State incentive measures for innovation with reference to the type of regional development

Incentivos estatales para la innovación, teniendo en cuenta el tipo de desarrollo regional

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Abstract
The article substantiates the hypothesis that state incentive measures for the development of an innovative sector in a region are determined by the type of development of a regional system. In support of this hypothesis, a restructuring of measures of state regulation of innovation development in certain areas is proposed, a typology system for regional development is developed, the relationship between the type of regional development and measures of state support to increase the investment attractiveness of the region is determined.
Key words: innovation, state support, type of regional development, investment potential

Resumen
El artículo confirma la hipótesis de que las medidas de incentivo del gobierno para el desarrollo de un sector innovador en una región están determinadas por el tipo de desarrollo de un sistema regional. Para respaldar esta hipótesis, se propone una reestructuración de las medidas de regulación estatal del desarrollo de la innovación en ciertas áreas, se desarrolla un sistema de tipología para el desarrollo regional, se determina la relación entre el tipo de desarrollo regional y las medidas de apoyo estatal para aumentar el atractivo de inversión de la región.
Palabras clave: innovación, apoyo estatal, tipo de desarrollo regional, potencial de inversión

1. Introduction

For the Russian geo-economic space, a characteristic feature is the unevenness of attracting investment capital in different regions. To describe the reasons of the uneven territorial distribution of investments, the concept of "investment climate" is used by scientists and economists.

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Assessment of the investment climate is the basis in terms of determining measures of state support for the development of innovation in the region. In addition, a key criterion from the point of view of investors in determining investment objects is the expected return on invested capital corresponding to the degree of risk. Thus, in addition to the investment climate, the category of investment attractiveness of the region comes to the fore.

There are many different kinds of methodological approaches to public administration for the development of regional investment attractiveness through financial support for the development of the innovative sector of the region.

State incentive measures regarding co-financing of innovative projects and programs, as well as financing of enterprises in the region directly depend on the results of the assessment of investment attractiveness.

The authors hypothesize that the effectiveness of state incentive measures for the development of the innovation sector in the region is determined by the type of development of the regional system.

2. Literature review

A number of domestic scientists studied the concepts of "investment climate", however, at present, a single definition of this category has not yet been formulated.

Thus, the investment climate is a set of political, socio-cultural, financial, economic, and legal conditions that have formed in a state that determine the quality of the business infrastructure, the effectiveness of investment activity, and the level of possible risks when investing (Gryaznova et al., 2002).

Also, the investment climate is considered as a generalizing characteristic of the totality of economic, social, organizational, legal, political and other conditions that determine the feasibility and attractiveness of investing in the economy of a country or a region (Igonina, 2005). A feature of this definition can be called the possibility of using the investment climate category in relation to the regions. The strength of this definition is the ability to take into account the estimated risks when characterizing the investment climate, which can limit it within a certain framework.

There is also a simplified definition of the investment climate, which names it a set of political and economic conditions that are forming in the state for investing temporarily free money in order to generate future income (Maksimova, 2005).

A number of authors supplement the list of factors that make up the investment climate with the environmental conditions of the region (Kiseleva, Borovikova, Zakharova, et al., 2006).

Thus, the investment climate is determined by a combination of objective and subjective working conditions of the investment market, which are formed under the influence of diverse interconnected processes.

To determine investment attractiveness, some authors identify a number of factors: economic, financial, natural resource, production, infrastructure, innovation, legislative, labor, social, institutional, political, environmental (Myakshin, 2014). Moreover, these factors can be divided into three groups from the standpoint of assessing changes as a result of targeted management actions: 1) amenable to change in a short time - the regional component of the legislative factor; 2) amenable to change in the long term - the innovative factor, the technological, social, production component of the infrastructure factor, the intellectual component of the labor factor; 3) not modifiable - the factor of natural resources, the climatic (geographical) factor (Myakshin, 2013).

