Smart Specialization of Russian Regions: Prospects and Limitations

Nadezhda Kalyuzhnova¹, Sergei Violin² and Maria Matveeva³

¹Irkutsk State University, 664003, 1 Karl Marx St., Irkutsk, Russian Federation
²Irkutsk Scientific Center, Siberian Branch, Russian Academy of Sciences, 664054, 134 Lermontov St., Irkutsk, Russian Federation
³Irkutsk National Research Technical University, Lermontov str., 83 Irkutsk, 664074, Russian Federation

Abstract. The article deals with the possibilities of integrating the concept of smart specialization into regional development policies in the Russian Federation. Strategies of smart specialization are being actively and successfully developed in the regions of the European Union. Smart specialization implies setting priorities for economic development based on local strengths and resources. The strategy assumes the ‘entrepreneurial discovery process’, during which promising market niches are identified along with technologies and innovations that a region can develop in order to gain competitive advantages in those niches. The article analyzes the required institutional framework for smart specialization implementation. Propositions are made on how Russian institutions in the fields of innovations and regional development can adapt to further the smart specialization agenda. The article concludes with the analysis of the draft strategy for social and economic development of the Irkutsk oblast from the point of view of its conformity with the criteria of smart specialization. Specific guidelines are outlined for the improvement of the strategy in this respect.
1. Introduction

In February 2019, the Government of Russian Federation adopted the Strategy for Spatial Development of the Russian Federation to the year of 2025 (hereinafter the Strategy). The primary goal of spatial development is to secure balanced and sustainable development of the Russian Federation aimed at reducing regional disparities in standards and quality of life of the population, increasing the rates of economic growth and technological development. One of the Strategy’s tasks is to reduce regional disparities in social and economic development and intraregional social and economic differences through, among other things, creation of favorable conditions for production of goods and services in the sectors of prospective economic specialization in Russian regions, as well as through strengthening of interregional cooperation and coordination in macro-regions of Russia.

The Strategy lacks rationale for selection of specializations and macro-regions. The analysis of specializations by regions shows that they, for the most part, reflect the existing economic structure. On the other hand, the specializations are broadly defined, their number for some regions exceeds 20. Thus, the specializations identified in the Strategy can hardly be considered specializations as such. It would be very difficult, if not impossible, to lend the state support to such a broad range of activities.

In spite of that, the issue of regional specialization is of high importance to the federal policy toward regional development because it is closely related to the issues of regional competitiveness and economic growth. In this regard, it is important to review the policy of development of the so-called ‘smart specialization’ adopted by the European Union towards the development of the European regions.

The following study is based on the bibliographic, institutional, comparative methods of analysis as well as ranking and expert estimates. The object of analysis is the concept of smart specialization as well as the practice of its application in western countries and feasibility of its use in Russia for regional strategic planning. Irkutsk oblast serves as an example.

2. The concept of smart specialization

A significant amount of scholarly work is devoted to the issue of smart specialization. The theoretical approaches to smart specialization policy have been developed by the Knowledge for Growth expert group [1, 2] and integrated into regional context by McCann and Ortega-Argilés [3]. Smart specialization has quickly gained acceptance among policy makers and incorporated into the European Union Cohesion Policy of the 2014-2020
planning period [4]. Financial support of regions by means of this policy depends on development of smart specialization strategies [5].

The concept of smart specialization relies on the classic works of A. Smith on division of labor and D. Ricardo on comparative advantage. It also utilizes ideas in evolutionary and agglomeration economics [6], particularly the path-dependence concept. Some experts in smart specialization [1, 7] think that the theoretical framework of this field should build upon the studies in regional relatedness [8] and knowledge complexity [9]. This approach implies that regional economic systems move along place-based technological trajectories and the processes of scientific and entrepreneurial search are driven by existing institutional features. In other words, geography still plays a crucial role in creation and development of technologies, especially of the complex and more valuable ones [9].

Smart specialization is understood to be “a vision of regional growth possibilities built around existing place-based capabilities” [10]. In other words, the focus is made upon utilization of a region’s strengths, search of hidden opportunities and creation of the foundation on which regions can build their competitive advantage in high value-added sectors. Smart specialization is based on the fact that innovations most often are created in mature industries or on the cross-sections of industries due to accumulation of a certain level of expertise [11]. The concept of smart specialization is developed as an alternative to strategies of catching-up with the leaders when regions try to imitate policies of leading regions, which more often leads to a sustained lag in development. Each region ought to select a number of priority sectors in which it can gain sustainable competitive advantage through development and implementation of innovations. Theoretical guidance to priorities setting is given in the Guide to Research and Innovation Strategies for Smart Specialisations developed by the European Commission [12].

