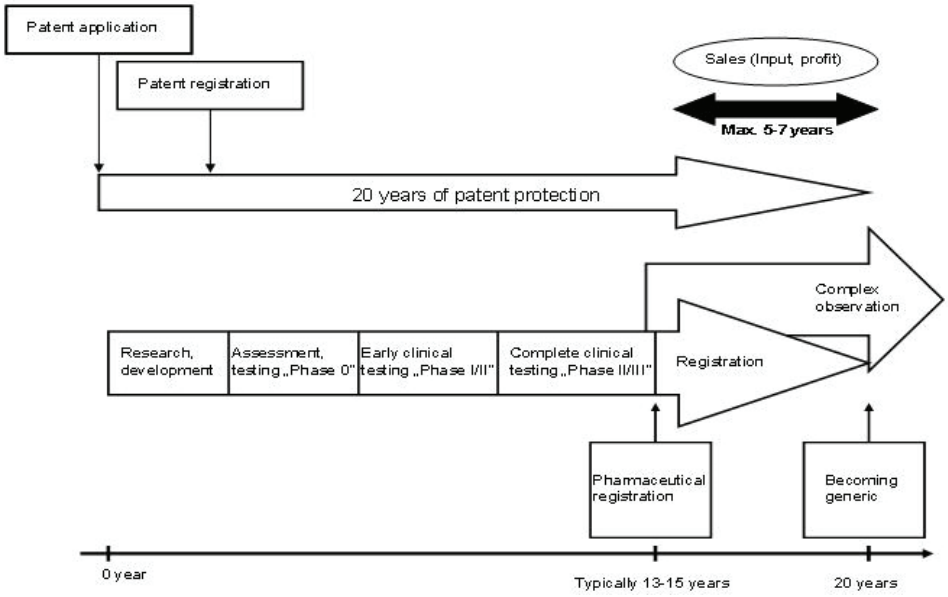
Source: Based on *Hronszky and Várkonyi*, 2006

Necessity of cooperation can be explained from another point of views as well (*Figure 2*). Validity period of a patent is 20years from the date of application, which, in case of pharmaceuticals can be extended by at most 5years (SPC). The product generally appears on the market 13-15years after the patent application. However, with the end of the patent period, one must also count with the appearance of generic and biosimilar products. As a result of this, there is at most 10, but more often only 5years to cover the entire costs of R+D and clinical trials. That is the reason why everyone

seeks to minimize R+D time as much as possible. One method could be open innovation, which supports cooperation and outsourcing instead of solving everything in-house. Since there is no time to localize new skills within the company, it is better to entrust R+D tasks to outsiders who are already experts in the given field. This method definitely saves time and possibly costs as well.

Figure 2

Typical timeline in biotech: R&D value chain and patent protection



BIOTECHNOLOGICAL STARTUPS, FEATURES OF THE PHARMACEUTICAL SECTOR

Biotechnological companies pursue B2B (business to business) strategy (the smaller they are the more they do so). That is, they hand on their products and services to other business organizations instead of end users/consumers. As for pharmaceutical development, from all the cooperating partners it is only the large pharmaceutical company that gets in contact with the B2C (business to consumer) model and the consumer.

For startup biotechnological enterprises, just like for other startup companies in the knowledge intensive sector, the existence of the following is crucial:

- Possessing new technologies, patents
- Academic or university background
- Workforce with great expertise in different sectors (professional expertise, e.g. from the industry or university, R+D; management and company leadership)
- Appropriate scientific and business environment.

New companies face many obstacles. It is difficult to find proper workforce, their employees are often not committed enough – or they cannot make them committed enough. Companies have little expertise in their new environment. All of their relations are new – with their costumers, their vendors, their partners, etc. These companies are small, and they are often unable to survive a performance decline, even if it occurs due to an exterior reason.

Startup companies are threatened by a lot of technological dangers, they often take part in the early phase of developments with the highest risk factor, so they and their technology have uncertain values. Furthermore, developments often require a considerable amount of capital, yet the amount of revenue is uncertain.

Innovative biotechnological companies have special characteristics. We can observe three remarkable features:

(I) Biotechnological developments are generally based on the appearance of a great number of small and medium-sized companies. As a rule, biotechnology is a great and turbulent population of innovators, where small companies are the engines of science-aided innovation. Large companies rather play a role in integrating new results in their products, after they have been developed by small companies.

(II) Biotechnology is a knowledge-intensive sector. The resulting special characteristics have two consequences. Start-up companies are near the source of the knowledge, e.g. universities, even if they are not university spin-offs. Second, founders come from scientific fields, they have a scientific background.

