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INNOVATION AS A FACTOR OF ECONOMIC DEVELOPMENT OF BORDER AREAS

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ABSTRACT

In the modern world the issue of innovation is the basis of economic development, it affects the competitiveness of businesses, how they build their values and operate on the market. Linking all these elements will allow one to properly determine the innovation potential and to introduce solutions that will lead the innovation process towards positive and intended results. This is particularly important in Polish, Slovak and Ukrainian border regions - each of them is located peripherally in relation to the main national economic centres and, therefore, deals with similar economic and social problems. Greater dynamism in the implementation of innovation in these areas could become important factors for the progression of transborder regions. For that reason, the article presents an analysis of selected indicators of innovation in conjunction with the level of socio-economic development of these regions.

Key words: *innovation, transborder areas, investment outlays*

1. Introduction

The development of the modern economy is largely linked to activities associated with raising the competitiveness of entities active on the market, and consequently their innovativeness. In the literature, the concept of innovation is differently defined by economists and researchers of exact and social science. This concept is increasingly used to describe the phenomena occurring in the economy, mainly to determine the challenges faced by entities operating in the economic environment and functioning in society. However, there are differences in defining this concept. The most common definitions refer to the classical approach of J.A. Schumpeter, according to which the innovative actions involve the implementation of a new or significantly improved product (good or service) or process, a new marketing method or a new organizational method in business

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practice, organization of workplace or external relations. Innovation can mean the willingness and ability of companies to constantly seek and use in practice the results of research and development. Innovative activities can be carried out by the company itself on its own grounds, jointly with others, or may involve the purchase of goods, services, including consulting services, or knowledge from external sources. Therefore, a company that wants to change its products, capabilities or production systems, marketing and organization, have two possibilities. It can invest in creative activities and develop innovations in-house - alone or jointly with external partners - or can assimilate innovations developed by other companies or institutions in the process of diffusion.

Innovative activity is connected with the development of information technology. As a result of continuous technical progress information has become one of the basic productive factors. On the one hand, progress helps to generate more and more information resources, on the other hand, the development of these resources becomes the condition for the emergence of new technologies, products and solutions. Today's complex socio-economic structures require that both communities and businesses have ever greater resources of information at their disposal.

Therefore, what is important nowadays is technology and tools that allow both access to information already produced and their use, but also make it possible to create new information.

One of the key elements of innovative activity is the development of research and development activity (R&D). It includes creative work undertaken on a systematic basis in order to increase the stock of knowledge and to use it to the creation of new applications.

While analysing the level of advancement of research and development activity in a given area, attention should be paid to its several key indicators such as the number of people employed in this activity, the number of R&D employees and the amount of outlays on R&D.

The growing role of innovation in accelerating the processes of socio-economic development became the basis for the search for sources of diffusion of knowledge and diffusion of innovation, which play a key role in shaping the innovation capacity of enterprises, and consequently their competitiveness, which is transferred over time to entire regions in which they operate. An important role in this process may be played by acquired investors. Hence, authorities responsible for the development of individual territorial units try to create conditions for enhancing the attractiveness of regions for investors. One of the ways leading to such an effect in the regions lagging behind in development and with structural problems is the creation of special economic zones (SSE). This "path" to attract investors is used in the region of Podkarpacie with great care.

2. Investment attractiveness of the border areas

The incurred investment outlays are undoubtedly one of the indicators of investment attractiveness of regions. Their level, as well as the dynamics in the analysed period showed great diversity. The leader of the surveyed border regions was the region of East Slovakia, both in absolute terms and per capita.

Investment outlays in the national economy[2] incurred in Podkarpackie Voivodship in 2009-2011 had an upward trend (an increase of 30.4% in 2011 compared to the previous year), while 2012-2013 recorded declines (Figure 1.). The share of outlays on investments in Podkarpackie Voivodship is in the range of 3.6% -5.5% of national outlays.

Of the total outlays, over 31% on average was allocated to industry (the highest in 2008 - 38.5%, and the lowest in 2011 - 27.2%). After a decline in 2009 (by 11.2%), the outlays incurred on industry recorded increases in subsequent years, but the rate of growth in 2012-2013 was slower (an increase of 0.1% in 2013) than in 2010-2011.

