METHODOLOGICAL IDENTIFICATION OF OPPORTUNITIES FOR DEVELOPMENT OF SMART SPECIALISATION IN POMERANIAN VOIVODESHIP IN POLAND

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Abstract

Smart specialization as a concept plays a more and more important role in development of the regions. David, Foray and Hall point it, as an important instrument for creating a strategy for the development of innovation at the state and regional level as well as for defining and building the knowledge-based economy. This term is present in a number of strategic development documents in the European Union, including Europe 2020, published by the European Commission in 2010. It implies the need for countries and regions to specialize as well as focus development of innovation in areas that are consistent with their endogenous potentials.

This paper presents the method as well as results of the studies undertaken to define the smart specialization of Pomerania, which is one of two Polish voivodeships with access to the Baltic Sea. Its main settlement node is the emerging metropolitan area of Gdansk – the fourth largest in Poland. Part of this research was project Identification of Smart Specialization in Pomerania Voivodeship – Technological Convergence, commissioned by the Regional Government. Technological convergence was defined as phenomenon of the use of technologies from different industries for the creation of a new specialization in order to gain a competitive advantage. The aim of the project was to analyze and evaluate the economic potential of the Voivodeship, indicating possible areas of cooperation between representatives of different industries. It was assumed that the process of identifying smart specialization would be a bottom-up approach. Regional Government invited all actors to build a partnership. They worked on identifying potentials then building on this analysis, developed a common strategy for the development of technological and functional smart specialization.

Analytical and diagnostic processes included: desk research, expert studies, individual in-depth interviews, focus group interviews, workshops and the Delphi study, SWOT analysis. The result is an aid for all stakeholders to identify opportunities and specify areas of development of smart specializations for the Voivodship. The method of identification of the priorities and implementation of the actions for the development of smart specializations assumes that the process itself should be flexible, meaning that adopted priorities and allocation of resources need to be reviewed and modified if such need occurs.

Key words: smart specialisation, technological convergence, Pomeranian Voivodeship, regional knowledge-based development, innovation strategy.

JEL codes: O2, O3, O38

1. Understanding Smart Specialisation

Smart specialisation as a concept plays a more and more important role in the development of regions. David, Foray and Hall (2009) point it out, as an important instrument for creating a strategy for the development of innovation at the state and regional level, as well as for defining and building a knowledge-based economy. Foray (2014) also noted a sequence that is essential if smart specialisation is to become an important drive force of industrialization and diversification. The first step is entrepreneurial discovery, which is exploring a new domain of opportunity, it precedes routinized innovation and is a decisive link, that allows a system to reorient and renew itself. Second phase he defined as an entry and usage of agglomeration advantages, leading to clustering. The process is established, when the last phase namely the structural change is taking place.

At the beginning it is essential to clarify the term Smart Specialisation. Definition promoted by the JRC S3 Platform seems to be the most appropriate: "a strategic approach to economic development through targeted support to Research and Innovation (R&I). More generally, smart specialisation involves a process of developing a vision, identifying competitive advantage, setting strategic priorities and making use of smart policies to maximize the knowledge-based development potential of any region, strong or weak, high-tech or low-tech" (JRC 2012).

2. European, national and regional context

European context

The Lisbon strategy evaluation indicated goals set for increasing the competitiveness, but which were not entirely met. There was a need for new approach towards innovation devel-

opment. The term Smart Specialisation is present in a number of strategic development documents in the European Union, including Europe 2020, published by the European Commission in 2010. It implies the need for countries and regions to specialize, as well as focus the development of innovation in areas that are consistent with their endogenous potentials.

Development of the concept of smart specialization is seen as part of the implementation of Europe 2020 Strategy's priority - development of an economy based on knowledge and innovation.

National context

The European Commission's guidelines on cohesion policy implementation for the period 2014-2020 state, that identification of smart specialization is a prerequisite (ex-ante) for the Polish regions to have access to the European Regional Development Fund (ERDF) and the European Agricultural Fund for Rural Development (EAFRD). For the ERDF, this concerns in particular funds for research, technological development and innovation, as well as improving the ICT access, while in the case of the EAFRD it refers to support of the transfer of knowledge and innovation in agriculture, forestry and rural areas.

