

## **SMART SPECIALISATION – A NOVEL APPROACH TOWARDS REGION DEVELOPMENT IN POLAND**

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**Abstract.** This article describes smart specialisation, a new mechanism for stimulating economic development in regions and EU member states. The aim of the article is to present theoretical assumptions behind this notion in the context of regional policy. The article, by critically analysing the research literature, describes the creation process of smart specialisation and attempts at identifying the potential areas of smart specialisation in the Polish regions. Smart specialisation is a new and hotly debated topic, as witnessed by a number of theoretical and empirical studies related to this notion worldwide.

**Key words:** smart specialisation, Europe 2020 strategy, regional development, EU regional policy

### **INTRODUCTION**

Smart specialisation, which aims at the optimal use of development potential of EU member states and regions by possibly best adjustment of scientific activities to the specific socioeconomic conditions, is the direction set for the member states by European Commission for the period 2014–2020. According to EU’s Directorate-General for Regional Policy, such a specialisation can increase the competitiveness of regions and, as a result, increase their rate of development.

Smart specialisation is a novel approach of EU towards regional policy. The basic assumption behind smart specialisation is to increase innovativeness and competitiveness of regions on the basis of their endogenous potential and the industries that are already functioning there. It can involve specialisations within a single sector as well as broader enterprises, spanning several sectors, allowing the achievement of specific competitive advantage.

The idea of the development policy based on innovation and entrepreneurship focused on specific areas of specialisation is reflected in the most important document emphasising

ing the importance of modern technological advances and setting the direction for further development of the EU policy in terms of innovation, the Europe 2020 strategy [Europe 2020. A European strategy for smart, sustainable and inclusive growth 2010]. European Commission emphasises that defining smart specialisations is going to be crucial for the realisation of the so-called smart growth priority: that is the economic development based on knowledge, which includes innovations.

At the same time, EU's cohesion policy requires that the evaluation of smart specialisation effects is based on measurable criteria allowing the comparison of rate and level of development of regions, hence striving for elimination of the differences that prove detrimental for their inhabitants. Such criteria also allow the evaluation of the current state of affairs and the development level of regions as well as determining the challenges ahead [Evidence-based Cohesion Policy and its role in achieving Europe 2020, 2011, McCann, Ortega-Argilés 2011].

European Commission moves away from supporting the weaker EU regions in their imitative approach to development consisting in copying the development process observed in the more advanced regions. T.G. Grosse [2013] emphasises that "the weaker regions should look for their own development path and a market 'niche' allowing them to become internationally competitive". The Commission, in the Common Strategic Framework for 2014–2020, proposes that the technologically advanced regions focus on keeping the top position, whereas the less developed regions try to catch up and create their own "paths to perfection" [Elements for a Common Strategic Framework 2014 to 2020, 2012].

Smart growth is one of the basic elements of interventions and implemented priorities, related to the general approach presented in the Europe 2020 strategy, according to which the productivity and innovativeness ensure efficient and increase the long-term chances of continuing economic development of Europe. Smart actions, stimulating knowledge- and innovation-based economic growth, consist not only of research but also of promoting other forms of innovation (of social, organisational kind but also including improved marketing strategies, new services and business plans), with the key factor for supporting smart growth being the push for increased innovation capabilities in regions [Markowska, Strahl 2013, Regulation (EU) No 1301/2013 of the European Parliament and of the Council 2013].

The measurable results to be achieved by 2020 in terms of smart growth on the EU and national levels include: 75% employment rate for people in the 20–64 age range, 3% GDP investment rate on the R+D activities, lowering the school dropout rate to 10% as compared to 15% today, 40% share by people with higher education in the 30–34 age range [Europe 2020. Flagship Initiative Innovation Union 2010, Skawińska 2014].

## **MATERIAL AND METHODS**

### **Smart specialisation – the core idea**

Smart specialisation was introduced by the Knowledge for growth Expert Group the group was established in 2005 by European Commissioner for Research – J. Potočnik. Prof. D. Foray is the creator and the leading expert on the notion of smart specialisation.