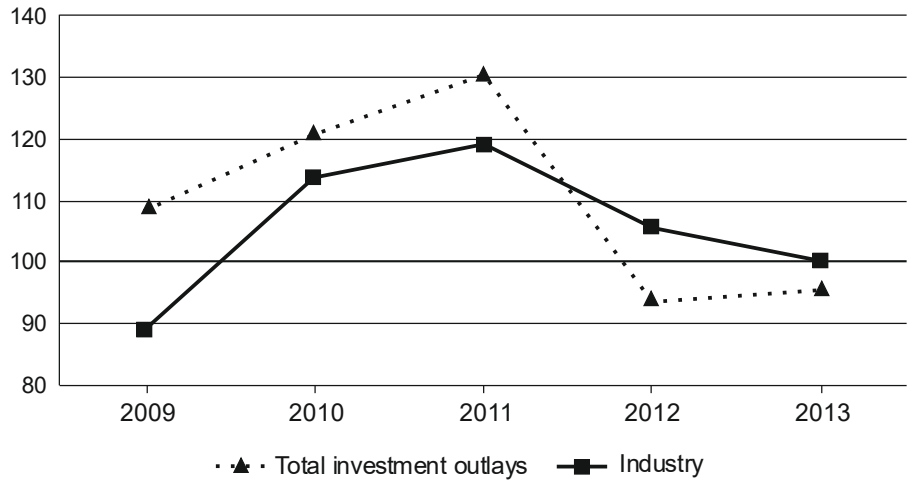

Figure 1. Investment outlays dynamics in Podkarpackie Voivodship (previous year = 100)
Source: Own elaboration.

Investment outlays incurred by entities[3] located in the border area of Podkarpackie Voivodship showed variable trends in the analysed period. After a slight decline in investment in 2009, an increase of 30% could be observed in the next two years, while in 2013 outlays were lower by 21.5% than in the previous year. More than half of investment outlays was incurred by industrial units.

[2] According to investment location.
[3] Data concern economic entities employing more than 9 persons; according to investment location.

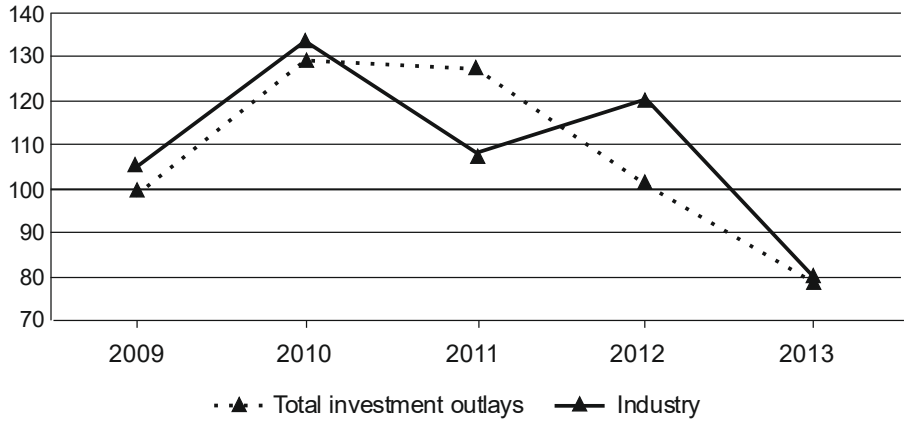

Figure 2. Investment outlays dynamics in the border area in Podkarpackie Voivodship (previous year = 100)

Source: Own elaboration.

The share of investment in enterprises located in the border area accounted for an average 29.5% of outlays of Podkarpackie Voivodship. The highest share was recorded in 2010 (33.4%) and the lowest in 2008 (25.5%). At the end of the analysed period (2013), the outlays in the border area accounted for 26.4%.

Investment capital in Lviv Region, as in the case of the border areas of Podkarpacie, recorded high growths in 2010-2011 in comparison to previous years (about 20%), whereas in 2012 and 2013 they were lower by 13.2% and 18.6%, respectively. The dynamics of the capital of industrial units was on an upward trend since 2010. In 2013, the increase in investment outlays was 32% compared to the previous year.

The share of industry in total investment in Lviv Region in 2008-2012 fluctuated in the range of 19.7%-25.8%, and in 2013 it was already 35.6%. From the above analysis one can conclude that the industry in Lviv Region is constantly evolving and strengthening its position in the economy.

