

**Katarzyna Miszczak**

Wroclaw University of Economics

e-mail: katarzyna.miszczak@ue.wroc.pl

ORCID: 0000-0001-6158-9339

### SMART SPECIALISATION IN INNOVATIVE ENVIRONMENT

### INTELIĞENTNA SPECJALIZACJA W INNOWACYJNYM ŚRODOWISKU

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**Summary:** The study offers a new reading of innovative environment, which when taken together constitute the basis for thinking about regions, society and space through the lens of smart specialisation. The aim of article is the identification and characterisation of the main features and challenges of smart specialisation, understood as a strategic approach to economic development through targeted support to research and innovation. This approach combines industrial, educational and innovation policies to suggest that countries or regions pinpoint and select a limited number of priority areas for knowledge-based investments, focusing on their strengths and comparative advantages. In the article, three case studies (from Poland, the Czech Republic and Turkey) of different types of implementation of smart specialisation illustrate the utility of the intelligent policies.

**Keywords:** smart specialisation, knowledge, R&D, innovative environment, regional growth.

**Streszczenie:** W artykule zaproponowano nowe spojrzenie na środowisko innowacyjne, które postrzegane holistycznie, stanowi podstawę do myślenia o regionach, społeczeństwie i przestrzeni poprzez pryzmat inteligentnej specjalizacji. Celem badawczym jest identyfikacja i charakterystyka głównych cech i wyzwań inteligentnej specjalizacji rozumianej jako strategiczne podejście do rozwoju gospodarczego poprzez ukierunkowane wsparcie badań i innowacji. Takie podejście łączy politykę przemysłową, edukacyjną i innowacyjną, sugerując, że kraje lub regiony określają i wybierają ograniczoną liczbę obszarów priorytetowych dla inwestycji opartych na wiedzy, koncentrując się na swoich mocnych stronach i przewagach komparatywnych. W artykule przedstawiono trzy studia przypadków (z Polski, Czech i Turcji) różnych rodzajów wdrażania inteligentnej specjalizacji, ilustrujące użyteczność tych inteligentnych polityk.

**Słowa kluczowe:** inteligentna specjalizacja, wiedza, B+R, innowacyjne środowisko, rozwój regionalny.

## 1. Introduction

The contemporary transformations of socio-economic systems are, among others, a consequence of forming the information society and technological changes, in particular the progress in terms of knowledge, R&D, informatics and telecommunication (ICT sector), as well as tendencies to localize the high-tech industries in regions offering beneficial conditions of development. Determinants facilitating the growth of innovation in a specific environment are stimulated by: intense development of ultramodern industry, attractive educational system, existence of highly qualified workplaces and effective activity of local authorities. Taking into account the abovementioned various conditions of development of territorial units and the functioning of individual entities, a study dedicated to smart specialisation in innovative environment was conducted. Hence the aim of the article is the identification and characterisation of the main features and challenges of smart specialization, understood as a strategic approach to economic development through targeted support to research and innovation.

In the context of the 2014-2020 funding cycle of the European Union, the following challenges justify the need for the application of smart specialisation in strategic management: slowing down economic growth following the economic and financial crisis; increasing imbalances across the continent (and within many countries); high social costs of austerity and declining public confidence; increased competition from other parts of the world. Smart specialisation has become a hallmark of the EU's Cohesion Policy [Balland et al. 2017, p. 2]. At the core of this development strategy is smart specialisation, a vision of regional growth possibilities built around existing place-based capabilities [Barca 2009; Foray et al. 2009, 2011; McCann, Ortega-Argilés 2015, pp. 1291-1302]. The goal of smart specialisation is not to make the economic structure of regions more specialised (i.e. less diversified), but instead to leverage existing strengths, to identify hidden opportunities, and to generate novel platforms upon which regions can build competitive advantage in high value-added activities. One of the most important stimulants of these achievements is knowledge and its innovative recombination occurring in contemporary R&D. Generating and accumulating knowledge is today the predominant determinant of long-term development. The ability to acquire knowledge (to learn) and to use it is becoming an ability that decides about one's (region and/or business entity) success or defeat. Nevertheless, one should agree with Bengt-Åke Lundvall that the effective supply of knowledge is not its sum [Lundvall 2011]. According to Bengt-Åke Lundvall "creative destruction" involves not only the acceleration of creating knowledge, but also the destruction of the insufficient hitherto existing and already unnecessary supplies of knowledge. Another significant problem related to knowledge is its diffusion, which can be explicitly followed, e.g. in the Internet or through confined channels. The most recent research testifies to the fact that openness in the diffusion of knowledge implies both more flexibility and numerous dangers (unjustified use,

