

# Assessment of the background for interregional economic cooperation

## Instrumentos de medición de las premisas de la cooperación económica interregional

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#### ABSTRACT:

The purpose of this article is to develop the tools for assessment of the background for interregional economic cooperation. Analysis of the effective interregional intractability has been carried out by the authors of the article by means of economic and statistical method, on materials of the Siberian Federal District, which includes 12 regions. For the comparative characteristics of the regions the quantified, recognized by national statistics specific indicator have been chosen: population concentration index per 1 sq. km. of territory, gross regional product per capita, number of students, receiving higher education, per 10,000 persons of the population, the average per capita income. Based on the analysis of specified indicators, the authors have developed the structure of regional integrative relations, which determines the qualitative characteristics and quantitative indicators of the interregional economic cooperation areas. The spheres, outlined by the authors, make it possible to ensure a unified approach to the organization of interregional interplay processes. Quantitative indicators can be obtained from official statistical data, as well as official websites of establishments, organizations, regional and interregional structures, providing corresponding services, or calculated with their use. Proposed by the authors qualitative characteristics and quantitative indicators secure a

#### RESUMEN:

El objetivo de este artículo es la elaboración de las premisas de la cooperación. El análisis de la capacidad efectiva de la cooperación interregional se basa por los autores del artículo utilizando las técnicas de gestión económico-estadístico, en los materiales del Distrito Federal de Siberia que tiene 12 regiones. Para las características comparativas de las regiones se han seleccionado los indicadores relativos, cuantitativamente medibles, contabilizados por los datos estadísticos nacionales: la densidad de población a 1 de kilómetros cuadrados de territorio, el producto regional bruto (PIB) per cápita, el número de estudiantes qui obtienen la educación superior por cada 10.000 habitantes de la población, los ingresos monetarios de la población per cápita. Sobre la base del análisis de estos indicadores, los autores han elaborado la estructura de los vínculos integradores de las regiones que define las características cualitativas y los indicadores cuantitativos de las esferas interregional de cooperación económica. Las esferas determinadas por los autores permiten garantizar un enfoque integral para la organización de los procesos de la interacción interregional. Los indicadores cuantitativos pueden obtenerse de las estadísticas oficiales, así como los sitios web oficiales de las instituciones, organizaciones regionales y las estructuras interregionales de que prestan servicios en ese ambito, o son calculados con estas tazas. Los

systematic approach to the study of interregional economic cooperation processes, which allows us to regard them as tools, used for the creation and effective executive decision-making at the regional and national levels.

**Keywords:** region, interregional economic cooperation, level of socio-economic development of the region

resultados cualitativos y indicadores cuantitativos propuestas por los autores garantizan un enfoque sistémico al estudio de los procesos interregional de cooperación económica, que permite considerar como los instrumentos utilizadas para el desarrollo y de toma de decisiones de gestión a nivel regional y nacional.

**Palabras clave:** la región, la cooperación económica interregional, el nivel de desarrollo socioeconómico de la región

## 1. Introduction

Nowadays, one of the key drivers of regional development is the expansion of interregional economic cooperation, as the lack of regional economies coherence leads to inefficient use of production factors (Zaitseva et al., 2016). The economic development of the Russian Federation in toto and its regions largely depends on the quality of the trade relations, not only external but also interregional, the intensity and distribution of marketable trade flows (Sadyrtdinov & Rodnyansky, 2015). According to expert appraisals, production and technological, financial, labor, intellectual and commodity flows are weakly oriented on interregional economic interaction. Territorial localization of resources serves as a constraint of interregional economic coordination, adversely impacting the elaboration and implementation of joint large-scale investment projects and programs. One of the most relevant tools, used by European institutions for the advance of interregional cooperation is the formation of the clusters C.B. Păuna (2015), According to G. Sarafopoulos & P. Ioannidis (2015) interaction between the two local governmental units determines crucially the cooperative implementation of an investment project. Thus, interregional economic interaction should serve as an instrument for effective integrative management of regional socio-economic systems, the basis for sustainable and steady development of the national economy.

## 2. Methodological Framework

The works of domestic and foreign authors in the field of regional economy, spatial development, and interregional cooperation have served as the methodological framework for the present research. For the analysis of the economy of the Siberian Federal District of the Russian Federation areas, the authors of the paper have utilized methods of Economic and Statistical Analysis. The official statistical data has served as the initial information for the realization of the analysis (Rosstat, 2016, 2017). The authors of the researched have analyzed the possibilities of effective interregional interplay on the materials of the Siberian Federal District, which includes 12 regions (subjects of the Russian Federation) that differs essentially in geographical location, natural climatic conditions and basic characteristics of socio-economic development. For the comparative characteristics of the regions the quantified, recognized by national statistics specific indicator have been chosen: population concentration index per 1 sq. km. of territory, gross regional product per capita, number of students, receiving higher education, per 10,000 persons of the population, the average per capita income. The experts believe that these indicators provide a systematic approach to the problem of the regions' differentiation in the context of interregional economic cooperation.