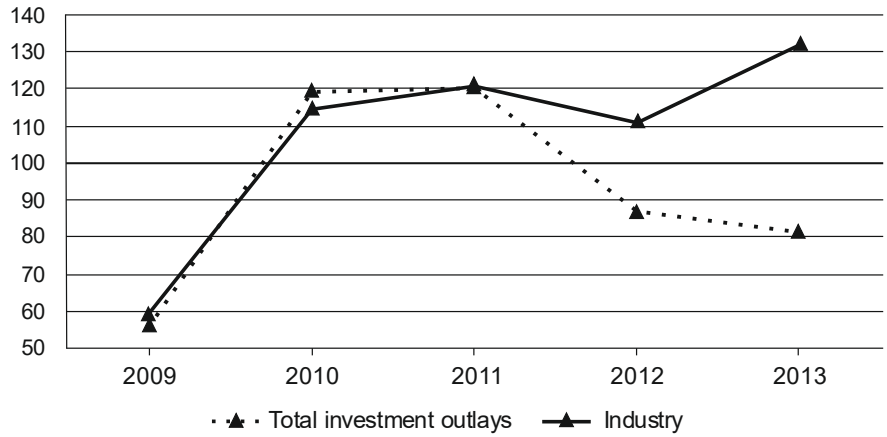

Figure 3. Investment outlays dynamics in Lviv Region (previous year = 100)

Source: Own elaboration based on data of the Statistical Office of Ukraine.

Investment capital of Lviv region in the analysed period accounted for an average of 4.3% of investment outlays in Ukraine. The highest shares were recorded in 2010-2011 (4.7%) and the lowest in 2012 (3.8%) and 2013 (3.7%).

Investment outlays in East Slovakia, after declines in 2009-2010, recorded a slight increase (an increase of 3.3% in 2011), and then again in 2012 they were lower than in the previous year. Similar trends were observed for outlays incurred in industry, which recorded a much higher growth in 2011 (by 37.5%) and a large drop in 2012 (by 24.3%). The share of outlays in industry in relation to the total outlays stood in the range between 31.5% (in 2009) and 42.2% (in 2011)[4].

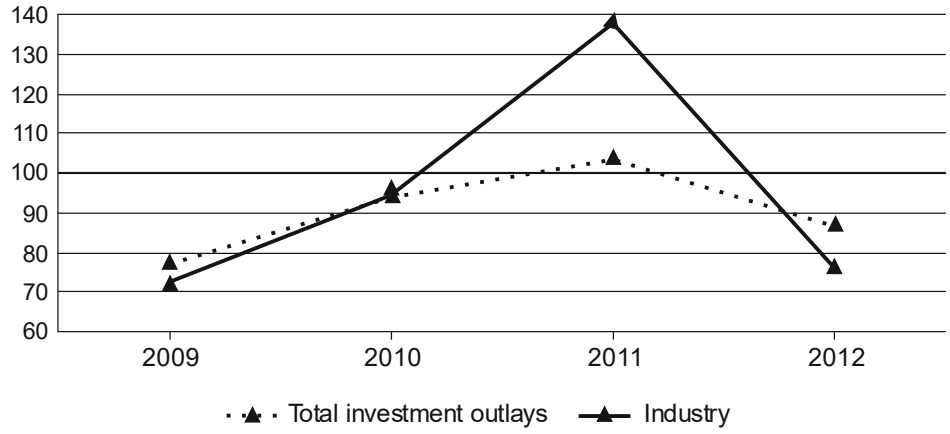

Figure 4. Investment outlays dynamics in East Slovakia (previous year = 100)
Source: Own elaboration based on data of the Statistical Office of Slovakia.

Outlays on fixed assets incurred in East Slovakia were on average over 19% of outlays incurred in Slovakia (the largest share in 2008 - 22.3%, the lowest in 2012 - 16.3%).

In order to compare outlays per 1 inhabitant of Podkarpackie Voivodship, Lviv Region and East Slovakia, the data have been converted into euro. In the analysed period, the highest outlays per 1 inhabitant was recorded by units in East Slovakia, but this difference was decreasing gradually from year to year, in comparison with outlays in Podkarpackie Voivodship and Lviv Region.

The largest increases in outlays per 1 inhabitant were recorded in 2010-2011 both in Podkarpackie Voivodship and Lviv Region. East Slovakia, after declines in 2009-2010, recorded a slight increase (2.1%) only in 2011. In 2013, the biggest drop in outlays per 1 inhabitant was recorded in Podkarpackie Voivodship and Lviv Region.

