

# INNOVATION OVERVIEW OF THE NORTHERN PLAINS REGION

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**Abstract**—Since the start of modern age and industrialization the innovation are bringing forward an increasing pace of development. Innovative applications and scholarships exist in almost every country in the world serve several purposes which are effectuated with a number of tools. Nowadays, large enterprises use this tool, which can help existence in the market against competitors in the long term. Our study presents the economic situation in The Northern Plains Region, Research and development activities and expenditures and the experiences of 2007-2013 cycle.

**Keywords**—Northern Plains Region, innovation overview, R&D

## I. INTRODUCTION

THE appropriate and creative response for the questions raised and problems to be solved is one of the tools of development which is the first step for innovative ideas. The innovation means the process from the idea to completion.

The scientific and theoretical basis of innovation was defined in the first time by Joseph Schumpeter in a study in 1934. As described in the following types are distinguished today: new products, the introduction of new production methods, opening up new markets, new raw materials or semi-finished goods resource acquisition, restructuring the industry.

Since the start of modern age and industrialization the innovation are bringing forward an increasing pace of development. The states of the world are aware of that the appropriate response to the problems can only be set in such a way with better support innovative thinking. Supporting has a number of tools: integrated education, create inspiring application systems which can help the successful implementation of the more ideas. Innovative applications and scholarships exist in almost every country in the world serve this purpose. Nowadays, large enterprises use this tool, which can help existence in the market against competitors in the long term.

## II. ECONOMIC SITUATION

The Northern Plains Region covers administrative area of Jász-Nagykun-Szolnok, Hajdú-Bihar and Szabolcs-Szatmár-Bereg County. The larger investment growth started from 1997 in the region and nowadays this rate is not lower than the national processes.

American, Austrian, Italian and German investor groups have reached a decisive share among the foreign investors. A small number of large share capital and large-scale production joint stock companies are important pillars of the economy in the region.

Foreign capital inflow contributed to prevent further deterioration of the unemployment situation, the ability to increase exports, to the technological renewal, increased productivity, and investment upswing, so actually economic stabilization of some small and medium-sized city in the region. Approximately 40 % of the foreign interest company (in 2001, 1232 pieces) are only in foreign-owned and approximately 30 % of these companies are in majority foreign-owned (the average proportion of foreigners in 74-78% of the registered capital). The industry dominates in the sectorized distribution of foreign capital, especially the processing industry. Transport and telecommunications, the agricultural sector and restaurant services, and the construction and tourism are also important role. The regional products are sold in more than 40% in abroad. Industrial productivity increased at a rate of over 10% per year since 1993. The capital intensive chemical industry, garment industry, food industry, and mechanical industry are determining the industry. These are decisive in several cities, regional significance.

There are 25 industrial parks and 3 enterprise zones in the Northern Plains. The 1990s in the Northern Plains region have also a breakthrough in the field of communications sector. [4]

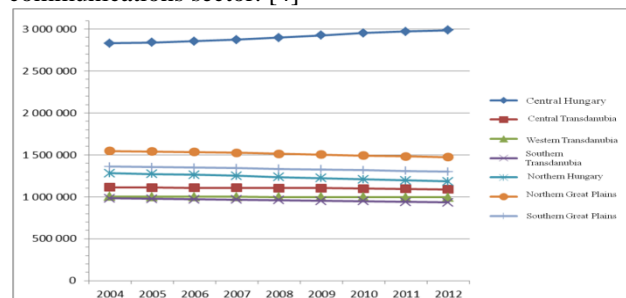


Fig 1 Population of Hungarian regions (2004-2012, person)  
(Source: [1])

15% of the country's population lives in the Northern Plains, approximately 1.5 million people. The region's population in 2004 was 1.54 million, for 2010 was 1.49 million with steady downward trend, which follows the

national trend of population decline (Fig 1). The Northern Plains region in terms of population is the second most populous region.

