

EVALUATION METHODOLOGY OF SOCIO-ECONOMIC AND SPATIAL DEVELOPMENT LEVEL OF THE SOUTH RUSSIA REGIONS

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Abstract

The article has revealed the essence of monitoring the socio-economic and spatial development of the region. The study has concluded that it is necessary to methodically differentiate spatial monitoring and “classical” monitoring of social and economic development. Besides, indicators of monitoring of spatial development of the region have been given and the order of their estimation has been described on the example of regions of the South of Russia. An assessment of the model of spatial organization of territories has shown that the most even distribution of economic power and impulses of economic development are noted in the Stavropol Territory. The economy of this region develops on a network principle, unlike other regions of the South of Russia, although it has a similar specialization and comparable conditions for the resource potential. The paper concludes that the implementation of monitoring of socio-economic and spatial development of the regions should be indivisible elements of the tools of the regional management system, aimed at timely identification of the existing differentiation of the territories in order to further smooth it. The application of methods of spatial analysis makes it possible to identify such important parameters of the development of the region as the level of centralization, narrowing, fragmentation of economic space. The analysis of spatial development allows reducing the asymmetry in the development of the regions of Russia through the application of complex targeted regional development programs, the activities of which are built individually for each typological group of regions, depending on the level of spatial development.

Keywords: region, monitoring, spatial development, socio-economic development, narrowing, economic space.

Introduction

The traditional problem of the Russian economy is the even development of territories. It is connected primarily with the lack of necessary information for making managerial decisions. Various methods are used to monitor the socio-economic development of the territories, but they all have shortcomings and do not allow smoothing the asymmetry in the development of mesoeconomic systems.

The methodological aspects of monitoring are largely determined by the specific information needs of the main categories of users (Trukhachev V. I., 2017). In the course of the study, we have determined the information objectives, the required result and the subject of monitoring for the main categories of users (state, business community, investors, and population).

In the regional economy, much attention is paid to the study of socio-economic differentiation of territories according to the level of their development (Gerasimov A. N., 2015); Bobryshev A. N., 2011; Bobryshev A. N. 2016; Usenko, L. N., Usenko, A. M., Uryadova, T. N., 2017; Manzhosova I. B., Putrenok E. L., 2017; Trukhachev V. I., Sklyarov I. Y., 2016).

The purpose of this study is to examine the specifics of the spatial development of the region, to identify structural imbalances, patterns and determinants in the development of the South Russia regions based on the authors' methodology.

Goal

The goal of the study is to identify the distinctive features of spatial and socio-economic monitoring of the development of the region, to rank the South Russia regions based on the authors' methodology, as well as to evaluate the main indicators of the development of the digital economy in the regions of the South of Russia.

The object and subject of the study

The object of the study is the South Russia regions. The subject of the study is the parameters of socio-economic and spatial development of the region.

Research methods

To study the opinions of the respondents regarding the prospects for the development of the digital economy in the South Russia regions, 3 focus groups of experts were formed. In total 406 respondents have been polled. Evaluation of the parameters of the socio-economic and spatial development of the regions has been based on the use of the authors' methodology. The study has applied the principle of taking into account the sectoral specificity of the territories when assessing the prospects for introducing digital technologies.

Results

In the Russian economy, the uneven development of the territories is due, on the one hand, to the peculiarities of the existing system of division of labor and territorial specialization, and on the other, the result of the spatial policy of the authorities. In the study, the authors carried out a comparative analysis of the monitoring of spatial and socio-economic development, and concluded that there are significant differences between them (Table 1).

Table 1. Distinctive features of spatial monitoring and monitoring of socio-economic development of the region

| The sign of demarcation | Monitoring of socio-economic development (MSED) of the region | Monitoring of spatial development of the region |
|---------------------------|---|---|
| Essential basis | It is focused on the study of socio-economic processes and the results of the functioning of the economic entity (the main diagnosed factor is the level and quality of life of the population, as well as reproductive processes in the region). In essence, it is more "human-contented". | It is complementary in nature and is a part of MSED of the region, but it has significant differences (the main diagnosed object is the physical basis - the location of material (resource) factors of production). It is most focused on the format of assessing the geopolitical component of development. |
| Object of monitoring | The object is not the very life space of the region, but the results of its functioning. More important is the assessment of a particular sector of the economy in the development of the region. | The physical basis of the economic space, the degree of its saturation, the type of localization of objects, the features of the networked and nodal organization. It is important not only the combination of industries and the parameters of their functioning, but also their spatial characteristics. |
| Monitoring target setting | Assessment of the parameters of the state of the social sphere and the level of development of the economy from the position of equalizing territorial policy for raising the standard of living of the population | Estimation of the degree of narrowing (expansion) of the economic space, the degree of disruption of its elements and the disruption of communication between them |
| Subject of monitoring | Assessment of the sustainability of the development of the regional socio-economic system (RSES) | Assessment of socio-economic processes in the context of peripheral, semi peripheral and central areas |
| The result of monitoring | Assessment of the state of development of the sectors of the regional economy, awareness of the nature and pace of socio-economic development of individual territories | Estimation of the degree of economic spacerareness, the search for potential "growth points" of the regional economy, the assessment of spatial asymmetry and heterogeneity |