theft or distortion). However, this way of spreading knowledge is more adjusted to the changing environment. At the same time, a certain paradox can be observed in highly-developed countries and regions: it turns out that the explicit diffusion of knowledge attracts innovation, which contradicts the intuitive thesis that such explicitness will result in a decrease in competitive advantage. A possible explanation for this situation is the increase in formal and informal institutions specializing in protecting intellectual property and the long-term relations connected with trust and reputation, factors having a more and more important role on knowledge markets [Musterd et al. 2007]. These issues also have an interregional (centre-periphery) dimension (i.e. within the EU). If cities are the centres of the knowledge-based economy attracting and retaining most of a nation's talent, then the development of the knowledge-based economy will be geographically uneven and knowledge poverty will become a new kind of locational disadvantage.

In policy terms the focus must be on how, without destroying what makes cities attractive places to be in, the less knowledge-based and peripheral regions can make themselves better capable of retaining and attracting industry that is likely to offer qualified, higher value-adding, more knowledge-intensive jobs for their own educated youth, and attract other talents as well.

In upgrading peripheral regional economies to knowledge-based economies, the formation of innovative environment could play a strategic role. Under the present circumstances optimizing the creation of such conditions requires the effective application of smart specialisation of which one of the most key building blocks is knowledge complexity.

## 2. What is smart specialisation?

Currently one of the significant research problems is attempting to identify and pinpoint dilemmas of complexity of the functioning of the process of modern economic entity or territorial unit in a spatial, networking and creative structure which is a consequence of the evolution of paradigms of social and economic development and increasing role of holistic, ecological and network paradigm [Miszczak 2012]. Smart specialisation as a strategic approach to economic development through targeted support to research and innovation may turn out to be a good solution. This approach combines industrial, educational and innovation policies to suggest that countries or regions identify and select a limited number of priority areas for knowledge-based investments, focusing on their strengths and comparative advantages. This entails [OECD 2013]:

- a) mechanisms to enable strategic development based on multi-faceted and multi-governance interactions;
- b) the creation of synergies between public support mechanisms for R&D and innovation, industrial promotion and training institutions;

c) the identification of the strongest or promising domains for entrepreneurship and growth through a careful analysis of the existing capabilities, assets, competences, competitive advantages in a city, region or country;

d) the elimination of the fragmentation and duplication of policy interventions that may result in a waste of public resources;

e) the more effective spending of public resources, concentrating on certain domains of knowledge or expertise;

f) mapping and benchmarking of clusters including analyses of the role and influence of key players;

g) evidence-based monitoring and evaluation systems to select the knowledge domains and innovation projects.

The idea of smart specialisation is based on the 4Cs:

1. **Competitive advantage:** match R&I with business and develop links (related variety); adoption of (generic/new) technologies for diversification/modernisation of sectors + explore emerging areas.

2. **Policy Choices (tough ones):** select only a few priorities on the basis of specialisation and integration in international value chains.

3. **Critical mass of resources and talent:** cooperation between regions by avoiding duplication and fragmentation.

4. **Collaborative Leadership:** involve stakeholders from academia, business, public administration and civil society (“quadruple helix”) and synergies between funding instruments (EU, national, regional).

