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Analysis of the regional economy and environment for innovation in Eastern Slovakia

1. Basic Characteristics of the Region of Eastern Slovakia

The region of Eastern Slovakia is located in the east of the country. Its area extends over approximately one third (32%) of the territory of Slovakia counting 29% of the total number of inhabitants of the country, thus representing a market for nearly 1.6 millions of citizens.

From the point of view of administration, the regional self-government of Eastern Slovakia is exercised by two self-governing regions: the Prešov Region and the Košice Region. In the past the area used to be divided into a number of counties that would delimit the existing traditional cultural characteristics of single areas. The most popular and widely known was the Spiš county the centre of which was the Spiš Castle and later the town of Levoča. In the period that followed the Abov County (or the County of Turnany and Abov) with its seat in the town of Košice, and the Šariš County with its seat in the town of Prešov gained significance. From the ethnical point of view the Zemplín county also was a county of considerable importance (Valentivič et al., 2006, p. 6).

Figure 1: The region of Eastern Slovakia and its position within the territory of the Slovak Republic

Source: Valentovič et al., 2006, p. 6

What is the competitive advantage of Eastern Slovakia is its favourable strategic position. It is the only region of the Slovak Republic to border three other countries, being at the same a border region of the European Union. Taking into consideration the cultural, transport, linguistic and other links already established, this very region could become an important trade bridge between the former Soviet Countries and the countries of the European Union (VALENTOVIČ et al., 2006, p. 7).

The Košice Region has total area about 6 753 km^2 with 11 districts, 440 municipalities and about 766 000 inhabitants. The Prešov Region has total area about 8 998 km2 with 13 districts, 666 municipalities and about 790 000 inhabitants.

Economic Performance of Slovak Regions

One way of judging the performance of a certain area economy can be done for instance using the indicators such as gross domestic product (GDP). The next table shows GDP at current market prices at NUTS level 2 measured as purchasing power parities per inhabitant in percentage of the EU average.

Table 1: Economic Performance of Regions of Slovakia

Region	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
EÚ (27)	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
EÚ (25)	104,4	104,4	104,5	104,9	105,0	105,0	104,8	104,6	104,4	104,2
EÚ (15)	115,7	115,3	115,2	115,5	115,5	115,2	114,8	114,3	113,8	113,2
Slovakia	46,7	49,1	49,5	50,0	49,3	49,7	51,0	53,4	55,2	56,7
Bratislava Region	100,0	102,9	106,2	107,6	104,9	107,9	112,4	120,7	124,1	129,3
Western Slovakia	44,5	47,0	46,7	46,8	47,0	47,1	47,4	48,8	51,6	52,7
Central Slovakia	38,3	40,5	41,0	41,6	40,6	41,0	42,6	44,8	45,7	46,7
Eastern Slovakia	35,3	37,5	37,7	38,3	37,3	37,4	39,1	40,5	41,1	42,3

Source: Eurostat

According to the presented data, Eastern Slovakia shows the lowest level of economic performance (only 42,3% of EU average and approximately 75% of Slovak average in 2004). If we take a look at the next chart showing the percentage of GDP EU average of Slovakia and Eastern Slovakia, we can see that the average annual growth of Slovakia is higher (about 2,2%) than growth of Eastern Slovakia (about 2,06%) (calculations are based on Eurostat data).