According to the methodology of the Council for the Study of the Productive Forces of the Ministry of Economic Development of the Russian Federation and the RAS Institute for Industrial Property Management, the main elements of the investment climate are investment potential, investment risks, investment attractiveness and investment activity. The integral indicator is determined by combining the numerical values of individual private indicators of investment attractiveness and for Russia as a whole it is used for 1, and for regions it is determined in relation to the medium-term level. Investment activity is measured by the per capita volume of investments and investment growth rates. The advantages of the methodology are: determining the function of the causal relationship of investment attractiveness and activity; the possibility of substantiating the reliability of the results that is the application of the criterion of the degree of tightness of the correlation between the categories; most indicators are estimated by statistical methods (Polozikhina, 2007).

In studies of Russian economic journals, a summary is often used of the sum of places occupied by regions for certain indicators. As a result of such a statistics, the ranking position of the region among others is determined. For example, according to the methodology of the Investment Newspaper, six types of investment potential (labor resources, level of development of production, institutional potential, innovative potential, level of infrastructure development, financial potential) and four types of investment risk (financial, political, legislative, economic) are evaluated (Serova , 2015).

Thus, each methodology considered uses a different set of accounting indicators for assessing investment attractiveness. Economic and mathematical methods (the method of summing up places, the method of point estimates) do not use qualitative indicators, and the method of expert estimates has such a drawback as a high degree of subjectivity in evaluating indicators. All this suggests that today it is difficult to objectively assess the real investment attractiveness of the region using only one assessment method.

A review of the literature allowed us to conclude that in determining measures of state incentives for the development of the innovative sector of the region, it is necessary to take into account not only the investment climate and investment attractiveness of the region, but also the type of regional development that historically determines the degree and sources of development of the investment climate, the presence of production enterprises, and labor potential.

In determining the state strategy for financial support to enterprises in the region, a significant role is given to the development of the innovation sphere.

Innovation is the strategic axis on which the planning and operation of various industries, the development of new methods, products or processes can be based that allow them to become a more attractive proposal while at the same time gaining greater profitability for their products. However, the lack of statistics demonstrating the existing weaknesses in the field of competitiveness, and the benefits that innovation can bring, do not allow individual industries to invest in research and development (R&D) in order to profit in the medium or long term (Chain, Goes & Sarrade, 2019).

A number of scientists are building a logical relationship between the successful implementation of innovative developments in production and the participation of the public sector in R&D financing (Krasova, 2019). Scientists from Cambridge University and other western universities are building statistical links between the region's innovation and economic development in various directions: the influence of human capital on the region's development has been studied by Whalley, J., Zhao, X. (2010); the impact of state-owned venture capital investments on innovation growth is reviewed by Wen et al. (2018).

Thus, a study of the causes of the unevenness in attracting investment capital, including state participation, as well as determining the direction of government support measures depending on the specifics of regional development, provide the basis for further scientific research on this problem.

3. Methodology

The methodological basis for determining the typologization of the regional system in order to determine measures of state incentives for the development of the innovation sector of the region is a systematic approach, expert assessment methods, factor analysis methods.

3.1. Expert assessment method

The application of the expert assessment method in the study of investment attractiveness is based on the organization of work with experts and on the statistical processing of their opinions, expressed both in formalized and in descriptive form.

The justification for the need to use the expert assessment method is the choice of the desired characteristics of investment attractiveness as a random variable, the distribution law of which is expressed in experts' assessments of the level (values) and probability of the event. It is assumed that the range of expert estimates obtained includes the true value of the random variable under study, and the generalized opinion of experts, based on knowledge and experience, is sufficiently reliable.

The main advantages of the expert assessment method:

- simplicity and efficiency of obtaining information;

- the possibility of using additional indicators during the assessment;

3.2. Factor analysis method

The factor approach to assessing the investment attractiveness of the region in order to determine measures of state support for the development of innovations in the region is based on the study of investment-significant factors for an effective indicator. Its advantages are as follows:

- the interaction of many factors is taken into account;

- the possibility of using statistical data that level the subjectivity of expert estimates;

- the use of a differentiated approach to various levels of the economy of regions when determining their investment attractiveness and typology of development.