The Polish Ministry of Regional Development took measures to create a coherent system of strategic documents at the national, macro-regional and regional levels, which will be the justification for the choice of instruments to support and ensure the attainment of that condition in the regulation for programs for the period 2014 - 2020.

On 8th April 2014 the Council of Ministers adopted the Enterprise Development Program, which is an integral part of the National Smart Specialisation Strategy (national RIS3). The document presents the analytical process of selecting smart specialization at the national level (areas of R & I) and outlines the process of monitoring and updating. National Smart Specialisation Strategy is an open document, which will be subject to ongoing review and updating on the basis of the monitoring and ongoing socio-economic changes. The result of the development of national RIS3 is an indication of the national smart specialization, which is a priority for science and innovation policy by 2020. RIS3 can also be a useful instrument to meet global challenges, such as demographic changes, limited access to natural resources, energy security and climate change.

Regional context

Research and innovation strategies (RIS3) for smart specialization should be a determinant of innovative development for the regions. The mode of action in determining these priorities for RIS3 at regional level has been termed the entrepreneurial process of discovery, a

bottom-up, evidence-based learning process for discovering the R&I activities or niches, in which a region can expect to excel (European Commission, 2014).

Guide to Research and Innovation Strategy for smart specialization (RIS3), a set of mandatory guidelines for the preparation of the design methodology, formulation and implementation of regional research and innovation strategies for smart specialization indicates that RIS3 should meet five important criteria:

- focused policy support and investments on key national/regional priorities, challenges and needs for knowledge-based development, including ICT-related measures;
- build on each country's/region's strengths, competitive advantages and potential for excellence;
- support technological as well as practice-based innovation and aim to stimulate private sector investment;
- get stakeholders fully involved and encourage innovation and experimentation;
- be evidence-based and include sound monitoring and evaluation systems.

3. Process of identification of smart specializations in Pomeranian Voivodeship

The authorities of the Pomeranian Voivodeship see the smart specialization as an area with high potential, relevant to the development of the Voivodeship, based on the unique resources of the Region and their innovative use. It is assumed that, among others, implementation of R & I contributing to the development of existing economic specialization and having an impact on the growth of competitiveness of the Pomeranian Region on the national and international arena (Regulamin…, 2014).

2020 Regional Development Strategy (SRWP 2020) stresses smart specialization principle. The document emphasizes, that public intervention will be focused on launching and using potentials relevant to the region's industries and emerging smart specialization of the region. Pomeranian Voivodeship Regional Government committed to set up a mechanism to identify and verify the areas of economic activity, which can determine the future competitive position of the region. This mechanism will enable the concentration of the intervention and its flexible adaptation to changing market conditions. The program Smart Specializations develops the mechanism introduced in SRWP 2020, in order to use it for identification and verification of smart specialization of the region. The functioning of the mechanism will be based on the following principles:

1. Continuity of building the analytically underpinned public intervention.
2. The use of incentives for grassroots mobilization of all the stakeholders.

3. Openness of the initiative for interested stakeholders.
4. Transparency of processes and decision making criteria.
5. Negotiation approach to building relations between regional authorities and interested actors.
6. Reproducibility.
7. EU Guidelines for the selection of smart specialisation. (Inteligentne…, 2013).

Pomeranian adopted a bottom-up process for the emergence of smart specialization: stakeholders form business and academia were indicated, later they selected regional specializations with the greatest potential for growth. It was assumed that the process of selection of smart specialization will be implemented with the participation of the expert committee basing on criteria, which have previously undergone public consultation process (Kryteria…, 2014).

The process of identification of smart specialization is planned to be implemented in the following 6 phases:

1. Determination of the economic profile of the region (technological and functional convergence); step involves the review and complementation of existing analyzes carried out by external consultants.
2. Discussions, consultations and partnerships building - various forms of interviews, workshops and meetings with stakeholders incl. business, R & D institutions, clusters, regional bodies, non-governmental organizations, local governments, academia, Pomeranian boards of education and others.
3. The organization of the competition for Pomeranian smart specialization provided as a two-stage process:
   Stage 1: presentation and evaluation of the initial concept of smart specialization
   Stage 2: assessment of the final concept and choice of smart specialization.
4. Negotiations to support the development of smart specialization between the authorities of the Pomeranian Voivodeship Regional Government and partnerships.
5. Signing of agreements for the Pomeranian Smart Specialisation between Pomeranian Voivodeship Regional Government and partnerships.
6. Monitoring of implementation of selected smart specialization (Proces…, 2014).

