SCIENTIFIC PAPERS OF SILESIAN UNIVERSITY OF TECHNOLOGY ORGANIZATION AND MANAGEMENT SERIES NO. 220

2025

SMART SPECIALISATIONS AS FACTORS OF INNOVATION DEVELOPMENT IN THE REGIONS OF EASTERN POLAND

Teresa MIŚ

University of Rzeszow, Institute of Economics and Finance; tmis@ur.edu.pl, ORCID: 0000-0002-5164-0804

Purpose: The purpose of the article is to identify and to assess the essence of the concept of regional smart specializations in the context of innovation development, with particular emphasis on the regions of Eastern Poland. Additionally, it aims to highlight the role of EU funds in financing activities related to the creation of smart specializations in these regions. **Design/methodology/approach**: In collecting empirical material for the article, the method of economic and general statistics was used. The time frame of the research covers the years 2014-2023. The justification for the research location lies in the significant innovation potential of the regions of Eastern Poland and the EU funds directed at improving their competitiveness and investment attractiveness. The question arises whether this has been successfully achieved. Findings: The research showed that in all five voivodeships of Eastern Poland, regional smart specializations included issues related to improving innovation. The regions of Eastern Poland received more funding from EU funds and programs per capita compared to the national average. This is also confirmed by the absorption rate. However, the analyzed voivodeships still have the lowest GDP per capita in the country. Therefore, they should continue to invest in the development of technical and social infrastructure, as well as innovation in enterprises. Originality/value: The article presents the utilization of EU financial resources supporting cohesion policy by the local governments of the voivodeships in Eastern Poland, as well as the effects of this support based on selected indicators, including the author's absorption indicator. Keywords: smart specializations, innovations, regional development, EU funds, Eastern Poland.

Category of the paper: research paper.

1. Introduction

The priority of the EU's cohesion policy is to support development in a way that reduces developmental disparities between member states, their regions, and local communities, with the intended effect being an increase in regional and local economic competitiveness (Grzebyk et al., 2019, p. 9). New key elements of the reform of the EU's cohesion policy highlight the need to improve quality of life by supporting local and regional development,

with a particular emphasis on the role of entrepreneurship and smart specializations (Fiaschi et al., 2018, pp. 386-423; McCann, Ortega-Argilés, 2016, pp. 537-552). Smart specializations refer to identifying the unique characteristics and endogenous resources of each country or region, highlighting their competitive advantages, and focusing the attention of local partners on a future-oriented perspective for development (Kalinowski, Głodek, 2024, p. 464). Their goal is to strengthen regional innovation systems, to promote them, to facilitate knowledge transfer, and to capitalize on the regions' potential. In the economies of EU countries, smart specializations are a means of promoting regional innovation policy (Oleksiuk, 2015, p. 10). Regional smart specializations embody the idea of building the innovative capacities of regions and serve as a tool for creating a unique position on the international stage. They require complex and complementary actions, starting from identifying resources and technological advantages, assessing existing collaboration networks, and ending with selecting the most critical specializations and defining a comprehensive and individualized regional policy (Nowakowska, 2015, p. 316). The concept of smart specializations emerged as a response to challenges in designing innovation policy in the European context. It takes into account issues such as innovation systems, entrepreneurship development, and the problem of rising transaction costs. Regions should select areas where they have the most well-developed resources and concentrate their research and innovation efforts in those areas. This concept introduces the idea of diversifying regional policy based on the level of innovation capabilities (McCann, Ortega-Argilés, 2015, p. 1292). The new regional policy based on smart specializations offers an opportunity for the peripheral regions of Eastern Poland, which are characterized by a low level of socio-economic development not only compared to the rest of the country but also in relation to the entire European Union. These regions have a traditional economic structure and generally low levels of innovation (Dziemianowicz, Peszat, 2016, p. 281).

