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REGIONAL DEVELOPMENT OF KAZAKHSTAN BASED ON "SMART SPECIALIZATION" MODEL

Abstract

In the conditions of increasing competition in the technological sector of the economy and the intensification of innovation, innovative management tools are needed to facilitate the effective planning, organization, stimulation and control of the introduction and implementation of innovations in the resource regions of Kazakhstan. Consequently, new scientific approaches are required to manage the innovative development of the commodity region, which will increase the effectiveness of regional socio-economic systems.Currently, an advanced tool in the field of determining the territories of cluster localization is the model of "smart specialization", which is a special scientific approach to the formation of regional clusters. The "smart specialization" model emphasizes the need to search for and select such spheres of activity which are capable of making the maximum contribution to the socio-economic development of the region by supporting and stimulating innovative research and development in the identified spheres of regional specialization. An important condition for regional economic progress is the identification of potential poles of innovative growth in the region based on the analysis of its own potential and best international practices. The purpose of the article is to substantiate the priority areas and develop methods, tools for managing the innovative development of resource regions of Kazakhstan on the basis of the model of "smart specialization" to create a new quality of economic growth of territories. The article analyzes the scientific literature and substantiates the priority, the effectiveness of applying the "smart specialization" model to the process of innovative development of the resource region. The methodological approaches (methodological principles, conditions, criteria, scenario variants, algorithm) of formation of rapidly developing sectors of economy of raw material region on the model of "smart specialization" are specified. The authors of the article specify the methodological tools, which will allow to carry out the choice of the most promising technologies for the formation of rapidly developing sectors of the economy of the commodity region.

Key words: innovation, smart specialization, development, management, management mechanisms, commodity region.

Introduction

In recent years, the economy of Kazakhstan, which entered the world markets, has strengthened its raw materials specialization. So, according to the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan in 2018, 70% of the structure of Kazakhstan's exports accounted for mineral raw materials and products. At the end of 2017, this figure was 68.6%, in 2016 – 65%. This indicates that the economic power of Kazakhstan is directly dependent on the volume of sales of natural resources – receipts from the export of metals, oil and gas form a significant part of the republican budget of the country.

The ideas of innovative development of the regions of Kazakhstan have always been important and are regularly raised in state strategic and program documents.

In the practice of typologizing the regions of Kazakhstan, it is not customary to single out exactly the «raw regions». To conduct a comprehensive analysis of socio-economic development, develop mechanisms for managing the innovative development of raw materials regions of Kazakhstan within the framework of the project AP08052209 «Development of mechanisms for managing the innovative development of raw materials regions in Kazakhstan based on the "smart specialization" model (CN MES RK), the following indicator was used as a key criterion. as a share of gross value added from the extraction of mineral resources in the structure of the gross regional product (in the period 2009-2019, more than 30%). According to this indicator, 4 raw material regions of Kazakhstan can be distinguished (Atyrau, West Kazakhstan, Mangistau and Kyzylorda regions) in the socio-economic development of which oil and gas production dominates over the extraction and export of other types of natural resources.

In modern economic conditions, the growing influence of scientific and technological progress on the development of regional ecosystems testifies to the importance and relevance of strategic innovation management at the regional level.

The "smart specialization" model is currently a modern tool and method in the field of determining territories and localizing clusters. The "smart specialization" model is a special approach to the formation of clusters in the regions.

The purpose of the peper – substantiation of priority courses and the development of methods and tools for managing the innovative development of the commodity regions of Kazakhstan on the basis of the "smart specialization" model to create a new quality of economic growth of the territories.

Materials and methods

In modern conditions, many countries and regions of the world perceive innovation as a way to solve existing and potential problems of socio-economic development. Currently, a new tool for regional development is the "smart specialization" model, which was originally implemented in the countries of the European Union and is an effective strategy to stimulate innovation in the least developed (resource) regions. The experience gained in the practical application of such strategies is an example for rapidly developing states.

To implement the set research tasks, the following scientific methods were used: analysis of scientific literature, comparative analysis, monitoring and trend analysis. Analysis of scientific literature on the research problem involves the use of methods of systematization and generalization.

Main provisions

The "smart specialization" model is a new scientific approach to the formation of regional clusters, in particular in resource-rich regions. The main vector of "smart specialization" is aimed at using the links emerging between the spheres of economic activity that permeate the boundaries of clusters. At the same time, clusters are able to move closer to the "smart specialization" model, provided that they stimulate the development of new knowledge-intensive areas and industries that have a positive effect on the economic growth of the region.

Our earlier studies conclude that there is a close relationship between productivity, competitiveness and innovation at the macro and meso levels, as they are key factors in increasing national income.