Smart specialisation among entities is experiencing rapid changes as a result of dramatic shifts in production and consumption patterns, advances in information and communication technologies and the creation of new, creative and dissipated structures. These changes pose many challenges for the analysis and management of territorial units. They are also leading to new ways of activities and relationships and new forms of clustering and networking among cities, regions or countries [Murdoch 1995]. At the same time, regions are becoming increasingly fragmented in many ways: economically, socially, environmentally and also politically. The governance of regions faces multi-level, multi-actor and multi-sectoral challenges. New spatial interactions at new scales demand new approaches for consultation and coordination. More flexible forms of governance are beginning to emerge which seek to work around traditional governmental arrangements. The result is a complex pattern of overlapping governance and fuzzy boundaries, not just in the territorial sense but also in terms of the role of both public and private actors [Stein 2003]. Additionally, these changes can be made by the dynamic development of network forms of learning organizations and the growth of significance of creative, innovative capital based on the capital of social trust which has been drastically weakened in recent years of the global economic crisis. Nonetheless part of the solution to exit from the economic crises is investment in R&D. “The general consensus... is that the driving force behind long-term economic growth is science, technology and innovation in its different forms and facets” [OECD 2011, p. 212].

These new arrangements cause many as yet unresolved dilemmas concerning the transparency, accountability and legitimacy of decision-making in innovative environment. The idea of smart specialisation can be one of the responses for many of the questions arising in the face of these problems and contradictions. Smart specialisation, both as an economic concept and a policy framework, provides a novel avenue to pursue the dual objectives of fiscal constraint and investment in longer-term growth potential in the context of rapid technological change and globalisation. The rationale for smart specialisation goes beyond the traditional market failure arguments for framework conditions and highlights the role of regional governments, knowledge-based institutions and entrepreneurs in shaping specialisation and competitiveness in a holistic place-based approach [OECD 2013, p. 30].

### 3. Case studies on smart specialisation

In this part of the paper, three selected examples of the implementation of smart specialisation will be presented:

- 1) Technology Cluster "Wałbrzych Raw Materials",
- 2) East Marmara, Turkey: The Automotive Cluster,
- 3) South Moravia, the Czech Republic: Regional Innovation Strategy in the South Moravia Region: searching for a smart specialisation under the conditions of a transitional economy.

The above-mentioned case studies illustrate various solutions undertaken in particular countries.

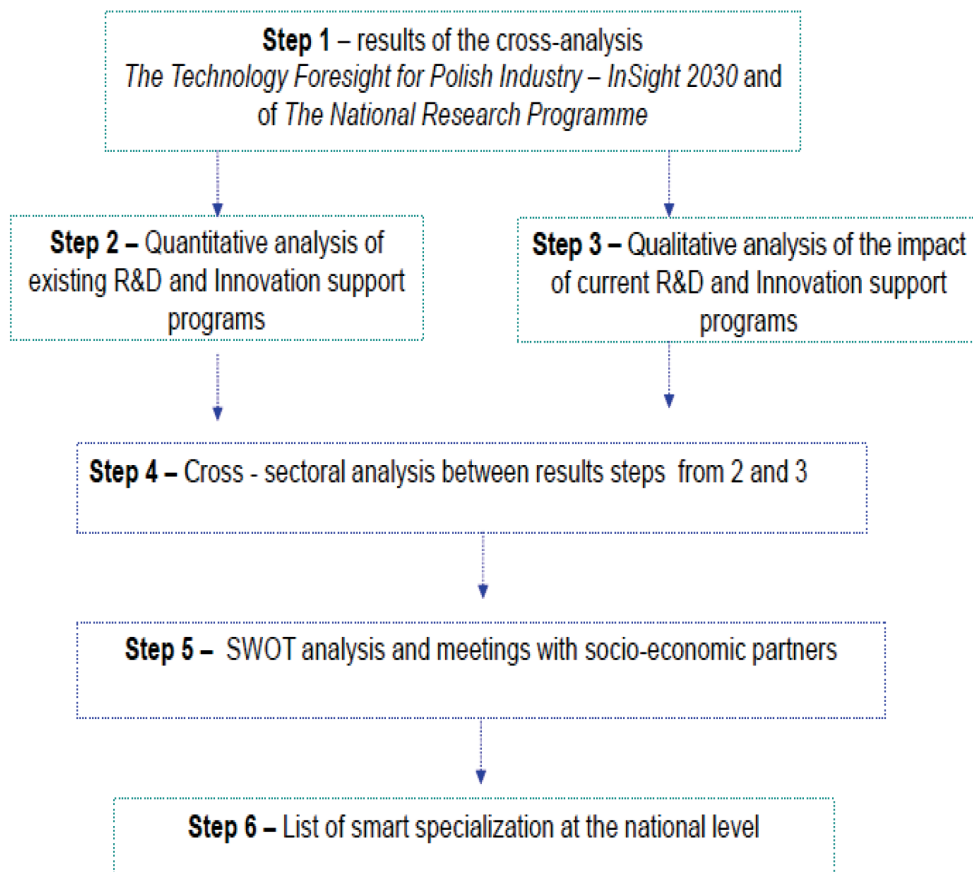
The cases are complex and have unique features but they create a common framework for the effective and appealing analysis of smart specialisation issues. In these circumstances, the evaluation of several, similar cases will provide a better answer to the research question than if only one case is examined, hence the multiple-case study [Stake 2006].