When understood in this way, smart specialization enhances the common perception of innovations. Few regions even in western countries are on the edge of development in such high-tech fields as nanotechnologies, biotechnologies, digital economy, etc. Nonetheless, smart specialization implies development of a unique innovation-based specialization in every region. This process is controlled by (supra-) national institutions in order to exclude duplications. Thus, we need to view innovations in this case as incremental improvements accumulated over time and capable of stimulating quality growth and gaining competitive advantage in the sectors where a region traditionally holds strong positions. Contemporary scholars also point out that innovations are often developed not by particular individuals or entities, but as a result of creating complex modes of interaction among them.
Under this approach, we can define innovations as a process of a confidential dialogue-based collaboration [13].

Smart specialization can also utilize strategies based on borrowing and adaptation of technologies, which suits least developed regions and countries [14]. Besides, much attention is given to a multidisciplinary approach and knowledge flow from one sector to another. A good example of this is the region of Galicia in Spain specializing on the production of organic foods—industry that combines innovative technologies in food industry and healthcare [15].

Priorities setting implies mobilizing the so-called entrepreneurial knowledge. Entrepreneurial knowledge represents not only scientific knowledge and technological competence but also understanding of a market potential, likely competitors, and resources required to launch a business activity in a certain field. Most often, this type of knowledge is possessed by entrepreneurs, business leaders but it can be also held by business associations, universities, non-profit institutions—all those who can forecast what type of innovations a region can pursue given its strengths and resources [16].

The process of a trust-based collaboration is built by means of creation of a platform for effective communication among stakeholders of regional development in order to reach consensus concerning prospective economic specialization of a region, as well as technologies that can be implemented in a regional economy to achieve sustained competitive advantage. One of the successfully applied instruments of reaching such a consensus is foresight.

Strategy of smart specialization (S3) is comprised of four key elements (the 4 Cs) [Ibid, p.17]:

- **Choice and Critical Mass:** a limited set of priorities based on strengths and international specialization, concentration of financial resources to ensure more effective budgetary management
- **Competitive Advantage:** mobilization of intellectual resources by matching business needs with research capabilities through an entrepreneurial discovery process
- **Connectivity and Clusters:** developing world class clusters and providing opportunities for establishing cross-sectoral links internally in the region and externally
- **Collaborative Leadership:** developing an effective innovation system as a collective initiative based on public-private partnership.

Smart specialization development process consists of six steps [Ibid, p. 17]:

1. Analysis of the regional context and innovation potential.
2. Set up of an inclusive governance structure.
3. Develop a vision for future development of the region.
4. Selection of a limited number of regional development priorities.
5. Establishment of suitable policies.
6. Design of monitoring and evaluation mechanisms.

Key role in this concept is assigned to the Platform of Smart Specialization (hereinafter the Platform) that is designed to lend support to countries and regions. The Platform:
- provides methodology and good practice examples
- contains information concerning strategy development and policy application
- gives access to required data
- organizes training for policy makers.

3. Prospects for implementing smart specialization in Russia

A distinctive feature of the S3 is its universality. To this point, it is used in Australia, Korea, Latin America, and other countries [17].

Successful implementation of S3 in Russia requires accounting for the institutional setting of regional development. Proper institutional setting is an integral part of S3 because smart specialization leads to significant changes in policy and modes of interaction among a region’s stakeholders. S3 combines regional and innovation policies. In other words, the goal is to stimulate development of innovations on a regional level based on the characteristics of a certain region.

In the Russian Federation, regional and innovation policies are conducted separately. As it will be shown further, development of innovations is a federal priority. Thus, development institutions in charge of innovations do not have developed regional networks. These include the Agency for Strategic Initiatives (the ASI), the Russian Fund for Fundamental Research, Rusnano, the Russian Venture Company (the RVC), the Skolkovo Fund, and others. On the other hand, development institutions aimed at stimulating regional development for the most part are represented by the federal legislature concerning strategic planning. This legislature creates the strategic planning system on the federal and regional levels including provision for the enactment of the Strategy of Spatial Development and the strategies of macro-
regions development. The strategic planning system is still in its early stage of development.

