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REGIONAL DISPARITIES IN PUBLIC FINANCIAL SUPPORT FOR INNOVATIONS FROM OPERATIONAL PROGRAMME INNOVATIVE ECONOMY IN POLAND

Summary: Nowadays, innovations plays a significant role in strengthening the competitive advantage of regional economies. In this light an innovation policy aimed at supporting innovativeness on this level becomes of crucial importance. The paper aims to determine the spatial distribution of public funds oriented to support innovation from the Operational Programme Innovative Economy in Polish regions (NUTS 2 level). The results of the analysis indicate the significant disparities in the examined field. Moreover, they reveal that the most developed Polish regions were granted the highest public financial support for innovation. This model of allocation enables the most effective spending of public funds by most technologically advanced and developed regions and strengthens their metropolitan functions, but simultaneously may lead to an increase of the innovation and development disparities in the Polish regional context.

Keywords: innovations, region, public funds, innovation policy.

1. Introduction

Innovation plays a significant role in strengthening the competitive advantage of regional economies. In this light, an innovation policy aimed at supporting innovativeness on this level becomes of crucial importance. The broad spectrum of instruments of contemporary innovation policy is strongly embedded and intertwined with regional policy [Sluismans et al. 2010, p. 90].

It is commonly considered that the main area of innovation processes is ‘region’ [Feldman, Florida 1994, pp. 210-229]. As Pavitt suggests (cited by [Baptista, Swann 1998, pp. 525-540]) new technological knowledge, due to its informal, uncodified nature, should flow more easily locally than over large distances. This implies that colocation facilitates knowledge spillovers by providing opportunities for interactions of the main actors of the innovation process: enterprises, research and government units. Bearing this in mind, innovation policy should be increasingly designed and implemented at regional level.

Polish regions are among the least developed areas of the European Union. Moreover, they are characterized by significant disparities in the level of development, which influence adversely the country's economic growth. Stimulating the innovation-driven development of Polish regions is undoubtedly an opportunity for their external and internal convergence.

International evidence indicates that the most efficient way of catching up with highly developed regions is encouraging endogenous, i.e. based on internal development factors, innovation processes [Fagerberg, Godinho 2006, p. 515]. This involves therefore the necessity of establishing favourable conditions in these regions, not only for the absorption of innovative solutions from abroad, but first of all, for the creation of innovation on their own.

The stimulus for strengthening the innovative potential of Polish regions is the possibility of exploiting the EU funds oriented to support innovativeness. This support becomes an important factor diminishing the risk and costs immanently connected with innovative activity, which is particularly significant in the context of the relative economic weakness of Polish enterprises and scientific and research units.

The paper aims to present the role of public financial support in strengthening the innovativeness of economies and to determine the spatial distribution of Operational Programme Innovative Economy funds oriented to support innovation in Polish regions.

2. The role of public financial support in strengthening innovativeness

Innovation is a complex process connected with high costs and uncertainty. In particular, the first stages of innovation process are characterized with the highest risk, mainly in R&D activities, as it is hard to predict the results of conducted research projects. The key features of innovation outputs are their approximation, a relatively long gestation period, inequality and the absence of recurrence. These factors imply therefore, as far as the high costs of innovation activity are concerned, that external financial support on innovation activity is especially important for small and medium size enterprises which are not able to conduct innovation activities on their own due to limited financial resources.

The financial support for innovation is the key instrument of innovation policy, whose major objectives are economic growth and international competitiveness. In EU policy, these objectives are combined with social cohesion and equality [Lundvall, Borràs 2006, p. 612].

The foundations for public support for innovativeness were established by the endogenous growth theory [Shaw 1992, pp. 611-621]. Contrary to the neoclassical growth models in which technological progress was considered as exogenous and independent variable [Solow 1957, pp. 312-320], endogenous growth is driven by

technological change that results from the R&D efforts. These assumptions imply that subsidies to R&D and other government policies may impact the long-term rate of economic growth [Jones 1995, p. 759]. Many economists argue that investing in R&D or in human capital could contribute to an improvement of innovativeness and to economic development [Romer 1990, pp.71-102; Aghion, Howitt 1992, pp. 323-351; Grossman, Helpman 1994, pp. 23-44; Lucas 1988, pp. 3-42; Benhabib, Spiegel 1994, pp. 143-173].