From the perspective of cohesion policy, smart specializations are extremely important. Securing and properly allocating European Union funds is fundamental to improving the competitiveness of peripheral and underdeveloped regions, such as the regions of Eastern Poland. In this context, it is justified to conduct research assessing the utilization of EU funds in these regions for financing the development of smart specializations related to innovation. Therefore, the aim of the article is to identify and assess the significance of regional smart specializations in the development of innovation in the regions of Eastern Poland, as well as to highlight the role of EU funds in financing activities related to their implementation.

2. Methods

The empirical material used in the research pertains to the five voivodeships of Eastern Poland, namely: lubelskie, podkarpackie, podlaskie, świętokrzyskie and warmińsko-mazurskie. The study employed the documentation method in order to compile and to compare empirical material and to explain the essence and specificity of smart specializations in the analyzed regions. Experts' opinions and financial reports from the Ministry of Funds and Regional Policy were used for this purpose. The study also applied the comparative analysis method, i.e. benchmarking, general statistical methods (including data from the Central Statistical Office in Warsaw), and descriptive methods.

The substantive scope of the article is both theoretical and empirical. It presents the issue of smart specializations from a theoretical perspective, including their essence and types, and identifies those that focus on innovation development.

The spatial scope of the study covers the regions of Eastern Poland, chosen due to their significant innovation potential and the EU funds directed at their development and the enhancement of their competitiveness, leveraging their investment attractiveness. The question arises whether this goal has been achieved.

The time frame focuses on the 2014-2020 programming period (including the n+3 rule, extending to 2023). However, due to the lack of statistical data from the Local Data Bank (BDL) of the Central Statistical Office (GUS), some issues are presented for the years 2014-2022.

To assess the use of EU funds by the regions of Eastern Poland in implementing cohesion policy in the area of smart specializations, the following indicators were applied:

- GDP per capita to evaluate the level of regional development, as this is the key indicator considered by the European Commission in assessing the socio-economic situation of a region and determining the need for funding.
- Expenditure on innovation activities in enterprises per active working person (in PLN).
- Amount of EU funds per capita (in PLN).
- Expenditure on R&D activities per capita (in PLN).
- Average share of innovative enterprises in the total number of enterprises (as a percentage).
- Innovation index according to the Regional Innovation Scoreboard.
- Change dynamics indicators and the author's absorption index.

The article proposes an indirect measure for assessing the added value created by EU funds, namely the absorption index. This index shows the actual share of a given region in absorbing financial resources, reflecting the amount of support relative to the total funds allocated to the entire region. It indicates the local government's engagement in securing financial resources for initiatives aimed at improving the quality of life for residents, including efforts to mobilize endogenous human and natural resources, as well as infrastructure, social, and ecological

investments covered by regional smart specializations. The index values should exceed 1; if they fall below 1, this suggests that the region's absorption of funds is less than expected based on its potential, indicating underutilization of opportunities for improving the socio-economic situation as outlined in the smart specializations.

Research by Dziemianowicz and Peszat (2016, p. 289), conducted during the 2007-2013 programming period, suggests that in Eastern Poland, there is a strong likelihood that, in the near future, companies and clusters will emerge that have improved their innovation and competitiveness through EU financial support (Dziemianowicz, Peszat, 2016, p. 289). Therefore, this article aims to examine whether this outcome was achieved in the 2014-2020 programming period.