The National Technology Initiative (the NTI) created by the ASI plays key role in development of innovations in Russia. The NTI is a long-term program aimed at creating favorable conditions for Russian companies to ensure their leadership on new high-tech markets that will determine the structure of the world economy in the next 15 to 20 years. The NTI includes 12 markets: AeroNet, AutoNet, MariNet, NeuroNet, HealthNet, FoodNet, EnergyNet, TechNet, SafeNet, FashiNet, MediaNet, EduNet. The project office, the RVC, coordinates the NTI development. Besides that, the RVC lends financial support to the implementation of the NTI projects.

The NTI project office has developed the regional standard of the NTI and the guidelines on how to implement it. The regional standard is a set of recommendations and best practices for establishing favorable conditions for the growth of the number of high-tech companies—the NTI projects. The distinctive feature of the regional standard is that it does not require its implementation by regional authorities. Participation in the NTI by regional communities is voluntary and requires initiative on their behalf.

Key issue in that regard is the question of whether the institutional infrastructure of the NTI is capable of implementing the concept and policies of smart specialization in the regions of Russia or creation of a specific institution analogous to the Platform is required. Both the Platform and the NTI provide guidance and methodological support for participants and give access to the expert and financial resources required for project implementation. Both institutions are an integral part of corresponding innovation support networks. Whereas the NTI presents the 12 specific markets and related technologies, the Platform leaves room for the participants to search for their own niches. Besides, the NTI focuses upon non-existing markets of those not formally established, and the Platform allows for the search of new markets as well as new niches in established markets.

Overall, the NTI focuses on the country as a whole whereas the Platform aims at regional development and gaining regional competitive advantage. Following that, one of the advantages of the Platform is the ability of policy makers to communicate and learn from each other’s experience. The NTI shows its low effectiveness in terms of its regional penetration, which is manifested in the fact that since its launch in 2015, only nine regions developed NTI roadmaps. Most Russian regions lack capabilities to create breakthrough innovative technologies, which is the focus of the NTI.

In our opinion, mobilization of regional innovative potential requires establishment of a new development institution that will translate the federal priorities including the innovations sector on a regional level. It is essential to
reach maximum regional participation in the process of entrepreneurial discovery, set up specific procedures, standards, principles of interaction, systems for control and evaluation, as well as incentives for promotion. Smart specialization implementation requires close relations between scientists and entrepreneurs. Development of such relations is, in our opinion, the primary task for creation of a proper institutional setting for smart specialization in the regions of Russia.

Of all the established institutions in Russia, the ASI came closest to solving that task while implementing the initiative on investment climate enhancement. This initiative assumes participation of all the regions, specific guidelines have been developed, regions have been provided with the opportunity to learn on best practices and share their experience with others. These practices and instruments can be used while developing the similar initiative concerning smart specializations of the regions. On the other hand, the ASI has experience in fostering dialogue among different regional stakeholder groups through instruments such as foresight, which also makes it the most probable candidate for the role.

4. The main results

Let us consider the possibilities of implementing the smart specialization principles in Irkutsk oblast. In the Strategy, Irkutsk oblast, together with Krasnoyarsk krai, Tuva, and the Republic of Khakassia, comprise the Angaro-Enisey macro-region. The economic specializations of Irkutsk oblast and Krasnoyarsk krai for the most part coincide and include all the specializations of Tuva and Khakassia.

Overall, the imposition of regional specializations without an open discussion with main stakeholders of regional development does not stimulate entrepreneurial initiative and innovations but encourages rent-seeking behavior. On the other hand, given a broad interpretation of specializations in the Strategy there is a room for a more narrow specification of priorities on a regional level.

According to the federal law “On strategic planning in the Russian Federation” each region should develop the long-term strategy for its social and economic development. In Irkutsk oblast the government officials have developed a draft strategy (hereinafter the Draft). Further, we present the results of the analysis of the Draft concerning its conformity to the principles of smart specialization according to the methodology presented in [17] (Table 1).
In general, the Draft conforms to the principles of smart specialization less than in half instances. The analysis of regional context has been conducted with the identification of strengths, weaknesses, opportunities, and threats including the sector of innovations. The environment analysis is limited to the study of interregional relations, and the analysis of the entrepreneurial activity lacks the key element—identification of potential market niches.