Monitoring of social and economic development of the region involves an evaluation of indicators that characterize the state of various sectors of the economy, the level and quality of life of the population, the state of infrastructure. The conducted research has led to the conclusion that the traditional composition of socio-economic development monitoring indicators does not take into account the important parameters of the spatial development of the region, such as the level of centralization, narrowing, fragmentation and openness of the economic space (Figure 1).

| | |
|---|--|
| Indicators of narrowing of economic space | Indicators of centralization of economic space |
| number of settlements with a population of less than 10 people; number of settlements without population; growth (reduction) in the number of enterprises in the region over 5 years; increase (decrease) in settlements for 5 years; increase (decrease) of the population over 8 years | Complex multidimensional indicator of centralization of economic space (1 - average annual number of employees of enterprises, 2 - availability of fixed assets of enterprises, 3 - volume of shipped goods of own production by types, 4 - processing industries, 5 - production and distribution of electricity, gas and water |
| Indicators of fragmentation of economic space | Indicators of openness and "in-touch capabilities" of local economy |
| <ul style="list-style-type: none"> - number of own cars per 1 000 people; - density of public roads with hard surface; - density of public railways; - passenger turnover of public buses; - departure of passengers by public railroad; - freight turnover of road transport of enterprises of all types of activities, etc. | <ul style="list-style-type: none"> - volume of communication services rendered to the population, per capita (thousand roubles); - proportion of enterprises with a website; - proportion of enterprises in the region that use the Internet; - number of foreign nationals who worked in the region; - value of foreign investment in the economy of the regions, etc. |

Fig. 1. Indicators of monitoring of the spatial development of the region

In the course of the study, the authors have monitored the parameters of social and economic development in the regions of the South of Russia for 24 basic social and economic parameters. The proposed methodology allowed to diagnose not only the current state of the region, but also to reveal structural disproportions of endoterritorial parameters of social and economic development. The authors have made segmentation of territories in the context of two multidimensional components: the level of economic development of the region and the conditions and quality of life of the population in it, as well as the application of the method of the sum of places, which assumes the preliminary ranking of all regions for each indicator characterizing the phenomenon under analysis. The first places are assigned to their best values (Table 2).

Table 2. Ranking of individual regions of the South of Russia by the criteria of socio-economic development (fragment) (Bobryshev A.N.; Kulagina N.A., 2018)

| Factors of economy and social sphere development of the region | The Stavropol Territory | The Republic of Daghestan | The Chechen Republic | The Republic of North Ossetia-Alania | The Kabardino-Balkarian Republic | The Karachayevo-Cherkessian Republic | The Republic of Kalmykia |
|--|-------------------------|---------------------------|----------------------|--------------------------------------|----------------------------------|--------------------------------------|--------------------------|
| 1.1. Unemployment rate | 4 | 9 | 12 | 7 | 10 | 8 | 11 |
| 1.2. Need for employees | 4 | 11 | 12 | 9 | 7 | 10 | 13 |
| 1.3. GRP volume | 4 | 5 | 7 | 9 | 8 | 11 | 12 |
| 1.4. Fixed capital accumulation | 5 | 4 | 7 | 8 | 9 | 11 | 12 |
| ... | | | | | | | |
| <i>The sum of places</i> | 53 | 79 | 102 | 89 | 105 | 115 | 135 |
| <i>Region rank</i> | 4 | 6 | 8 | 7 | 9 | 10 | 11 |
| 2.1. Average per capita income of the population | 6 | 2 | - | 9 | 10 | 8 | 11 |
| 2.6. Number of own cars per 1000 people | 4 | 11 | 12 | 7 | 10 | 8 | 9 |
| 2.7. Emissions of pollutants into the air | 9 | 7 | 8 | 5 | 3 | 6 | 2 |
| 2.8. Number of preschool institutions | 3 | 5 | 8 | 7 | 12 | 10 | 11 |
| 2.9. Housing construction | 3 | 4 | 13 | 8 | 7 | 9 | 12 |
| <i>The sum of places</i> | 62 | 55 | 71 | 85 | 83 | 105 | 113 |
| <i>Regionrank</i> | 4 | 3 | | 8 | 7 | 10 | 11 |

Having calculated the sums of places for all the indicators considered, the ranks of the regions were obtained according to their level of development. Further, the results of ranking on the indicators of economic development were imposed on the results of ranking by indicators of the level and quality of life of the population (Table 3).