Evaluation of the final concept of smart specialization is a basis for negotiations with the partnerships submitting proposals of specializations, and for the signing of the agreements. Pomeranian Voivodeship Regional Government will negotiate with partnerships, whose pro-

posals obtained the highest scores for overall concepts. The negotiations will determine the scope and form of public support, that may be provided at the regional level for packets of actions and flagship projects implementing these concepts. The proposal should be consistent with regional strategic programs.

If successfully, the completed negotiations will be concluded with the agreements for smart specialization between Partnerships and Pomeranian Regional Government. Agreements will define the scope of activities related to the development of specialization and point the mechanism and projects for implementation, defining the partners responsible for the implementation and measurable goals for assessing results and impacts. Agreed actions and flagship projects will be given priority in accessing funding under regional financial instruments.

Agreement will be valid for no more than three years, with an option to prolong it in a situation when the parties positively assessed the outcomes and prospects for cooperation. The abovementioned procedure (steps 1-6) is to be launched by the regional authorities every two years. The first started in 2013 (Proces…, 2014).

4. Expertise on segments of the economy, smart specialization and technological convergence

Expertise on *Identification of smart specialization in Pomeranian Voivodeship - technological convergence* was commissioned by the Office of the Pomeranian Marshal - Regional Government and prepared by consultants from Warsaw company (ResPublic). The aim of this study was to clarify the specific to Pomeranian endogenous resources and comparative advantages, and identify areas of economic activity with the highest growth potential in this area at the interface between different sectors, industries and technologies, together with an indication of the possible directions of technological convergence.

Technological convergence in this study was defined as a phenomenon of the use of technologies from different sectors for the creation of a new specialisation in order to gain a competitive advantage. Wojciechowski (2010) points out that in Poland technological convergence is forcing a close cooperation between actors in different areas. Functional convergence is the combination of solutions from different sectors to create innovative expertise to meet new needs of the customer. Directions of functional convergence are defined as specializations in various industry sectors, that allow them together to meet the needs of the customers (Identyfikacja…, 2011).

In the first stage, based on a set of areas specified by the contracting authority, segments of the economy were established (in a different division than NACE). The definition of seg-

ments and their list was confirmed in a panel discussion. The participants decided to conduct further analyzes for all 12 segments, which have a wide range, as they include 42% of employees in the Voivodeship and 35% of GDP is created in the region. The second step was the preparation of analysis and assessment of the potential of different branches. For each of the 12 segments data was collected and 17 indicators were developed.

Results of comparative analyzes are presented for all 12 segments. For each segment SWOT and PESTER analysis were drawn out based on information obtained during the research. The PESTER analysis assesses the determinants of development of each segment: Political (P), Economic (E), Social (S), Technological (T), Environmental (E) and Regulatory (R). An "asset map" showing current and potential resources was prepared. It allows to evaluate the present level of development and the potential of each segment.

5. Debate and consultation - building partnerships

At this stage the study included, among others 28 individual in-depth interviews (IDI) and focus group interviews (FGI). In individual interviews (IDI) representatives of different sectors took part:

- Entrepreneurs - 10 persons representing the following sectors: chemical, biotechnology, ICT, maritime, logistics, textile, tourism, sport and recreation, food processing, creative industries, business services, eco-energy sector;
- Business support organizations - 5 persons;
- Clusters - 4 persons;
- R & D - 6 persons;
- Local government - 3 persons.

In-depth interviews (IDI) were primarily designed to: identify strengths and weaknesses of the individual segments, as well as trends that most strongly influence them, find the leading industry in the region, as well as directions of the technological and functional convergence.

Three focus group interviews (FGI) were organized and they were attended by a total of 20 persons - representatives of businesses, R & D institutions, clusters and business institutions. Discussions were raised primarily around the fastest growing specialization in the Pomeranian Voivodeship, the development prospects and future directions of technological and functional convergence. The course of the interviews was as follows: in the beginning 12 broad industrial segments were rated. The fastest developing and the most at the time developed were indicated. Also the ones with the highest level of innovation, those which are a

showcase of the Pomeranian region in Europe or Poland, as well as those having the greatest potential for development in the next 10-15 years. From the ones having the highest ratings, narrower specializations were separated and they were put through the same process of evaluation. It was pointed out which specializations in this period should develop the fastest. The list was expanded by technologies and products.