The main assumptions were presented in the working documents of the Expert Group [Foray et al. 2009] as well as in the report containing suggestions related to the functioning of the European Research Area<sup>1</sup> [The role of community research policy in the knowledge-based economy 2009]. Intelligent specialisation is also promoted by the Synergies Expert Group, established by the European Commission's Directorate-General for Research and Innovation and is considered an important component enabling synergies between Horizon 2020 and structural funds in the context of developing potential and striving for perfection [Guide to Research and Innovation Strategies for Smart Specialisation (RIS 3) 2012]. Also, the Committee of Regions [Europe 2020. Flagship Initiative Innovation Union 2010], World Bank and OECD [Innovation-driven Growth in Regions: The Role of Smart Specialisation 2013] engage in promoting smart specialisation by means of comparative research including all the EU regions.

The topic of smart specialisation has been connected with the notion of regional development within the EU and the institutional character of its research and development sectors as well as the actions that aim at improving the quality of public interventions in terms of research and innovation, including the integrated approach and the conditionality principle [Kardas 2012].

The S3 Smart Specialisation Platform is a new network of European regional representatives and experts aiming at supporting regions in designing and implementing smart specialisation strategies and promoting efficient, effective and synergic use of public investments in order to achieve innovative development by creating multifarious strategies and promoting good practices within the regions [Słodowa-Helpa 2013a]. The Platform, steered by the Institute for Prospective Technological Studies (IPTS) does not offer ready-made solutions and serves instead as a medium for contact and exchange of views and experiences, providing ideas, guidelines and access to case studies and methodology. The Guide to Research and Innovation Strategies for Smart Specialisations (RIS3) is a publication ordered by the European Commission, presenting the principles behind creating a new version of regional innovation strategies for 2014–2020.

Smart specialisation requires a deep analysis of resources and identification of distinguishing unique features and strengths of each region and on its competitive potential and focusing the regional partners and resources around the vision of their achievement-oriented future [Ejdys, Lulewicz-Sas 2013, Słodowa-Helpa 2013a]. It includes companies, research centres and universities that work together to determine the most promising areas of specialisation for a given region, but also to identify the weaknesses hindering the introduction of innovation. It takes into account the differences in the economic potential of regions from the point of view of innovation [Regional Policy contributing to smart growth in Europe 2020, 2010]. This means a support of the regional innovation systems, help in maximising knowledge flow and spreading the benefits related to innovation within the entire regional economy.

Smart specialisation is the way in which innovation strategies are being formulated and a tool used to identify and develop the present and future position of a given region

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<sup>1</sup>The notion has been therefore proposed by the experts (mostly academics) during the discussion on the role European Research Area in the context of ongoing globalisation, clustering and networking and the growing importance of global challenges.

or state in the knowledge-based economy [Foray et al. 2009]. There are four main assumptions behind smart specialisation [Kardas 2011, Ejdys, Lulewicz-Sas 2013]. The first is the creation of research and innovation area allowing limitless competition. The European Research Area (ERA) can be considered a case in point here, understood as integrated, multinational space ensuring full mobility of resources (e.g. free knowledge flow) and minimising the structural obstacles related to competitiveness (e.g. ensuring low entry level conditions for the potential competitors). Such an area should allow a better usage of: scale, range and spill-over effects. The second assumption is that if all European regions or member states are going to compete for the topmost position in the same area of science, then most of them is not going to achieve their goal as a result of lack of the required critical mass and scale and range effects. The optimal solution is to focus on those areas of science and innovation that are complementary to the resources of a given region and will contribute to the creation or strengthening of its comparative advantages. Smart specialisation is therefore based on a close link between research and development activity, human capital development (employees' qualifications and skills) and the economic characteristics of these regions or states. Smart specialisation should result in an increase in regional diversification in the EU in terms of specialisation related to various areas of science and technology and sectors of economy. The third assumption is related to the so-called general purpose technologies (GPTs)<sup>2</sup>. These can function as the so-called enabling technologies, that is creating the possibilities for growth instead of complete final solutions. The general purpose technologies function on the basis of the so-called basic technology, which is a radical turning point when compared to the technological solutions in use today as well as on the basis of capital goods that are designed to use the basic technology as a part of ready-made products and services. The relation between basic technologies and their practical implementations can be described as a feedback mechanism. Basic technologies create new possibilities in terms of developing product and services. Whereas, the latter increase the implementation scope of the former, increasing the return rate connected to their design and development. The list of general purpose technologies is not closed and the technologies themselves are presented with various levels of specificity: from concrete inventions (a steam engine, a generator) to types of technology (mechanical, IT) or areas of science. The fourth assumption related to smart specialisation deals with the way it is to be implemented, and especially with the role to be played by public administration in that respect. Smart specialisation is neither determined in a top-down manner by the administration in a form of development plans (e.g. strategies or development programmes) nor within the foresight projects as prepared by external advisors. Instead, it is an "entrepreneurial" process of learning indicating in which area of science and technology a given region or a state can become a leader in Europe and in the world.