[4] Data for 2013 not available.

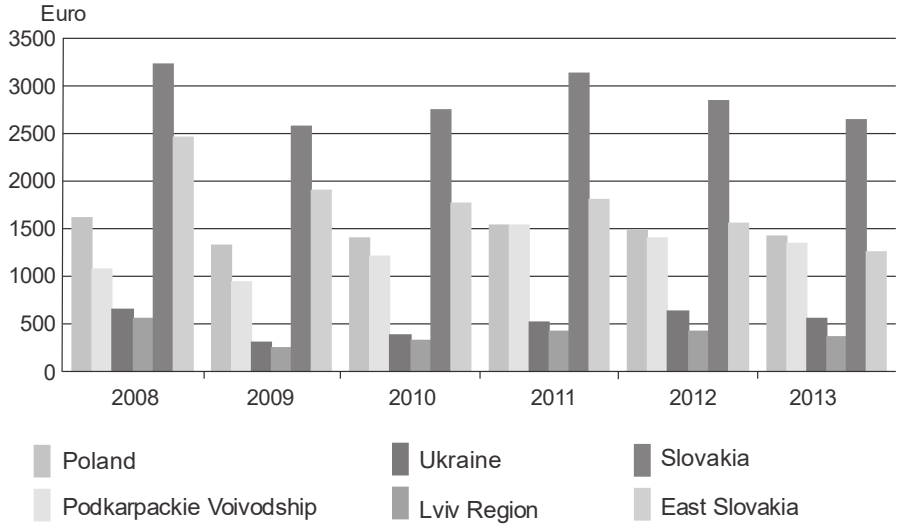

Figure 5. Investment outlays per 1 inhabitant

Note: Preliminary data for 2013 for Slovakia and East Slovakia.

Source: Own elaboration based on data of the Statistical Office of Poland, Slovakia and Ukraine.

In the last three of the analysed years one can observe decreasing disparities in investment outlays per 1 inhabitant between Podkarpackie Voivodship and Poland. A reverse trend was reported for East Slovakia, where outlays were decreasing and were half the outlays in Slovakia at the end of the analysed period. Similarly, in Lviv Region they accounted for 2/3 of outlays per 1 inhabitant in Ukraine.

3. Employment and outlays in the field of research and development

In 2013 in Podkarpackie Voivodship in the field of R&D 7339 persons were employed which accounted for 5.0% of all persons employed in research and development in the country. Compared with 2008 the number of employees increased by 3977 and their share increased by 2.2 percentage points. In the region of East Slovakia in 2013 in the R&D area 5123 persons were employed and in comparison with 2008 there was an increase in employment by 1050 persons. The number of persons employed in research and development in the region of East Slovakia constituted 18.4% of all employees in R&D in Slovakia in 2013.

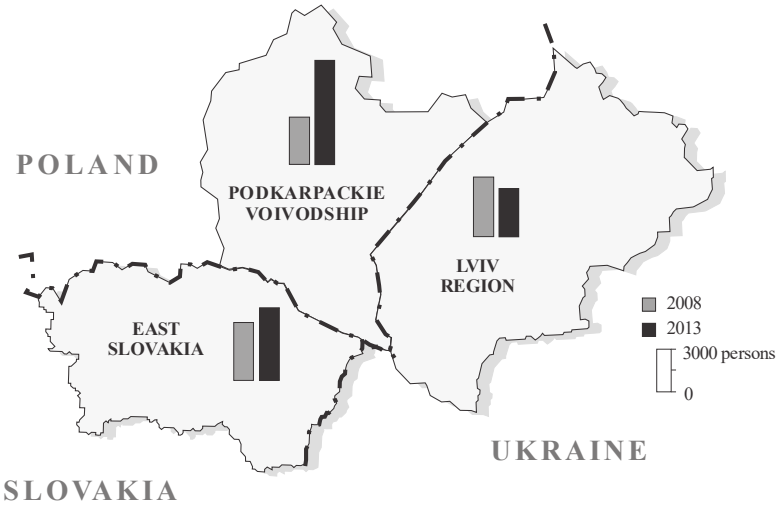

Figure 6. Employment in the field of R&D

Source: Own elaboration based on data of Eurostat and the Statistical Office of Ukraine.