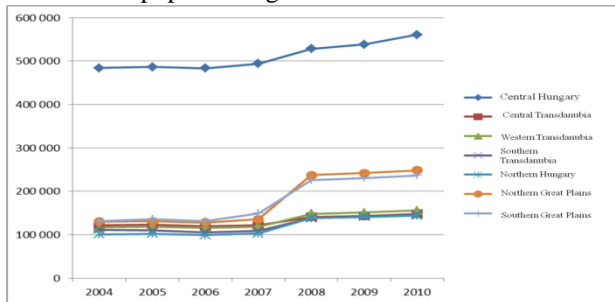


Fig 2 The number of companies operating in regions of Hungary (2004-2010, pieces)  
(Source: [1])

Most of the existing businesses are located in Central Hungary (Fig 2). The Northern Great Plain region is the second between operating businesses in the region, but there are much smaller number of firms than in Central Hungary. The numbers of operating businesses in 2006 are declined in all regions since 2004.

### III. RESEARCH AND DEVELOPMENT ACTIVITIES AND EXPENDITURES

Research and development plays an important role in the developed countries in promoting economic development and conservation. The activity can create new jobs, due to the rise in living standards. The competition between the world's leading economic regions of the technical development is of paramount importance.

The research and development has macroeconomic significance. The amount of expenditures indicates that the operators how much money can pay to ensuring the future situation. The ratio of R & D expenditure is therefore thought to be related economic development opportunities as well. Support for R & D is a strategic priority for the European Union, which means an increase in the expense ratio of the target set for all Member States.

Research and development plays an important role in sustaining economic development, preservation of competitiveness and improving, especially in resource-poor countries.

The magnitude of the sums invested in research and development in the strategy don't reach the desired level of Member States, including in Hungary. In recent years, the development of costs arising from the economic crisis is also affected by unfavourable market environment. Nevertheless, the research and development expenditures also increased steadily during the period after the millennium. Although a proportion of gross domestic product (GDP) decrease was observed in a few years, the tendency is increasing in this regard. In 2011, research development in our country was paid HUF 336.5 billion.

This after the 2010 enlargement showed a modest

increase of 8.5%, than in 2007 and nearly four tenths higher.

In 2011, the share of R & D expenditure was 1,20 %, calculated relative to the gross domestic product. This is after a year earlier indicated a decrease of 3.4% growth in the previous five years was surpassed by more than a fifth. [2]

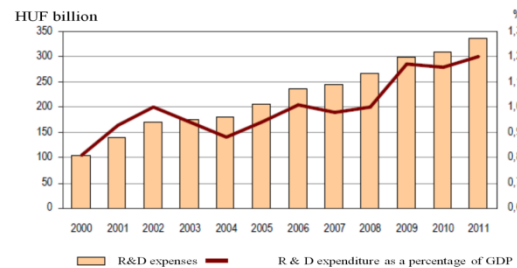


Fig 3 Evolution of research and development expenses and proportion of GDP  
(Source: [2])

The amount of resources devoted to research and development, despite the significant increase in international comparison, still belongs to the lower. In terms of the 27 EU member states Hungary is at the end of the middle third on the basis of purchasing power parity, and the ratio of research and development expenses GDP the per capita expenditure. In the EU-27 in 2011 2.03% of gross domestic product was spent on research and development purposes, while in Hungary this value was 1.20%. [2]

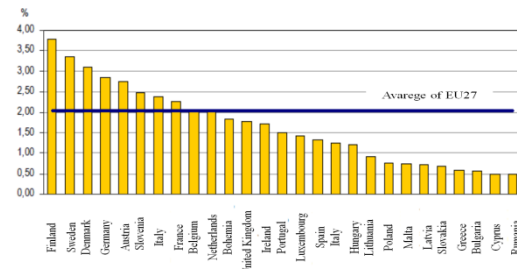


Fig 4 The size of R & D expenditure as a percentage of GDP in the EU-27 Member States, 2011  
(Source: [2])

Research and development in relation to observed differences between regions in the country in recent years have shown less change. Central Hungary plays a prominent role in the country in which the expenditures, the number of employees in terms of magnitude can be detected through the capital's dominance. The ratio of gross domestic product in R & D spending is also the highest; in 2011 the rate was 1.65% of the total, which is 1.4 times the national rate reported. Value closing to the average is observed only in the Northern Great Plains and Southern Plains. The regional differences were declined in the considered five years based on relative to GDP in R & D expenditures magnitude.