3. Results

All voivodeships have characterized their smart specializations using a list of elements from the Regional Smart Specializations (RIS). In the case of RIS for Eastern Poland, each of the five voivodeships has identified its own areas.1 In the Lubelskie Voivodeship, five smart specializations were selected, including: high-quality food, green economy, healthy society, digital society, and materials technology, production processes, and logistics. The Podkarpackie Voivodeship has four smart specializations: aeronautics and space technology, information and communication technologies, quality of life, and automotive industry. The Podlaskie Voivodeship includes the following smart specializations: agricultural and food industry, metal and machinery industry, shipbuilding, medical sector, life sciences, and related sectors, particularly ICT and eco-innovation, as well as environmental sciences. In the Świętokrzyskie Voivodeship, four main smart specializations were identified, including: resource-efficient construction, metal and foundry industry, health and wellness tourism, modern agriculture and agri-food processing, as well as three horizontal areas covering: information and communication technologies (ICT), sustainable energy development, and the trade and congress industry. In Warmia and Mazury, three smart specializations were established: water economy, high-quality food, and wood and furniture manufacturing. For the purposes of this article, the area encompassing innovative activities across all regions of Eastern Poland has been highlighted (see Table 1).

¹ Ekspertyza MFiPR (2002): Analiza logiki interwencji programu Fundusze Europejskie dla Polski Wschodniej 2021-2027 w zakresie Celu Polityki 1 Bardziej konkurencyjna i inteligentna Europa, Policy & Action Group Uniconsult Sp. z o.o., Warszawa [Expert Analysis by MFiPR (2002): Analysis of the Intervention Logic of the European Funds for Eastern Poland 2021-2027 Program in the Scope of Policy Objective 1 - A More Competitive and Intelligent Europe, Policy & Action Group Uniconsult Ltd., Warsaw].

Table 1.

The most	important	regional	smart	specializations	that	align	with	the	areas	of	innovative
activities	in the regio	ns of Eas	tern Po	oland							

Voivodeships	The most important features of innovative activity
Lubelskie	High-quality food innovative systems and software, smart methods and tools for managing
	and monitoring the production process, and assessing the quality of raw materials and
	finished products; developing tools and modern research techniques and food markers;
	innovative systems for agricultural and food applications.
	Healthy Society innovative systems for medical applications, medical robotics and
	simulation technologies, and IT tools for collecting and analyzing medical data.
	Digital socjety digitization of resources, cloud computing, smart telecommunication and
	information technology systems, e-shopping platforms, telemarketing, e-commerce,
	innovative products and technologies applied in education, culture, and sports, as well as
	technologies related to artificial intelligence, etc.
	Materials technologies, production processes, and logistics innovative load-bearing
	structures, innovative VR technologies for applications in production and construction
	processes, smart packaging enabling quality monitoring, smart warehouses, etc.
Podkarpackie	Aeronautics and space technology technologies for processing data acquired from
	spacecraft and their application in economic and social practices.
	Information and communication industry development, commercialization, and
	enhancement of solutions in the areas of artificial intelligence, machine learning, robotics,
	and digital security; activities related to ICT infrastructure; creation of new data centers;
	etc.
Podlaskie	Medical sector, life sciences, and related sectors, particularly ICT medical engineering
	technologies, biotechnology/bioinformatics, sensor technologies, as well as robotics and
	the Internet in medicine.
Świętokrzyskie	Resource-efficient construction the application of digital data and artificial intelligence
	algorithms, the use of control systems, monitoring, and visual technology for threat
	identification.
	Information and communication technologies the application of ICT technologies in all
	areas of life and production activities.
	Trade and congress industry modern communication methods in business, utilizing ICT
	technologies.
Warmińsko-	1. Water economy: science and business environment institutions (BEI), universities,
mazurskie	institutes, laboratories, etc.
	2. High-quality food: science and business environment institutions (BEI), universities,
	institutes, laboratories, etc.

Source: MFiPR (2015). Common areas of smart specializations in the regions of Eastern Poland. Annex No. 5 to the Project Selection Regulations, Warszawa, pp. 13-15.

Research by Miś (2021) indicates that in the voivodeships of Eastern Poland, the total investment expenditures per capita and the GDP per capita index values from 2004 to 2020 did not exceed the national average. However, the amounts of contracts for EU funding per capita in the regions of Eastern Poland during the 2014-2020 period were higher than the national average. This is confirmed by the latest data from the Central Statistical Office (GUS) from July 2024, which encompasses the entire 2014-2020 programming period under the n+3 rule, covering the years 2014-2023 (see Table 2).