When analyzing the features of the factor method used in assessing the attractiveness of the region to ensure government measures to support innovative development, the following areas of research factors are proposed:
- development of a mechanism for coordinating the interests of all participants in the investment process: investors, venture capital funds with state participation, the population of the region, government bodies;

- the need for structural transformation and ensuring sustainable economic growth of the region was taken into account;

- focus is placed on assessing the status, development and effective use of scientific, technological and innovative potential of the region;

- the investment attractiveness of the region is structured depending on the typologization of its development and the degree of participation of government support measures.

4. Results

The substantiation of the hypothesis that attractiveness for public financing is predetermined by the type of regional system implies:

1) allocation of directions of state support measures for the development of the investment climate in the region; 2) the allocation of types of regional development, determined by the specifics of the resource potential of the region.

4.1. Directions of measures of state support for the development of the investment climate in the region

The role of the state in the process of state financial support is reduced to the creation of a set of measures for legal and economic provision of conditions for the formation of a full-fledged infrastructure of the domestic innovation industry. In order to implement the proposed measures within the region, the state needs to solve the following tasks:

- improving the mechanism of stimulating innovation;

- optimization of the system of measures for the comprehensive support and support of innovative activities;

- implementation of measures to improve the legal framework for innovation;

- assistance in the formation of infrastructure projects.

Table 1 shows the vectors of optimization of measures of state regulation of the development of innovations in certain areas.

Table 1
Directions of state support measures
for the development of innovations

Directions of optimization	State regulation policy
Tax policy	Profit tax rate reduction. Reducing the VAT rate on finished products. Land tax reduction Property tax rate reduction
Insurance	Stimulating insurance companies to increase insurance products for the innovative sector of the economy Admission to state financing is possible only for enterprises that have insured their risks in the field of innovation
Customs policy	Reducing the size of customs duties on imported equipment Import VAT reduction Excise rate reduction
Depreciation policy	An increase in the number of depreciation methods for fixed assets. Reducing the useful life of fixed assets.
Leasing policy	An increase in the number of depreciation groups to which the depreciation acceleration coefficient applies. The increase in the size of the coefficient of acceleration of depreciation. Expanding groups of regulatory types of leasing.

Credit policy	Decrease in loan rates in connection with the purchase of equipment. Increase in lending limits. Reducing the amount of remuneration for factoring operations. Reduction in the amount of remuneration on letters of credit

Source: developed by the authors, based on Google Analytics

The identified directions of government support for innovation development in the region will be applied unevenly in each region, which is due to the type of regional development.

4.2. Types of regional development determined by the specifics of the resource potential of the region

1. Inertial type of development of depressed regions - it is characterized by a negative macro- and meso-economic result. Such regions, as a rule, are actively supported by the state through dating tools. One of the ways to implement state social policy in these regions remains state subsidies. This method of state support is extremely ineffective, since productive forces are not formed on the state money (and they can be considered a category of investments), unemployment is not reduced, and negative social phenomena are growing.

Examples of regions of this type can be the Ivanovo region, in which the sewing cluster has been historically developed, as well as the Kirov region, in which the forestry and chemical industries are traditional spheres of production. These regions, despite large-scale government injections, ultimately lost the bulk of private investors (Sizova & Sennikova, 2018). This, in turn, led (despite state subsidies) to the negative balance of labor migration, negative social phenomena and the intensification of the depressive nature of the region's development.