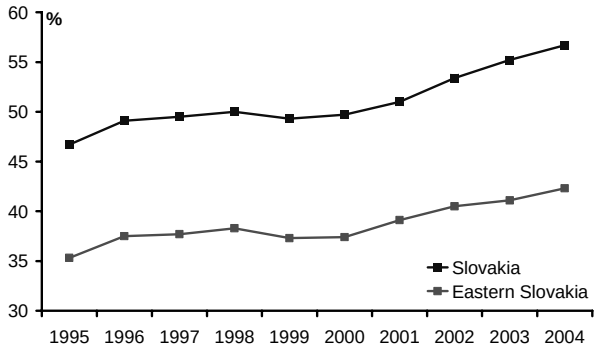
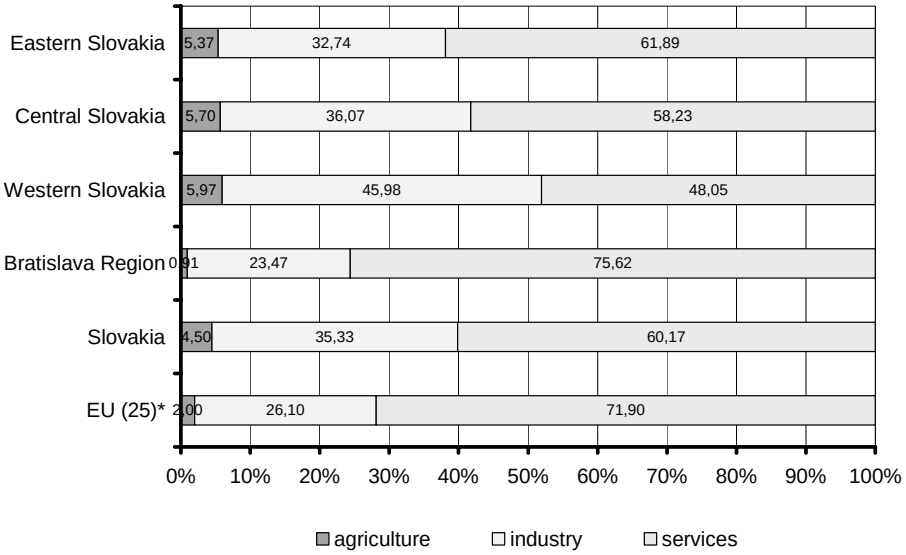


Figure 2: Percentage of GDP EU average
Source: Eurostat

If the Slovak economy grew faster than the economy of Eastern Slovakia, regional economic performance of Eastern Slovakia would never reach national average. In other words, regional disparities in Slovakia would never disappear. The situation of Eastern Slovakia can change only after eliminating existing structural and peripheral disadvantages, which by itself is not security for convergence.

Regional Economic Structure

Structure of economy can be analyzed for instance by using the share of each sector's value added in GDP or share of employment in sectors.



** EU(25) data available for 2003 only, EU(27) not available*

Figure 3: Regional Economic Structure in 2004
Source: Eurostat, calculations done by the authors

Comparing the structure of economy of Eastern Slovakia to other regions of the country, we can say that its structure is the best after Bratislava Region and is comparable to the EU average. The share of agriculture (including forestry and industry) is about 5,4%; industry and construction about 32,7% and services about 61,9%. It is remarkable that the share of services in GDP, which is above the national average still doesn't reach the EU-25 average.

Let's take a look at a more detailed view of economic structure of Eastern Slovakia. The next figure shows share of each sector's gross value added in GDP:

In Fig. 4 we can see, that the share of manufacturing in GDP is declining, while the share of wholesale, real estate and almost all kinds of services is increasing.

The other way of analyzing economic structure can be done by using share of each sector's employment in GDP. The numbers obtained by one method will probably differ from the numbers obtained by the other method. Comparing the both numbers we get a picture of correspondence of employment with added value in GDP in each of the sectors.

According to the chart in Fig. 5 *agriculture* (including hunting and forestry) creates about 6% value added in GDP. The share of agriculture in GDP during the whole period has been stable, while the proportion of employees in agriculture on total employment has decreased. Before 2002 the ratio of employment in agriculture was higher than share of agriculture in GDP. The cause of such development could be explained by improving labor productivity in the field of agriculture.