The weakest part of the Draft in this respect is governance of the strategy development and implementation. There is no provision for a special entity that will govern strategy implementation. Stakeholders have been engaged mostly during the presentation of a finished draft. There was no open discussion of the Draft in the interactive manner.

Innovations in the Draft are viewed mostly as research and development. Global challenges are not addressed. Scenario analysis is present but scenarios are not thoroughly developed. The set of priorities, in our view, is too broad. Thus, it is problematic to concentrate resources on their implementation.

The Draft contains only broad courses of action and lacks roadmaps and specific measures to achieve the identified goals. The document contains provisions for general improvement of the business climate, stimulating R&D and local initiatives. The most thoroughly developed part of the Draft is the mechanisms for monitoring and evaluation. The specific set of indicators is put in place that correspond to the set of priorities and the timeframe. The monitoring system of strategy implementation allows making adjustments to the strategy based on the results of a yearly evaluation.

| Steps of Strategy Development | Evaluation Criteria | Score | Overall score |
|-------------------------------|---------------------|-------|---------------|
| 1. Analysis of the regional context | Analysis of regional resources | 1 | 2 |
| | Environment analysis | 0,5 |
| | Analysis of entrepreneurial activity | 0,5 |
| 2. Governance | Implementation of a multi-layer governance | 0 | 0,5 |
| | Stakeholder involvement on an inclusive basis | 0,5 |
| | Management and communications development | 0 |
| 3. General vision | Broad perception of innovations | 0 | 1 |
| | Responses to global challenges | 0 |
| | Scenario analysis | 0,5 |
| 4. Priorities | Priority setting | 0,5 | 1 |
| | Priority consistency | 0,5 |
| | Critical mass | 0 |
5. Policy measures

| Road-mapping  | 0 | 1 |
| Policy balance | 0 |
| General conditions | 1 |

6. Monitoring and evaluation

| Efficiency indicators | 1 | 3 |
| System of monitoring | 1 |
| Mechanism of strategy actualization | 1 |

TOTAL: 8

Source: composed by the authors on the basis of [17]

On the other hand, the Draft does contain certain prerequisites to form on its basis the strategy of smart specialization. Filimonenko and Vasilieva [18] have tested the possibility of applying smart specialization principles to a new economic model for regional development taking Krasnoyarsk krai as an example. They identify three possible scenarios of future regional development based on smart specialization: niche leadership, local technological competitiveness, and international technological competitiveness. Niche leadership assumes borrowing existing technologies in traditional sectors to be able to integrate into global value chains. Local technological leadership implies development of technologies and innovative technological competencies locally for application in traditional sectors. Finally, international technological competitiveness implies development of breakthrough technologies and competencies locally for creation of new sectors of economy.

In the Draft, innovative development of traditional industries is not assumed. However, much attention is given to innovative development of the sectors that have not had significant influence on economic development of the oblast. There are two such sectors in the Draft: the biotechnological complex and the digital economy. The biotechnological complex includes pharmaceuticals, healthy food, healthcare, and tourism. Biotechnologies, as rightly put in the Draft, can be used to foster development of all of the aforementioned industries, which fits well in the concept of smart specialization. There are certain links among the industries and opportunities to develop technologies of a cross-sectoral nature. This complex is supported by unique competitive advantages including the ecosystem of Lake Baikal, a significant number of research institutes and universities conducting research in that field, regional and federal government programs.

The digital economy gains momentum as through government support and spontaneously (cryptocurrency mining). One of the competitive advantages of Irkutsk oblast is low cost of electric power, as well as developed telecommunication infrastructure. The following priorities in the field of the digital economy are outlined in the Draft: distributed database management, big data and artificial intelligence, industrial internet and the internet of things,
development of information infrastructure, and information security. Research institutes and universities will also lend support to the development of these sectors.

Overall, the analysis shows that the Draft does not conform to the criteria for S3: the priorities are not well defined so the concentration of resources is problematic. On the other hand, there are certain prerequisites for S3 that can be built upon in the future. The following recommendations should help improve the Draft based on the smart specialization approach.

1. Expanding the ‘Science and Innovations’ paragraph to a full section similar to the ‘Economic Industrial Complexes’ section. It is important to include organizational, social, service and other types of innovations along with R&D. Priorities for development of innovations should be set according to their role in solving global economic and social problems.