Table 3. Parameters of the level and quality of life of the population

| Typological group of social and economic development of territories | Interval value by level of economic development (points) | Interval value on the level and quality of life of the population (points) | Region |
|---|--|--|--------------------------------------|
| The most developed regions | 10-31 | 10-31 | - |
| Developed regions | 32-61 | 32-64 | The Stavropol Territory |
| | | | The Krasnodar Territory |
| | | | The Rostov region |
| Dynamically developing | 62-91 | 65-94 | The Republic of Daghestan |
| | | | The Astrakhan Region |
| | | | The Volgograd Region |
| Low-developed | 92-121 | 95-125 | The Republic of North Ossetia-Alania |
| | | | The Republic of Adygeya |
| | | | The Chechen Republic |
| | | | The Karachayevo-Cherkessian Republic |
| Depressive | 122-152 | 126-156 | The Kabardino-Balkarian Republic |
| | | | The Republic of Ingushetia |
| | | | The Republic of Kalmykia |

The identification of typological groups has been based on the diagnosis of the parameters of social and economic development of regions by the method of the sum of places. At the same time, the smaller the indicator,

the greater the number of competitive advantages the region has over the corresponding parameter. At the next stage of the study, some parameters of the spatial development of individual southern Russia have been diagnosed.

In the opinion of the authors, the parameters of the centralization of the region's economic space are crucial in analyzing and evaluating the effectiveness of spatial policies of regional socio-economic systems. In this regard, the type of model of spatial organization of territory has been determined. So, in the geo-economic space, most scientists and specialists distinguish two basic models of spatial organization of territories: integrated (centralized) and network.

The integrated model was formed in the era of industrialization, and was characterized by the presence in the region of large-scale mass industrial enterprises that dominate the regional space, which concentrate economic power and spread the impulses of economic development to smaller settlements. At the same time, the share of such an economic center in the GRP structure of the region is the largest and peripheral territories develop exclusively due to impulses from the center.

In turn, *the network model* of spatial organization of the territory is characterized by an even distribution of economic power and the impulses of economic development between several settlements of different scale. The economic power of the region with a network model of spatial development is determined not by the volume of production, but by the mobilization resource of the entire network, its overall influence on the global convergent links of various actors in the regional economy.

The carried out research has allowed conducting typology of models of the spatial organization of territory of the South of Russia regions (Table 4).

Table 4. Evaluation of the model of spatial organization of territories Ranking of individual regions of the South of Russia according to the criteria of socio-economic development (fragment) (Bobryshev A. N., Kulagina N. A., 2018)

| Region | Cities-millionaires | The largest (0.5-1 million) | Great (250-500 thousand) | Large (100-250 thousand) | Medium (50-100 thousand) | Small (up to 50 thousand) | Total | Type of model of spatial organization of the territory |
|--------------------------------------|---------------------|-----------------------------|--------------------------|--------------------------|--------------------------|---------------------------|-------|--|
| The Republic of Dagestan | – | 1 | – | 3 | 2 | 4 | 10 | Centralized* |
| The Republic of Ingushetia | – | – | – | – | 1 | 3 | 4 | Weak network |
| The Kabardino-Balkarian Republic | – | – | – | 1 | 1 | 6 | 8 | Weak network |
| The Karachayevo-Cherkessian Republic | – | – | – | 1 | – | 3 | 4 | Weak network |
| The Republic of North Ossetia-Alania | – | – | 1 | – | – | 5 | 6 | Highly centralized |
| The Chechen Republic | – | – | 1 | – | – | 4 | 5 | Highly centralized |
| The Stavropol Territory | – | – | 1 | 4 | 4 | 10 | 19 | Highly network |

* With network interaction on the periphery and semi-periphery.

The most even distribution of economic power and impulses of economic development has been noted in the Stavropol Territory, where Stavropol dominates only in two respects: retail turnover (54% - which is natural due to the possession of this agglomeration of the most capacious market for the sale of products) and availability of fixed assets of organizations (52.5% - which is also explained by the presence of large production capacities). At the same time, other agglomerations dominate in some indicators, for example, in terms of shipped goods of own production in the manufacturing sector and the production and distribution of electricity, gas and water, the city of Nevinnomyssk is the leader (29.5% and 24.5% respectively), while the share of the city of Stavropol according to these indicators is 16.6 and 9.8%, respectively.