The evidence in economic literature shows that public funding with a civic objective actually has a positive effect on the elasticity of business R&D, and that government funding is successful in enhancing business R&D with higher social returns. Simultaneously, the defence-related part of public funding seems to have a significant negative impact on the effectiveness of business R&D [Guellec, Van Pottelsberghe de la Potterie 2004].

Moreover, economic analyses on the impact of public financial support for innovations have not revealed the “crowding-out” effect between public and private spending [Hall, Maffioli 2008, p. 172-198]. On the contrary, the absence of subsidies may in fact constrain some firms (mainly small and operating in low technology sectors) from engagement in R&D activities [González, Pazò 2008, pp. 371-389]. Public financial support affects R&D intensity. In addition, it induces a more proactive attitude of enterprises towards innovation activities.

This implies that innovation policy aimed at financial and organizational support becomes of crucial importance, especially in the less developed national and regional economies, among which there are Polish regions.

3. Public funds oriented to support innovativeness in Poland

The main source for the financing of innovation policy in Poland is EU structural funds. The support directions from the EU budget in 2007-2013, available through the European Regional Development Fund (ERDF), European Social Fund (ESF) and the Cohesion Fund, were defined in the National Cohesion Strategy – the National Strategic Reference Framework (NSRF). The aggregate sum of NSRF funds in 2007-2013 is 89,9 billion EUR. The EU funds constitute 85% of the total public funds allocation (67,9 billion EUR), whereas the national public funds – 15% (almost 12 billion EUR). In the NSRF the allocation of funds to operational programmes is made both on regional and national level [*National Strategic...2007*, p. 15].

The key operational programme of NSRF that focuses on the support of competitiveness of the Polish economy through the improvement of its innovativeness, is the Operational Programme Innovative Economy (OP IE). This programme contributes to achieving the objectives of the Lisbon Strategy and the Europe 2020 Strategy by designating 90% of the financial allocation for actions in the areas of R&D, innovation, information and ICT [*Operational Programme...2007*, p. 56].

The strategic goal of the OP IE is the development of the Polish economy on the basis of innovative enterprises. For the realization of the Programme's assumptions, detailed objectives that encourage innovation activities in the fields of R&D, electronic economy and internationalization of the Polish economy were formulated [*Operational Programme...2007*, pp. 58].

The Programme is oriented towards entrepreneurs, scientific institutions, universities and government units. By the end of 2011 the highest support was granted to the following groups of beneficiaries [*Sprawozdanie roczne...2012*, pp. 6-7]:

- entrepreneurs (53% of the contracted funds),
- universities and scientific units (27% of the contracted funds),
- government administration (14% of the contracted funds).

The total amount of public funds allocated to OP IE in 2007-2013 was 10,19 billion EUR. This sum consists of funds from ERDF - 8,66 billion EUR and national funds – 1,53 billion EUR.

Due to the fact that OP IE is governed at national level, the competition for public financial support occurs between regions. It is therefore essential to analyse the allocation of public funds from this programme at regional level.

4. An analysis of the spatial distribution of OP IE funds in Polish regions

4.1. Data and methodology

An analysis of the spatial distribution of public funds oriented to support innovations was conducted for 16 Polish voivodships, which are NUTS 2 regions. In order to evaluate the disparities between regions in the analysed field the value of financial support from OP IE funds granted to voivodships in signed contracts for co-financing, during the period 2007-2011 was examined, on the basis of data provided by the Ministry of Regional Development of Poland [*Załącznik nr 2 do Sprawozdania okresowego...2012*]. The number of signed contracts and the value of public financial support from OP IE per one entity of national economy recorded in the REGON register were also examined. Moreover, the effectiveness of application submitting, measured by the relation between the amount granted in the contracts for co-financing signed with the beneficiaries, and the value of public funds in submitted applications, was calculated.

In order to evaluate the strength of the association between public support and the level of economic development in Polish regions, the Pearson linear correlation coefficient was calculated. The value of OP IE funds granted to each voivodship in the period 2007-2011 was chosen as a measure of public support and the average level of regional GDP *per capita* in the period 2007-2010 – as a measure of economic development based on the data provided by the Central Statistical Office of Poland, Local Data Bank¹.

¹ <http://www.stat.gov.pl>, March 2013.

4.2. Results

The implementation of PO IG 2007-2013 funds in Polish regions at the end of 2011 is presented in Table 1.

