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SMART SPECIALIZATION AND ITS IMPLEMENTATION

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***Abstract:** In recent years, the so-called “smart specialisation” has assumed great importance in the new generation of research and innovation policies for economic growth of European regions and beyond. The concept of smart specialization on the regional level is related with the implementation of the Cohesion Policy for the period of 2014–2020. This paper presents the methodological approach and results of the ongoing national level foresight process organised in Slovenia in the context of preparing the smart specialisation strategy and defining the national research and innovation priorities. The methodology accepted in Slovenia focuses on identification of research fields or economy sectors, and builds on the concepts of long-term challenges and critical technologies. Choosing the right priorities can lead to better develop synergies and integrated policies, thus reducing fragmentation. We used a descriptive, non-experimental method of empirical research based on statistical and bibliometric analysis, expert panels and analytical studies.*

***Keywords:** smart specialisation, entrepreneurial discovery, research and innovation, cohesion policy*

1. Introduction

Smart specialisation is a strategic approach to economic development through targeted support to research and innovation. It has recently gained tremendous importance for regional innovation-related policymaking. The concept acknowledges that regions cannot do everything in terms of developments in science, technology and innovation and policies so they do need to focus on specific (carefully chosen) domains. In other words, regions should not try to imitate each other but develop distinctive areas of specialisation and then strategically concentrate their policy efforts on those “smart specialisation areas”.

Smart specialisation strategy is originally an academic concept, which is increasingly applied to regional policies in Europe, as it is part of the wider Europe 2020

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strategy. It gained its political and economic significance in 2011 when it was established by the European Commission's proposal for cohesion policy in 2014-2020 as a precondition for using the European Regional Development Fund (ERDF). Hence, it is of great relevance for policy makers to correctly understand and apply the core concepts underlying this strategic approach for an innovation-based regional development policy.

The existence of a national strategy for smart specialisation is an *ex ante* conditionality for the use of the EU Structural Funds from 2014 to 2020. The underlying rationale is that by concentrating resources in research and innovation and linking them to a limited number of priority economic areas, countries can become and remain competitive in the global economy (<http://www.visionary.lt>). Possibly future evaluations might show if the attempt of coupling cohesion and innovation policies is a successful endeavour. Smart specialisation appears to be a useful tool for less developed states/regions as an alternative to the current bundle of mainly horizontal policy measures that are usually not only disconnected but also stand in mutual competition.

In this paper, we pursue two aims: First, we clarify what smart specialisation means and introduce theoretical perspectives strengthening this policy approach. Second, we aim to describe the smart specialisation process and present the key findings from a case study of Slovenia, a country who is exploiting the advantages of the efficiency or factor driven phase of economic development, but at the same time aspiring to make a further shift towards the competitiveness based on knowledge and innovation.

2. The Concept of Smart Specialization

2.1. The background of the concept

The theoretical origins of smart specialisation are deep and are grounded in the classical economic theories of economic growth (e.g. the theory of the division of labour by Adam Smith) and notably trade specialisation (OECD, 2013, 18). According to Ortega-Argilés (2012) the basis of the concept goes back to the study of the traditional gap on the productivity between the US and the EU due to different aspects, including labour markets, industry performance and the adoption of information and communication technologies. An important number of them is connected to the level of the economic integration and the economies of scale it generates (McCann, Ortega-Argilés, 2011). In this framework, the idea of promoting a European system increasing spillovers coming from the new cross-border generation of knowledge was seen as the key to reduce the productive gap.

As stated by Foray and Van Ark (2007), the EU faces two main problems regarding the attraction of international R&D flows. The first one is the fragmentation along national lines, which is a brake on the process of creating world-class centres of excellence. The second one is the imitation of those strategies that have been successful within the EU by other regions and states, instead of designing new ones, leading to uniformity on the innovation-based policies, which have translated to excessive homogeneity on knowledge and what relates to it. These two problems were the main arguments to design a policy based on a European model for specialization with a higher degree of coordination.

The origin of the concept "smart specialization strategy" comes from the strategic reflection carried out in 2007 as a result of the work of the experts group called "Knowledge for Growth (K4G)". Through different policy briefs, they introduced the concept following

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the principle of the Lisbon Treaty, including the Lisbon growth agenda. Since then, the presence of smart specialization strategy in the EU communications and reports grew exponentially, and it switched from being an academic concept to a reality. Even more, a number of countries, within OECD or not, are now taking interest in smart specialisation as one way to lead their economies out of the crisis by leveraging regional dynamism in innovation led/knowledge-intensive economic development (OECD, 2013, 10).