2. Aligning the ‘Science and Innovations’ section with the ‘Economic Industrial Complexes’ section. Through interactions with the science and business communities the most promising technologies need to be identified that can be borrowed or developed in order to implement them in the traditional sectors of the oblast’s economy.

3. Conduct benchmarking of the Irkutsk oblast relative to the regions with similar economic specializations to study from best practices, determine unique competitive advantages of the region in the sectors of specialization and in the innovation system. Include strategies for interregional cooperation and opportunities for collaborative development of innovations in traditional and new sectors.

4. Conducting the entrepreneurial environment evaluation: institutions for support of the local business, startups, forms of self-employment. Identifying promising market niches for local business.

5. Thoroughly elaborating the scenarios for future development of the Irkutsk oblast focusing on the innovation-based scenario. It is desirable to include scenarios in the section on strategic goals.

6. Identifying the specific set of priorities, fields of economic specialization of the region.

7. Making provisions for the establishment of roadmaps for the implementation of each of the priorities.

8. Considering the possibility of delegating the coordination functions for strategy implementation to an institution independent of the regional government.

References
[1] D. Foray, P.A. David, & B.H. Hall, Smart specialization. The concept. Knowledge Economists Policy Brief No. 9, June. Brussels: European Commission (2009).

[2] D. Foray, P.A. David, & B.H. Hall, Smart specialization. From academic idea to political instrument, the surprising career of a concept and the difficulties involved in its implementation. MTEI Working Paper, November. Lausanne: MTEI (2011).

[3] P. McCann, & R. Ortega-Argilés, Smart specialization, regional growth and applications to European Union Cohesion Policy. Reg. Stud., 49 (8), pp. 1291–1302. (2015).

[4] A. Varga, T. Sebestyén, N. Szabó, & L. Szerb, Estimating the economic impacts of knowledge network and entrepreneurship development in smart specialization policy, Reg. Stud. (2018).

[5] P. McCann, & R. Ortega-Argilés, The early experience of smart specialization implementation in EU Cohesion Policy. European Planning Studies, 24, 1407–1427. (2016)

[6] S. Radošević, Advancing Theory and Practice of Smart Specialization: Key Messages. Advances in the Theory and Practice of Smart Specialization / Eds. S. Radošević, A. Curaj, R. Gheorghiu, I. Wade. Amsterdam: Academic Press, pp. 345–355 (2017).

[7] R. Boschma, Constructing regional advantage and smart specialisation: Comparison of two European policy concepts. Italian J. of Reg. Sci., 13 (1), pp. 51–68 (2014).

[8] C. Hidalgo, B. Klinger, A. Barabassi, & R. Hausmann, The product space conditions the development of nations. Sci., 317, pp. 482–487 (2007).

[9] P.A. Balland, & D. Rigby, The geography of complex knowledge. Economic Geography, 93 (1), pp. 1–23 (2017).

[10] P.A. Balland, R. Boschma, J. Crespo, D.L. Rigby, Smart specialization policy in the European Union: relatedness, knowledge complexity and regional diversification. Reg. Stud., pp. 1-17 (2018).

[11] D.L. Rigby, & J. Essletzbichler, Evolution, process variety, and regional trajectories of technological change in U.S. manufacturing. Economic Geography, 73 (3), pp. 269–284 (1997).

[12] European Commission, Guide to Research and Innovation Strategies for Smart Specialisations. Brussels: European Commission (2012). Available at: http://s3platform.jrc.ec.europa.eu/documents/20182/84453/RIS3+Guide.pdf/fce8c58-73a9-4863-8107-752aef77e7b4
[13] Н.Я. Калюжнова, Конкурентоспособность российских регионов в условиях глобализации. М.: ТЕИС, 2003. 526 с. [In Russian]

[14] Европейская экономическая комиссия (2015). «Умная специализация» – стратегии в области устойчивого развития. Записка секретариата. Женева. С. 1-10. [In Russian]

[15] E. Kutsenko, E. Islankina, A. Kindras, Smart by Oneself? An Analysis of Russian Regional Innovation Strategies within the RIS3 Framework. Foresight and STI Governance, 12, no 1, pp. 25–45 (2018).

[16] I. Filimonenko, Z. Vasilieva, Smart-technology based model of managing the development of the regions: smart specialization. J. of Sib. Fed. Univ. Hum. & Soc. Sci., 12 (2017 10), pp. 1856-1868 (2017).