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Driving Regional Sustainability through Smart Specialization: Insights from Podlaskie Voivodeship

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Abstract:

Purpose: *The aim of this article is to characterize the areas of smart specialization selected by the Podlasie region and to assess their impact on the competitiveness of this region.*
Design/Methodology/Approach: *The article is based on information from secondary sources, mainly from the Entrepreneurship Development Plan, based on smart specialisations of the Podlaskie Voivodeship for 2015-2020+ and national and international legal documents and literature on the subject under study. The study also uses public statistics data published by the Central Statistical Office. The Regional Competitiveness Index (RCI) 2022 published by the European Commission and data on the GDP of the regions were used for the assessment.*
Findings: *As it results from the conducted research, the identified smart specialisations in the Podlaskie Voivodeship have only a small impact on the development of the region.*
Practical Implications: *Although the indicators reflecting the development of the region are growing, the research results do not indicate a connection between the growth of the discussed indicators and smart specialisations.*
Originality /value: *Smart specialisations of the Podlaskie province do not have a direct impact on the development of the region.*

Keywords: *Smart specialisations, factors influencing regional development, regional competitiveness.*

JEL codes: *O18, R11, Q01, O25, R58.*

Paper Type: *Research article.*

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1. Introduction

Regional innovation strategies for smart specialisation (RIS3 strategies) are integrated economic transformation programmes that capitalise on a region's strengths, competitive advantages and development potential. Smart specialisations focus on selected priority development areas that are tailored to the regional context, thereby enabling competitive advantages in a given field.

The smart specialisation strategy is based on a region's specific technological, scientific and economic potential. The article presents theoretical assumptions concerning the concept of smart specialisation. The aim of the article was to characterise the areas of smart specialisation selected by the Podlaskie region and to assess their impact on the region's competitiveness.

The analysis concerned indicators characterising the competitiveness of Podlaskie voivodeship. The Regional Competitiveness Index (RCI) 2022 published by the European Commission and the volume of GDP were used for the assessment.

2. The Essence of the Concept of Smart Specialisations

Europe 2020 - A strategy for smart, sustainable and inclusive growth states that, at national level, Member States will need to reform national and regional R&D&I systems to foster excellence and smart specialisation (Programming..., 2015, p. 87).

The idea of smart specialisation, although a relatively new instrument in cohesion policy, is based on theories that have been present in the body of economic thought for many years (Measure, 2016, p. 293).

The concept of smart specialisations was developed by a group led by J. Potočnik and D. Foray. It is a tool for formulating innovation strategies based on endogenous nature. Smart specialisation makes it possible to combine the analysis of regional competitiveness with the process of determining priorities in science and technology policy (Kardas, 2011, p. 125)

The term smart specialisation encompasses a new generation of research and innovation policy. It is a process of economic transformation through entrepreneurial discovery and is an innovation policy tool for identifying and building the current and future place (position) of a region or country in the knowledge economy (Foray, David, and Bronwyn, 2011, p. 1).

The concept of smart specialisation originates from research into technological change and the role of knowledge in the economy, and is an attempt to improve the efficiency of innovation processes. It is based on the assumption that individual regions, understood as voivodeships or countries, should not develop research activity in all areas. They should selectively choose those domains in which they

have the best developed resources and concentrate their research and innovation activity within them. These domains should derive from the endogenous nature of the region concerned.

Identifying smart specialisations should first and foremost stimulate the development of organisations on the basis of innovation, which is a competitive advantage. This is not a top-down process, but the result of in-depth analyses in terms of potential and cooperation with socio-economic partners. They contribute to the transformation of enterprises and the economy through its modernisation and diversification of products and services by effectively financing investments in those areas that will bring real economic effects.