After completing the list of specializations, technologies and products those that are not limited to one sector were sought out. Also the type of technologies, specializations and products emerging at the border between different sectors and, in the opinion of the respondents, having a high potential for development were chosen. Respondents were asked to indicate in their field: specialization or technologies that have developed at the border with other sectors or developed through the use of technology from other sectors and specialization, which combine the functions of various sectors to better meet the needs of customers.

In the next step these issues were added to the list of specialization and technology:

- Providing examples and creating a list of companies that are successful in the internal and external market,
- Rating the level of research conducted in the Pomeranian region, indicating centers and research units,
- Rating which specializations and technologies have the greatest potential for growth and are most likely to develop in the Pomeranian region.

Lastly, the conditions which should be met for analyzed specializations and technologies to reached a high level of development in a European or country level were indicated.

In the next stage, the directions of convergence were specified using participatory approach. Four workshops for a wide group of different sectors private and public (incl. academia) representatives were conducted: for companies representing 12 sectors, R & D institutions, clusters, business environment institutions, government and representatives of capital investment funds and in the seed capital funds. Using the results of previous work, potential directions of functional and technological convergence at the interface between 12 sectors surveyed were identified. They have been subjected to various evaluation in Delphi study. The invitation was sent to over 200 persons, from which finally 40 participants were involved. Experts pointed out several directions with the highest potentials within each criteria. Tab. 1 shows the synthesis of these assessments - the directions with accordance to Delphi study with the highest growth potential, which were the subject of further analyses.

Tab. 1. Convergence directions with the highest potential development according to the Delphi survey (average ratings of experts, in the scale of 1-5)

Directions of functional and technological convergence	The level of development of enterprises	Level of scientific institutions	Human Resources	Organization and cooperation	External factors affecting the direction
Port services and industry	4,25	3,88	3,83	3,42	4,17
Off-shore technology	4,08	3,91	3,44	3,45	4,55
"Smart" tourism / Leisure Industry	3,10	2,30	3,10	2,60	4,10
Technologies and products in the area of biotechnology and medicine	3,75	3,00	3,38	3,13	4,25
Business - logistics hub / advanced business services	3,75	3,00	3,28	3,13	4,25
Functional nanotechnology	2,40	3,00	2,80	3,00	3,30
Smart building and energy-efficiency	3,14	3,28	3,42	3,28	3,42
Amber jewellery	4,60	4,00	4,40	2,20	4,30

Source: Identyfikacja…, 2014

During the next workshop for the above-mentioned directions in-depth analyzes were carried out, covering: SWOT analysis, analysis of the resources; creating a list of leaders and scientific institutions, qualitative assessments of human resources and other assets accumulated in the region in a given direction of convergence. Creating scenarios of specializations starting from adopting assumptions such as key factors, current level of development. Later 2-3 thesis on direction of convergence development were formulated and then estimation was made when they will be fulfilled and lastly scenarios of development were constructed.

6. Competition for Pomeranian's smart specializations

Partnerships connected with development of potential smart specializations have been invited to present the concept of their activities. The invitation was sent to all stakeholders, including those gathered around the sectors with the greatest development potential identified in the Pomeranian Regional Development Strategy 2020, particularly to the developed ones and sectors operating in key clusters of the region. The competition for the selection of Smart

Specialisations of Pomeranian was announced on May 14 this year. The selection procedure of smart specialization of Pomeranian consists of two stages:

Stage I involves the following steps:

- Submission of the initial application by the partnership.
- Formal evaluation of initial applications.
- Analysis of the initial application by the Selection Committee and the formulation of conclusions and recommendations to present during the meeting of partnerships with members of the Selection Committee.
- Formulation of written conclusions and recommendations for partnerships.

The result of this step is to identify the strengths and weaknesses of the concept, as well as formulate recommendations aimed at strengthening the impact of the proposed specializations on the competitiveness of the region. The added value of this form of identification of specializations is the ability to peer assess the potential of each proposal by the interested parties, which may be moved to make modifications or even in some cases extend/prolong?? the partnerships (Proces…, 2014). At the first stage of the evaluation of initial applications experts will only point out weaknesses of the proposals in particular areas and formulate a list of recommendations and would not eliminate any proposals (Założenia…, 2014).