Figure 1 shows the lag in the dynamics of investment in fixed assets from the dynamics of the physical volume of the gross regional product (GRP) and labour productivity since 2014.
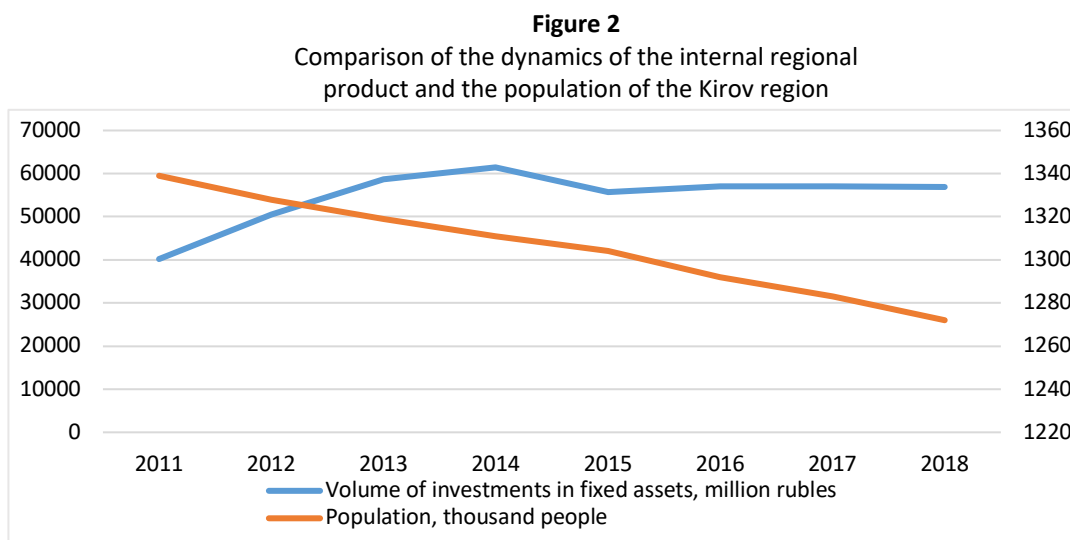
Figure 1
Comparison of the dynamics of the gross regional product (GRP),
labour productivity and investment in the Kirov region
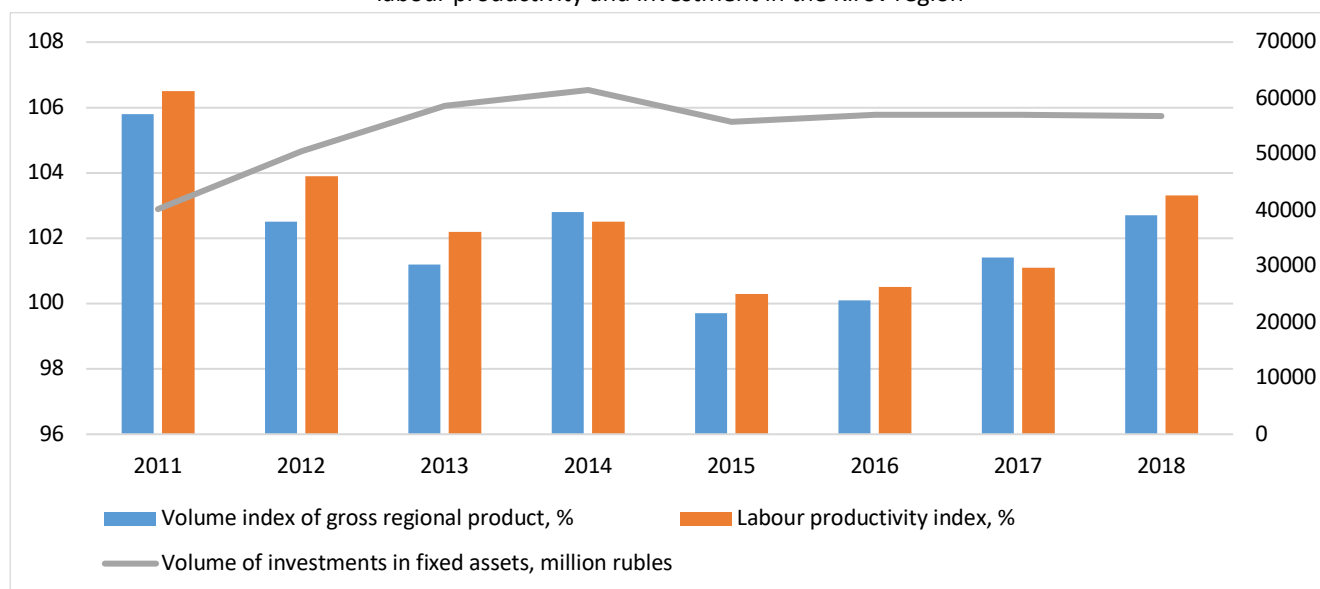
Source: Compiled by the authors on the basis of the
(Rosstat: Russian Statistical Yearbook, 2019)

Figure 2 shows the inverse relationship between investment in fixed assets and the demographic indicator of the population of the Kirov region, which has been steadily declining since 2011.