Table 1. Public financial support from OP IE in the period 2007-2011 in Polish regions

Voivodships	Public funds in mln PLN	Public funds per 1 entity recorded in the REGON register in PLN	Effectiveness of application submitting in %
Dolnośląskie	2 103,4	6 420,0	39,8
Kujawsko-pomorskie	841,0	4 561,3	35,4
Lubelskie	885,0	5 459,8	33,7
Lubuskie	282,8	2 708,1	26,6
Łódzkie	1 371,4	6 000,7	26,7
Małopolskie	2 359,6	7 115,8	38,4
Mazowieckie	4 844,9	7 176,6	33,0
Opolskie	622,8	6 384,2	34,8
Podkarpackie	1 155,2	7 645,5	37,0
Podlaskie	479,2	5 223,6	32,4
Pomorskie	949,8	3 678,6	28,2
Śląskie	1 873,7	4 225,7	34,9
Świętokrzyskie	487,3	4 601,5	40,8
Warmińsko-mazurskie	400,3	3 416,3	31,5
Wielkopolskie	1 676,0	4 451,6	31,1
Zachodniopomorskie	333,4	1 553,9	25,6
Variability coefficient (%)	86,4	32,9	13,7
Gini coefficient	0,421	0,187	-
max/min	17,1	4,9	1,6

Source: own elaboration.

The data presented in Table 1 reveals that the allocation structure of funds from OP IE is characterized with a high level of disparities and regional concentration. Since the beginning of the implementation of OP IE, the highest value of financial support (estimated on the basis of signed contracts) was received by the Mazowieckie voivodship – over 4,8 billion PLN, that accounted for almost a quarter of the total amount granted to all voivodships. Three voivodships (Mazowieckie, Małopolskie and Dolnośląskie) together obtained almost a half of the total sum of the funds' allocation. This fact is undoubtedly proof of the significant regional concentration in the examined field. The lowest value of public support from OP IE was granted to the Lubuskie voivodship (0,3 billion PLN), over 17-times lower than in Mazowieckie. The large scale of concentration is also confirmed by the fact, that the value of funds granted to Mazowieckie exceeded the value of the joint support received by eight other voivodships.

The estimated value of the variability coefficient indicates that, on average, the value of support for each voivodship deviated from the mean by over 86%. The estimated Gini coefficient was 0,421, which confirms the significant concentration in the examined field.

The analysis revealed that the highest value of public financial support from OP IE per one entity of national economy recorded in the REGON register was found in the Podkarpackie voivodship, whereas the lowest – almost five times lower – in the Zachodniopomorskie voivodship. It is worth pointing out that the regional disparities and concentration in this field is lower in comparison to the distribution of the whole amount of funds granted to voivodships. The estimated variability coefficient was equal to almost 33%, and the Gini coefficient – 0,187.

During the five years of implementation of OP IE the highest effectiveness of application submitting was achieved in the Świętokrzyskie voivodship, in which the relation between the amount granted in the signed contracts and the value of public funds in submitted applications exceeded 40%. The lowest efficiency of submitting applications was found in the Zachodniopomorskie voivodship, where the examined indicator was only 25%.

In the next stage of the research, an analysis of the correlation between public support and the level of economic development in the Polish regions was conducted. The estimated Pearson linear correlation coefficient between the value of OP IE funds granted to each voivodship in the period 2007-2011 and the average level of regional GDP per capita in 2007-2010 was 86,6%. The coefficient was significant at the level of 0,01.