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<sup>2</sup>The general purpose technologies are defined by indicating their main, characteristic, features. Such technologies are – ubiquitous and find applications in many areas of human activity (in the past, it was for example a steam engine or a generator, nowadays: semiconductors and the Internet) – a subject of continuous technological improvement that increase their effectiveness – such that their application requires complementary investments in the sectors that are using them (feedback between the technologies and sectors).

The analysis of the notion of smart specialisation indicates that it aims at the optimal use of the potential behind a given region or a member state by focusing on the potentially optimal matching of the direction, in which science and education is developed with the specific socioeconomic conditions found in a given area: that is a combination of the three important elements: science – education – economy (it is worth pointing out that such recommendation was already formulated in 1992 by D. Archibugi and M. Pianta [1992]). This means focusing public interventions on such initiatives, actions and projects that enable specialisation of a given region or state in relation to either basic technologies development or the development of products or services using such technologies.

Implementing smart specialisation is expected to result in strengthening of a given area in terms of its specialisation by, for example, adjusting educational environment to the requirements of a given region and supporting and funding the development of sciences. M. Słodawa-Helpa [2013a] indicates that the aim of smart specialisation is to reach the critical mass level in terms of key competitive areas and sectors; the spreading of the general technologies, especially by their use in products and services and the strengthening of local potential in terms of innovative activity. Using knowledge and specialised research and development actions, which are appropriate for their socioeconomic character, regions are expected to perfect in a given area, enabling them to compete on international markets by:

- determining, on the basis of an analysis aimed at identifying strong points and weaknesses as well as the growth possibilities and developmental tendencies, a number of investment priorities in relation to the specialisation areas and using this as an advantage;
- mobilising talents by combining the needs with the potential of the R+D sector and business as well as by using knowledge and specialised R+D activity, closely related to the socioeconomic needs of a given region;
- going towards cluster development and creation of space for the development of various relations between sectors that influence the diversification processes in terms of increased participation in multi-regional networks;
- including in the pro-innovative processes not only academic institutions, companies and public authorities but also the recipients, that is the innovation users.

M. Słodawa-Helpa [2013b] also emphasises that the most difficult task related to the requirements of smart specialisation are related to determining the socioeconomic identity of a region and localising the most promising specialisation areas. In this context, it is important to notice that the specific and unique resources are the most important factors behind the potential of a given region in the process of creating a sustainable competitive advantage. Such potential, rooted in the space and in a way “tied” to the region, cumulated and evolutionary created over long periods, is hard to be distinguished from the place of occurrence [Nowakowska 2008, Jewtuchowicz 2009]. Hence, the specific resources, rare in terms of their occurrences, are hard to imitate, copy and transfer by the competitors, and their creation in another space, despite large sums involved, is not guaranteed to succeed.