Researcher Chernyshev K.A. (2016) notes that migration decline began to play a major role in reducing the population of the Kirov region since 2010.

Figure 2
Comparison of the dynamics of the internal regional
product and the population of the Kirov region

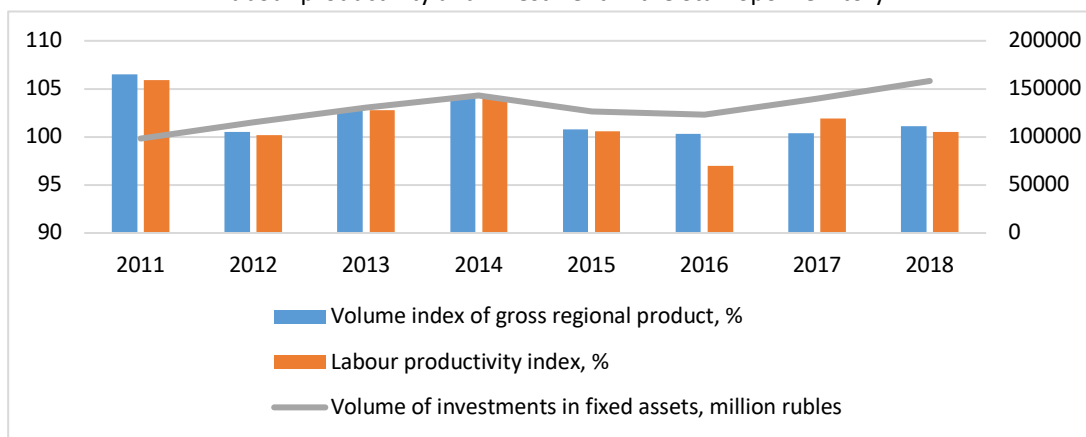Source: Compiled by the authors on the basis of the (Rosstat: Russian Statistical Yearbook, 2019)

2. For the inertial type of development of regions with a high level of resource potential, negative development indicators are characteristic. The simple use of regional resources dominates without reproduction of the resource base and fixed assets. The business sector, as a rule, does not use innovative technologies. Implemented investment programs are characterized by a focus on minor optimization of existing fixed assets.

An example of such a region is the Stavropol Territory, the economic complex of which is characterized by an industrial-agricultural-recreational direction. The tourism sector, which operates outdated fixed assets, is traditionally developed. The actions of state authorities aimed at popularizing and promoting the territory are more likely to have a negative effect for this type of development, since government spending is redistributed into profits for individual businessmen, causing serious damage to the competitive position and investment potential of the region.

Figure 3 demonstrates the steady growth dynamics of investments, while at the same time, the lag in the indices of the physical volume of the gross regional product (GRP) and labour productivity is recorded starting in 2014. Despite the growth in investment in the region's economy, a decrease in the labour productivity index is noted.

As a result, government initiatives, backed by budget spending, do not have a positive effect on the region; investment attractiveness and the image of the Stavropol Territory as a center of agricultural production and recreation zone are worsening.