Among the analysed border regions in East Slovakia this indicator was the highest and in comparison with 2008 this share increased by 1.2 percentage points. In 2013 in Lviv Region in research and development 3422 persons were employed which accounted for 4.4% of all employees in R&D in Ukraine. In comparison with 2008, their number decreased by 819 and their share fell by 0.1 percentage points.

In 2008-2013 the largest increase in the indicator presenting the number of employed in R&D per 1000 population was observed in Podkarpackie Voivodship (increase from 1.60 in 2008 to 3.52 in 2013). In East Slovakia in 2013 this indicator amounted to 3.17, while in Lviv Region to 1.35. In the analysed period, both in the region of Podkarpackie and region of East Slovakia this indicator showed an upward trend, while in Lviv Region its value was steadily decreasing.

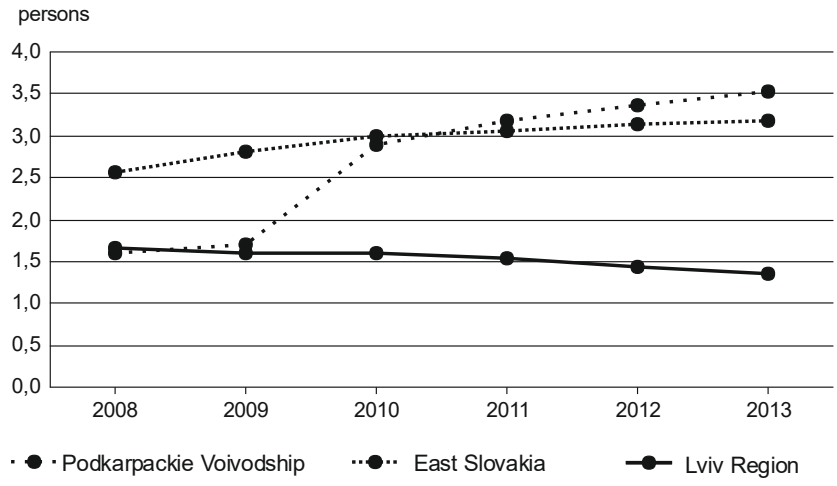

Figure 7. Employment in the field of R&D per 1000 population

Source: Own elaboration based on data of Eurostat and the Statistical Office of Ukraine.

The share of persons employed in R&D activity in the economically active population in 2013 in Podkarpackie Voivodship amounted to 0.79% and was the highest in the analysed border regions. For Poland this indicator was higher and reached 0.84%. In the region of East Slovakia the share of persons employed in R&D in the economically active population amounted to 0.67%, while for the whole Slovakia – to 1.02%.

The largest group of employed persons constitute employees of scientific research dealing with the conceptual work and creation of new knowledge, products, services, processes, methods and systems, as well as directing (managing) research projects related to the implementation of these tasks.

In 2013 the largest share in this group of professionals in the economically active population was observed in the region of East Slovakia, where this indicator amounted to 0.60%. In Podkarpackie Voivodship this indicator was slightly lower - 0.55%, while the lowest value was observed in Lviv Region - 0.25%.

Analysing the value of this indicator in 2008-2013 it should be noted that in both regions of Eastern Slovakia and Podkarpackie Voivodship this indicator showed an upward trend, however, in Podkarpackie in 2013 this indicator was almost twice higher than in 2008. In Lviv Region one could observe an opposite phenomenon - a gradual decline in the share of research and development employees in the economically active population.

Analysing the dynamics of the current outlays on R&D activities in 2008-2013 it should be noted that the biggest increase occurred in Podkarpackie Voivodship in 2010 - by 107.6%. In the region of East Slovakia the highest growth was recorded in 2012 - an increase of 29.8%. However, in Lviv Region the highest increase was observed in 2008 - by 20.1%.