This unique character is not only related to the specific sector, in which the region is better than the “rest of the world” but can also be expressed in a specific interrelation between the already existing potentials found in economy tradition, culture, natural

resources, intellectual and social capital. These can include non-material resources, like those related to the notion of cultural identity, skills and capabilities, identity, organisational capabilities of regions, as well as the system of needs, aspirations and values shared by its inhabitants [Słodowa-Helpa 2013a]. It is precisely the specific resources of a region, viewed as a part of global processes, that become key factor responsible for success. Having such resources decides about the uniqueness of the regional space and should be viewed as a base for endogenous development and a natural competitive advantage.

Not only technological but also social innovation and their combinations, e.g. new services and processes, marketing or branding, contribute to smart specialisation. Given the legitimate concern that smart specialisation is mainly associated with technological innovation, the representatives of European Commission's Directorate-General for Regional Policy assure that it is also consistent with the economic growth related to the promotion of natural produce, manufactured by hand in small series, which describes a large part of craftworks.

In Poland, the assumptions behind smart specialisation are included in the new long- and medium-term central strategic documents, with Strategy for Innovative and Effective Economy – Dynamic Poland 2020 describing its National Strategic Framework.

The documents indicating national specialisations in terms of research and innovation are: Polish Roadmap of Research Infrastructure, National Research Program and the foresight projects results, in particular of the technological foresight for industry project InSight 2030 [National Smart Specialisation 2014].

Polish Roadmap of Research Infrastructure is a Polish contribution to European Research Area, and of the European research infrastructure in particular. Polish Roadmap of Research Infrastructure covers 33 projects chosen, following competitive procedure, by experts from Poland and abroad. Such projects are consistent with the idea of creating research centres consolidating the national scientific potential in a given area, where strong research teams, recognisable on a national as well as on the international level, would be conducting research. The idea behind these centres is related to the notion of open access to the research tool on the basis of the criterion of scientific excellence.

The National Research Program indicates strategic directions for research and developmental actions, identifying the aims and assumptions behind a long-term research, technological and innovative national policy. The aim of the National Research Program is to focus public funding on prioritised research and development directions, from the point of view of the needs of the Polish society and competitiveness of Polish economy on the international market. The National Research Program describes seven strategic, interdisciplinary directions of scientific research and developmental activities. The specified directions are as follows: (1) new energy-related technologies, (2) diseases of civilisation, new medicines and regenerative medicine, (3) advanced IT and mechatronic technologies, (4) modern material technologies, (5) natural environment, agriculture and forestry, (6) social and economic development of Poland in view of globalised economy, and (7) national safety and security.

Technological foresight for industry – InSight 2030, is a project identifying industrial areas and technologies that by 2030 will become a powerhouse of Polish economy and contribute to an increase in competitiveness and innovativeness of Polish industry. Analytical works were conducted in 10 horizontal Research Areas, allowing an identification

of 35 areas (the so-called leading markets) and 127 key technologies, where after the public consultations and meetings with the representatives of the respective industries, the list was verified and decreased to 33 areas and 99 technologies, grouped in the following Research Areas: (1) industrial biotechnologies, (2) photonic technologies, (3) micro-electronics, (4) advanced production methods and materials, (5) nanotechnologies, (6) IT technologies, (7) co-generations and rationalisation of energy use, (8) natural resources extraction technologies, (9) healthy society, and (10) green economy.

The cross-analysis of the priorities identified in Polish Roadmap of Research Infrastructure, National Research Program and Insight 2030 showed broad-ranging synergy and complementariness in the areas identified as key on the national level, which confirmed the consistency between the identified scientific and technological specialisation areas.

On a national level, Enterprise Development Programme until 2020 is also a basis for identification of smart specialisations. This document is a comprehensive catalogue of tools supporting the development of innovativeness and entrepreneurship in Poland. At the same time it is an executive program for the Strategy for Innovative and Effective Economy.

Also the Road plan for innovation in science and higher education is an important source in terms of region specialisation. The plan is an interactive presentation of investments designed or implemented in the area of science. The actions are presented for every region in relation to 25 areas of science.