When forming the strategy of "smart specialization" of the region, it is important to use an approach based on the concept of "four-tier innovation spiral". The concept of the "four-link innovation spiral" is embedded in the "innovation-productivity-competitiveness" model. Using the concept of "four-link innovation spiral" in the context of "smart specialization" provides an opportunity to launch a locally oriented process of active research, invention and experimentation in a resource region.

Literature review

Overview and assessment of the development of regions requires the formation of a model of "smart specialization". The article is thematic and carries a literary review. It is noted that the problems of dynamic growth model "smart specialization" started in the works of D. Foray, P. David, B. Hall smart specialization in which the model is shown as an instrument of regional development of the countries of the European Union [1]. According to scientists M. Landabaso and D. Foray, – "the main goal of the concept of "smart specialization" is to diversify the structure of the regional economy based on the creation of new profile sectors of the economy and new jobs" [3-5]. The basis for this process is cooperation based on the "bottom-up" principle of science, education, business, state authorities and civil society – the concept of the "four-link spiral of innovation" [3].

The concept of "smart specialization" is a relatively new scientific approach to the development of regions, which is based on the theory of trade specialization and division of labor A. Smith [12], the theory of industrial development, neoclassical social economy and flexible specialization [10, 16], evolutionary and agglomeration economy [10, 17], the principle of profit growth from investment in science, the influence of market barriers on the development of competitive advantages of regions, increasing effects from the flow of knowledge. "Smart specialization" is a "region-centric" economic model [13], reflecting the state's contribution to stimulating innovative activity, forming scientific and economic specialization of the region, increasing its productivity and competitiveness [14, 15, 16].

Results and discussion

"Smart specialization" as a new scientific approach helps to stimulate economic growth in the region. To implement "smart specialization", developing countries need to carry out constructive and systematic comparisons, study the national and international context in which new sectors of the economy are to be developed, establish cooperation with countries, and borrow their best practices [1, 2]. Subject to certain principles, conditions and criteria, the effects of the introduction of the "smart specialization" model can be colossal [2].

Consider the principles of "smart specialization".

"Smart specialization" in the "Europe-2020" Strategy [3] is a key element in the formation and development of regional innovation policy. There are five basic principles of "smart specialization":

- Entrepreneurial discoveries. Entrepreneurial discoveries, in accordance with the theory of I. Kirzner [4], is a process of constant search and assessment of new opportunities and prospects for business. Regional authorities need to continuously seek entrepreneurial opportunities that contribute to the achievement of the goals and objectives of national or regional plans and programs. Entrepreneurial discoveries have great potential in creating new lines of business for the region's "smart specialization" strategy.
- Specialization. A smart specialization strategy should target specific activities rather than firms or sectors. At the same time, the government is simultaneously solving 2 important tasks: increasing the efficiency of the industry and building capacity for diversification.
- Diversification. Proceeding from the fact that in a few years the "new" specializations chosen today will no longer be such, one should continuously seek and develop the priority areas of the "smart specialization" strategy.
- Inclusive strategy. The inclusiveness of "smart specialization" means that every sector of the economy should have a chance to be included in the smart strategy, provided there is a good project.
- Experimentation. This principle is based on the fact that the success of the chosen direction of activity is not guaranteed, in addition, failure is inevitable. Failure is a necessary and inevitable element of the process of finding the most successful lines of business. There is a need to experiment,

continually seek out and evaluate new lines of business to incorporate into "smart specialization" strategies.

In 2012, the European Commission, the highest executive body of the EU, developed and adopted the Guidelines for Research and Innovation of the Smart Specialization Strategy [5]. It sets out the main guidelines for the development of research and innovation in the EU countries.

The Research and Innovation Guide is regularly updated as the "smart specialization" strategy is put into practice. In 2011, the Institute for Advanced Technological Research (Seville, Spain) for the operational development, implementation and revision of the priority areas of the strategy of «smart specialization» created the Platform of «smart specialization» [6]. The capabilities of the Platform include: prompt receipt of up-to-date information; detailed methodology for implementing the "smart specialization" strategy; opportunities for consultation and examination of projects; training and collaboration. The "smart specialization" platform helps European countries in choosing a direction of activity (specialization) by comparing the existing potential and opportunities with other EU regions, identifying target markets, assessing competitiveness and identifying priorities [6].

Within the Platform, experts have developed adapted methods for reviewing and evaluating the "smart specialization" model. Also, the Platform has the ability to organize events of two main types:

- seminars with the aim of solving specific problems for registered participants;
- seminars to promote and disseminate experience in the implementation of «smart specialization» for all stakeholders.