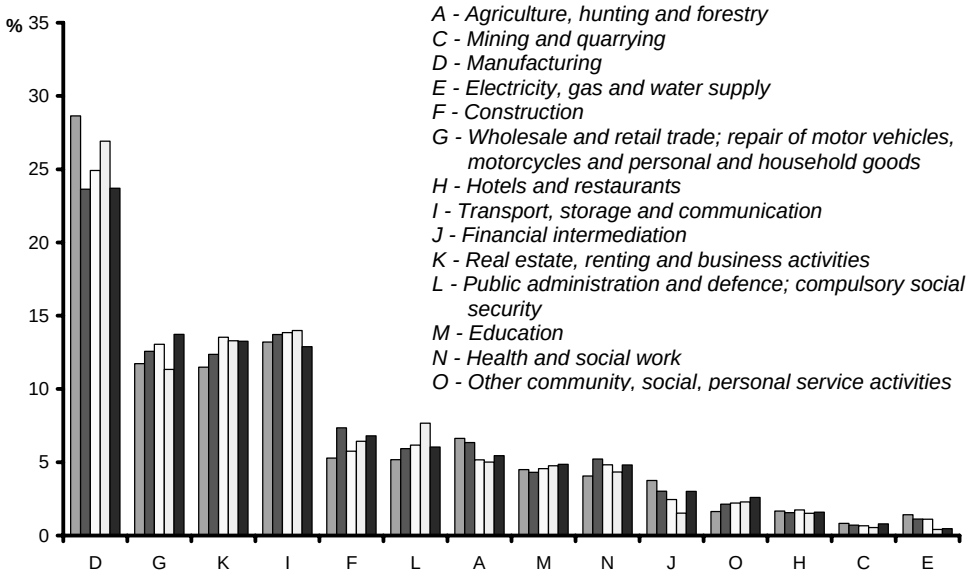


Figure 4: Regional economic structure of Eastern Slovakia (gross value added in GDP)
Source: Eurostat, calculations done by the authors

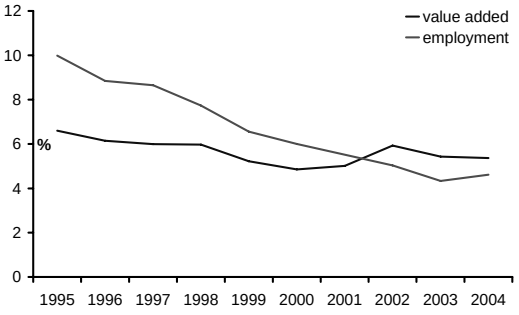


Figure 5: Agriculture, hunting and forestry
Source: Eurostat, calculations done by the authors

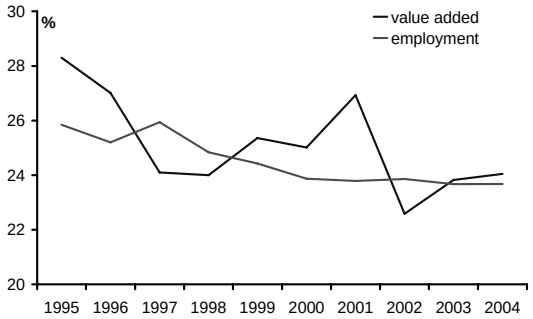


Figure 6: Manufacturing
Source: Eurostat, calculations done by the authors

One of the most important sectors for Eastern Slovakia is *manufacturing* (see Fig. 6). The trend of manufacturing's share in GDP shows some cyclical pattern and is declining over the period. Also its share of employment in total employment is declining.

*Wholesale and retail trade (*including repair of motor vehicles, motorcycles and personal and household goods) is probably sector with the fastest growth rate of employment in the sector – as shown in Fig. 7. Share of employment in wholesale in total employment was about 10% in 1995 and about 15% in 2004. The share of value added in GDP of this sector was stable – about 12 – 14% during the period.

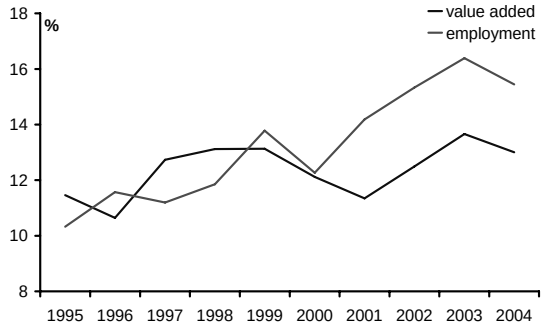


Figure 7: Wholesale and retail trade
Source: Eurostat, calculations done by the authors