Describing the first of the three case studies, the general conditions for the introduction of smart specialisations in Poland should be outlined. Poland has decided to prepare:

- 1) national research and innovation strategy for smart specialisation (coordinated by the Ministry of Economy, the Ministry of Science and Higher Education and the Ministry of Infrastructure and Development),
- 2) 16 regional research and innovation strategies for smart specialisation (coordinated independently by the Marshal's Offices).

In Poland, regional smart specialisations were prepared independently by the regions according to their regional development policy and within the implementation of their regional programmes. Nevertheless, central government was involved through:

- organising seminars and workshops,
- participation in the Regional Forum for Smart Specialisation,
- providing regions with the necessary tools (IT platform),
- regional smart specialisations are mainly in line with national smart specialization,
- there are some unique specialisations that are not 'visible' from the central level (e.g. the textile industry or yacht building).



**Figure 1.** National Smart Specialisation – the process of identifying R&D&I priority areas in Poland

Source: [Kamieński].

As the above map illustrates, in Lower Silesia (Dolnośląskie Voivodeship) seven various smart specialisations are identified. Nonetheless each of those is implemented according to the clustering idea. Regional authorities promote close cooperation between the pro-innovation institutions and the exchange of good practices which can maximize the benefits obtained by the businesses. An example



**Figure 2.** Regional Smart Specialisations in Poland

Source: [Kowalczyk 2015].

of this kind of activity is the technology cluster “Wałbrzych Raw Materials”. In the Lower Silesian voivodeship, as many as 3800 different entities are recorded as elements of industrial heritage (250 of them have been entered in the register of monuments). The largest number of entities associated with hard coal mining is located in the Wałbrzych district. The cluster includes 60 companies of Wałbrzych Agglomeration collaborating with the World Bank and research institutions in identifying the industry’s needs. One of the result of the functioning of the cluster is the establishment of a “Knowledge Library” dedicated to technologies, patents, papers, conferences in the field of “minerals as advanced materials” [Kowalczyk 2015]. The involvement of so many different entities in this cluster initiative means that firstly, the risk of activity is diversified and therefore lowered, and secondly resources which are scarce might be substituted with technological alternatives.

The other case study on smart specialisation is taken from the Turkish region of East Marmara. The automotive sector is one of eight sectors identified as priority areas in the recent STI Strategy document, namely the National Science, Technology and Innovation Strategy (UBTYS) 2011-2016 in Turkey. The automotive sector

has been the pioneering sector of the Turkish economy in terms of exports and R&DI capabilities. The Turkish automotive industry is mainly located in the East Marmara Region comprising of the provinces of Bursa, Kocaeli and Sakarya. Producing circa 98% of the 1.6 million vehicles (2011 findings) made in Turkey and providing employment opportunities for approximately 45 000 people, the region is the center of the Turkish automotive industry. Undoubtedly the cluster has already in its possession the much needed “critical mass” of companies. The cluster has strong connections with various umbrella organizations of the automotive sector. There is a strong political commitment to support the automotive cluster among policy-makers from different ministries and agencies. The lessons learned from the functioning of the automotive cluster in East Marmara are the following:

1. Strengthening R&D and innovation competences through the whole supply chain: Turkey has fifty years of experience in automobile production, backed up with a powerful supply industry and technological knowledge. In order to keep the automotive sector competitive, strengthening R&D and innovation competences through the whole supply chain should be ensured.