Let's list the tools of the European «Smart Specialization» Platform:

- ESIF-viewer – the tool provides the ability to search for planned investments of EU investment and structural funds;
- Eye@RIS3 – an electronic database of priority specializations. An online base of priorities in the form of an interactive map, which contains information about the selected priority areas of activity of the regions. Its main goal is to provide information on the priorities for implementation to find partners for cooperation and their own niches;
- benchmarking – a tool that allows you to identify similar regions by structure;
- monitoring of information and communication technologies – a tool for searching for planned investments of investment and structural funds of the EU in the field of ICT;
- R&I Regional Viewer – a tool for visualizing and comparing investments in research and innovation across various programs and EU funding channels;
- «Trade» – an Internet application that allows you to visualize and analyze the competitive positions of regions and interregional flows of goods in Europe. The main goal is to assess the region's assets and analyze its position as a step in shaping a «smart specialization» strategy.

Thus, we can conclude that clusters are the main horizontal instrument of the "smart specialization" strategy. The effectiveness of regional development depends on measures to support and stimulate research and innovation in clusters, which are the foundation of the identified areas of activity.

Despite the advantages of the "smart specialization" model, the scientific literature indicates a number of difficulties in its implementation in practice [7]. A wide range of stakeholders in the development and implementation of a "smart specialization" strategy involves the functioning of a multi-level management structure. This can lead to a conflict of interests of the authorities at the national and regional levels. Another challenge to the "smart specialization" strategy is maintaining the balance of political participation in its design and implementation. The dominance of politicians in the decision-making process can lead to low responsibility of other participants. In addition, the challenge for the government is to ensure that regional and national strategies are aligned.

When implementing the "smart specialization" strategy, the state relies on indicators of the efficiency of the social sphere, which pushes it to interact with business. In this regard, when implementing the "smart specialization" strategy, the authorities should be ready to interact within the framework of the "region-business-university" integration. The problem of implementing "smart specialization" in this case is related to the fact that the strategy requires bold decisions of a political nature, and due to its specificity, the public sector is deprived of the opportunity to make mistakes.

Types of technologies are used in the "smart specialization" model:

- knowledge economy;
- breakthrough technologies developed and implemented due to the scientific potential of the raw material region.

There are two possible sources for creating innovations and accumulating competencies in the region – borrowing and adaptation, as well as creating own technologies.

In this case, according to I.V. Filimonenko et al. [8], the task of finding new opportunities for economic growth in the region is being transformed into a priority task of the economy's transition to a "multi-sectoral development model". The basis of such a model is the process of formation in the regional economy of a model of a rapidly developing sector [9, 10, 11] through the application of new knowledge in the basic sectors of regional specialization and the formation of new areas of activity.

As criteria for identifying sectors of the economy of resource regions Russian scientists Z.A. Vasiliev and I.V. Filimonenko [12] used:

- manufactured products;
- prices;
- technological structure of the region;
- factors of production.

The combination of such characteristics makes it possible to reveal the purpose of the sector of the economy of a raw material region from market positions (supply and demand), as well as taking into account the possibilities and risks of functioning in the system of the world economy.

The raw material sector of the regional economy produces raw materials and resources focused on meeting, first of all, external demand; prices for such products are set by world markets [12].

The infrastructural sector of the region's economy mainly produces products and services aimed at meeting local demand, prices for which are determined by domestic markets. The third or fourth technological mode characterizes the industries that are part of the infrastructure sector of the economy of the raw materials region. The output is determined by the value of domestic demand, the cost of labor and investment resources.

The high-tech sector of the economy of the resource-based region is rapidly developing. The main drivers of growth in this sector are scientific and technological progress, innovations in basic sectors, new technologies, and areas of activity. The sector's products are able to compete in foreign markets. The fifth to sixth technological mode characterizes the industries that make up this sector. The region's external markets determine prices. The output is determined by the costs of intellectual, investment and innovative resources [12].

The synergistic effect due to the integration of production, R&D and consumption activities determines the development of the "knowledge economy" sector. The products of the "knowledge economy" sector are knowledge based on ICT, "smart" technologies, digital production, modern management systems that ensure the competitiveness and leadership of the region on the world stage. The transition to the sixth technological order is seen in the sector as the end result. The development of the "knowledge economy" sector is determined by the development of IT infrastructure, the structure of the innovation system, and the cost of intellectual and innovative resources.