One of the effects of designing the strategy for smart specialisation is the identification of smart specialisations and an identification of national priorities in terms of science and innovation policy and definition of goals and actions to be realised by 2020.

## **RESULTS AND DISCUSSION**

### **Smart specialisation in regions**

According to the assumptions behind smart specialisation, in order to increase region competitiveness, it is necessary to identify specific attributes of resources related to the specific character and potential of that region, as well as to define a concrete path for the future. The proponents of the idea of smart specialisation indicate that strategy for smart specialisation relies on the choice of a few priorities for R+D and innovative activity in the so-called entrepreneurial process of discovery. This means an engagement of the interested parties in the process of identification of the areas that determine or will determine the future development path of a given region. Among the interested parties, the leading role is assigned to the entrepreneurs, and the entrepreneurial knowledge in particular. This knowledge is a combination of information regarding science and technology, entrepreneurship, market potential for new products and services and the behaviour of current or future clients and competitors. Obviously it is entrepreneurs, who have a direct access to this type of knowledge but it is important to emphasise that research units can also be considered important sources in that respect [Foray 2011]. “The entrepreneurial process of discovery” relies on designing creative solutions by combining the available

resources and new partner, taking up risks, experimenting, searching for new ideas in the chain of values or becoming a part of new chains of values.

The representatives of local administration should be the initiators and coordinators of regional strategies for smart specialisation [Strzelecki 2012]. Local administration can be considered in many ways to be the closest to the citizens of the “world” of business and research units and hence able to generate a set of tools best matched to the local and regional resources. The aims of the strategy are predominantly related to an efficient use of public funding and stimulation of private initiative. The fundamental challenge faced by local administration is related to stimulating the endogenous development path, in such a way that it is less based on the dependent development model or that is not merely imitating external developmental patterns. The point is to search for an individual development path, adjusted to the local characteristics and at the same time to attempt to identify own competitive edge on a national and international levels.

The last element in the process of creation of regional strategy for smart specialisation is the definition of indicators used for monitoring and evaluation of both the strategy and the designed plan of action [Ejdys, Lulewicz-Sas 2013]. European Commission’s communication entitled Regional Policy contributing to smart growth in Europe 2020 suggests that strategies for smart specialisation cover actions focused in clusters, create support for business environment (especially SMEs), stimulate life-long learning in the area of research and innovation, create or modernised research infrastructure and supported the development of advanced research centres. European Commission also suggests that the development of cultural and artistic centres can contribute to the creation of developmental niches for certain regions and that regions should focus on connecting the B&I actions with those aimed at promoting the digital agenda and properly directed public procurements. The Commission also indicates that the regional policy and European innovative partnerships both face a challenging international situation.

The subject literature contains an attempt at evaluating the area of smart growth of Polish regions as proposed by the investigators of the project entitled Classification of the European regional area in the context of smart growth – a dynamic approach. In order to identify and characterise smart specialisation in regions, it has been deemed necessary to use the appropriate econometric tools. The division of the European space using fuzzy  $k$ -means method allows the estimation of levels of membership of Polish regions in the distinguished classes [Jefmański, Markowska 2012, Markowska, Strahl 2012, Markowska, Strahl 2013].

In Poland, on a regional level, the diagnosed smart specialisations have been included in the updated voivodeship development strategies or regional innovation strategies. Table 1 presents the smart specialisation areas identified in Poland.

Within each voivodeship, the economic, scientific and technological areas are identified that can potentially become a regional specialisation. These are, however, variously defined. In general, one can distinguish two approaches: the first emphasises the ongoing development of current regional specialisation, so that in the future these become areas distinguishable on a national level as well as among other EU regions. The second approach focuses on searching and developing new areas, market niches, which are often found somewhere between the current specialisations.