2. Strategic intelligence: in line with this target, for future policies it is seen that strategic intelligence should be considered as of the utmost importance within the national innovation systems; and governance mechanisms should be arranged dynamically and long-term oriented, rather than static and short-term. Accordingly, policy-learning and an interactive point of view should be embedded within the whole cycle of policy-making in order to achieve better governance and coordination among actors of the national innovation systems.

The third example of implementation of smart specialisation is based on the Regional Innovation Strategy of South Moravia (RIS SM) in the Czech Republic. The key instruments in the third generation of RIS in South Moravia include: technology transfer, services for companies, human resources, and internationalization. The first two generations of RIS were mainly about the development of incubators and services for innovative start-ups. The third generation is about the fundamental progress of regional innovation policy in various ways:

- a large survey (much larger than in previous versions of RIS SM) was conducted among businesses and research teams as a source of strategic intelligence for the design and implementation of the strategy;
- an evaluation system is under development;
- a much higher focus in terms of specific industries has been introduced. Based on a combination of desk research and extensive surveys, key industrial branches have been identified – mechanical engineering, electronics, ICT, life-sciences;
- a much broader set of measures facilitates significant synergies across all priority axes.

The third generation of RIS SM is, therefore, the first comprehensive strategy for regional economic development based on the principles of the S3 approach in



South Moravia. The key lessons learned might be helpful primarily for regions from other transitional economies that have been on their uneasy way towards a standard system of liberal democracy with the market economy. At the same time it is necessary to tackle the global trend of shifting towards a networked knowledge-based economy. This is why the prospects and ambitions must be global, regional initiatives and stakeholders' mobilization should be dynamically developed and maximally supported, and the combination of personal engagement and expertise must be strengthened.

## 4. Conclusions

Smart specialisation is a highly important policy concept in the European context because European regions are required by the European Commission (EC) to develop smart specialisation strategies as a precondition for accessing significant amounts of funding [Grillitsch 2015]. Mikel Landabaso, Head of Unit in the EC responsible for smart specialisation, describes it as “a process of priority-setting in national and regional research and innovation strategies in order to build “place-based” competitive advantages and help regions and countries develop an innovation-driven economic transformation agenda” [Landabaso 2014, p. 378]. By creating an ex-ante conditionality framework for accessing structural funds, which requires regions to develop RIS3 strategies, this strategic approach is extremely relevant in the European context.

On the other hand, as shown by the case study of the automotive cluster in East Marmara, a region in Turkey which is not an EU member, the implementation of the smart specialisation idea is not a formal requirement but the inevitability of face the challenges of modern market determined by innovative environment. Nevertheless, the realization of smart specialisation strategies by territorial units brings them measurable significant profits, regardless of whether they are members of an international grouping or not. In other words, diverse regions will benefit most from increasing institutional integration, while integrated regions will benefit most from increasing diversity [Grillitsch 2015]. In achieving these competitive advantages, the building of advanced clusters can fundamentally help. The clusters which acquire critical mass and notable successes in specific sectors are a striking feature of nearly all innovative environments. A general rule of the functioning of a cluster is continuous learning and benchmarking, i.e. seeking the best global practices and their practical application, also referred to striving to become the best [Wojnicka et al. 2001, p. 6].

It is worth emphasising that the operation of clusters is used in the development of innovation, particularly in its interactive form. They provide the conditions for exchanging information and experience as to the quality and gaining practical

knowledge by partners, which may be applied in their organisations. Therefore clusters are also one of the main milestones in innovation environment, And this concept allows regional policy to be considered from a new perspective. In fact, if the territory is not given a priori, but built thanks to the dynamics of the environments, one can consider that regional collectives have the possibility of promoting and initiating real territorial development. Smart specialisation through the promotion of intelligent, inclusive and sustainable growth represents a unique opportunity in contemporary policy for territorial development. Due to it, national and regional authorities are implementing a common set of policy principles and methodologies which optimises the realization of highly-specialised and long-term activities.

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