In the COM(2010) 546, Europe 2020 Flagship Initiative Innovation Union, the European Commission established smart specialization as a key concept for the innovation plans of the EU. In October 2010, through its COM(2010) 553, about the Regional Policy contributing to smart growth in Europe 2020, it understood as “concentrating resources on the most promising areas of comparative advantage, e.g. on clusters, existing sectors and cross-sectorial activities, eco-innovation, high value-added markets or specific research areas”. Towards this goal, the European Commission designed three main activities that they would undertake:

- the development of the Smart Specialization Platform, which already operates depending on the JRC-IPTS,
- the provision of analysis and information on research, innovation, and specialization from a EU perspective, and
- the development of platforms for mutual learning and to facilitate the implementation of the strategies.

Within this framework, the European Commission asked states, regions, and territories in general, to develop their own smart specialization strategies, under which precepts the European structural funds (the European Regional Development Funds and the European Social Funds) will be allocated. For instance, in the case of regions, each one of them is asked to establish some priorities that must be considered when deciding to which projects (linked to sectors) are going to be funded by European funds. At the present moment, regions and states (Slovenia included) are finishing the design of their strategies to start implementing them related to the structural funds in the present period 2014 – 2020.

Although initially relatively simple as a concept – the concentration of public resources in knowledge investments on particular activities in order to strengthen comparative advantage in existing or new areas – the conceptual and policy implications of smart specialisation are far more complex and transcend three distinct areas (OECD, 2013, 11):

- the underlying role of scientific, technological and economic specialisation in the development of comparative advantage and more broadly in driving economic growth;
- policy intelligence for identifying domains of present or future comparative advantage and;
- governance arrangements that give a pivotal role to regions, private stakeholders and entrepreneurs in the process of translating specialisation strategies into economic and social outcomes.

2.2. What is smart specialisation?

When defining smart specialisation we should consider the following features (Foray and Van Ark, 2007; Foray et al., 2012):

- *Global perspective* - the aim for intelligent specialization is to create a large area of research and innovation in order to compete on a global market beyond geographic boundaries;
- *Specialisation in technological domains/specific sectors* in order to achieve competitive advantage over the other locations, specialisation is connected with general purpose technologies, which means technologies, which caused a breakthrough in the global economy;
- *Regional diversity* – identification and exploitation of the regional related diversity in order to develop new technology domains and sectors;
- *Government role* – a huge role in shaping smart specialisation plays government policy which tasks are as follows: giving incentives for entities involved in the process of specialisation identification, assessing the value of chosen specialisation, selecting and promoting innovation which is complementary to specialisation, reducing investments, which were supported in the ex-ante framework of seeking appropriate expertise, and which turn out to be inadequate ex-post.

The European Commission, through the “Guide to Research and Innovation Strategies for Smart Specialisations” (Foray et al., 2012, 9), defines the concept, as an integrated, place-based economic transformation agendas: (1) to focus policy support and investments on key national/regional priorities, challenges and needs; (2) to build on each state/region strengths, competitive advantages and potential for excellence; (4) to support technological as well as practice-based innovation and aim to stimulate private sector investment; (5) to get a larger involvement of the different actors (stakeholders) by encouraging innovation and experimentation; and (5) to be defined from an evidence-based point of view and include sound monitoring and evaluation systems. In other words, the strategy aims to promote fields and sectors according to the potentialities they have to grow and to interconnect with the rest. Within the meaning of Europe 2020 strategy smart specialisation constitutes strategic approach to economic growth. This approach combines the analysis elements of nations/regions competitiveness and development with the priority setting process in the technological and science policy.

Smart specialisation should be the means by which we understand the relative strengths and weaknesses of local, devolved and national innovation landscapes and strategies. Businesses operate across these borders and therefore government at all levels must provide a coherent package of innovation support. OECD (2013) emphasizes that smart specialisation can be one of the key drivers for growth but it requires effective and active coordination of policy interventions and longer term visions of policy makers but also various stakeholders, including business.