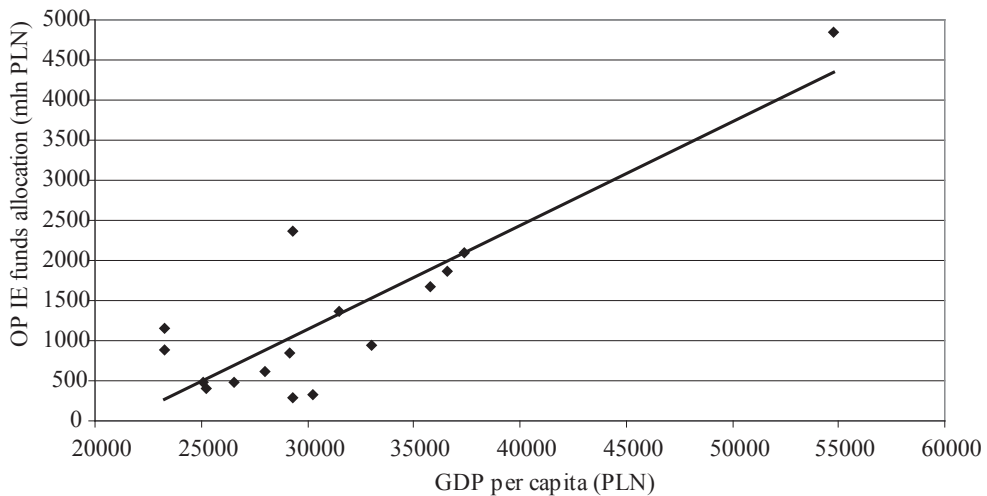


Figure 1. Regression between the average regional GDP per capita in the period 2007-2010 and the value of OP IE funds granted to each voivodship

Source: own elaboration.

The linear regression analysis between the discussed variables revealed that the variability of the average regional GDP per capita in the period 2007-2010 was able to explain 72,4% of the variability of the value of OP IE funds granted to each voivodship (Figure 1). Both the regression and structural parameters of the regression function were significant at the level of 0,01.

The results of the analysis indicate that although the interregional disparities in the level of innovativeness and development are significant, the highest total value of public financial support was granted to the most developed regions in Poland.

This model of the allocation of EU funds oriented to support innovations can be assessed both positively and negatively. On the one hand, the highest value of public financial support is concentrated in the most developed regions with the highest innovative potential in which, presumably, enterprises could exploit the obtained funds most effectively. On the other hand, this way of distribution of public funds could extend existing disparities, which should be criticised from the sustained regional development point of view.

An opportunity for the more equal allocation of funds is the regionalisation of the operational programmes oriented towards supporting innovation. This should create the conditions for the allocation of EU funds taking into consideration the needs of each Polish region, regardless of the level of its development, as the competition between the potential beneficiaries occurs within a given region.

5. Conclusions

The main conclusions derived from the conducted research are as follows:

1. The public financial support for innovations could contribute to the growth and development of economies. Innovation policy aimed at financial support becomes of crucial importance especially in the less developed national and regional economies, among which there are Polish regions.

2. Significant interregional disparities occurred in the field of spatial distribution of EU public funds oriented to support innovations in Poland. The value of the financial support from OP IE 2007-2013 granted to voivodships was characterized by high variability and concentration. Three voivodships (Mazowieckie, Małopolskie and Dolnośląskie) obtained together almost half of the total sum of the funds' allocation.

3. The results of the analysis indicate the positive correlation between the value of public financial support for innovativeness from OP IE 2007-2013 and the level of development measured by GDP per capita. The most developed Polish regions achieved the highest value of public financial support for innovation.

4. The analysed model of allocation in Poland enables the most effective spending of public funds by the most technologically advanced and developed regions and strengthens their metropolitan functions. However, simultaneously it could exceed the regional disparities as observed in the low dynamics in diffusion of development processes from metropolitan centres onto the surrounding regions.

5. The chance for a more equal allocation of funds could be the implementation of the regionalization of operational programmes oriented to support innovation in the future financial framework in the EU 2014-2020.

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REGIONALNE ZRÓŻNICOWANIE FINANSOWEGO WSPARCIA INNOWACJI W POLSCE ZE ŚRODKÓW PUBLICZNYCH Z PROGRAMU OPERACYJNEGO „INNOWACYJNA GOSPODARKA”

Streszczenie: Celem artykułu była analiza przestrzennej alokacji środków publicznych z Programu operacyjnego „Innowacyjna gospodarka”, ukierunkowanych na wspieranie innowacyjności w polskich regionach poziomu NUTS 2. Rezultaty analizy wskazują na znaczące zróżnicowanie międzyregionalne wartości otrzymanego dofinansowania. Ponadto udowodniono, że najbardziej rozwinięte polskie regiony otrzymały najwyższe publiczne finansowe wsparcie w obszarze innowacyjności. Taki model alokacji środków publicznych z jednej z strony zapewnia efektywne wydatkowanie środków publicznych przez najbardziej rozwinięte i zaawansowane technologicznie regiony i wzmacnia ich metropolitalne funkcje, z drugiej zaś prowadzi do pogłębiania się dysproporcji w poziomie innowacyjności i rozwoju w polskim układzie regionalnym.

Słowa kluczowe: innowacje, region, środki publiczne, polityka innowacyjna.