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COMPETITIVE POTENTIAL AND SOCIO-ECONOMIC DEVELOPMENT OF THE REGION

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Abstract

The purpose of the research described in the article is to develop tools for assessing Russian regions' competitive potential and identifying its impact on regional socio-economic development. Harmonized methods for assessing the region's competitive potential and socio-economic development are developed and presented in this article. The study methodology is based on the use of statistical analysis and data processing, calculation, and analytical methods for constructing private and integral weighted average indicators of competitive potential and socio-economic development, the use of correlation and regression analysis tools, and methods of graphical data presentation. The use of econometric methods and statistical analysis methods is provided by software from MS Excel and Gretl packages. The results of calculations of the integral indicators of competitive potential and socio-economic development in Russia's regions and the correlation-regression analysis of the competitive potential of the regions and their socio-economic development are shown. The data on the coefficients of pair correlation between the general integral indicator of the region's competitive potential, its four-factor components, and the region's socio-economic development are presented. It is pointed out that the established relationship makes it possible to choose the most effective tools for influencing the dynamics of the socio-economic development of the region based on managing its competitive potential.

Keywords: Competitive potential, region, socio-economic development

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1. Introduction

The strategic priorities for the development of the regions are to increase the rates of socio-economic development and maintain their stable dynamics. At the same time, the first is a target function and the second is a necessary condition the failure to fulfill, which may entail serious socio-economic consequences for the region. In the conditions of active interregional competition, the formation of a high competitive potential of the region is necessary to ensure high socio-economic development rates. This view is noted in studies by Bolatbayeva et al. (2020); Duranton et al. (2015); Fyliuk et al. (2019); Mau (2019).

The competitive potential of a region is a combination of opportunities to ensure a high competitive position among other regions due to the concentration of economic power, the formation of means of adaptation and the speed of adaptation to changes in the competitive environment, the development of the ability to achieve high socio-economic results in the region. At the same time, the region is considered a subsystem of the country's socio-economic system as a whole and the competitive potential is designed to help outstrip competing regions in the formation and use of real and potential competitive advantages in the short and long term. Regions with significant competitive potential can entirely or mainly neutralize the adverse effects of external and internal factors. Simultaneously, the most significant external factors are a decrease in demand for a regional product and internal factors are financial instability of enterprises, budget deficit and demographic problems. In this case, high competitive potential can play a reserve that the region can use in unfavorable and crises to create additional competitive advantages. In turn, such competitive advantages can maintain a high level and dynamics of socio-economic development of the region.

2. Problem Statement

In this regard, forming the competitive potential of the region is necessary and sufficient to ensure a high level and maintain high rates of its socio-economic development becomes urgent. This problem is faced both by the regional authorities and by the economic entities that form the regional economic system.

Currently, there are various approaches to solving this problem. A study by Stolbov and Sharygin (2016) focuses on capital to ensure regional competitiveness. Tret'yakova and Osipova (2018) and Klimanov et al. (2019) examine various aspects of the sustainability of regions as socio-economic systems. The studies of Mikheyeva (2018); Nizhegorodtsev et al. (2017); Ovchinnikov et al. (2019) address the issues of forecasting the indicators of the socio-economic development of the region and the structuring of the regional economic space. The studies by Dement'yev (2020); Klinova (2020); Kolmakov et al. (2019) study the factors of regional differentiation in terms of economic growth, the stability of Russian regions, and the formation of regional clusters. Savin et al. (2019) explore the measurement of competitive selection across regions. Nezhivenko et al. (2018) are developing a regional competitiveness index methodology.

At the same time, the solution of the above problem requires, first of all, getting answers to several questions concerning the construction of a monitoring system, assessment and analysis of the current state

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of competitive potential in its relationship with the state of socio-economic development of the region which have not yet found adequate coverage in the scientific literature.

The construction of such a system will expand the possibilities of searching for reserves to enhance potential and ensure the sustainable socio-economic development of the region.

3. Research Questions

Within the framework of the research, the authors set the tasks of generalizing the approaches accumulated by science to solve the problem indicated above, constructing a methodology for assessing the competitive potential of a region and its impact on regional socio-economic development, choosing adequate statistical analysis software, assessing the current state of the competitive potential of Russian regions, establishing the relationship between the socio-economic development of regions with their competitive potential.

4. Purpose of the Study

The research task's solution was to create tools and present the results of assessing the competitive potential of Russian regions and its impact on regional socio-economic development based on their testing.