In the context of smart specialisation strategy, the concept of market creation is also important. Smart specialisation strategy should not primarily aim to identify and support single innovations produced by projects, but should ideally aim to (co-)create new domains of activities where innovations can be developed and used to modernise traditional sectors or to stimulate the emergence of new market areas (Sörvik, Kleibrink, (2015, 3).

Smart specialisation is a key action in the ‘Innovation Union’ flagship initiative of the Europe 2020 agenda for smart, sustainable and inclusive growth. Smart specialisation implies that a Member State or region selects a limited number of priorities on the basis of its own strengths and comparative advantages and where there is the highest potential for lasting impact. This approach helps regions realise their innovation potential and refocus

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their industrial and knowledge structures in the direction of emerging industries and services, and international markets. The aim of smart specialisation is to transform economies towards higher added value and more competitive activities. Smart specialisation is an approach which the European Commission is now building into its cohesion policy programmes (<http://esiskladi.wix.com/strategijaps#!about/c1enr>).

3. The Smart Specialisation Process

For the 2014-2020 period of European Regional Development Funding it has introduced an ex ante condition that requires all EU member states and regions to have a research and innovation strategy for smart specialisation (an RIS3) in place before their operational programmes are approved (European Commission, 2014). Building such a strategy is an ongoing process and participatory process, which involves all of the various stakeholders, that from the quadruple helix of the innovation process: public authorities, the business community, the academic world and knowledge-based institutions, and civil society.

European Commission in their Guide to Research and Innovation Strategies for Smart Specialisation proposes six steps for the development of a national/regional RIS3, namely (Foray et al., 2012, 18-60):

1. the analysis of the national/regional context and potential for innovation,
2. the set-up of a sound and inclusive governance structure,
3. the production of a shared vision about the future of the country/region,
4. the selection of a limited number of priorities for national/regional development,
5. the establishment of suitable policy mixes, and
6. the integration of monitoring and evaluation mechanisms.

As the guide highlights, the steps should not be thought of as separate and autonomous stages in the process, but as interacting components of a comprehensive design scheme whose implementation pattern depends on the specificity of the regional context.

With regard to the *first step* of analysing regional context and innovation potential, the guide refers to economic differentiation as one of the central principles behind smart specialization. It is argued that the key to successful differentiation is to exploit related variety, which suggests that a regional economy can build its competitive advantage by diversifying its unique, localized know-how into new combinations and innovations which are close or adjacent to it. Several methods can be used to support the identification of potential niches for smart specialisation. The most relevant methods include analysis of scientific and technological specialisation, analysis of regional economic specialisation, in-depth cluster case studies, per reviews and foresight. This analysis should cover three main dimensions: regional assets; linkages with the rest of the world and the position of the region in the global economy; and the dynamics of entrepreneurial environment.

The *second step* refers to governance and highlights the relevance of ensuring participation and ownership of different actors from the quadruple helix in the development of RIS3. In order to ensure that all stakeholders own and share the strategy, governance schemes should allow for collaborative leadership, meaning that decision-making hierarchies should be flexible enough to let each actor have a role and eventually take the lead in specific phases of RIS3 design, according to their characteristics, background and capacities. The *third step* is strongly related and emphasise the importance of having a clear

and shared vision of the future development of the region around which stakeholders can be engaged in the process. It highlights the importance of communication for an RIS3 that is alive and constantly evolving.

Step four refers to the identification of priorities, and here the guide underlines that RIS3 entails an effective match between a top-down process of identification of broad objectives aligned with EU policies and a bottom-up process of emergence of candidate niches for smart specialization, areas of experimentation and the future development stemming from the discovery activity of entrepreneurial actors. It is of crucial importance to focus on a limited number of innovation and research priorities in line with the potential form smart specialisation detected in the analysis phase. These priorities will be the areas in which a region can realistically hope to excel. In addition to vertical, activity-based priorities, it is important to pay attention to defining horizontal-type priorities in terms of broad regional competences. The final two steps are connected with the policies to support the development of RIS3 and the integration of evaluation mechanisms. *Step five* is to define a coherent policy mix. The RIS3 should be implemented through a road map with an effective action plan allowing for a degree of experimentation through pilot projects¹. *Step six* follows from this logically, with the suggestion that mechanisms for monitoring and evaluating policies should be integrated in the strategy from the very beginning. In this sense the design effort in an RIS3 does not come to an end when the strategy moves on to the implementation phase. A strategy for smart specialisation should evolve and adjust to changes in economic and framework conditions, as well as to the emergence of new evidence during implementation through evaluation and monitoring activities.