For resource regions, the application of the "smart specialization" model makes it possible to develop strategies for innovative development for the main sectors of the economy. At the same time, strategies are based on the use of two sources of innovation and the accumulation of competencies in the region – borrowing and adaptation, as well as the creation of their own technologies. At the same time, as noted by Z.A. Vasiliev and I.V. Filimonenko [12], it is necessary to distinguish between the types of strategies for the innovative development of a raw material region (Figure 1).

The local technological competitiveness strategy focuses on leadership in the local sector. Within the framework of this strategy, the creation of innovations and new competencies is the result of our own research and development in the traditional sectors of the economy of the resource-based region.

The strategy of international technological competitiveness is aimed at global leadership in the high-tech sector, the «knowledge economy», as a result of unique research and development in the region in the form of disruptive technologies.

The niche leadership strategy is based on borrowing innovations and competencies due to the low development of its own production of high value added and low scientific and technical potential in new and traditional sectors of the economy of the resource region.

The structure and potential of a raw material region determine the possibilities of implementing a particular strategy of innovative development, on the basis of which the feasibility of borrowing and adapting new technologies and competencies, or the possibility of creating their own innovations, is assessed.

Figure 1 – The space of strategic positioning
of the region according to the "smart specialization" model

Note: Compiled by the authors based on the source [12].

The main effects of the transition of a resource region to a developed high-tech sector of the economy are the release of competitive products capable of claiming leadership in the local sector of the economy [12, 13].

The effects of the development of the "knowledge economy" sector:

- ensuring high added value in the sectors of the manufacturing industry;
- diversification of the economy;
- release of competitive products capable of claiming global leadership in new sectors;
- formation of a new management system [14, 15].

Socio-economic effects for the resource-based region:

- diffusion of innovations;
- transition to new, more complex technological structures;
- an increase in revenues to the local budget, which will allow directing additional costs to the development of the social sphere.

Successful examples of support and development of EU regions according to the "smart specialization" model are shown in Table 1.

Table 1 – Successful examples of support and development of EU regions according to the "smart specialization" model

№	Country	Case
1	Finland	Experience of the Ostrobothnia region. Smart city projects in Helsinki, Turku, Espoo, Oulu, Tampere, Vantaa
2	France	Loire Region: Clusters of biopharmaceuticals and engineering
3	Spain	Extremadura region: «intelligent» cheese production
4	Poland	«Aviation Valley": partnership of educational institutions and industry
5	Romania	Old industrial zones: transformation into business and digital development support centers
Note: Compiled by the authors.		

Despite the existing successful cases of implementing the "smart specialization" model, some examples show very contradictory results of its implementation in the practice of developing the "commodity material" regions of Kazakhstan. So, we can identify the following shortcomings in

the implementation of the "smart specialization" strategy, taking into account the technological capabilities of Kazakhstan:

- increasing demand for high-level competencies: deep analysis of economic processes, competencies in the IT field and jurisprudence, skills in building constructive relationships with organizations and government officials at the national and international levels;
- the need for key competencies is reduced: project management, financial management, control and monitoring;
- under the new conditions, a lack of management skills at the state level was discovered.

In general, the generalization of the experience of developing regions according to the "smart specialization" model in the EU countries allows us to draw certain conclusions and recommendations when implementing the "smart specialization" strategy in the resource regions of Kazakhstan:

- taking into account the national and regional innovation and technological system when building a "smart" strategy;
- at the stage of determining the economic profile of the region, close interaction with business representatives is necessary;
- it is unacceptable to simply replicate the successful experience of developing EU regions according to the "smart specialization" model without taking into account local specifics.

Conclusion

The "smart specialization" model is a new scientific approach to the formation of regional clusters, in particular in resource regions. Clusters are capable of approaching the "smart specialization" model if they stimulate the development of new knowledge-intensive spheres and industries that have positive effects on the economic growth of the region.

«Smart specialization» as a new scientific approach is helping to stimulate economic growth in the region. To implement "smart specialization", developing countries need to carry out constructive and systematic comparisons and study the national and international context.

For resource regions, the application of the "smart specialization" model makes it possible to develop strategies for innovative development for the main sectors of the economy. At the same time, the strategies are based on the use of two sources of innovation and the accumulation of competencies in the region – borrowing and adaptation, as well as the creation of their own technologies. At the same time, it is necessary to distinguish between three types of strategies for the innovative development of a raw material region.

In further studies, work will be carried out to identify and implement the opportunities for innovative development of the resource regions of Kazakhstan based on the "smart specialization" model.