In turn, in terms of the volume of work performed in the construction sector, Pyatigorsk is leading - 31.8% (Table 5).

Table 5. The share of Stavropol and towns with population of more than 100 thousand people in the main socio-economic indicators of the Stavropol Territory in 2010, %

| Indicator | Largest cities | | | | | Coefficient of centralization | |
|---|----------------|------------|------------|--------------|------------|-------------------------------|--------------|
| | Stavropol | Yessentuki | Kislovodsk | Nevinnomyssk | Pyatigorsk | 1-fractional | 5-fractional |
| Population size | 14.3 | 3.6 | 4.9 | 4.2 | 7.6 | 0.143 | 0.346 |
| Average number of employees | 24.8 | 3.1 | 4.1 | 5.3 | 9.0 | 0.248 | 0.463 |
| Availability of fixed assets | 52.5 | 0.8 | 3.2 | 5.2 | 7.4 | 0.525 | 0.691 |
| Processing industries | 16.6 | 1.0 | 2.6 | 29.5 | 4.1 | 0.166 | 0.538 |
| Production and distribution of electricity, gas and water | 9.8 | 2.4 | 3.5 | 24.5 | 17.7 | 0.98 | 0.579 |
| Scope of work in the construction sector | 18.7 | 2.6 | 2.8 | 19.7 | 31.8 | 0.187 | 0.756 |
| Commissioning of the total area of residential buildings | 44.0 | 5.8 | 4.2 | 2.4 | 7.4 | 0.440 | 0.638 |
| Retail trade turnover | 54.0 | 1.8 | 1.8 | 2.2 | 18.6 | 0.540 | 0.784 |
| Investments in fixed assets | 10.0 | 3.1 | 4.3 | 32.1 | 3.4 | 0.100 | 0.529 |
| Total | – | – | – | – | – | 3.331 | 5.326 |

The network principle of organizing the economic space is most characteristic of the digital economy, the development of which is one of the main priorities of Russia's state policy. The use of digital technologies makes it possible to reduce the disadvantages of the spatial distribution of economic entities. The study made it possible to conclude that there is significant digital disparity among the subjects of southern Russia.

It should be noted that among the subjects of the North Caucasus Federal District, the Stavropol Territory leads in the number of subscribers of broadband Internet access per 100 population (units) (13.7 fixed (67th place in Russia), 76.7 mobile (27th place in Russia), with the average Russian indicator of 20.9 and 79.2, respectively).

At the same time, in the Stavropol Territory, 74.4% of households have broadband Internet access (4th place among the subjects of the North Caucasus Federal District, 32nd place in the country), while the average for Russia is 72.6% (Table 6).

Table 6. Key Indicators of the Digital Economy Development in the South of Russia in 2017

| Regions of the South of Russia | Subscribers of broadband Internet access per 100 population, units | | The share of households with broadband Internet access in the total number of households, % | The share of organizations (in the total number of organizations in the business sector) that use, %: | |
|--------------------------------------|--|--------|---|---|---------------|
| | Fixed | Mobile | | broadbandinternet | cloudservices |
| North Caucasus Federal District | 7.5 | 65.7 | 69.3 | 79.5 | 19.4 |
| The Republic of Dagestan | 2.4 | 54.6 | 69.0 | 64.5 | 16.0 |
| The Republic of Ingushetia | 1.0 | 57.1 | 56.1 | 91.8 | 28.6 |
| The Kabardino-Balkarian Republic | 9.5 | 71.1 | 76.9 | 79.8 | 24.3 |
| The Karachayevo-Cherkessian Republic | 10.1 | 60.7 | 81.5 | 68.1 | 20.5 |
| The Republic of North Ossetia-Alania | 12.7 | 72.4 | 80.5 | 79.1 | 18.4 |
| The Chechen Republic | 3.6 | 65.8 | 32.8 | 68.6 | 9.1 |
| The Stavropol Territory | 13.7 | 76.7 | 74.4 | 91.3 | 23.2 |

91.3% of organizations in the Stavropol Territory are provided with broadband Internet (2nd place in the North Caucasus Federal District, 4th place among all regions of the country), with an average Russian level of 80.5%. 23.2% of enterprises use cloud services in the region, which is generally higher than the national average (20.5%) and the North Caucasus Federal District (19.4%), where the Stavropol Territory gives way only to the Kabardino-Balkarian Republic (24.3%) and the Republic of Ingushetia (28.6%). According to this indicator, the Stavropol Territory is on the 21st place among all regions. Also in recent years there has been a significant increase in the number of active mobile radio telephone subscribers using Internet access services in the Stavropol Territory.