The smart specialisation process can be initiated by different lead actors or institutions such as companies, research institutions, national or regional authorities. The role and diversity of these lead actors and institutions in setting the priorities and the designing of the strategy may help to clarify that the smart specialisation approach calls for an 'entrepreneurial-driven' allocation of resources. Once the process of 'discovery' has been initiated, the immediate challenge is to ensure mechanisms or structures for these new 'entrepreneurial bottom-up initiatives' to emerge and prove that they can mobilise – through an open invitation – and empower the relevant stakeholders that have the potential to provide value added (OECD, 2013, 38). The core idea of smart specialisation - the *entrepreneurial process of discovery* – urges the entrepreneurial forces of a region to take action and redefines the role of policy support substantially. SMEs and entrepreneurs (start-ups are also very important to be able to tackle new market opportunities) are at the same time key actors and targets for smart specialization strategies actions. The "entrepreneurial discovery process", based on a strong involvement of entrepreneurs is at the heart of the selection and policy mix definition processes of any smart specialisation strategy. Recent experiences from Europe show that nearly all regions have a growing number of enterprises; most of them growing slowly, with only a few that are "champions" either at national, regional or world level. Only these champions become an engine for the local economy. Defining an intervention portfolio tailored to their needs is a key priority for any support organization willing not just to "pick the winners" but to "support winners". When understanding how to support winners, the following types of enterprises should be looked

¹ Pilot projects constitute the main tools for policy experimentation and allow testing unprecedented mixes of policy measures at a small scale, before deciding or implementing at a larger or more expensive scale.

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at: SMEs competitive in global niche markets; start-ups with high growth potential (gazelles); local champions (SMEs serving local markets, including healthcare and other services); “hidden” champions (according to a definition by EURADA, enterprises with a growth potential not yet fully exploited) (Anselmo, 2014).

4. Smart Specialization in Slovenia

We present the smart specialization process in Slovene case study. In this context, the concept of smart specialisation is perceived as a useful tool for replacement of the current surplus of horizontal and mutually disconnected policy measures with a new policy mix build upon the concept of linking identified priority thematic areas with key enabling technologies and other cross-cutting themes such as tourism and information and communications technology.

Slovenia wishes to build on its natural assets, focuses on sustainable technologies and services for a healthy life on the basis of which Slovenia will become a green, active, healthy and digital region with top-level conditions fostering creativity and innovation focused on the development of medium- and high-level technological solutions in niche areas (GODC, 2015, 7).

Table 1 demonstrates some selected macro-economic variables appertaining to the research and development activities, including the R&D expenditure and number of full time equivalent research personnel by different sectors. It also provides a general understanding on the position of the Member State in the European context.

Table 1. General macro-economic indicators of the country in 2013

	Slovenia	EU15	EU28
Population	2 058 821	401 484 800	506 611 827
GDP - Euro per capita	17 100	29 800	25 700
GDP - Euro per capita in % of EU average	66,3	115,3	100
R&D expenditure – Total (million Euro)	935,01	260 036.97	271 558.78
R&D expenditure – Total [% of GDP]	2,59	2,09	2,01
R&D expenditure - Business Enterprise Sector (BES) [% of GDP]	1,98	1,34	1,28
R&D expenditure - Government Sector (GOV) [% of GDP]	0,34	0,25	0,25
R&D expenditure - Higher Education Sector (HES) [% of GDP]	0,27	0,49	0,47
R&D expenditure - Private non-Profit Sector (PnP) [% of GDP]	0	0,02	0,02
R&D Personnel* - Total (% of active population)	1,51	1,25	1,12
R&D Personnel – BES (% of active population)	0,97	0,69	0,60
R&D Personnel – GOV (% of active population)	26	0,15	0,15
R&D Personnel – HES (% of active population)	0,28	0,39	0,36
R&D Personnel – PnP (% of active population)	0	0,01	0,01
Unemployment Rate**	-	9,50	9,60

* R&D personnel refer to the number of full time equivalent R&D personnel.

**Unemployment uses latest available figures for 2013 age group 15 years and over.

Source: European Commission, 2015, p. 6.