(III) Strategic cooperations are becoming a central feature in biotechnology.

These cooperations help companies gain considerable advantage over stand-alone companies in terms of resources and abilities. The competencies of cooperating partners complement each other, which leads to new opportunities, e.g. new technologies can be developed, new markets can be captured. Mason (*McCutchen and Swamidass*, 2004) and Calazo explained the advantages as follows: (1) the technological gap is filled, market is provided for replenishing production capacity; (2) initial cost and risk are reduced; (3) new products can be marketed faster; (4) size-efficiency is reached; (5) trade and legal obstacles are easier to overcome; (6) extended field of activity; (7) decreasing specific cost.

In biotechnology small companies use outer R+D capacities (as well). The reason for this is the lack of inner resources (money and knowledge). Yet other factors also support the idea to rely on outer resources: (1) the management endeavours to complete inner resources (2) the environment feels that R+D is too risky and difficult, because products and regulation are changing too fast; (3) the company seeks to reduce the risk; (4) the company has experience in using outer resources; (5) the management have a strong global approach (*Atuahene and Gima*, 1999).

Biotechnology and pharmaceutical companies often cooperated since the time they could achieve a "win-win" type (that is, advantageous for both parties) cooperation through helping each other. A small company can come in for the cooperation in different ways. Of course it cannot invest hundreds of million dollars and cannot wait for years for the payback. The small company gets a certain

ratio of the revenue of marketing, so its value and prestige is increasing, it can easier gain new partners and investors.

In biotechnology company success requires 3 different competencies: strong management, financial resources, good technology. Out of these criteria, strong management is the most important one, of course, since they can obtain money and control research directions. On the other hand, the available capital and technology alone are not enough for the success. Since in biotechnological strategies the product's or service's novelty are more important than their prize advantage, technology requires a considerable amount of investment, a long time before any revenue could be generated.

THE KEY TO SUCCESS: COOPERATION BETWEEN BIOTECHNOLOGICAL AND PHARMACEUTICAL COMPANIES

In the 90s organizations differentiated in the sector, platforms (cooperation samples) were formed and were often used (author's and patent royalties, research and licence agreements, spontaneous cooperations, formal and informal alliances between supplier companies, organizations). Nowadays this phenomenon is getting intensified because of the complexity of projects (e.g., human genome), the amount of knowledge in life sciences, as well as the complexity of pharmaceutical requirements. Today biotech companies' strategy allows the existence of more and more product-orientated enterprises in the medical industry.

The increasing complexity created paradoxes systematically: a global competition emerged, this, however, caused cooperations too. The reason for this was that cooperations helped reach the critical mass which ensured success.

Even these days, biotechnology companies are smaller than traditional pharmaceutical companies, but their small size is compensated by them being highly specialized and mobile, and reacting faster to tendencies. Their other advantage is cooperation, which they are forced to form, because cooperations are becoming more and more important. According to today's requirements, the development of the increasing number of new molecules and pharmaceuticals needs a lot more energy and money as it did a few decades ago. Companies need to cooperate since only a few companies can afford to invest 800-1200 M $ in a very risky pharmaceutical original project. As a consequence of this, risk and cost sharing are necessary.

The time available is another critical factor. The available 10-15years seem to be a long time, but in fact they are not. Clinical trials (3 phases) and the registration process last several years each. What is more, one have to act faster than its competitors, a few months of delay in the programme can result in another company entering the market sooner with a similar active substance. Because of special market and industrial property protectional customs and laws the second participant entering the market can gain only a small fragment of the turnover – which makes it doubtful whether development costs will return. That means companies are supposed to enter the market as soon as possible. Accordingly, there is a tendency that companies can accelerate the phase of development with the help

of knowledge obtained from other organizations rather than using their own research results, since pharmaceutical companies purchase already successful, immediately available concepts. That is, time limit also necessitates the preference of knowledge-brokering and the cooperation of organizations instead of strengthening in-house research potentials.

As for finances, cooperations are controlled and influenced by the large pharmaceutical company, even though it only takes part in the real work after Phase 2, or Phase 3. As a result of this, the large pharmaceutical company also becomes dependent on the small ones, which provide technology and knowledge, because it builds upon them while investing in markets and production potential. It is more economical for it to spend a part of its budget on supporting small companies and cooperations than to finance broad R+D. Accordingly, a power imbalance of participants is characteristic of biotechnological cooperations.

Today cooperation is a feature of not only biotechnological companies, but most pharmaceutical companies are also forced to form strategic cooperations. Small pharmaceutical and biotechnnology companies can achieve an impressive result only when they cooperate and share labour to a necessary extent.