At the same time, during the survey, 41.23% of respondents noted that the organization uses digital technologies, another 44.74% of respondents noted that the organization partially uses similar elements (Table 7).

Table 7. The usage of elements of the digital economy, %

| Does the organization use elements of the digital economy? | Focus-groups | | Total |
|--|--------------|-------------------------|-------|
| | Leaders | Employees / specialists | |
| The organization uses digital technology | 37.50 | 42.22 | 41.23 |
| Partial use of elements of the digital economy | 16.67 | 52.22 | 44.74 |
| No, but the organization plans to introduce elements of the digital economy, which will significantly increase production and technological efficiency | 29.17 | 2.22 | 7.89 |
| No, we do not consider it necessary to introduce elements of the digital economy | 16.67 | 3.33 | 6.14 |

In general, a group of experts more highly appreciates the degree of penetration of digital technologies into agricultural sectors (Table 8).

Table 8. Innovative technologies and technical means of digital format applied at enterprises of the agricultural sector

| Seq No. | Innovative technologies and technical means of digital format | Focus-groups | | | Total |
|---------|---|--------------|-------------------------|---------|-------|
| | | Leaders | Employees / specialists | Experts | |
| 1 | Precision agriculture | 13.73 | 5.17 | 9.64 | 8.95 |
| 2 | Official website | 11.76 | 59.48 | 13.21 | 25.06 |
| 3 | Drones | 15.69 | 0.86 | 7.86 | 6.94 |
| 4 | Transmitters and sensors | 7.84 | 3.45 | 12.86 | 9.84 |
| 5 | Remote monitoring of fields | 7.84 | 6.90 | 7.50 | 7.38 |
| 6 | Agricultural land inventory | 1.96 | 2.59 | 7.86 | 5.82 |
| 7 | Usage of pilotage sensors GLONASS /GPS in agriculture | 15.67 | 6.90 | 11.79 | 10.96 |
| 8 | Storage automation | 1.96 | 1.72 | 6.43 | 4.70 |
| 9 | Robotic green houses | 0.00 | 0.00 | 5.71 | 3.58 |
| 10 | Development of specialized mobile applications | 0.00 | 0.86 | 7.14 | 4.70 |
| 11 | Office system automation | 13.73 | 11.21 | 9.64 | 10.51 |
| 12 | Other | 9.80 | 0.86 | 0.36 | 1.56 |

Conclusion

The study has found that indicators of centralization of the economic space of a region are most important for analyzing the effectiveness of spatial policy in a region.

The study has showed that the network model of the spatial organization of the economy is observed only in several regions of the South of Russia. One of the territories for which this model is characteristic is the Stavropol Territory. The network model in this regions determined not by the volume of production, but by the mobilization resource of the entire network, its general influence on the subjects of the regional economy. Based on the obtained values of one fractional centralization coefficients (by the ratio of the largest city in the total value of the indicator for the region), a comprehensive indicator of centralization was calculated, while the higher the value of this indicator, the more centralized is the economic space of the region. The study concluded that the most centralized economic space among the regions of the South of Russia with absolute dominance of the central agglomeration in the implementation of economic power is the Republic of North Ossetia-Alania (complex coefficient of centralization is 0.698). High centralization of the economic space was also noted in the Chechen Republic (0.616).

The Stavropol Territory has the most prominent network organization of the economic space. At the same time, the level of centralization of the economy is low. There is a high diversification of the sectors of the regional economy in comparison with other regions of the South of Russia, as well as the poly-profile of large and medium-sized urban settlements. At the same time, the high dependence of territorial entities on the administrative center has not been revealed, which makes it possible to speak about the high mobilization potential of territorial entities in the region that give even impulses for the development of smaller towns and settlements, which ultimately contributes to the even development of the territories.

The methods of spatial and socio-economic monitoring do not fully reflect the trends occurring in the regional economy. It is important to assess the dynamics of the introduction of digital technology. This area is dynamic and rapidly developing, capable of leveling the problems of spatial distribution, but the transition to a new technological structure, which is linked to the spread of digital technologies, requires the solution of a whole complex of problems in personnel training. An important problem in the development of digital technologies in the regions of the South of Russia is a steady digital divide between urban and rural settlements. So in rural areas,

only 56.3% of the population has access to the Internet from a computer and 59.6% have access to broadband Internet, while in urban areas 74.8% and 76.8% respectively.

Digital technologies are not actively used in the regions of the South of Russia.

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