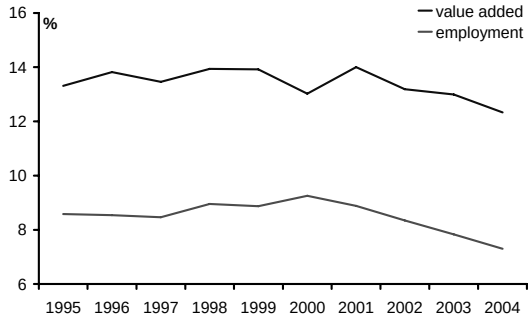


Figure 8: Transport, storage and communication
Source: Eurostat, calculations done by the authors

Transport, storage and communication – as shown in Fig. 8 and *real estate* (including renting and business activities) – as shown in Fig. 10 are sectors with much greater share of value added in GDP than sectors' share in employment. Both sectors show stable shares in GDP as well as in employment during the whole period.

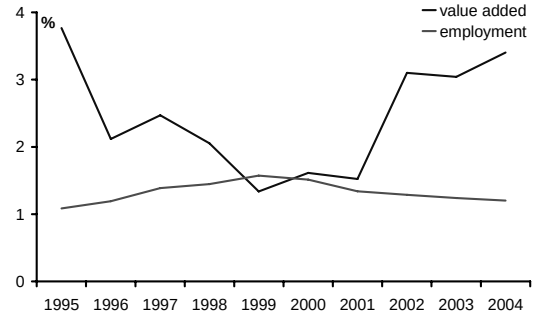


Figure 9: Financial intermediation
Source: Eurostat, calculations done by the authors

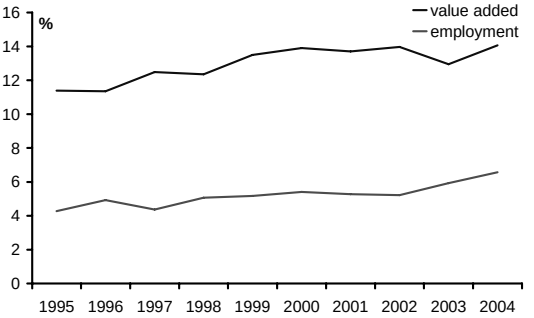


Figure 10: Real estate
Source: Eurostat, calculations done by the authors

The last sector to be discussed in this paper is *financial intermediation*. Share of employment of this sector in total employment was stable – about 1%. Its share of value added in GDP declined more or less slightly from about 4% in 1995 to about 1,5% in 2001. We can then notice sharp increase in 2002 – from 1,5% in 2001 to over 3% in 2002. Such development can be reasoned by the process of bank sector restructuralization.

Foreign Direct Investments in Eastern Slovakia

We could say that inflow of foreign direct investments (FDI) to a certain region might be one of the indicators of an improved environment of the region. The next figure shows volume and inflow of FDI to Eastern Slovakia.

The inflow of FDI to Eastern Slovakia increased slightly from 1996 to 1999. In November 2000 the ownership of the complete metallurgical operation of the East Slovakian Steelworks was successfully transferred to the U. S. Steel Group, then a unit of the USX Corporation (now the United States Steel Corporation). That's the reason why the growth of FDI volume was so sharp in 2000.