Experience of the use of these methods has enabled to identify priority activities of the regions of the Siberian Federal District of the Russian Federation and to justify the practicability and necessity of their economic interaction.

## 3. Results

During the first stage of the investigation, the authors have compared the socio-economic development of the subjects of the Siberian Federal District. The values of the indicators in 2016 are presented in Table 1.

Comparative characteristics of the regions of the Russian Federation (Siberian Federal District, 2016).

Región	Region population Density per 1 sq. km. per.	Gross regional product per capita, rub.	The Number of students enrolled in tertiary education per 10 thousand population, per.	Average per capita monetary incomes of the population per month, rub.
Siberian federal district	<b>3,8</b>	<b>349512,9</b>	<b>298</b>	<b>23720</b>
Republic of Altai	2,3	194825,4	141	17827
Republic of Buryatia	2,8	208239,8	292	25165
Republic of Tuva	1,9	150258,3	137	14107
Republic Of Khakassia	8,7	320095,8	159	21191
Altai Krai	14,1	206712,2	220	21485
Zabaikalsky Krai	2,5	229303,6	227	22846
Krasnoyarsk Krai	1,2	565272,3	282	28030
The Irkutsk Region	3,1	419885,1	298	22268
The Kemerovo Region	28,4	309637,3	194	21256
The Novosibirsk Region	15,5	356086,5	380	25401
The Omsk Region	14	311973,3	421	25245
The Tomsk Region	3,4	440395,6	554	24325

*sources: Regions of Russia. Social and economic indicators (2017)*

Conclusions, concerning the degree of differentiation of regions have been formulated by the authors on the basis of the results of calculation the variation coefficient, which allows to evaluate the abnormal results of corresponding indicator in the region from the value of the similar index in the Siberian Federal District as a whole (formulas 1,2).

$$\sigma = \sqrt{\frac{\sum(y_i - \bar{y})^2}{n}} \quad (1)$$

Where:

$\Sigma$  - mean-square deviation of the value of measurements in the region (the subject of the Russian Federation) from the average according to the federal district,

$y_i$  - indicator values in the region (subject of the Russian Federation),

$\bar{y}$  - the average ratio in the federal district,

$n$  - number of regions (constituent territories of the Russian Federation) that are members of the federal district.

$$v = \frac{\sigma}{\bar{y}} \quad (2)$$

Where:

$v$  - the coefficient of variation of the index value in the region (territorial entity of the Russian Federation) from the average according to the federal district,

$\bar{y}$  - the mean value in the federal district.

The characteristics of the degree of divergence of the regions' parameters from the average in the Siberian Federal District, according to the data of Table 1, lead to a following conclusion:

Population concentration index per territory unit in the Siberian Federal District varies from 1.2 pers. on 1 square. km (Krasnoyarsk Krai) to 28.4 people. on 1 square. km (Kemerovo Region). Calculated by the authors, mean square deviation - 9.09 pers. on 1 square. km and the coefficient of variation 2.39 attests to the extremely poor distribution of the population across the district's territory. It may be noted, that uneven population concentration is also observed within individual regions. For example, in the Krasnoyarsk Territory the northern part of the region is less inhabited, while the southern part is more populated. This creates an additional manpower needs, higher payments for transport facilities in the region.

Gross regional product per capita is the major economic indicator, the ratio of which in the Siberian Federal District in 2016 varies from 150,258.3 rubles. (Republic of Tyva) to 565272.3 rubles. (Krasnoyarsk Krai). The indicator of the standard deviation is 123187.84 rubles; the coefficient of variation is 0.35. Higher index, reflecting the results of economic activity, taking place in the regions where extraction of mineral resources is well developed (the Krasnoyarsk Territory, Tomsk and Irkutsk regions).

The number of students, learning through the programs of higher education per 10 000 pers. per population serves as an indicator, reflecting the level of the innovative capacity of the region. Its index in the Siberian Federal District ranges from 137 pers. (The Republic of Tyva) to 554 people. (Tomsk Region). The figure of mean square deviation is 122 pers, the coefficient of variation is 0.41. The field of higher education ensures the attractiveness of the territory for the young economically active population in the regions, leading by value of the present indicator. (Tomsk, Omsk, Novosibirsk regions).