Slovenia is a small open economy with a population of 2,06 million people and a GDP per capita that amounted to €17.100 in 2013 (see table 1). Development of smart specialisation strategy has a strong potential to catalyse systemic changes in the Slovene research and innovation arena in many respects. First, the smart specialisation strategy turns the research and innovation policy's centre of gravity to economy and society and their long term challenges compared to the previous technology-centred and linear understanding of innovation. Second, it enforces to make selections, set clear and consistent priorities and mobilise resources across different actors both at national and transnational level, thus reducing fragmentation. Third, it can considerably improve the policymaking and implementation practice and set new requirements for the policy governance.

The smart specialisation route requires a clear idea of a country's or region's strengths and weaknesses which must be combined with strong leadership and a common vision among the innovation stakeholders. The process of entrepreneurial discovery which mainly focuses on the search for new opportunities by joining the most important players from companies, knowledge institutions to the state and the non-governmental sector to act together, is fundamental to identify the niche markets and opportunities.

In the first half of 2013 the Slovene Government Office for Development and European Cohesion Policy (GODC) launched a process for identifying the smart specialisation priorities. After having prepared the first draft of the smart specialisation strategy in the second half of 2013 and in light of the critical response of the European Commission and the public, the GODC decided to carry out another round of consultations which took place in the period between April and June 2014. The Strategy was amended and supplemented with empirical and technical bases. Through active dialogue with stakeholders, GODC received initiatives for identifying the areas where Slovenia has the potential to position itself on global markets in the long run. GODC was submitted 700 pages of business plans focusing on various technologies and partners of various spheres of society. Thus, a new draft of the smart specialisation strategy was prepared by the end of June 2014 with emphasis on the comparative advantages of the economy. Then, the new draft was subject to two rounds of consultation, which took place in July and August 2014, and was, thus, coordinated at the inter-ministerial level. With the new version of the smart specialisation strategy, Slovenia wishes to further address the natural assets, base the development orientations on its specifics and support the achieved broader consensus of the public with regard to the vision of the green Slovenia. In year 2015, following the process of analytical justification, identification of the broadest development opportunities and mapping of economic policies on the one hand as well as the capacities of Slovenia's scientific and public research sphere on the other, the process of concretisation of Slovenia's smart specialisation strategy has reached the final phase of entrepreneurial discovery by identifying Slovenia's key development priorities. On Friday 10 July 2015 GODC submitted to the European Commission the upgraded version of its Smart Specialisation Strategy for final coordination.

The overview of key strength, weaknesses, opportunities and threats (SWOT analysis) of economic and R&D innovation system of Slovenia is seen in table 2.

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Table 2. SWOT analysis of economic and R&D innovation system

Strengths	Weaknesses
<ul style="list-style-type: none"> • Relatively good scientific quality of research and quality research infrastructure; • A high share of investment in research mainly by companies; • Quality of human resources and increase in the number of researchers, especially in the private sector; • Experience gained on the integration of the knowledge triangle at the EU level (the projects of the Framework Programme and participation in the ESFRI initiatives); • A relatively high share of students enrolled in tertiary education and a growing number of students of technical studies; • Export-oriented economy; • Biodiversity, natural resources (wood, soil, water, energy) and other potentials for the transition to green economy (knowledge, innovation, past investments, competences) as well as cultural wealth. • Social awareness on damaging effects of corruption and conflicts of interest. 	<ul style="list-style-type: none"> • Weak interaction between universities and research organisations, non-systematic knowledge transfer and insufficient attention paid to the needs on the market; • A lack of focus of investments and research and innovation activities; • An evaluation system of scientific achievements and non-established business models of mixed ownership of intellectual rights; • A lack of openness to foreign students, researchers and professors; • Weak innovation activities in companies, underexploited potential of knowledge-based capital (patents, brands, models); • Too weak integration of Slovene companies into global value chains, poor international engagement of SMEs and relatively low presence of FDI; • Insufficient capacities of broadband infrastructure and unused ICT potential in education.
Treats	Opportunities
<ul style="list-style-type: none"> • Delays in structural reforms in the fields such as the remuneration system in knowledge institutions, a reform of the monitoring system of the effects of the R&D incentives; • Excessive diversification of RTDI investments from private and public sources; • Slow strengthening of intangible capital; • Over-dependence of research institutions on public funds, focus on non-market projects and an insufficiently developed platform for the promotion of technology transfer; • Talent flight (especially of the young ones); • Low level of early entrepreneurial activities and the continuation of low survival rates of newly established enterprises; • Further decline in the share of innovation active enterprises in market services; • Digital divide. 	<ul style="list-style-type: none"> • Development of a clear governance structure in the area of RTDI; • Efficient and effective use of research infrastructure and developed knowledge/competences through the synergies within the knowledge triangle; • Adjustment of the supportive environment and instruments to the fields with clear market potential; • Acquisition and strengthening of entrepreneurial knowledge and competences; • Establishment of a supportive environment favourable to the establishment, start-up and growth of companies; • Promotion of internationalisation, cross-border connections and the inflow of foreign investments; • Mobility of students, professors and researchers. • Early introduction and effective implementation of measures focusing on the transition to a sustainable society, effective resource management; • Integration of all social innovations (technological and non-technological) into comprehensive solutions.