Central Hungary showing outstanding, but even showed a two-fold advantage over second place in the rankings. This is followed by Southern Great Plains and Western and Central Transdanubia and Northern Hungary and Southern Transdanubia. Number of R & D

units are continued to increase between 2007 and 2011 in the country. Of course, much different from region to region, but overall the rates do not show significant changes. In 2011, in Hungary research and development activity was conducted in 3000 research place, which is 5.6% more than in 2007. During the five years, an average gain of 1.4% is observed. [2]

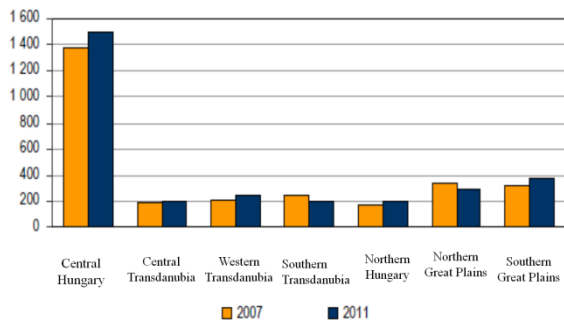


Fig 5 Number of research sites in 2007 and 2011  
(Source: [2])

Northern Great Plains, although still plays an important role in the research and development, in recent times the number of research sites registered a 13% decrease, so in 2011 in the region of 293 units were registered, which is about a tenth of the country. Examining the grouping in the research sector units during the period of expansion of the business sector can be observed the expense of the higher education and the public. This process has already started, in recent years it is intensified. In 2007 has worked more than half of the R & D sites in the field of higher education. In 2011, the business has become dominant. The number of public sector research and development is dwarfed by the other two sites, although in a smaller reduction was also there. The national growth led to a significant increase in the number of business research sites. In 2011 compared to the previous five years 27% more business maintained by the research unit operated in Hungary, while in higher education increased by 7.8% less. [2]

TABLE 1  
EVOLUTION OF R&D PLACES BY SECTORS, 2011

Region	Enterprise	Higher education	General government	Total	Enterprise	Higher education	General government	Total
	Number of R&D places				2007 = 100.0			
Central Hungary	770	614	115	1499	130,7	93,9	87,8	109,1
Central Transdanubia	126	56	13	195	131,3	73,7	92,9	104,8
Western Transdanubia	96	132	17	245	128,0	103,9	121,4	113,4
Southern Transdanubia	83	110	9	202	112,2	67,1	112,5	82,1
Northern Hungary	87	97	12	196	124,3	103,2	133,3	113,3
Northern Great Plains	105	179	9	293	99,1	85,6	45,0	87,5
Southern Great Plains	165	192	13	370	143,5	111,6	56,5	119,4
Total	1432	1380	188	3000	127,3	92,2	85,8	105,6

(Source: [3])

The higher education sector also experienced a decrease against of five years earlier. In 2011, only 1,380 places have already been carried out research and development activities. In spite of the decrease higher educational institutions are considered the main R & D base. That is why there are a significant number of Central Hungary reported (614). In contrast, the Northern

Great Plains, despite the drop in the number of academic research centres in the sector remained dominant.

International comparison of the data in the field of research and development and innovation indicate failure of the Hungarian economy is strong. This applies for patents and researchers (the employees, or the ratio of the number of population as well). Furthermore, it is difficult to lower the number of R & D and innovation investment of foreign capital in Hungary value. In contrast, we are well represented by the ratio of export production and modern techniques.

Overall positive assessment of academic performance suggests that the gap is mainly due to the Hungarian creativity lacking resources can successfully replace in part.

All survey on innovation confirms the fact that operating in Hungary, strong capital, foreign-owned businesses at the forefront of innovation. The position of the region in this regard nationally apparently is favourable. In the Northern Great Plain region the number of foreign-owned businesses per 1,000 inhabitants is higher than in the other regions. However, taking into account the capital strength of the region it is just in a fifth place.

In the most quantifiable factors of research and development underlying the innovation (number of researchers, scientific degree number of R & D expenditures, scientific publications) the Northern Great Plains is usually in a better position than the other regions.