Table 2.

	The value of FU co-financing agreements per capita	Absorption rate
(as of the end of 2023)	and the absorption rate	
The value of EU co-fine	ancing agreements per capita under the Cohesion	Policy for 2014-2023

Voivodoshins	The value of EU co-financing a	Absorption rate	
volvodesnips	in PLN	in %	
Dolnośląskie	13 468.55	85.3	0.85
Kujawsko-pomorskie	13 894.09	87.9	0.88
Lubelskie	16 921.20	107.1	1.07
Lubuskie	13 495.83	85.4	0.85
Łódzkie	14 973.02	94.8	0.95
Małopolskie	13 670.26	86.5	0.85
Mazowieckie	13 290.07	84.1	0.87
Opolskie	14 217.17	90.0	0.82
Podkarpackie	15 098.21	95.6	0.90
Podlaskie	16 341.55	103.4	1.03
Pomorskie	13 897.90	88.0	0.88
Śląskie	12 924.66	81.8	0.82
Świętokrzyskie	15 394.92	97.4	0.97
Warmińsko-mazurskie	20 672.13	130.9	1.31
Wielkopolskie	10 612.49	67.2	0.68
Zachodniopomorskie	18 817.75	119.1	1.19
Eastern Poland	16 885.00	106.9	1.07
Poland	15 797.90	100.0	-

Source: own elaboration on the basis of the data from Statistics Poland in Warsaw (updated on 25.07.2024).

For the voivodeships of Eastern Poland, cohesion policy represents a unique opportunity for development, as its priorities in the financial perspective 2014-2020 were: smart development, sustainable development, and inclusive growth. Among the voivodeships in Eastern Poland, according to data from GUS in Warsaw (as of the end of 2023), the highest EU funding per capita was recorded in the Warmińsko-mazurskie Voivodeship, which was 39% higher than the national average, 22.4% higher than in all regions of Eastern Poland, and 94.8% higher than in the Śląskie Voivodeship (see Table 2). The article proposes an indirect measure for assessing the added value created by EU funds, known as the absorption index. This index illustrates the actual share of individual regions in Poland in absorbing financial resources, reflecting the amount of support relative to the total funds allocated to the region. The highest level of EU fund absorption occurred in the Warmińsko-mazurskie Voivodeship (see Table 2). It is important to note that this voivodeship recorded the highest amounts of funding per capita. This is a positive phenomenon, indicating that the authorities in this region are actively working to improve the quality of life for residents by undertaking initiatives related to investments funded under the cohesion policy. A high level of EU fund absorption is also observed in the Podlaskie Lubleskie and Zachodniopomorskie Voivodeships. Values of the index below 1 indicate that the absorption of funds to improve the socio-economic situation is lower than what the region's potential would suggest. The absorption index for the regions of Eastern Poland was greater than 1, which is a favorable sign indicating that Eastern Poland is effectively utilizing EU funding and the regions' potential by implementing projects within the framework of smart specializations. Among the regions of Eastern Poland, only two voivodeships, the Podkarpackie and Świętokrzyskie Voivodeships, obtained indices close to

but below 1, to be precise 0.90 and 0.97, respectively. The local authorities in those voivodeships should strengthen their efforts to secure funding for projects from EU funds in the current programming period 2021-2027. Considering the GDP per capita, it is evident that both in 2014 and 2022, the values for the country were higher than those for Eastern Poland (see Table 3). This indicates that despite Eastern Poland's two decades of receiving EU funding, the quality of life, as expressed by GDP per capita, falls short of the national average, even though the growth dynamics for all voivodeships in Eastern Poland were high. According to GUS data, in 2022, the GDP per capita in Eastern Poland was more than twice as low as the national average and that of the Mazowieckie Voivodeship. The lowest GDP per capita in both 2014 and 2022 was observed in the Podkarpackie Voivodeship, which is one of the regions in Eastern Poland.