Source: GODC, 2014, 6-7.

The key variable of Slovenian Smart Specialisation Strategy (S4) is raising the value added per employee, which will be measured at the level of chosen domains. At the aggregate level, the successful implementation of the Strategy reflected in the following key objectives (up to 2023):

- I. increased share of high-tech intensive products in exports (from 22,3% to the average level of EU-15, which is 26,5%);
- II. increased share of export of knowledge-intensive services in total exports (from 21,4% to 33%, which means halving the ratio to the EU average);
- III. increased entrepreneurial activity from the current 11% to at least on the EU level average, to 12,8% (GODC, 2015, 7).

Objectives for each of the nine priorities have been identified with clearly specified focus areas and technologies where Slovenia has the competitive advantages. In these areas Slovenia will no longer act as a follower but as a co-creator of global trends. The achievement of the strategic objectives requires particular emphasis to be put on the following *priority areas* over the medium term (GODC, 2015, 8-26):

A. HEALTHY WORKING AND LIVING ENVIRONMENT

1. *Smart cities and communities* with IT platforms and conversion, distribution and energy management: raising the value added per employee by 15%.

2. *Smart buildings and homes, including wood chain* with smart building units, building management systems, smart appliances and advanced materials and elements: raising the value added per employee by 25%.

B. NATURAL AND TRADITIONAL RESOURCES FOR THE FUTURE

3. *Networks for the transition to circular economy* with biomass transformation and new bio-based materials, technologies for use of secondary raw-materials and reuse of waste, and production of energy based on alternative sources: raising the material efficiency index from 1.07 to 1.50.

4. *Sustainable food production* with functional foods and sustainable agricultural production (livestock and plants) in the framework of at least three value chains which will provide the critical mass of consumption and which will be supported by long-term contractual partnership based on economic initiative: raise the value added per employee of companies participating in value chains by 20%.

5. *Sustainable tourism* with technology-based marketing and networking, investments for enhancing the quality of services, technological solutions for sustainable use of resources in accommodation facilities and a green Slovenian tourism scheme: raising the value added of tourism by 15%, increasing the inflow from export of travel services by 4-6% annually, and reducing CO₂ emissions from tourism by 20% by 2023.

C. (S)INDUSTRY 4.0

6. *Factories of the Future* with optimisation and automation of production and production processes, including enabling technologies:

- a) Raising the value added per employee in tool industry by 25%, i.e. on the average EUR 45.000 per employee by 2023.

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- b) Raising the level of robotisation and automation in manufacturing: in the automotive industry the rate of robotisation is comparatively high so emphasis will primarily be put on introducing automation. In all other areas automation as well as increasing the number of robots is key with the target standing at a 50% increase, i.e. an increase from 48 to 72 per 10.000 employees. In the framework of demonstration factories the value added per employee will rise by at least 20%.
- c) Connect knowledge and creativity of stakeholders in the field of photonics for new impetus and new market opportunities in the global markets with the aim of achieving the average value added of EUR 75.000 by 2023.
- d) Increase export of automated industrial systems and equipment by at least 25% by 2023, in particular in tool industry, robotics and smart industrial mechatronic systems.

7. *Health – medicine* with biopharmaceuticals, diagnostics and therapeutics in translational medicine, cancer treatment, resilient bacteria and natural medicines and cosmetics: 2023 objective: increase export of participating partnership companies by over 30% of which small and medium-sized enterprises should increase export by at least EUR 250 million. In addition to promoting the establishment of at least 20 new companies the objective is also to attract at least one foreign direct investment which will employ over 50 people.