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«АҚЫЛДЫ МАМАНДАНДЫРУ» МОДЕЛІ БОЙЫНША ҚАЗАҚСТАННЫҢ ӨҢІРЛІК ДАМУЫ

Аңдатпа

Экономиканың технологиялық секторындағы бәсекелестіктің күшеюі мен инновациялық қызметті белсендіру жағдайында Қазақстанның шикізат аймақтарында инновацияны енгізу мен іске асыруды тиімді жоспарлау, ұйымдастыру, ынталандыру және бақылауды жеңілдету үшін басқарудың жетілдірілген құралдары қажет. Демек, шикізат аймақтарының инновациялық дамуын басқарудың аймақтық әлеуметтік-экономикалық

жүйелердің тиімділігін арттыруға мүмкіндік беретін жаңа ғылыми тәсілдері қажет. Бүгінгі таңда аймақтың локализация кластерін анықтау саласындағы алдыңғы қатарлы құрал, аймақтық кластерді қалыптастырудағы ерекше ғылыми шешім «ақылды мамандандыру» моделі болып табылады. «Ақылды мамандандыру» моделі аймақтық мамандануды анықталған бағыттары бойынша инновациялық зерттеулер мен әзірлемелерді қолдау және ынталандыру арқылы аймақтың әлеуметтік-экономикалық дамуына максималды үлес қоса алатын қызмет түрлерін табу және таңдау қажеттілігін көрсетеді. Өңірлік экономикалық прогрестің маңызды шарты – бұл өз әлеуеті мен озық әлемдік тәжірибені талдау негізінде аймақтың дамуының инновациялық өсуінің полюстерін анықтау. Мақаланың мақсаты аумақтардың экономикалық өсуінің жаңа сапасын құру үшін «ақылды мамандандыру» моделі негізінде Қазақстанның шикізат өңірлерінің инновациялық дамуын басқарудың басым бағыттарын негіздеу және әдістерін, құралдарын әзірлеу болып табылады. Мақалада ғылыми әдебиеттерге талдау жасалып, шикізат аймағының инновациялық даму процесіне «ақылды мамандандыру» моделін қолданудың басымдылығы мен тиімділігі негізделген. «Ақылды мамандандыру»моделі бойынша шикізат өңірі экономикасының екпінді дамып келе жатқан секторларын қалыптастырудың әдіснамалық тәсілдері (әдіснамалық қағидаттары, шарттары, критерийлері, сценарийлік нұсқалары, алгоритмі) нақтыланды. Мақала авторлары шикізат аймағы экономикасының қарқынды дамып келе жатқан секторларын қалыптастыру үшін ең перспективалы технологияларды таңдауға мүмкіндік беретін әдістемелік құралдарды анықтады.

Тірек сөздер: инновациялар, ақылды мамандандыру, даму, басқару, басқару механизмдері, шикізат аймағы.

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РАЗВИТИЕ РЕГИОНОВ КАЗАХСТАНА ПО МОДЕЛИ «УМНАЯ СПЕЦИАЛИЗАЦИЯ»

Аннотация

В условиях все больше усиливающейся конкуренции в технологичном секторе экономики и активизации инновационной деятельности необходимы передовые инструменты управления, способствующие осуществлению эффективного планирования, организации, стимулирования и контроля за внедрением и реализацией инноваций в сырьевых регионах Казахстана. Следовательно, требуются новые научные подходы к управлению инновационным развитием сырьевого региона, позволяющие повысить эффективность региональных социально-экономических систем. В настоящее время передовым инструментом в области определения тер-

риторий локализации кластеров является модель «умная специализация», которая является особым научным подходом к формированию региональных кластеров. В модели «умная специализация» подчеркивается необходимость поиска и выбора таких сфер деятельности, которые способны внести максимальный вклад в социально-экономическое развитие региона посредством поддержки и стимулирования инновационных исследований и разработок в выявленных сферах региональной специализации. Важным условием регионального экономического прогресса является выявление потенциальных полюсов инновационного роста развития региона на основе анализа собственного потенциала и лучших мировых практик. Целью статьи является обоснование приоритетных направлений и разработка методов, инструментов управления инновационным развитием сырьевых регионов Казахстана на основе модели «умная специализация» для создания нового качества экономического роста территорий. В статье проведен анализ научной литературы и обоснована приоритетность, результативность применения модели «умная специализация» к процессу инновационного развития сырьевого региона. Уточнены методологические подходы (методологические принципы, условия, критерии, сценарные варианты, алгоритм) к формированию стремительно развивающихся секторов экономики сырьевого региона по модели «умная специализация». Авторами статьи уточнены методические инструменты, которые позволят осуществить выбор наиболее перспективных технологий для формирования стремительно развивающихся секторов экономики сырьевого региона.

Ключевые слова: инновации, умная специализация, развитие, управление, механизмы управления, сырьевой регион.