Despite significant investments, substantial disparities still exist between countries and their regions. This imbalance is particularly visible within EU member states, where the gap between the least and most developed regions continues to widen (Świstak, 2018, p. 34), even with the utilization of EU funds.

In addition to GDP per capita, a very important indicator is the expenditure on innovative activities in enterprises per active person, which has more than doubled in Eastern Poland over the past eight years (see Table 3), while in the country as a whole, it has nearly tripled.

Table 3.

Voinadachina	Expenditu in enter ac	ires on innov prises per 1 p tive person (i	ation activities rofessionally n PLN)	Gross Domestic Product per capita (in PLN)			
voivodesnips	2014	2022	Dynamics, year 2014 = 100	2014	2022	Dynamics, year 2014 = 100	
Dolnośląskie	3 016	3 110	103.1	49 717	90 980	183.0	
Kujawsko-pomorskie	1 466	1 319	90.0	36 232	66 547	183.7	
Lubelskie	610	1 235	202.5	31 186	55 182	176.9	
Lubuskie	656	827	126.1	37 644	66 313	176.2	
Łódzkie	2 517	1 287	51.1	41 751	76 228	182.6	
Małopolskie	1 562	3 582	229.3	39 568	72 004	182.0	
Mazowieckie	4 500	8 090	179.8	71 125	127 791	179.7	
Opolskie	682	1 107	162.3	36 182	64 383	177.9	
Podkarpackie	2 841	2 850	100.3	31 576	55 125	174.6	
Podlaskie	540	1 042	193.0	32 461	59 818	184.3	
Pomorskie	1 957	3 287	168.0	42 346	81 149	191.6	
Śląskie	2 078	2 864	137.8	46 167	85 131	184.4	
Świętokrzyskie	404	492	121.8	32 613	56 507	173.3	
Warmińsko-mazurskie	538	1 314	244.2	31 958	56 368	176.4	
Wielkopolskie	2 204	2 250	102.1	47 679	85 867	180.1	
Zachodniopomorskie	1 664	1 406	84.5	37 423	66 443	177.5	
Eastern Poland	987	1 387	140,5	31 959	56 600	177.1	
Poland	2 210	3 136	141,9	44 466	81 093	182.4	

Expenditures on innovation activities in enterprises and Gross Domestic Product per capita in Eastern Poland compared to the national average from 2014 to 2022

Source: own elaboration on the basis of the data from Statistics Poland in Warsaw (updated on 5.09.2024).

An important indicator in assessing issues related to innovation development within the framework of smart specializations is the amount of financial expenditure on R&D per capita. Data in Table 4 indicates that in 2022, these expenditures were highest in the Mazowieckie Voivodeship, being nearly 2.5 times higher than the national average and almost 5.5 times higher compared to the average for Eastern Poland. Analyzing R&D expenditures per capita among the voivodeships of Eastern Poland, it was noted that the lowest expenditures in 2022 occurred in the Świętokrzyskie Voivodeship. In the whole country, these expenditures in 2022 were five times higher than those in the Świętokrzyskie Voivodeship, while in the Mazowieckie Voivodeship, they were twelve times higher than in the Świętokrzyskie region. Another indicator considered for this article was the average share of innovative enterprises in the total number of enterprises. This share was, on average, lower in Eastern Poland compared to the national average (by 0.4% in 2014 and by 2.7% in 2022; see Table 4). Among the voivodeships of Eastern Poland, the lowest average share of innovative enterprises in the total number of enterprises in 2022 was recorded in the Warmińsko-mazurskie Voivodeship (20.9%), while the highest was in the Podkarpackie Voivodeship (39.0%). It is noteworthy that in the Podkarpackie region, this indicator reached its highest values in 2022 - 6.8% above the national average, 9.5% above the average for Eastern Poland, and 18.1% higher than in the Warmińskomazurskie region. This can be attributed to Rzeszów, the capital of Podkarpacie, being recognized as the capital of innovation, and to the fact that one of the significant smart specializations of Podkarpacie is aviation and aerospace, which has significantly influenced the development of enterprises in the Dworzysko zone around Jasionka airport, where many innovative enterprises with foreign capital and startups have emerged. The second smart specialization of Podkarpacie, the automotive industry, also invests in the development of innovative enterprises, along with other RIS sectors in Podkarpacie, such as ICT, which established an IT cluster, and quality of life, linked to the agri-food cluster and the production of high-quality food. This raises the question about the smart specializations in the Warmińskomazurskie region, which invest to a lesser extent in the development of innovative enterprises. Research by Słodowa-Hełpa (2013) confirms that the driving force of economy of the Podkarpackie region is the Aviation Valley cluster, where there has been a concentration of aerospace industry firms, research centers, and educational and training facilities that stimulate economic development and improve regional innovation (Słodowa-Hełpa, 2013, p. 101).