Stage II:

- Submission of the final application by the partnership proposing smart specialization.
- Formal and substantive assessment of final application by the Selection Committee.
- Meeting of partnerships, which submitted proposals for smart specialization with Selection Committee (presentation applications, verification of strategies and possibilities of achieving the planned objectives).
- Meeting of the Selection Committee and the formulation of the evaluation of individual applications along with a justification and recommendation for the Pomeranian Voivodeship Regional Government

The final decision on the selection of smart specialization of Pomeranian, will be taken by Pomeranian Voivodeship Regional Government by resolution (Regulamin…, 2014; Założenia…, 2014). Proposals for smart specialization should be described according to the following criteria, which will be the same for evaluating:

A. Challenges, trends and potential markets;

B. Economic and technological potential;

C. National and international benchmarking;

D. Strategy and Action Plan (including the R & D and key projects);

E. Potential of partnership and previous activities, that support development of the specialization.

Till mid June 2014 following partnerships for potential smart specializations emerged:

- The economic use of marine resources – marine constructions (including off-shore), off-shore services, vessels, exploitation of marine resources, e.g. for the production of cosmetics, assessment of mutual influence of the structure and the environment.
- Smart E + (power industry construction) - new construction technologies to improve the diminishing energy use and to increase comfort of living, renewable energy, air conditioning and ventilation, water and waste disposal, ICT support for energy saving.
- Advanced technologies in the prevention and treatment of civilization diseases, care for the disabled and elderly: prevention and therapy, monitoring supported by ICT solutions, modern health monitoring devices to improve quality of life, therapy supported by uses of biotechnology, new materials for the prophylaxis and regenerative medicine; medical tourism, cosmetics, pharmaceuticals.
- Smart LAB city (ICT technologies as tools for urban development), and embedded intelligent systems - based on resource of existing INTERIZON cluster (Smart City / Building / Factory, etc.).
- E-Zone – multi-modal interfaces man – machine, smart embedded systems, internet of things, wearable, cloud computing and modern data centers.

Two other partnerships are being formulated on maritime logistics and electric mobility (Dotychczas…, 2014, Lipińska, 2014).

Among the 8 defined directions of functional and technological convergence with the highest potential, and 7 partnerships for smart specialization 3 are common: the use of marine resources, including off-shore structures, technologies and products in medicine and biotechnology, as well as smart construction and energy efficiency. So far there is no partnership on nanotechnology, around the port services and industry, advanced business services, logistics and amber. There are two initiatives connected with the ICT sector, which were not on the list of the 8 directions of convergence.

7. Conclusions

Smart specialisation strategy shouldn't be set as a policy process to select and prioritize fields or areas where a cluster of activities should be developed. It should be introduced by

letting entrepreneurs discover the right domains of future specialisations, so smart specialisation strategy can be effective only at a certain point in the development cycle, where a degree of local commitment and development is already achieved (Foray, 2012). This approach was taken by Pomeranian Voivodeship. It is the only region in Poland, where the emergence of smart specialization is planned as a bottom-up process, through competition. The process of identification of smart specializations in Pomeranian Voivodeship is still an on-going one, but it looks promising so the assessment presented in this paper is ax-ante evaluation. Evaluation at a later stage of the process should be conducted as it will allow to estimate real influence on regional development and diffusion of the innovation.

The whole process involved two kinds of actions:

1. The research (which is now completed), carried out by an external company, with the participation of stakeholders, consisting of: expertise, which examined the potential for 12 wide segments, the work involving many entities (including interviews, debates, workshops, Delphi research).
2. The emergence of smart specialization in a competition. The process has only just started: a call for proposals including assessment criteria and schedule was lunched.

Evaluation of the potential 12 broad segments was labor intensive and costly, required, among others obtaining statistical data on request. Studying 42% of employees in the region also has its value, but if would be narrowed to sectors related to the potential directions of convergence it might be conducted more deeply.

The greatest advantage of this approach was the use of different methods and techniques, including many actors and experts: different types of interviews (IDI, FGI), workshops, debates, Delphi study. As a result 35 possible directions of convergence were indicated, and then 8 with the highest potential were chosen.

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