Table 1. Smart specialisations in Poland

Details	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Bio-economy																
Construction																
Water economy																
Energy management (including renewable resources)																
Marine economy																
ICT/multimedia																
Logistics																
Aeronautics and space exploration																
Medicine																
Modern business services																
Environmental protection																
Plastic products manufacturing																
Chemical industry																
Wood and furniture industry																
Machine and metal industry																
Textile industry																
Creative industries																
Pharmaceutics and cosmetics																
Off-shore technologies																
Tourism/health tourism																
High life quality																
Healthy food (agricultural and food sector)																

1 – Lower Silesian Voivodeship, 2 – Kuyavian-Pomeranian Voivodeship, 3 – Lublin Voivodeship, 4 – Lubusz Voivodeship, 5 – Łódź Voivodeship, 6 – Lesser Poland Voivodeship, 7 – Masovian Voivodeship, 8 – Opole Voivodeship, 9 – Subcarpathian Voivodeship, 10 – Podlaskie Voivodeship, 11 – Pomeranian Voivodeship, 12 – Silesian Voivodeship, 13 – Świętokrzyskie Voivodeship, 14 – Warmian-Masurian Voivodeship, 15 – Greater Poland Voivodeship, 16 – West Pomeranian Voivodeship.

Source: Own compilation on the basis of Dziedzic [2013], Malik [2013], Oborski [2013], Słodowa-Hełpa [2013a], Dziemianowicz et al. [2014].

It is one of the most frequently chosen smart specialisations on a regional level. Most of the voivodeships bases their development on the areas related to nature: bio-economy, health food and health tourism. Yet, there are voivodeships, where it is the traditional industries that will continue to play an important role in regional development (mainly machine and metal industry and energy management). The specific smart specialisations, each chosen by one voivodeship, include: plastic products manufacturing (Kuyavian-Pomeranian Voivodeship), textile industry (Łódź Voivodeship), aeronautics and space exploration (Subcarpathian Voivodeship), tourism – a gate to East (Podlaskie Voivodeship), off-shore technologies<sup>3</sup> (Pomeranian Voivodeship) and water economy (Warmian-Masurian Voivodeship). The specialisations of more general character are chosen by only a few voivodeships (e.g. creative industries, business services, high life quality).

<sup>3</sup>This is predominantly the technologies related to oil and gas extraction from the seabed.

## CONCLUSIONS

Smart specialisation, which is an important element of smart growth, is understood as the cooperation between companies, research centres and universities in finding the most promising areas in terms of regional profiles.

The regional research and innovation strategies for smart specialisation and their implementation will play an important role in the upcoming 2014–2020 perspective in terms of increasing the rate of the development of the EU regions. The emphasis on supporting national and regional specialisation should contribute to the improvement in effective UE funds use as well as to the improvements in coordination and synergy between the initiatives undertaken on the European, national and regional levels.

The presented analysis shows that the member states and regions that are willing to apply for support in terms of scientific research, technological development and innovations within the coherence policy have to design their unique strategy for smart specialisation. This also includes Poland and the nation's research and innovation policies. Smart specialisation is not a new agenda in terms of national policy for science and innovation, but its impact and importance will continue to grow in the following years, resulting in scientific analyses and strategic documents, especially on a regional level.

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## **INTELIĞENTNA SPECJALIZACJA – NOWA KONCEPCJA ROZWOJU POLSKICH REGIONÓW**

**Streszczenie.** Artykuł prezentuje koncepcję inteligentnej specjalizacji, nowego mechanizmu pobudzania rozwoju gospodarczego regionów i państw Unii Europejskiej. Celem artykułu jest przedstawienie założeń teoretycznych inteligentnej specjalizacji w kontekście polityki regionalnej. W artykule, wykorzystując krytyczną analizę literatury przedmiotu, omówiono proces tworzenia strategii inteligentnej specjalizacji oraz podjęto próbę identyfikacji obszarów inteligentnej specjalizacji w polskich regionach. Jest to zagadnienie nowe i jednocześnie aktualne, czego wyrazem są liczne w literaturze światowej w ostatnich latach opracowania teoretyczne i empiryczne.

**Słowa kluczowe:** inteligentna specjalizacja, strategia Europa 2020, rozwój regionalny, polityka regionalna Unii Europejskiej

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