8. *Mobility* with niche components and systems for internal combustion engines, e-mobility and energy storage systems, systems and components for security and comfort (interior and exterior), materials for the automotive industry: raising value added of partnership companies by 20%, and increasing the number of pre-development partnership suppliers from 15 to 22 (45% increase).

9. *Development of materials as end products* with sustainable production technologies in metallurgy, and multi-component smart materials and coatings: raising value added per employee in companies manufacturing alloys and metals from EUR 45.000 to at least EUR 55.000 by 2023, increasing exports and value added per employee in the field of smart coatings by 20%, increasing investment in development by 15%, value added by 5% and exports of multi-component smart materials by 10%.

According to Sörvik and Kleibrink, (2015) the most common smart specialisation priority areas in the EU (among 20 EU countries, 174 EU regions, 6 non-EU countries and 18 non-EU regions) are energy, health, information and communication technologies, food, advanced materials, services, tourism, sustainable innovation, advanced manufacturing systems, and the cultural and creative industries. They found that very few regions and countries have developed similar combinations.

Slovenian Smart Specialisation Strategy identifies a comprehensive package of measures defining the method of achieving the set objectives. Investments, implemented on the basis of the Strategy, amount to EUR 750 million annually of which public funding amounts to over EUR 400 million, or EUR 575 million if including the financial leverage under financial instruments. The measures pertain to the area of research, development and innovation, human resources, entrepreneurship and rural development as well as to promoting development (public procurement, tax relief, economic diplomacy and promotion, as well as to issuing permits and eliminating regulatory barriers) (GODC, 2015, 37).

The smart specialisation strategy does not address only the cities and related areas, but also the innovation potentials of rural areas – the smart specialisation strategy is therefore not only a strategy of urban areas but an innovation strategy of Slovenia as a whole.

The quantified objectives of the smart specialisation strategy are among others (<http://esiskladi.wix.com/strategijaps#!home/mainPage>):

- Improved innovation performance measured by a synthesis indicator, Innovation Union Scoreboard: the objective is to raise the Innovation Index to the level of five most successful innovation followers (LU, NL, BE, UK, IE, AT), which means from the current 0.51 to 0.62 by 2020;
- A share of SMEs which, in the field of innovation, cooperate with other companies and/or PRO: According to the Commission's figures, 2014, this share accounted for 13.6% in 2010, which is higher than the EU average (11.7%), however, by 2020, Slovenia will strive to bring it to the level of the average of the five most successful innovation followers equalling 17.9%.
- A share of SMEs which have introduced a product or process innovation: According to the Commission's figures, 2014, this share equalled 32.6% in 2011, which is below the EU average (38.4). Slovenia will strive to bring it at least to the level of the average of the five most successful innovation followers equalling 42.2%.
- A share of high-tech intensive products in the export of goods: this share amounted to 21.5% in 2012, and by 2020 Slovenia will strive to bring it at to the level of the EU-15 average equalling 27.6.
- A share of the export of knowledge-intensive services in total export: According to the Commission's figures, 2014, this share equalled 21.4% in 2011, and by 2020 Slovenia will strive to halve the gap to the EU average totalling 45.3% - the objective is to raise this share to at least one third of the average.

Without measurement activities leading to the production of indicators and the regular collection of systematic data, smart specialisation is hardly visible and policies have no way to track progress, assess structural transformations and compare performance. Therefore, the smart specialisation monitoring system has three main purposes (Gianelle and Kleibrink, 2015, 3): (i) learning about actual transformation processes and informing policy (re)actions accordingly; (ii) building and reinforcing trust and cooperation with and among stakeholders and citizens; (iii) guarantee accountability of policy making. The monitoring system serves these purposes by performing three key functions: gathering information and making it available to decision makers; clarifying the purpose and functioning of the strategy and making it comprehensible to the broader public; supporting the constructive involvement and participation of stakeholders through transparent communication. Accordingly, in the S4 document (GODC, 2015, 39), the monitoring and evaluation of smart specialisation strategy in Slovenia is based on identified and quantified objectives justified through a process of entrepreneurial discovery. In this process, measurable objectives will be (where appropriate) further elaborated, concretised and revised in roadmaps drawn up by strategic partnerships. Their implementation will be monitored and evaluated by the Government unit responsible for development and also for ensuring consistency with the process of monitoring and evaluation in the context of cohesion policy and a systematic evaluation instrument relevant to S4.