Smart specialisation is a tool for identifying and building the current and future position of a region or country in the knowledge economy (David, Foray, Hall, 2009, p.3) .The concept of smart specialisation is based on four main assumptions (Mardas, 2011, p.122):

- Firstly, a prerequisite for smart specialisation is the creation of an area of research and innovation that allows competition between a number of competitors. Such an area could be the European Research Area, which should enable better exploitation of economies of scale, scope and diffusion.
- Secondly, according to D. Foray, if all European regions or countries compete for leadership in, for example, the same fields of science, most of them will fail to achieve their goal, due to a lack of sufficient critical mass, economies of scale and scope. He points out that the best solution in this case is to concentrate activities on those scientific fields and areas of innovation that will be complementary to a region's assets and contribute to creating or strengthening its comparative advantages.
- Thirdly, the essence of the concept of smart specialisation is defined by so-called general purpose technologies. These can act as enabling technologies, i.e., create opportunities for development, rather than complete, end-to-end solutions.
- The fourth assumption concerns the way smart specialisation is implemented, especially the role of public administration in this regard.

Focusing on designated areas will allow distinctive and endogenous areas of specialisation to be developed and economies of scale to be achieved.

It is a tool used in the field of innovation policy to identify and build the current and future place of a region or country in the knowledge economy (Foray, 2004, p. 58).

The development of smart specialisations should contribute to the following outcomes
(https://s3platform.jrc.ec.europa.eu/documents/portlet_file_entry/20125/Factsheet+Smart+Specialisation.pdf/74101a2c-c2b9-420e-9dbc-c37da591f041):

- targeting investments to key challenges and needs (ensuring knowledge-based development),
- to capitalise on the strengths, competitive advantages and potential for excellence of each country,
- support for all forms of innovation,
- active involvement of partners in co-creating the strategy, analysing the facts and introducing a system of monitoring and ongoing evaluation. Smart specialisations are not new. They refer to the theoretical foundations of regional development and specialisation, and above all to the concept:

  - primary product (the basis of regional development is production specialisation of the most competitive goods in external markets),
  - flexible production (a system based on SMEs showing adaptability to changing market conditions),
  - A. Marshall industrial district (the area where specialised industrial plants concentrate their location),
  - diamond of competitive advantage (five forces) and M. Porter's cluster concept,
  - poles of growth F. Perroux,
  - H. Hoyt's economic base,
  - new theories (growth, institutional economics and economic geography).

The following key elements are highlighted within the regional perspective (European Union..., 2015, p. 31):

1. Rooting and territorialisation of specialisation domains - smart specialisations should be firmly rooted in the endogenous resources of the region, stemming from the region's traditions, experiences and socio-economic past, creating its uniqueness. The domain of specialisation should be "anchored" in the specific socio-economic and spatial regional environment.
2. Combining the diversity and relatedness of regional resources - smart specialisations require complementarity of regional resources, a strong encapsulation of the specialisation in the resources that support its development (e.g., human resources, infrastructure, institutional resources, social capital, economic traditions and experience, networks).
3. Entrepreneurial environment - smart specialisations require dense relationships and interactions between actors operating in the territory. Sustained relationships and networks, both formal and informal, involving different groups of regional actors, are necessary.

All the elements mentioned should be integrated (create an innovation ecosystem) around key industries. Smart specialisation must be based on facts (a reliable diagnosis) and take into account the endogenous resources of the region, including technological infrastructure, existing export linkages and business dynamics.

The need to identify smart specialisations (select endogenous competitive advantages, strategic areas of specialisation) at the national and regional level stems from Poland's obligation to meet the ex-ante condition, defined by the European Commission as necessary to obtain support for the development of R&D and enterprises from EU structural funds for 2014-2020 (Strategy..., 2013, p. 42).

Smart specialisations of Podlaskie Voivodeship are defined in the document "Entrepreneurship development plan based on smart specialisations of Podlaskie Voivodeship 2021-2027+". They are the same as the smart specialisations defined in the document "Entrepreneurship development plan based on smart specialisations of Podlaskie voivodeship 2015-2020+".

Studies and evaluations, among others, of the activities within the framework of the RDP 2014-2020 carried out by the Regional Territorial Observatory, in particular the RIS evaluation carried out in 2019 and the monitoring carried out by the Marshal Office of the Podlaskie Voivodeship confirmed that the specialisation "core" identified in the Podlaskie RIS3 plan can be assessed as accurate, while the regional specialisations have been correctly identified and remain valid.

The start of the process aimed at determining smart specialisations of the Podlaskie Voivodeship and fulfilling ex ante conditionality should be considered to be the start of work on updating the Podlaskie Voivodeship Development Strategy until 2020 (SRWP), which took place when the Podlaskie Voivodeship Assembly adopted a Resolution on 24 October 2011 (Resolution No. XII/125/11 of the Podlaskie Voivodeship Assembly of 24 October 2011).