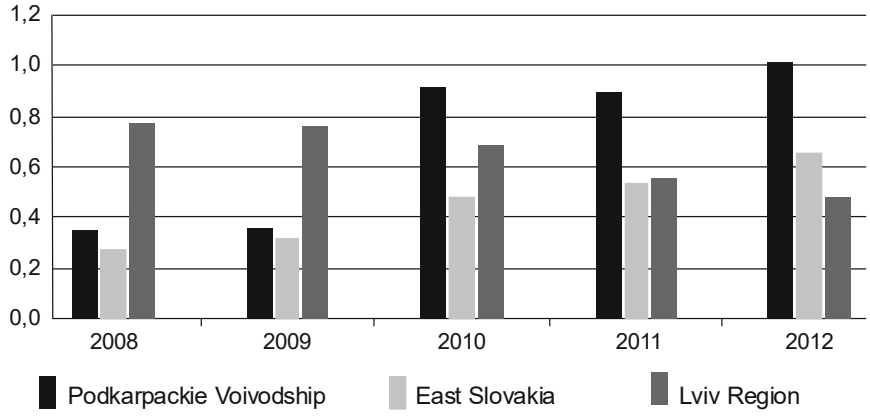

Figure 8. Outlays on research and development activity in % of GDP

Source: Own elaboration based on data of Eurostat and the Statistical Office of Ukraine.

In the analysed regions the share of outlays on research and development in Gross Domestic Product in 2012 was the highest in Podkarpackie Voivodship,

where it amounted to 1.02%. The lowest value of this indicator was observed Lviv Region where it reached the value of 0.48%. Compared to 2008 in Podkarpackie Voivodship the share of outlays on R&D in GDP almost tripled. The region of East Slovakia also saw a significant increase in the share of outlays on R&D in GDP (more than double) and Lviv Region reported a decline in this indicator from 0.78% in 2008 to 0.48% in 2012.

4. Innovative activity

In Podkarpackie Voivodship the share of innovative companies in the total number of companies in 2013 amounted to 14.7%. In comparison with 2008 it fell by 5.1 percentage points. In Poland in 2013 the value of this indicator was 14.3% and in comparison with 2008 it also decreased (by 4.5 percentage points).

In 2013 innovative industrial companies in Podkarpackie Voivodship accounted for 19.9% of all industrial companies. Compared to 2008 this indicator decreased by 2.7 percentage points. Analysing the share of innovative companies in terms of the number of employees, the largest share in 2013 occurred in the group of industrial companies employing more than 250 persons, where they accounted for 58.5% of all companies. In the group of companies employing 50 to 249 persons this indicator reached the value of 39.1%, while in companies where the number of employees ranged from 10 to 49 persons there was only 11.8% of innovative companies.

In 2013 the share of innovative industrial companies that introduced new or significantly improved products amounted to 13.2% and compared to 2008 it was lower by 5.1 percentage points. New or significantly improved processes in 2013 were introduced by 14.5% of innovative industrial companies in Podkarpackie Voivodship, i.e. 2.6 percentage points less than in 2008.

Among companies active in the service sector in Podkarpackie Voivodship in 2013 innovative companies accounted for 9.5%. In 2008 the value of this indicator was 17.0%. The share of innovative companies in the services sector that introduced new or significantly improved products in 2013 was 4.3%, while the share of companies that introduced new or significantly improved processes was 7.3%. Compared to 2008 these shares decreased.

In 2012 in the region of East Slovakia[5] innovative companies accounted for 32.1% of companies in the region and 17.0% of innovative companies in Slovakia. In comparison with 2008 the share of innovative companies in the region of Eastern Slovakia did not change significantly. In 2012 the smallest percentage of innovative companies occurred in the group of companies employing 10 to 49 persons with the share of 27.2%. Among companies employing 50 to 249 persons its value amounted to 41.7%, while the highest share of innovative companies occurred in the group of companies employing more than 250 persons - 55.7%.

[5] Due to the unavailability of data for 2013 the analysis covered the period of 2008-2012.

Among all innovative companies in the region of East Slovakia 60.7% were entities employing 10 to 49 persons, while the share of companies employing more than 250 persons was 9.9% in 2012. In 2013, in Lviv Region 16.6% of industrial companies were innovatively active. In 2008 this indicator was 12.1% and was increasing steadily until 2013. In Ukraine the share of innovative industrial companies in 2013 amounted to 16.8%. Innovative industrial companies in the Lviv Region amounted to 6.8% of innovative industrial companies in Ukraine in 2013[6].

In 2013 the share of industrial companies in Lviv Region that introduced innovations amounted to 12.0% and in comparison with 2008 this figure increased by 3.5 percentage points.

The decrease in the share of innovative companies in the total number of companies in 2008-2013, both in Poland and Podkarpackie region must be considered an alarming phenomenon from the point of view of the role attributed to innovation in the development of companies and improvement of their competitiveness. At the same time it should be added that this decline is not synonymous with a lack of any progress in the development of innovative economy of the region since in the period covered by the research both investment in R&D sector and their share in the GDP of the region increased, similarly to employment, which also increased in this sector. This however does not change the fact that progress in this field is still insufficient, which, among others, confirms the declining share of innovative companies in the general population of companies in the region, and therefore indicates inadequate structural changes in the economy of the region.