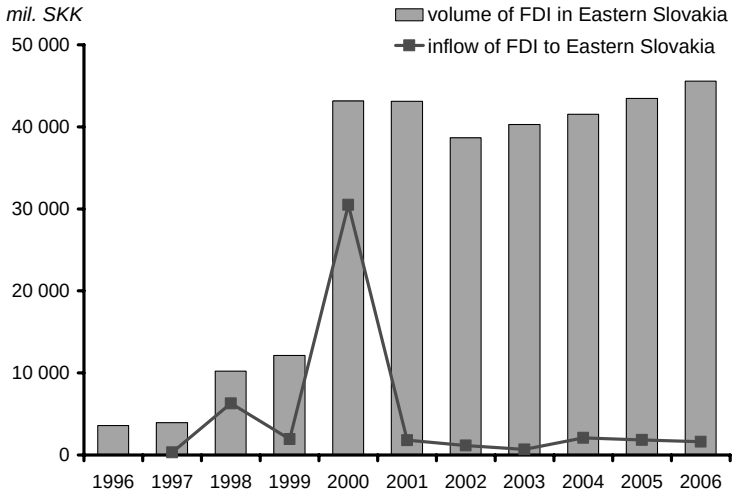


Figure 11: Volume and inflow of FDI to Eastern Slovakia
Source: National Bank of Slovakia, calculations done by the authors

Now we can take a look at the sector distribution of FDI in Eastern Slovakia:

Table 2: Sector distribution of FDI in Eastern Slovakia in 2002 – 2005

Industry	Branches ranked according to three criteria					
	Number of investments	Rank	Newly created jobs	Rank	Investment in mil. EUR	Rank
Aubomobile	6	**1**	2811	**1**	367,35	**1**
Machinery	5	**2**	353	**5**	26,3	**6**
Wood and furniture	3	**4**	262	**6**	110,4	**2**
Chemical	4	**3**	417	**4**	16,5	**7**
Textile	1	**5**	25	**13**	0,1	**12**
Electrotechnical	1	**5**	200	**8**	4,5	**10**
Shoemaking	1	**5**	500	**3**	13	**8**
Construction	1	**5**	40	**11**	1	**11**
Plastics	3	**4**	1343	**2**	47,76	**3**
Metal	1	**5**	100	**9**	38	**4**
Paper	1	**5**	125	**10**	37	**5**
IT	1	**5**	220	**7**	6,6	**9**
Metallurgical	1	**5**	30	**12**	4,5	**10**
Development Centre	1	**5**	20	**14**	N/A	**N/A**

Source: HUDEC et al., 2006a, p. 21

From the figures in Tab. 2. we can see that the most of the investments between 2002 and 2005 were directed to automobile industry. Investments in the industry created over 2800 new jobs and the total amount invested was about 367 mil. EUR.

Over 1340 new jobs were created in plastics industry with the total investment about 50 mil. EUR and about 110 mil. EUR were invested in wood and furniture industry, while about 260 new jobs were created.

2. The Innovation Environment in Europe and Eastern Slovakia

Innovation plays central importance in the development of knowledge-based economy. There exists significant research that demonstrates how high levels of innovation activities influence rate of economic growth, business activity, national and regional competitiveness and others economic values.

However, the measurements of innovation performance are limited to available data and indicators. [1] The main sources of the data useful for the description of innovation performance are OECD, Eurostat and national and regional surveys. At the European level, a big effort has be done by the European Commission to observe the innovation capacities of Member states/regions/sectors through the annual innovation trendchart and European Community Innovation Surveys (CIS), which gives the picture of the relative strengths and weaknesses of the innovation indicators in Member States/regions/sectors[2] in order to fulfill the targets of the Lisbon strategy.

There are several approaches to describe the regional innovation potential according the selected innovation indicators. The selection of such benchmarking indicators is determined by the available statistics at regional level and by the specific dimension of innovations.

The last European Regional Innovation Scoreboard (2006 RIS)[3] revised in January 2007 provides data of 208 regions including the regions of the new member states. The number of compared indicators was reduced from 13 (2003 RIS) to 7, which are good available on the regional level:

1. Human resources in science and technology – core (% of population)
2. Participation in life-long learning per 100 population aged (25-64)
3. Public R&D expenditures (% o GDP)
4. Business R&D expenditures (% of GDP)
5. Employment in medium-high and high-tech manufacturing (% of total workforce)
6. Employment in high-tech services (% of total workforce)
7. EPO patents per million population

Mentioned indicators, compiled with Eurostat data, enable a comparative overview of each region´s performance against the EU average.

The RIS 2006 used a composite indicator to identify the best and worst performing region for each country. From this point of view the best performing Slovak region is “Bratislava – region (Bratislavský kraj)” (on rank 29) and the worst performing is “Eastern Slovakia (Východné Slovensko)” (on rank 189).