The process of identifying areas that strengthen the endogenous development potentials of Podlaskie Voivodeship was based on a bottom-up entrepreneurial discovery process, supported by an in-depth diagnosis of the economic, scientific-technological, educational and institutional potentials (Entrepreneurship Development Plan..., 2015 p. 15).

The selection of the IS was based on close cooperation between representatives of business, science, business environment institutions and administration. Work began in June 2014. It took 6 months to develop a preliminary version of the document, including numerous workshops. The document was then subjected to extensive consultations and modifications taking into account important conclusions from the consultations.

The "entrepreneurial discovery" process[2] was coordinated by the Marshal's Office of the Podlaskie Voivodeship. In the first stage of the work, the Marshal's Office set up

[2]*The entrepreneurial discovery process to develop the Plan involved the provincial government and experts together with local innovation actors, such as representatives of the*

the Working Group on Specialisation of the Regional Economy, as a coordinating, consultative and advisory body.

Taking into account all the results of both the research and the workshop works, a draft document containing smart specialisations of the Podlaskie region was prepared, which was then subjected to extensive consultations, mainly with business circles[3]. Consultations included all regional stakeholders, were conducted in the capital of the region, as well as in all sub-regions (Łomża, Suwałki, Bielsk Podlaski).

On this basis, a document containing smart specialisations of the Podlaskie Voivodeship was created. On 1 March 2016, the Podlaskie Voivodeship Board adopted the document by Resolution No. 120/1431/2016. RIS3 was updated in 2021. However, the update did not affect the scope of smart specialisations but the actions supporting their development[4].

The plan confirms the correctness of the identification of the so-called 'leading specialisations' of the region and their validity, while raising the profile of the ICT sector as a horizontal specialisation and supporting the core industries. It also updates the scope of priority R&D&I activities and emphasises the importance of the entrepreneurial discovery process. The list of smart specialisations of Podlaskie voivodeship is presented in the table below.

The smart specialisations of the Podlaskie Voivodeship are divided into three groups:

The core of the smart specialisations of the Podlaskie Voivodeship are:

1. **Agri-food industry and related sectors, especially ICT** (e.g., efficient agriculture, precision crop and animal production, food industry, milk production and processing, biofood).
2. **Metal and mechanical engineering, boatbuilding and related sectors, especially ICT** (e.g., metal processing, production of machinery and equipment, in particular for agriculture, construction, forestry and the food industry, ship and boatbuilding, robotics, Industry 4.0).
3. **Medical, life sciences and related sectors, in particular ICT** (e.g., diagnosis of civilisation diseases, genetics and molecular biology, manufacturing of medicinal products, modern therapies including fertility

business community, academia, public administration and the public and users, according to the concept of the quadruple helix.

[3]The consultation took place in January-February 2015, involving 294 people, including 99 entrepreneurs, 44 science and research centres, 35 NGOs and BEIs, 40 administrative units.

[4]For more information, see the document entitled " Entrepreneurship development plan based on smart specialisations of Podlaskie Voivodeship 2021-2027+, RIS3 2027+ ".

treatment, medical engineering technologies, biotechnology/bioinformatics, regenerative medicine, silver economy, rehabilitation, physical therapy, health tourism, medical implants, sensor technologies and robotics in medicine).

4. **Eco-innovation, environmental sciences and related sectors, in particular ICT** (e.g., eco-innovation; eco-development, eco-engineering, biodiversity research, eco-tourism; organic farming and processing, sustainable wood harvesting and processing, RES, resource- and energy-efficient construction, prefabricated house production, closed-loop economy, energy efficiency technologies, electromobility solutions, water management systems).

Emerging specialisations "Innovation in sectors with high growth potential" - Sectors covered by the National Intelligent Specialisations, not included in the regional IS core, as well as other sectors showing regional employment growth significantly above the national dynamics.

The document also lists 'other' - all sectors outside the core and emerging specialisations when demonstrating economic benefits in the region.