Average per capita income of the population reflects the level of prosperity, the quality of living of the local residents'. Their value in the Siberian Federal District varies from 14,107 rubles. (Republic of Tuva) to 28030 rubles. (Krasnoyarsk Krai). The factor of the standard deviation is 3804 rubles; the coefficient of variation is 0.16. A sufficiently low ratio of variation of this indicator witnesses to the results of the state policy, aimed at regulation of the household incomes, the key measures of which are to support needy layers of the population.

The next stage of the research is the analysis of the specific structure of the gross regional product and the pattern of shipped products by the regions of the Siberian Federal District. On the grounds of official statistics, the authors have determined the dominant activities in each region (Table 2). Activities - aggregated data. The specialization of the region on the production of certain output is possible within the framework of one kind of activity. According to the data on the shipment of products in the Table 2, it is possible to see the percent of goods and services, most crucial for each region of the Siberian Federal District.

**Table 2**

Basic elements in the structure of the gross regional product and shipped output of the Russian Federation regions (Siberian Federal District), 2016.

<b>Region</b>	The main branches of activities in the structure of the gross regional product	The basic goods and services in the structure of shipped output
<b>Republic of Altai</b>	<p>Agricultural sector, hunting and forestry (17%).</p> <p>Building and construction work (16%).</p> <p>Public administration and defense; compulsory social benefits (15.8%).</p>	<p>Production of food and tobacco (43.2%).</p> <p>Cellulose and paper industry; publishing and printing (42.1%).</p>
<b>Republic of Buryatia</b>	<p>Manufacturing industries (17.6%).</p> <p>Wholesale and retail trade, repair of motor vehicles (14%).</p> <p>Transport and connection (13.6%).</p>	<p>Manufacture of machinery, vehicles and equipment (74.8%).</p>
<b>Republic of Tuva</b>	<p>Public administration and military security; compulsory social security (22.4%).</p> <p>Education (12.9 %).</p> <p>Health care (12.7%).</p>	<p>Manufacture of food products and tobacco (37,8%).</p> <p>Metallurgical production and production of finished metal products (22.4%).</p>
<b>Republic Of Khakassia</b>	<p>Manufacturing industries (15.4 %t).</p> <p>Wholesale and retail trade, repair of motor vehicles (14.7%).</p> <p>Mining (12.9%t).</p>	<p>Metallurgical production and manufacture of finished metal products (75.4%).</p>
<b>Altai Region</b>	<p>Manufacturing industries (18.3%).</p> <p>Agriculture, hunting and forestry (17.3%).</p> <p>Wholesale and retail trade, repair of motor vehicles (15.7%).</p>	<p>Manufacture of food products and tobacco (43.5%t).</p> <p>Production of coke and petroleum products, chemical production, production of rubber and plastic products (26.7%).</p>
<b>Zabaikalsky Region</b>	<p>Transport and communications (21.8%).</p> <p>Public administration and military security; compulsory social security (12.1 %t).</p> <p>Wholesale and retail trade, repair of motor vehicles (12.1%).</p>	<p>Other types of manufacturing (41.6 %).</p> <p>Manufacture of food products and tobacco (22.9 %)</p>
<b>Krasnoyarsk Region</b>	<p>Manufacturing industries (33.5 %t).</p>	<p>Metallurgical production and manufacture of finished metal products (72.3%).</p>

	Mining operations (17.5%). Wholesale and retail trade, repair of motor vehicles (7.2%).	
<b>The Irkutsk Region</b>	Mining operations (24.3%). Manufacturing industries (13.4%). Transport and connection (12.7%).	Metallurgical production and manufacture of finished metal products (20.6%). Production of coke and petroleum products, chemical production, production of rubber and plastic products (20.4%). Manufacture of machinery, vehicles and equipment (20.4%).
<b>The Kemerovo Region</b>	Mining operations (25.6%). Manufacturing industries (17.4%). Wholesale and retail trade, repair of vehicles (9.4%).	Metallurgical production and production of ready-made metal products (41.0%). Production of carbonite and oil products, chemical production, output of rubber and plastic products (33.6%).
<b>The Novosibirsk Region</b>	Real estate operations (21.5%). Wholesale and retail trade, repair of vehicles (18.5%). Transport and connection (15%).	Production of food and tobacco (31,0%).
<b>The Omsk Region</b>	Manufacturing industries (36.1%). Wholesale and retail trade, repair of vehicles (12.7%). Agricultural sector, hunting and forestry (9.6%).	Production of carbonite and oil products, chemical production, output of rubber and plastic products (75,7%).
<b>The Tomsk Region</b>	Mining operations (29,5%). Real estate operations (11,3%). Transport and connection (10,9%).	Production of carbonite and oil products, chemical production, output of rubber and plastic products (36,3%).