Table 4.

Voivodeships	Internal ex	xpenditures o per capita (in	n R&D activities PLN)	The average share of innovative enterprises in the total number of enterprises (in %)		
	2014	2022	Dynamics, year 2014 = 100	2014	2022	
Dolnośląskie	367.9	1 348.8	366.6	16.3	37.6	
Kujawsko-pomorskie	122.9	605.5	492.7	12.4	29.9	
Lubelskie	321.0	648.4	202.0	19.4	25.4	
Lubuskie	66.7	255.0	382.3	10.5	20.4	
Łódzkie	280.5	791.0	282.0	13.5	24.3	
Małopolskie	550.0	1 840.9	334.8	13.5	29.4	
Mazowieckie	1 218.4	2 842.4	233.3	17.1	36.6	
Opolskie	122.0	516.2	423.1	17.6	30.3	
Podkarpackie	437.4	652.9	149.3	14.6	39.0	
Podlaskie	195.6	496.8	254.0	14.7	33.1	
Pomorskie	448.8	1 510.6	336.6	12.3	36.1	
Śląskie	265.2	795.0	300.0	15.7	37.5	
Świętokrzyskie	111.0	238.0	214.4	11.1	29.2	
Warmińsko-mazurskie	87.3	577.6	661.6	10.9	20.9	
Wielkopolskie	305.3	824.2	270.0	11.3	25.5	
Zachodniopomorskie	104.7	456.9	436.4	14.1	29.9	
Eastern Poland	230.5	522.7	226.8	14.1	29.5	
Poland	420.1	1181.7	281.3	14.5	32.2	

Expenditures on R&D activities per capita and the share of innovative enterprises in the total number of enterprises in Eastern Poland compared to the national average from 2014 to 2022

Source: own elaboration on the basis of the data from Statistics Poland in Warsaw (updated on 5.09.2024).

The final indicator considered for assessing the level of innovation in the regions of Eastern Poland is the innovation index (Table 5). Analyzing the data presented in Table 5, it was found that the innovation index for the regions of Eastern Poland is lower than the national average. Over four years, it increased by 18% for the regions of Eastern Poland and 27% for the country. A decline in the innovation index was noted for three voivodeships, including two that are part of Eastern Poland: Podkarpacie and Świętokrzyskie.

Table 5.