When developing smart specialisations, a lot of attention was paid to making them the basis for defining the development path of the local economy. On the one hand, on the basis of the data included in the table, it can be concluded that during the development of RIS3 strategic documents, attention was focused on using the endogenous potential inherent in the region.

On the other hand, efforts were made to ensure that the scope of smart specialisations included the largest possible group of enterprises. The endogenous character stands out mainly in the core of the specialisation, which is to a large extent related to the development of the agri-food industry.

A wide range of smart specialisations of the Podlaskie voivodeship can be seen in emerging specialisations, which include all national smart specialisations, as well as in the group of other industries, which include all other industries that do not fall within either the core specialisations or the emerging specialisations. The broad approach can also be seen in the entry included in the Podlaskie region's specialisation core, where to each specialisation is added: "and value chain related sectors".

Here, the value chain should be understood as the relationship between all the resources of each company and the processes taking place both within the company and within its relations with cooperators and the market (Entrepreneurship Development Plan... 2015, p. 4).

From design to selling a product or service, thousands of processes are involved. The key is for companies to know which ones they want to improve through innovative solutions. An example is a software manufacturer that develops software for the agri-food industry, by which it can be included in the core of smart specialisations through the value chain with the agri-food industry. The key criterion in this case is not the section, industry or sector, but the value chain of the companies that make up our core competences.

This means that any entrepreneur - irrespective of the industry, who will have an idea for a research project co-implemented with the R&D sector, the results of which will support the value chain, will be able to apply for R&D funds (Entrepreneurship development plan..., 2015, p. 4).

5. Research Methodology

The article is based on information from secondary sources, mainly from the Entrepreneurship Development Plan, based on the smart specialisations of the Podlaskie Voivodeship for 2015-2020+; 2021-2027+, as well as national and international legal documents and literature on the subject under study.

The study also used data from public statistics published by the CSO. The Regional Competitiveness Index (RCI) 2022 published by the European Commission and individual regions' data on GDP were used to assess the competitiveness of the Podlaskie region.

5. Findings

The competitive position of regions is characterised, among other things, by the size of gross domestic product per capita (GDP per capita) - the lower the level of synthetic regional competitiveness, the lower the level of development. GDP per capita is widely recognised as a measure of prosperity (Zawodziński and Bartoszczuk, 2013) and, at the same time, a starting point for further analysis of factors affecting regional competitiveness in such models of regional competitiveness as the competitiveness pyramid or competitiveness hat (Piotrowski, 2012, p. 137).

Poland is not among the lowest income countries in the world, some of its regions are still characterised by a very low level of economic development compared to other regions of EU countries. Poland has one of the highest rates of territorial disparities in terms of GDP per capita among EU countries, and differences in development levels persist between the eastern and western parts of the country.

In 2022, the volume of GDP per capita in Podlaskie was PLN 63,697tys, and in 2018. - PLN 39,160 thousand (an increase of 65.63%). The size of this indicator in 2018 placed the region in 12th position in the country, and this indicator was much

lower than in other regions of Poland. Accession to the EU and the possibility of benefiting from European funds further increased the indicator, but not enough to talk about levelling out disparities at the level of EU regions. Regional GDP per capita, despite growing criticism, is still the main indicator used to measure the economic growth and development of an EU region.

It is also a key indicator used to assess the efficiency and effectiveness of the regional policies implemented by the European Commission. In 2022, the value of GDP per capita in the Podlaskie Voivodeship in relation to the national average was 72.7% and stood at 63,697tys PLN, an increase of more than 65% in compared to 2018 with an average increase for the country of 67% (Table 1). GDP growth in the Podlaskie Voivodeship was lower than the average for the whole country. This shows how low competitiveness the Podlaskie region has.