These days the visible tendency is for certain biotechnology companies to establish long lasting strategic cooperations with certain pharmaceutical companies. That means the biotech company develops its portfolio, its knowledge importers in order that its products meet the requirements of the large company comprising its market. In certain cases topics and ideas come from the pharmaceutical company itself. Accordingly, knowledge importers are becoming more and more specialized. Of course these interrelations do not mean exclusivity. New companies and results are emerging all the time, new interactions can be formed alongside these interrelations. The reasons for interconnections are the important changes in knowledge-generation which dynamically influences this branch of industry and its specific isntitutes.

During the struggle for survival and growth, formal and informal cooperations, groups of strategy and interest are formed. One of the most importants groups are clusters.

The driving forces of biotechnology and the related modern pharmaceutical industry are innovation, the flow of knowledge, the appearance of new ideas and technologies in the industry.

In the sector, several practically realizable solutions were born for knowledge flow which innovation required and for cooperations between organizations. Their common features are that they bring academic and industrial spheres, as well as their needs together; they make new ideas and knowledge obtained in the academic sphere to be industrially usable. It is also of crucial importance to reach the "critical mass" necessary for the realization, in terms of involving technology – capacity, equipment, workforce, suppliers, background industry, infrastructure- as well as involving capital necessary for technology operation.

With cooperations and labour sharing costs and risks are also shared automatically. Since pharmaceutical companies prefer to find "knowledge importers" with the greatest knowledge and expertise in a certain field, they

probably won't need to develop a complete in-house knowledge-base, which results in reduced cost and time requirements. Successful projects, industrially realizable basic research results are chosen, cooperations are based upon them. Consequently, projects cost less in general, because a relatively less amount of money is needed to be invested to decide which research result can be utilized at the industrial level. That is, there is no need to develop in-house capacities to obtain research results, and, on the other hand, small companies and academic institutes cannot afford to invest considerable amounts of money in projects. In several cases, projects were marketed already after the proof of concept phase, but cooperation cost much less until that point.

At biotechnological companies innovation have special features which have been paid great attention to for the last years:

(1) Just like in every new branch of industry, small companies are typical to exist, for which cooperations are beneficial. A further similarity to information technology and telecommunication is that the great and stabile companies are present rather as key partners and costumers. Cluster organizations often depend on them financially, and they also determine strategic business directions. This phenomenon is emphasized in biotechnology as well: large pharmaceutical companies often establish start-up organizations and contact smaller companies, take part in the pharmaceutical production (generally around the Phase 2 of clinical research), whereas small biotechnology companies take projects from proof of the concept to the Phase 1 of clinical research. A significant prerequisite of biotech sector growth is the exponentially increasing number of small and medium-sized companies in the sector. The sector of biotechnology is often described as the great and turbulent population of innovators. Small and medium-sized enterprises represent the power in the innovation environment, whereas large companies play a role in integrating new developments in their products, after being developed by small and medium-sized enterprises.

(2) Biotech is a knowledge-intensive sector. This has two consequences. First, small and medium-sized enterprises are near the source of knowledge, even if they are not spin-off companies. Second, company founders have mainly a scientific background – with all its advantages and disadvantages.

SUMMARY

I presented that in the "high risk – high benefit" biotechnology industry participants seek to minimize and share uncertainties and risks. A practical, well functioning solution is forming cooperations, groups of interest, networks and strategic relations. As a result, biotechnology companies with a specific knowledge become knowledge importers for large pharmaceutical companies, on the other hand, they gain share of the large companies' profit. Unique features and advantages of these cooperations may prevail, which can lead to further specifications.

REFERENCES

Atuahene, G.K. (1999): Inward Technology Licensing as an Alternative to Internal R&D in New Product Development: A Conceptual Framework. In: Journal of Product Innovation Management, 9. 6. 156-167. p.

Hronszky, I., Várkonyi, L. (2006): Management of radical innovations. In: Harvard Business Manager Review, 10. 28-41. p.

Mark, R., Smith, A. (2003): Corridor Biotech "Cluster"? It Could Happen [online] <URL: http://209.116.252.254/7_2003_focus/f_2.html> [15.12.2006]

McCutchen, W., jr.; Swamidass, M.P. (2004): Motivations for strategic alliances in the pharmaceutical/biotech industry: Some new findings. In: The Journal of High Technology Management Research, 15. 2. 197-214. p.

Murray, F. (2002): Innovation as co-evolution of scientific and technological networks: exploring tissue engineering. In: Research Policy, 31. 1389-1403. p.

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