Figure 3
Comparison of the dynamics of the gross regional product (GRP),
labour productivity and investment in the Stavropol Territory
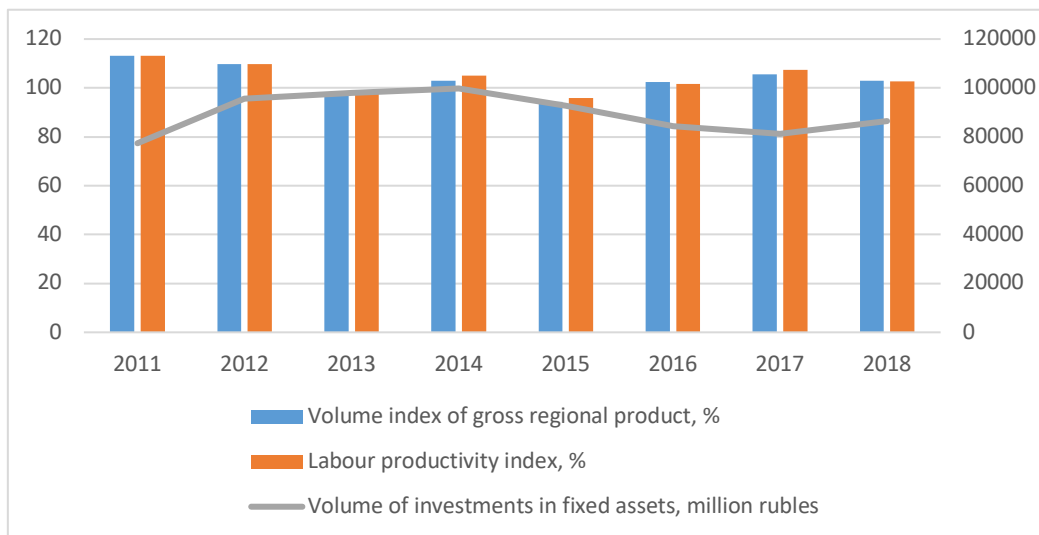

Source: Compiled by the authors on the basis of the (Rosstat: Russian Statistical Yearbook, 2019)

3. The extensive type of development involves the increment of key indicators of the development of the regional system, due to the constant additional involvement of resources in production and supply processes. An example is the Kaluga region, in which tools such as industrial parks and industrial zones, regional development institutions are introduced. Using the cluster development approach, 12 industrial parks, a special economic zone of the industrial-production type named Kaluga, and Sosensky territory of the leading social and economic development were created in the Kaluga Region. New enterprises with a high degree of automation, producing high-tech products, came to the Kaluga region. Since 2006, 114 new enterprises have been opened in the Kaluga Region (Ministry of Economic Development of the Kaluga Region, 2020).

Figure 4 illustrates the growth of the physical volume of GRP and the labour productivity index since 2014, while the volume of investments in fixed assets is declining. This allows us to confirm the increase in the efficiency of the use of attracted resources.

Figure 4
Comparison of the dynamics of the gross regional product (GRP),
labour productivity and investment volumes in the Kaluga region

Source: Compiled by the authors on the basis of the (Rosstat: Russian Statistical Yearbook, 2019)

Table 2 shows a description of the relationship between the type of regional development, regional advantages in the short, medium and long term, as well as certain areas of state support in terms of increasing the investment attractiveness of the region.

Table 2
The relationship of the type of regional development and state regulation
measures in the medium term to increase the investment attractiveness of the region

Type of regional development	Type characteristic	Medium-term investment value	Long term investment value	Medium-term state support priorities (items from table 1)
Inertial (typical for depressed regions)	Develops through state subsidies	Reduction	Reduction	Tax policy Customs policy
Inertial (with high resource potential)	Develops by attracting additional available resources	Reduction	Reduction	Credit policy Depreciation policy
Extensive	Additional external resources are involved, their effectiveness is absent	Minor change	Reduction	Insurance Leasing policy

Source: compiled by the authors

For depressed regions related to the inertial type of regional development, the most effective measures of state support should be the mechanisms of tax and customs regulation, which should stimulate the flow of funds into the region.

For inertial regions with high resource potential, the most significant areas of state stimulation in the medium term will be credit and depreciation policies.

For the extensive type of regional development, the directions of state support concentrated in the field of insurance and leasing policy are considered the most promising.

Assigning priority directions of state support to certain types of regional development (for specific regions) does not imply ignoring (or excluding) other state incentive measures, indicated in table 1.

5. Conclusions

Thus, measures of state support for development are directly determined by the investment attractiveness of the region, which must be measured and correlated with the type of regional development, as well as regulated through specific methods and tools that give maximum efficiency from the position of state management.

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