[1] Methodology problems of innovation indicators contains Trend Chart Methodology Report 2006 http://trendchart.cordis.lu/scoreboards/scoreboard2006/pdf/eis_2006_methodology_report_missing_indicators.pdf

[2] European Innovation Scoreboard, European Sector Innovation Scoreboard, European Regional Innovation Scoreboard etc.

[3] http://trendchart.cordis.lu/scoreboards/scoreboard2006/pdf/eis_2006_regional_innovation_scoreboard.pdf

There are several problems in analyze of the innovative capabilities of regions. We can summarize them in follow way:

- According to NUTS classification there are large differences in the size (population, economic indicators) of compared regions[4].
- Countries are divided in different size of regions.
- Different availability of data in regions.
- The regional data delayed behind national data.

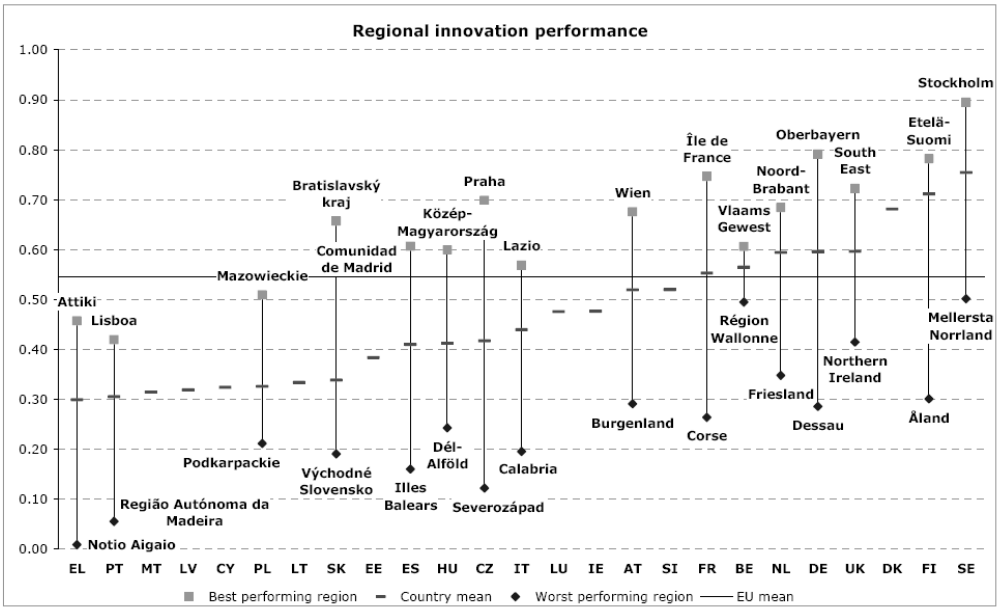


Figure 12: Regional innovation performance in EU

Source: European Regional Innovation Scoreboards 2006, European Commission

Innovation performance of Eastern Slovakia

Regional innovation capability of Eastern Slovakia seems to be weak according to input indicators such the employment in high-tech sectors and R&D expenditures. Rate of researchers in Eastern Slovakia is about 17,12 % of the total researcher in Slovakia, there are only 2,5 researcher per 1000 inhabitants and their monthly salaries are lower than Slovak average. Although in the region are several educational institutions located (e.g. Technical University) serious problem is lack of tertiary educated human resources who move into regions with higher economic performance and higher salaries. The number of tertiary educated people is about 2,6 per 1000 inhabitants (Slovak average 5,4/1000 inhabitants).

The region miss the direct regional Technology foresight and innovation in region. Wide scale of stakeholders and foreign partners will be included into this RIS project. The RIS will be finished by the end of 2009.

Identification of RIS objectives and its implementation can be the basis for enhancement of innovation activities in the region. Important could be the document obligatory force for involved partners and regular evaluation of the implementation process.