The concern may be even greater as this happens in a situation where all regions in Poland, including Podkarpackie Voivodship, follow Regional Innovation Strategies (RIS). There can be many reasons for this state of affairs. It seems that in general it is related to the fact that the increase rate in the number of companies is much higher (total number of companies in Podkarpackie Voivodship during the survey period increased by 10.6%, for comparison, in the region of Eastern Slovakia in the same period this increase was only 1.9%) than the rate of increase in the number of innovative companies. In addition, in the structure of start-up companies an essential role is played by small entities focused, to some extent, on innovative solutions in their business.

An indirect confirmation of this thesis is the earlier analysis which shows that in the formation of gross value added an important role is played by trade and catering, hence the sectors which development is based mainly on the use of a low-skilled labour factor. The observed decline could also be caused by changes in the assessment of the level of innovation by entrepreneurs. This is partly due to the definition of innovative activity of companies, according to which the products, processes and organizational methods and marketing do not have to be

[6] There are methodological differences between Ukraine and the countries of the European Union in relation to the examination of the level of innovation.

new to the market in which the company operates, but must be at least a novelty for the company itself. Therefore, the evaluation largely depends on the already implemented innovative solutions – the companies which introduced a number of innovations in previous years no longer evaluate itself as innovative in subsequent years.

In addition, one should remember that innovation is an individual event and the key role in building an innovative economy is played by diffusion of innovation, which is the process of multiple use of a given solution. Innovation is a competitive good in relation to products or processes used so far. Therefore, the primary economic factor in determining the rate and scope of innovation diffusion is the extent of the relative advantages of considered goods, services or solutions over the existing equivalent. The final choice of solution is usually the effect of the comparison of profits and costs, and the latter, especially in the early period of the introduction of new solutions, can be significant, particularly for small businesses.

5. Conclusions

Polish, Slovak and Ukrainian transborder area is characterized by large internal differences, it is often seen as a problematic and underdeveloped area.

The common feature of each of the three border regions (Podkarpackie Voivodship, East Slovakia, Lviv Region) is the rate of GDP per capita that is much lower than the average in each of the countries. The difference was about 30% and remained at a similar level throughout the analysed period. One can deduce from that that these regions are the peripheral ones in their countries, and the distance to the economically more developed regions was not reduced in recent years.

The analysed cross-border area is characterized by relatively low indicators in the field of innovation compared with other regions in each country.

A moderate proliferation of innovation requires a support of not only individuals, but also institutions by building innovation systems (at various levels - national, regional and even local) constituting an efficient mechanism for the generation and diffusion of knowledge. Both the development of innovative companies, as well as the observed decline in their share undoubtedly were highly influenced by the EU funds. At the beginning of the surveyed period a relatively easy access to funding for innovative projects actuated the growth of innovative companies (often in the name only), and tougher criteria for innovative projects in the final period of survey could also be one of the causes of slowdown in growth and a decline in their share in the total number of companies. It should also be noted that the level of innovativeness of Polish companies is significantly lower than the average in the European Union.

One can note, however, that the years 2008-2013 saw a dynamic development of research and development activity in Podkarpackie voivodship, where the values of certain indicators to assess innovativeness of the region doubled. The

acceleration in the innovativeness development in Podkarpackie voivodship should be certainly associated with EU programs implemented in this area, among other things. Also, in East Slovakia, which is definitely not a leader in innovation in Slovakia, innovativeness indicators show a positive trend, although the progress is much slower. In contrast to these two regions, Lviv Region is characterized by a clear slowdown in the progress in the field of research and development activity. It should be noted, however, that in the case of Ukraine, these indicators are also declining.

In light of the above it can be concluded that innovations at the current level in the regions covered by the survey are not a factor limiting their risk of peripherization. They rather represent a big challenge, without which it will be difficult to take effective use of endogenous potential and produce competitive products to external markets.

Innovation, as an economic category, must be subject to surveys and monitoring in order to yield the desired results. These activities should be carried out at meso, macro and microeconomic levels. Linking all these elements will allow one to properly determine the innovation potential and to introduce solutions that will lead the innovation process towards positive and intended results.

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