5. Research Methods

The study was based on statistical analysis and data processing, calculation and analytical methods for constructing partial and integral weighted averages, correlation-regression analysis, and methods of graphical presentation of data. Software for statistical analysis from MS Excel and Gretl packages were used.

The methods for assessing the competitive potential and socio-economic development of the region developed by the authors of this article are harmonized. This ensures the correctness of the correlation-regression analysis of the dependence of the region's socio-economic development on the degree of development of its competitive potential.

The methodology for assessing a region's competitive potential is based on the selection of its defining properties. With such a selection, it is important to take into account the following principles: the properties of competitive potential should have a determining relationship with the socio-economic development of the region, properties can be objects of regional management and their assessment can be carried out following the criterion of objective quantitative measurability. By these principles, the main properties of the competitive potential of the region are determined. These are properties that reflect the possibility of ensuring a high competitive position of the region through the region's economic and innovative development, the quality of life and infrastructure in the region, and the human potential of the region.

The assessment of the region's competitive potential and the identification of its influence on the socio-economic development of the regions is proposed to be carried out in the context of the indicated four properties. Groups of indicators reflecting each of the four properties are formed. Also, the

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composition of particular indicators included in each of these groups (statistical and derivatives from primary statistical indicators) characterizing each of the selected properties of the region's competitive potential and its impact on the region's socio-economic development has been determined. A method for calculating the integral indicator of the region's competitive potential has been developed.

The selection procedure for key indicators into groups included using econometric analysis tools from the Gretl, MS Excel software packages. Each selected indicator has a statistical significance above p = 0.9, that is, it is statistically significant as a component that determines the property of the competitive potential of a region.

To assess the properties of competitive potential that determines the possibility of economic development of the region four groups of indicators are proposed:

- a group of indicators reflecting the presence and structure of jobs in the region;
- a group of indicators characterizing the compliance of the structure of the region's economy with market principles;
- a group of indicators of the level and dynamics of development of the regional economy;
- a group of indicators of the performance of the regional economy.

The property of competitive potential which determines the possibility of innovative development of the region is proposed to be assessed in the context of the following four groups of indicators, characterizing the number and level of qualifications of personnel involved in regional innovation; provision of the innovation process in the region with financial resources; the number and structure of innovations produced in the region; the use of innovative technologies and the effectiveness of innovative activities.

Assessment of the properties of the competitive potential associated with the possibility of ensuring the quality of life and infrastructure of the region involves the use of groups of indicators reflecting housing conditions; life safety of citizens; income level of the population of the region; provision of the population with medical services; ecological situation; the level of cultural development in the region and the degree of its accessibility to citizens.

Indicators for assessing the properties of competitive potential associated with accumulated human potential are combined into groups reflecting the level of education and professional training in the region, reproduction of the region's population, health of the region's population, physical culture.

The selection of particular indicators that form the following key criteria carried out the groups listed above:

- availability of annual official statistics that allow calculating the absolute value of the indicator;
- the ability of the indicator to display the properties of the region, which are key for several groups of subjects interested in the resources of the region;
- the presence of a relationship between the indicator and the socio-economic development of the region;
- lack of autocorrelation (direct interdependence) between the two estimated indicators.

The integral indicator of the competitive potential of a region allows one to obtain its complex quantitative characteristics and, on this basis, to carry out a comparative analysis of regions in terms of

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their competitive potential to track the correct dynamics of the strength of the competitive potential of a region. The method of calculating the integral indicator of a region's competitive potential involves converting natural indicators into a dimensionless form for the possibility of summing up and (or) comparing different-sized indicators. For this purpose, dividing each indicator into 5-percentiles is used, that is, into a scale cut into 20 equal parts. Thus, each indicator was assigned a dimensionless score in points (from 1 to 20) by which 5-percentile the value of a particular region will fall into according to the indicator.

The methodology provides assigning a score to each indicator where 1 is the smallest, 20 is the highest value of the indicator, and 10 points correspond to the median value of the Russian Federation indicator. The use of this method levels out statistical outliers and ensures the adequacy and objectivity of the assessment of indicators. The interval range is calculated according to the formula (1):

$$S_i = \frac{FCP^1_{i\,max} - FCP^1_{i\,min}}{20}, \quad (1)$$

where S_i – step of the 5-th percentile for the i-th factor, an indicator of the competitive potential of the region,

$FCP^1_{i\ max}$ – the maximum value of the i-th factor, an indicator of the competitive potential of the region in the sample,

$FCP^1_{i\ min}$ – the minimum value of the i-th factor, an indicator of the competitive potential of the region in the sample.