[4] This can create anomalies, such as a small region doing comparatevely well on a indicator because a single innovative firm or public research institute is based there (RIS 2006)

RIS, although there have been prepared several documents, which included the innovation policy objectives (Regional operation program, Regional development plan for Eastern Slovakia, Social and economic development plan for Košice-region etc.).

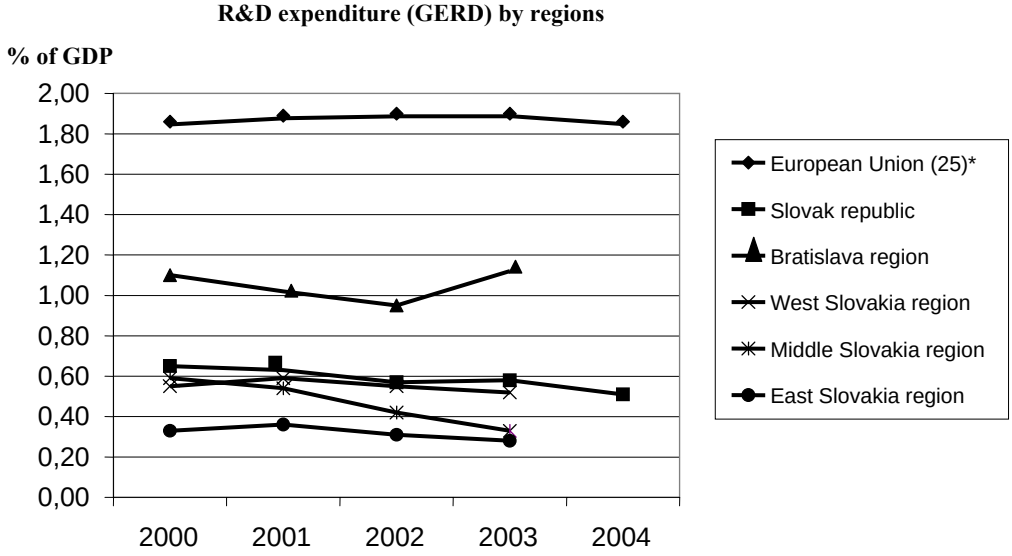


Figure 13: R&D expenditures in Eastern Slovakia

Source: Eurostat, graphic made by author

Since 2005 there was established cooperation between regional government and regional education institution (Technical University of Košice) targeted to develop RIS for Košice-Region. There is preparing common RIS for Košice- region and Nothern Hungary and not for the whole Eastern Slovakia. The Prešov –region is preparing its own RIS. The common bilateral RIS is preparing with the support of the Sixth Framework Program NORRIS. Nowadays there is realizing qualitative and quantitative survey about present state

We can define as the main problems of low regional innovation capacity in Eastern Slovakia following issues:

1. Insufficient financial resources for innovation. (dependence on EU funds, lack of risk capital)
2. Missing innovation tradition (in public, private sector)
3. Brain drain of potential innovation holders
4. Missing innovation strategy (Technology foresight, RIS)

There are broad possibilities for regional governments to influence regional innovation capability. The main opportunities for innovation policy in Eastern Slovakia could be e.g. using of EU funds: - RIS preparation based on regional partnership and coordination with RIS of Prešov region, development of Partnership public – private sector (example IT Valley in Košice region), improvement of regional innovation governance system, attracting of FDI – investors in high-tech sector (Industry park Kechnec, international R&D park Prešov-Košice-Miskolc), human resources development (e.g. Support of study programs related to IT) and improvement of innovation support infrastructure (including financing support mechanism, hard infrastructure etc.)

3. Conclusions

There exists positive relation between innovative and economic performance, in particular in regions with low per capita income, the support of innovation could become driver of regional development. Eastern Slovakia shows the lowest level of economic performance in Slovakia. The regional policy can influence innovation activities using several policy instruments. The strategic documents (RIS, Regional Technology Foresight) play a crucial role the effectiveness of governance structures related to innovation policy.
Eastern Slovakia is lagging behind in innovation performance, but there exist several important opportunities, that could have significant impact on its innovation potential in the future.

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