Table 1. *Gross domestic product per capita by region in Poland in 2018 and 2022.*

Specification	GDP per capita (current prices) in PLN		GDP per capita, Poland = 100	
	2018	2022	2018	2022
Poland	55 056	82 079	100,00	100,00
Podlaskie	39 160	63 697	72,7	78,6
Lower Silesia	60 447	88 480	112,5	107,8
Kujawsko-pomorskie	44 694	681 30	83,9	83,0%
Lublin	37 100	57 467	67,6	70,0%
Lubuskie	45 317	66 799	84,5	81,4%
Lodz	51 166	77 383	92,1	94,3%
Małopolskie	50 735	72 946	84,9	88,9%
Mazovia	88 826	126 381	161,0	154,0%
Opolskie	43 712	66 678	79,5	81,2%
Podkarpackie	38 872	58 221	67,3	70,9%
Pomeranian	53 947	80 885	96,0	98,6%
Silesia	57 255	85 942	107,0	104,7%
Świętokrzyskie	39 742	60 075	75,8	73,2%
Warminsko-Mazurskie	37 843	58 536	73,4	71,3%
Wielkopolskie	59 355	85 665	104,1	104,4%
Zachodniopomorskie	45 700	67 261	87,0	82,0%

Source: *Own compilation on the basis of CSO LDB data.*

In comparison with other regions, the Podlaskie Voivodeship was ranked 13th in the period under review, ahead of only three voivodeships (Podkarpackie, Warmińsko-Mazurskie, Lubelskie). In turn, GDP per capita according to PPS3 in 2022 was 59% of the EU average. (Regional Development of Poland..., 2024, p. 66).

In addition to GDP per capita, indexes calculated from algorithms based on a number of specific factors are often used to synthetically measure regional competitiveness. In all models, the dependent variable is the competitive position achieved by the region and the independent variables are the factors of competitive ability.

Examples of such indices include, The *Global Competitiveness Index* developed by the World Economic Forum and the *Regional Competitiveness Index* (RCI). The latter is the first indicator to provide a synthetic picture of regional competitiveness for each region of a member state, at NUTS 2 level. It shows both the strengths and weaknesses of each EU region.

Poland belongs to countries with large differences in the level of socio-economic development between individual regions, which can be confirmed by the Warsaw Capital Region and the Warmia-Mazury Region. It should be noted, however, that such differences are not exclusive to our country; similar differences exist between regions in France or Spain.

According to RCI 2.0-2022, the examined region with score of 78.8, similarly to the majority of Polish voivodeships, was qualified to the group of regions with relatively low competitiveness below the average (Table 2).

Out of 224 regions surveyed, the Podlaskie Voivodeship was only ranked 181st. (https://ec.europa.eu/regional_policy/assets/regional-competitiveness/index.html#)

Table 2. *The region's competitiveness index according to the 2022 RCI 2.0*

Region	RCI 2.0 Competitiveness Index
Podlaskie	78,8
Lower Silesia	89,1
Kujawsko-pomorskie	82,1
Lublin	79,0
Lubuskie	82,1
Lodz	86,1
Małopolskie	94,3
Mazovia	80,3
Opolskie	83,5
Podkarpackie	82,7
Pomeranian	90,4
Silesia	96,9
Świętokrzyskie	76,7
Warminsko-Mazurskie	75,8
Wielkopolskie	84,8
Zachodniopomorskie	82,1

Source: *Own compilation based on the European Competitiveness Index (https://ec.europa.eu/regional_policy/assets/regional-competitiveness/index.html#/).*

Podlaskie achieved a particularly low competitive position in a group of indicators related to innovation. The weaknesses of the studied region were mainly: business activity, market size and infrastructure. The strengths of the voivodeship in the national scale, but still weak in the system of EU regions, were: basic education and innovation.

6. Conclusions

The basis for the implementation of the strategic priority relating to the development of a knowledge-based economy (*smart growth*) included in the Europe 2020 strategy, in the financial perspective 2021-2027, is smart specialisation. Its aim is to select the most relevant (from the point of view of the region's potential) areas of the economy and support their development, including intensive research.

This strategy is a determinant for the activities of the public administration to obtain funds for the implementation of the priorities arising from it. So far, the implementation of the region's strategic priorities enshrined in successive strategic documents has proved to be ineffective.

Hence, in the financial perspective 2021-2027, which may already prove to be the last one with access to large financial resources, it is necessary to use the experience to date to effectively implement the assumed objectives, including those related to smart specialisation. In order to do this, changes were made to the tools indicated to support the development of smart specialisations of the Podlaskie Voivodeship in the document entitled "Plan of entrepreneurship development based on smart specialisations of the Podlaskie Voivodeship 2021-2027+, RIS3 2027+".

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