The total assessment of an individual property of competitive potential is calculated using the formulas (2) and (3):

$$CP_j = \frac{\Sigma S_{ij} M_{ij}}{n_j}, \quad (2)$$

where CPj – assessment of the j-th property of the competitive potential of the region, points,

Mij – assessment of the i-th indicator of the j-th property of the competitive potential of the region, points,

nj – the number of indicators in the group of the j-th property.

$$ICP = \sum_1^{m_j} CP_j, \quad (3)$$

where ICP — integral indicator of the competitive potential of the region.

The properties included in the calculation of the integral indicator of the region's competitive potential are of equal importance.

The use of correlation as a means of determining the importance of competitive potential for the region's socio-economic development required the application of the same approach to the formation of the indicator of the socio-economic development of the region. The method for determining the integral indicator of the region's socio-economic development is based on the same principles as the method for determining the integral indicator of the competitive potential of the region.

The Federal State Statistics Service provides such indicators of the socio-economic development of regions as the area of the territory; population size; the average annual number of employees; average per capita money monthly income; consumer spending on average per capita; average monthly nominal accrued wages of employees of organizations; gross regional product; investments in fixed assets; fixed

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assets in the economy (at full cost at the end of the year); the volume of shipped goods of own production, works and services performed on their own; agricultural products; commissioning of residential buildings; retail trade turnover; balanced financial result of organizations.

The territory area is excluded from the presented indicators, as this indicator cannot be controlled by regional authorities and does not directly affect the socio-economic development of the region. In addition, this indicator is not dynamic and will only smooth out the general curve of the dynamics of the region's socio-economic development. The population size in the proposed methodology is considered in dynamics using the indicator of annual population growth. The absolute indicator of the average annual number of employed also does not reflect the region's socio-economic development. In this regard, in the developed methodology to ensure the comparability of data for regions with different population sizes, it is proposed to use the share of employed in the region's total population. Since the average per capita monthly monetary incomes autocorrelate simultaneously with the average monthly nominal accrued wages of employees of organizations and with the number of employees this indicator was not taken into account when constructing an integral indicator of socio-economic development. Consumer spending in absolute terms also cannot be used as an indicator that ensures the comparability of regions in terms of social and economic development. Therefore, it is recommended to use an indicator that expresses the ratio of consumer spending to the average per capita monetary monthly income of the population. This indicator indicates the share of funds set aside by the population. A high share of funds on deposits indicates both a high level of economic development and the region's social stability. The volume of agricultural production autocorrelates with the volume of shipped goods of own production, therefore, it is proposed not to use this indicator in calculating the integral indicator of the socio-economic development of the region. The rest of the indicators are taken into account when calculating the integral indicator of the region's socio-economic development. The method for calculating the integral indicator of the socio-economic development of the region is similar to the method for calculating the integral indicator of the competitive potential of the region (formula 4):

$$R_i = \sum_l^i P_{ij}, \quad (4)$$

where Ri - indicator of socio-economic development of the i-th region in the reporting year,

Pi – score of the i-th region by the j-th indicator

The calculation used a score from 1 to 20 in accordance with the breakdown of each indicator into the 5-th percentile. In this case, 1 is also the lowest indicator, 20 is the highest indicator and 10 corresponds to the median for all regions of Russia.

The study calculated integral indicators of competitive potential and socio-economic development in all Russia regions for the period from 2013 to 2018. The results of these calculations formed the basis for the correlation and regression analysis and the construction of econometric models, which made it possible to establish the significance of the regions' competitive potential for their socio-economic development.

6. Findings

Three groups of regions present the results of calculating the integral indicator of competitive potential. The first group form regions with the highest level of potential (10 regions of this group with

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the highest competitive potential). The second and most numerous groups form regions with an average level of competitive potential (a sample of 10 regions with central values of the indicator level is shown in Table 1). The third group form regions with a low level of competitive potential (10 regions with the lowest potential level are also presented in Table 1).