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The process of entrepreneurial discovery will be implemented also after European Commission's confirmation of S4. The analysis of future trends in the priority areas, discussions with experts in future technologies and future markets, and implementing elements of participatory foresight should allow for thinking 'outside the box' and really capturing the changes in the external environment as well as the national economy and science scene. It is a time consuming process, but it can give a good kick for discovery on how research and innovation can actually contribute to the restructuring of the national economy.

5. Conclusion

Smart specialisation understood as a strategic policy approach to innovation-based regional development emphasises the diversification of the regional economy into new fields building on the knowledge bases and capabilities developed in the past. Entrepreneurs and other key actors (governments, firms, universities, research centres) in all sectors of society are mobilised and consulted in order to identify these new fields of economic activity. These efforts to promote the development of new growth paths in regions require an understanding of the place-based current and potential future competitive advantage.

EU regions and Member States had to select a limited number of investment priorities, via an entrepreneurial discovery process, to develop smart specialisation strategy. The concept of smart specialisation is based on long standing economic theories and empirical evidence and mobilises well tested policy instruments. As a regional and place-based growth policy framework it aims to improve the allocation of public investment in R&D and innovation related investments, in order to stimulate competitiveness, productivity and economic growth through entrepreneurial activities.

The adopted focus on critical technologies and processes in the selected broader priority areas in Slovene puts more emphasis on measurable outcomes and hence the results oriented approach. The implementation of a smart specialisation in Slovenia should be considered very important, as smart specialisation requires regular monitoring and evaluation in terms of growth areas as well as regular assessment of anticipated projects and measures.

References

1. Anselmo, A. (2014) The concept of Smart Specialization and innovative SMEs, <https://insme.wordpress.com/2014/12/18/the-concept-of-smart-specialization-and-innovative-smes/> (04.07.2015).
2. COM (2010) 546: Europe 2020 Flagship Initiative Innovation Union. European Commission.
3. COM (2010) 553: Regional Policy contributing to smart growth in Europe 2020. European Commission.
4. Enabling entrepreneurial discovery, <http://www.visionary.lt> (06.07.2015).
5. European Commission (2014) National/Regional innovation Strategies for Smart Specialisation (RIS3), Cohesion Policy 2014-2020 Factsheet. Brussels: European Commission.

6. European Commission (2015) Stairway to Excellence, Cohesion Policy and the Synergies with the Research and Innovation Funds, Slovenia (SI) Facts & Figures. Joint Research Centre.
7. Foray, D., Goddard, J., Goenaga, X., Landabaso, M., McCann, P., Morgan, K., Nauwelaers, C., Ortega-Argilés, R. (2012) Guide to Research and Innovation Strategies for Smart Specialisations (RIS3). Brussels: European Commission.
8. Foray, D., Van Ark, B. (2007) Smart specialisation in a truly integrated research area is the key to attracting more R&D to Europe. Policy brief n. 1, Expert Group for Knowledge Growth; European Commission.
9. Gianelle, C., Kleibrink, A. (2015) Monitoring Mechanisms for Smart Specialisation Strategies. S3 Policy Brief Series No. 13/2015. Spain: European Commission, Joint Research Centre.
10. GODC (2015) Slovenska Strategija Pametne Specializacija S4 [Slovenian Smart Specialisation Strategy S4]. Government Office for Development and European Cohesion Policy, Ljubljana, 10 July 2015.
11. GODC (2014) Smart Specialisation Strategy of the Republic Slovenia. Second Drift. Government Office for Development and European Cohesion Policy, Ljubljana, 24 August 2014.
12. McCann, P., Ortega-Argilés, R. (2011) Smart specialisation, regional growth and applications to EU cohesion policy. Economic Geography Working paper 2011: faculty of Spatial Sciences, University of Groningen, 26 pp.
13. OECD (2013) Innovation-driven Growth in Regions: The Role of Smart Specialisation.
14. Ortega-Argilés, R. (2012) The transatlantic productivity gap: A survey of the main causes. *Journal of Economic Surveys*, 26(3): 395-419.
15. Sörvik, J., Kleibrink, A. (2015) Mapping Innovation Priorities and Specialisation Patterns in Europe. S3 Working Paper Series No 08/2015. Spain: European Commission, Joint Research Centre.