Innovation in Polish regions based on the innovation index (EU = 100)

	Innovation index (UE = 100))						
Voivodeships	2019	2023	Dynamika, year 2019 = 100				
Dolnośląskie	57,0	69,4	121,8				
Kujawsko-pomorskie	46,0	55,6	120,9				
Lubelskie	46,2	58,9	127,5				
Lubuskie	41,0	46,1	112,4				
Łódzkie	52,4	58,9	112,4				
Małopolskie	70,1	80,2	114,5				
Mazowieckie	47,0	37,2	79,1				
Opolskie	41,2	47,3	114,8				
Podkarpackie	58,3	56,7	97,3				
Podlaskie	43,3	58,3	134,6				
Pomorskie	57,7	66,8	115,8				
Śląskie	51,4	57,7	112,3				
Świętokrzyskie	46,1	45,2	98,0				

Warmińsko-mazurskie	37,0	54,2	146,5				
Wielkopolskie	53,0	56,3	106,2				
Zachodniopomorskie	43,1	50,7	117,6				
Eastern Poland	46,2	54,7	118,3				
Poland	49,4	62,8	127,1				
Same a Designal Investige Same hand 2022							

Source: Regional Innovation Scoreboard 2023.

Over the four-year period, the largest increase in the innovation index (nearly 50%) occurred in the Warmińsko-mazurskie Voivodeship. This indicates that the local government of the Warmińsko-mazurskie Voivodeship has made efforts to enhance the innovation of its region, which is a positive development.

4. Discussion

The foundation of the new regional policy has become the concept of smart specializations, whose main assumption is to build competitive advantages for regions and improve the efficiency of innovation processes in the EU. The value of this concept also lies in establishing sustainable regional cooperation networks (Dziemianowicz, Peszat, 2016, pp. 278, 279). Today, the competitiveness of regions, especially those facing developmental challenges, such as the regions of Eastern Poland, depends on the proper acquisition of funding from EU funds and programs (Grzebyk et al., 2019, p. 206). Smart specializations represent a new paradigm for building competitive advantage in regions. They also constitute a new way of shaping regional innovation policy aimed at eliminating existing barriers and uncertainties in building the innovative capacity of regions (Nowakowska, 2015, p. 310). The Entrepreneurial Discovery Process (EDP) is a central element of this new approach – a strategy for research and innovation towards smart specializations. Each Voivodeship in Poland prepares its own Regional Innovation Strategy, which outlines the opportunities and needs of the region.

Smart specializations in highly developed regions are more often based on innovative industries and on enhancing their competitiveness through increased innovation than in poorer regions with traditional industries. Local governments should play the role of active leaders, both in initiating new solutions and in fostering a culture of innovation within the region (Słodowa-Hełpa, 2013, pp. 109, 114).

5. Summary

In conclusion, it should be noted that in all the regions of Eastern Poland, regional smart specializations encompassed issues related to improving the regions' innovation. A unique opportunity for implementing the objectives outlined in the regional smart specializations of Eastern Poland is the EU funds and programs within the framework of cohesion policy aimed at enhancing the competitiveness and innovativeness of these regions. This is confirmed by the absorption rate, the average value of which for all regions of Eastern Poland has exceeded 1, indicating a very positive trend, which demonstrates that these regions have correctly identified the potential of their voivodeships for regional smart specializations and have effectively utilized the opportunities created by the programming period of 2014-2020. It is worth recalling that the five voivodeships in Eastern Poland had the lowest GDP per capita in the country in 2022, not exceeding 57 thousand PLN, while in the Mazowieckie voivodeship, this indicator was higher than 127 thousand PLN. The highest funding per capita, over 20% more than in other regions of Eastern Poland, as well as the highest absorption rate in the country, was recorded in the Warmińsko-mazurskie Voivodeship. For other indicators, including expenditures on innovation activities and R&D, the regions of Eastern Poland achieved values that were half lower than the national average. The average share of innovative enterprises in the total number of enterprises and the innovation index in the regions of Eastern Poland were also lower than the national average. Only in the case of funding from EU funds and programs per capita and the absorption rate did the analyzed regions achieve more favorable values compared to the national average. Therefore, it is essential to continue financially supporting the regions of Eastern Poland with EU funds and programs to enhance their innovativeness and competitiveness and to utilize the potential of these regions within the framework of regional smart specializations.

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