Table 1. Integral indicator of the competitive potential of Russian regions, 2018

Region	Overall indicator	Group indicator of competitive potential by attribute			
		«Economic growth»	«Innovative development»	«Quality of life»	«Human development»
Group 1. Regions with a high level of competitive potential (10 regions with the highest level)					
Moscow city	243	73	75	46	49
Saint-Petersburg city	164	47	25	51	41
Tyumen region	159	49	23	41	46
Moscow region	158	46	25	46	41
Sverdlovsk region	140	36	9	50	45
Republic of Bashkortostan	129	34	4	50	41
Republic of Tatarstan	125	37	9	39	40
Voronezh region	124	34	24	33	33
Nizhny Novgorod region	123	35	19	33	36
Krasnodar region	122	37	10	36	39
Group 2. Regions with a median level of competitive potential (10 regions with the median level)					
Kaluga region	98	35	4	30	29
Altai region	97	33	4	29	31

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Tambov region	97	27	9	31	30
Chukotka Autonomous district	97	41	3	23	30
Arkhangelsk region	96	29	4	28	35
Novgorod region	96	32	7	25	32
Orenburg region	96	30	4	29	33
Tver region	96	32	5	29	30
Kirov region	95	31	4	27	33
Kostroma region	95	32	9	26	28
Group 3. Regions with a low level of competitive potential (10 regions with the lowest level)					
Republic of Crimea	84	31	4	22	27
Chechen Republic	84	23	3	20	38
Amur region	83	31	4	22	26
Kabardino-Balkarian Republic	81	23	4	18	36
Republic of Adygeya	81	34	4	20	23
Tuva Republic	80	25	5	20	30
Republic of Kalmykia	79	26	4	19	30
Jewish Autonomous region	76	29	4	15	28
The Republic of Ingushetia	75	17	4	17	37
Karachayevo-Circassian Republic	74	27	4	14	29

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Based on the correlation-regression analysis, data on the coefficients of pair correlation between the general integral indicator of the region's competitive potential and its four factor components and the region's socio-economic development were obtained. In the calculations, a lag of 1 year was adopted between the integral indicators of the region's competitive potential and socio-economic development. This is explained by the nature of the potential, its ability to influence the dynamics of a particular indicator not at the current moment, but in the future, after the potential is realized and its transformation into real competitive advantages of the region. The obtained values of the correlation coefficients allow us to conclude that all factors that determine the level of the region's competitive potential are significant enough for the formation of sustainable socio-economic development.

Thus, the paired correlation coefficients between the indicators of the competitive potential of the region and the integral indicator of the socio-economic development of the region have the following meanings:

- the coefficient of pair correlation between the integral indicator of competitive potential and the integral indicator of the socio-economic development of the region - 0.81,

- the coefficient of pair correlation between the group indicator for the factor of economic growth and the integral indicator of the socio-economic development of the region - 0.97,

- the coefficient of pairwise correlation between the group indicator for the factor of innovative development and the integral indicator of the socio-economic development of the region - 0.83,

- the coefficient of pair correlation between the group indicator for the quality of life factor and the integral indicator of the socio-economic development of the region - 0.72,

- the coefficient of pair correlation between the group indicator for the factor of human development and the integral indicator of the socio-economic development of the region - 0.94.

Figure 1 shows a correlogram of the integral indicator of competitive potential and the indicator of socio-economic development of the region.

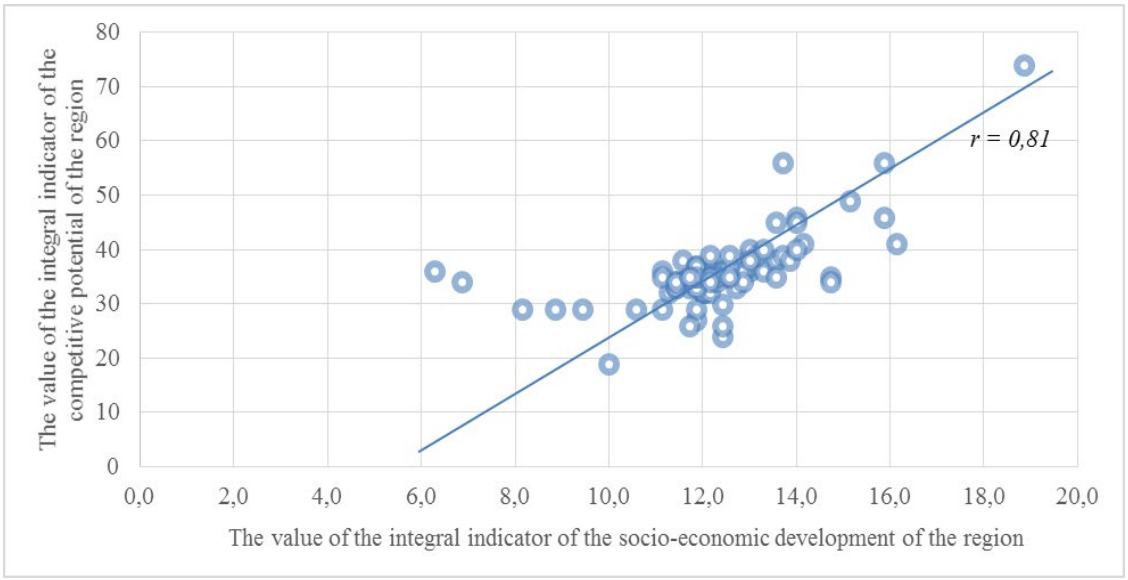

Figure 1. Correlation coefficient between the integral indicator of the socio-economic development of the region and the integral indicator of the region's competitive potential

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The high level of the pairwise correlation coefficient between the integral indicators of the socio-economic development of regions and their competitive potential indicates their close relationship which allows us to conclude that the competitive potential of a region is an important factor in its socio-economic development.