The numbers of secondary and higher education people are lower than average rates. It weakens the innovation potential of the region's human resources side. The application of high technology is essential to the well-educated, susceptible new technical and creative team of professionals, which is a fundamental prerequisite for innovation.

The investments are the most important and perhaps the more effective indicator of the innovation indicators. Economic development requires a long-term continuous renewal of fixed assets, the introduction of advanced technologies. The region's investment performance per capita is not reached the half the country, it has the last place among the regions.

The region's innovation industry has an impact for the innovation, within this small machine weighs the most productive industrial activities, production capacity, technological level lower level, a higher proportion of less competitive, cheap mass produced goods. From high-tech industries, only a few are present meaningful weight (For example: optical industry, household appliances production).

In order to improve the quality of cooperation between the companies and the development of innovative services it is necessary creating an internal incentive system and external marketing development. One of the key tasks for it is describing of the principal providers of existing knowledge (know-how), which is most suitable

for a specific unit (For example: technology transfer office of the fittest). Create perspective Cooperative Research Centres (CRC) is also important. It depends on the nature of the sector. [1] [2]

#### IV. THE EXPERIENCES OF 2007-2013 CYCLE

Statistical data of the second development cycle after our entry into the European Union are the following [6]-[7]:

- 1) *GOP tender submitted 1 priority of all the Northern Plains Region: 898 pieces*
- 2) *Total funding requested: HUF 110 bn*
- 3) *Number of Winning Proposals: 488 pieces*
- 4) *A grant for 60, £ 3 billion*
- 5) *All aid paid so far: USD 43.9 billion*
- 6) *The four measures of GOP 1.5, the application has not been printed, which bore the title of project preparation.*
- 7) *GOP 1.1. action: innovation, R & D co-operation between universities, research institutions and enterprises*
- 8) *GOP 1.2. action: The development of innovation and technology parks bridging institutions*
- 9) *GOP 1.3. action: encouraging independent innovation and R & D activities*

##### IV.2 Development cycle plans, objectives of the 2014-2020 in national and regional level

National specializations defined the smart specialization strategy are the following:

- A. System-oriented research (The focus is on system-oriented approaches in the research.)*
- B. Intelligent manufacturing (Product development is in the focus.)*
- C. Sustainable society. (This is an innovative answer to societal challenges.)*

Priority areas for research:

- A. Social well-being and healthy*
- B. Advanced vehicle engineering and other technologies*
- C. Clean and renewable energies*
- D. Sustainable Environment*
- E. Healthy local food*
- F. Agri-Innovation*
- G. ICT (information communication technologies) and Services*
- H. Inclusive and sustainable society, livable environment*
- I. Smart technologies.*

The measures provided for in GINOP creating opportunities for S3 priorities for access to the resources necessary on the basis of the horizontal areas of intervention which were defined in national R&D strategy.

Tender priorities:

*A. R & I activities, investments, supporting links*

*B. Support investment OFF - cooperation and networking*

*C. The creation of R & I capacity for excellence [5]*

#### V. SUMMARY

The innovation means the process from the idea to completion. The following types are distinguished today: new products, the introduction of new production methods, opening up new markets, new raw materials or semi-finished goods resource acquisition, restructuring the industry. Since the start of modern age and industrialization the innovation are bringing forward an increasing pace of development. Nowadays, large enterprises use this tool, which can help existence in the market against competitors in the long term.

15% of the country's population lives in the Northern Plains, approximately 1.5 million people. The Northern Great Plain region is the second between operating businesses in the region, but there are much smaller number of firms than in Central Hungary. Research and development plays an important role in the developed countries in promoting economic development and conservation. In Hungary in 2011 the money spent on R&D was 336.5 billion HUF.

On the basis of development cycle plans, objectives of the 2014-2020 in national and regional level the priority areas for research are the following: social well-being and healthy, advanced vehicle engineering and other technologies, clean and renewable energies, sustainable Environment, healthy local food, agri-innovation, ICT (information communication technologies) and Services, inclusive and sustainable society, liveable environment and smart technologies.

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