Figure 2 shows the dynamics of the average integral indicator of socio-economic development and competitive potential in the regions of the Russian Federation for the period 2013-2018.

The significant growth of the integral indicator of competitive potential observed in the period from 2013 to 2014 is replaced by a drop in its level from 2014 to 2015. The level of this indicator during the period from 2015 to 2016 remained practically unchanged but in 2017 there was a slight increase which stopped in 2018.

With a step of one year, the trend of change in the average level of the integral indicator of socio-economic development in the regions of Russia repeats the trend of change in the integral indicator of competitive potential. The revealed analogy of the tendencies of dynamic changes in the studied indicators confirms the conclusion about the high tightness of the connection between the processes of accumulation of the region's competitive potential and its socio-economic development. This definitely indicates the importance of choosing those tools for managing the growth of the socio-economic development of the region which are based on the formation of high competitive potential. The directions for choosing such tools within the framework of individual factors of the region's competitive potential are justified by identifying those particular indicators the closeness of which is the most significant. Ensuring the growth of the level of such indicators of competitive potential through economic, organizational and other instruments of regional management will allow obtaining the most significant effect of increasing the level of socio-economic development of the region. The calculations carried out in the course of the study showed that for the factor «Economic growth» such an indicator is the structure of the economy of the subjects adequate to the market economy (r = 0.97), for the factor «Human development» - the level of education and professional training of the population (r = 0.97), for the factor «Innovative development» - the production of innovative products and technologies (r = 0.93), for the factor «Quality of life» - the level of monetary income of the population (r = 0.89).

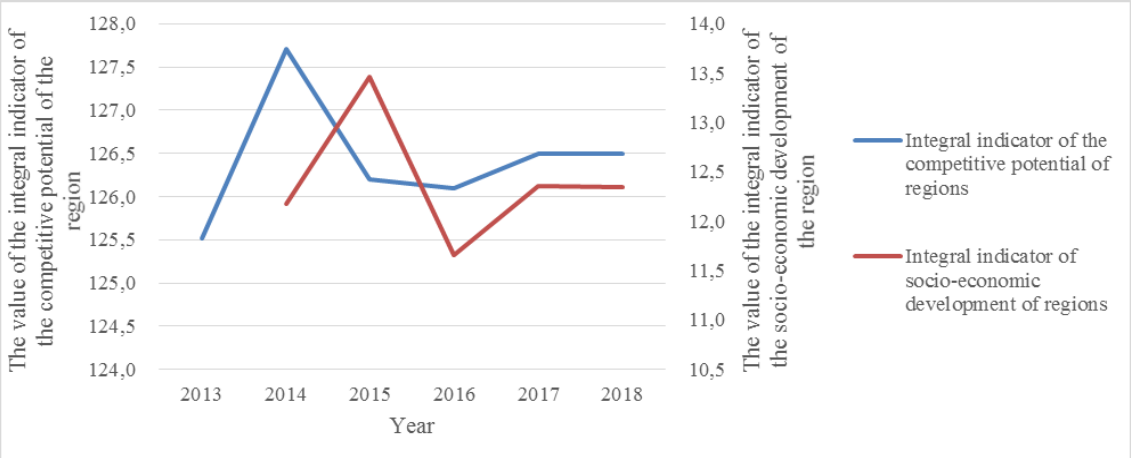

Figure 2. Dynamics of the average integral indicators of socio-economic development and competitive potential by regions of Russia

7. Conclusion

Based on the established relationship, it becomes possible to choose the most effective tools for influencing the dynamics of the socio-economic development of the region based on managing its competitive potential. In current economic conditions, the management capabilities of regional authorities are growing, but at the same time, it is becoming more and more challenging to ensure a balance of sustainable economic growth. In such conditions, the use of the proposed new instruments in forming a regional policy of socio-economic development and ensuring the competitiveness of the region becomes more and more relevant.

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