*Source: Compiled by the authors on the basis of the analysis of official statistics - Regions of Russia. Socio-economic indicators (2017).*

The Siberian Federal District includes regions with a pronounced specialization on one certain production line (specifically, fall into extractive industries) and regions' specializing in the production of several different types of products. In the opinion of the authors, the specific variety of the structure of the region's economy is one of the drivers for interregional economic interaction.

*Interregional economic cooperation*, from our point of view, is the process of exchange, transfer, sharing resources (material, human, financial, information) and the results of scientific, production, innovative activities of the regions with a view to achieve synergetic effect from integrative ties and national economy efficiency. The absence of market agglomeration essentially forms the circularity of the regions' economies. Autonomy of regions, orientation to self-sufficiency leads to misallocation of resources, poor performance

of production and economy as a whole.

In the regions of the Siberian Federal District, the diversity of natural and climatic and economic conditions predetermines the possibilities for effective economic interplay within the regions that are a part of it. Regions' industry specialization on certain types of activities (Table 2) provides facilities and opportunities for cooperation in the process complicated production, effective commodity barter of final products, neutralizes the impact of factors, restricting the regional development.

The structure of integration links of the regions, represented by the authors, determines the qualitative characteristics and quantitative indicators of the areas of interregional economic interaction (Table 3).

**Table 3**  
Qualitative characteristics and quantitative indexes  
of the interregional economic interaction spheres

Area of interregional economic cooperation	Qualitative characteristic	quantitative index
Public administration	Interaction of regions organs of government	Number of agreements and programs of cooperation between regional government bodies
Production	Interaction of manufacturing companies of the real sector of economy of the regions	Number of created integrated structure, strategic partnership
Innovation	Interaction of the regional innovation systems	Number of investment and innovative agreements between authorities and business structures
Science	Interaction of scientific institutions	Number of joint projects and programs
Study	Interaction of educational establishments	Number of agreements on cooperation, network educational programs
Business	Interaction of business entities in the markets of goods and services	totals of interregional flow of goods and services
Marketing	information exchange in order to impact the population on forming a positive image	Number of info messages

*Source: created by the authors*

The areas, outlined by the authors permit to provide a multifaceted approach to the interregional cooperation process structuring. Quantitative relatives can be obtained from official statistical data, as well as official websites of establishments, agencies, regional and interregional structures, furnishing the corresponding services, or calculated according to them. For the efficiency determination of interregional economic interaction, it will be required to update the factual information with expert estimation. The qualitative characteristics and quantitative indexes, proposed by the authors, guarantee a systematic approach to the study of the interregional economic interaction processes, which makes it possible to consider them as tools, used for developing and making effective managerial decisions at the regional and national levels.

## 4. Discussion

In the modern scientific literature, much attention has been paid to the issues of interregional interaction. Development problems of regional socio-economic systems, interregional cooperation have appeared as the subject of discussion in the works of Y.V. Dubrovskaya (2016), N.Kh. Tokareva & V.O. Marzoeva (2012), Y.S. Polozhentseva (2013), O.A. Bakumenko (2016), earlier works of the authors of the present article (Butakova, Sokolova & Bezmaternykh, 2017; Butakova, Mamchenko & Sokolova, 2006; Rodionova, 2015; Lubnina et al., 2016; Petrovskaya et al., 2016; Oreshina, Povorina & Vinogradova, 2017; Chizhankova et al., 2017; Kvon et al., 2017).

Spatial coherence of the regions, cluster forms of interaction have found expression in the works of N.D. Rodionova (2015), A.G. Polyakova & I.S. Simarova (2014). In foreign studies, the means of realization of interregional economic interplay have been reviewed in the works of E.M. Bergman & E.J. Feser (1999), Feser (1998), G. Lindqvist, C. Ketels & S.O. Orjan (2013).

Presuppositions, conditions, factors of effective economic interaction of the regions have been investigated by such authors as S.J. Rey (2001), D.P. Woodward (2012), A.Ya., Trotskovskiy & Y.Y. Nazemtseva (2014), I.N. Sannikova, T.A. Rudakova & O.V. Kozhevina (2015).

The report to the analysis of the signature achievements of the scientific discussion in the regional economy theory, spatial development on the problems of interregional cooperation has allowed to ground the author's position on the need and practicality of deepening of processes of interregional economic interaction.

As a result of theoretical and practical researches on the issue of interregional interaction, the authors came to the conclusion about the necessity to specify the nomenclature. The authors have formulated the concept of "interregional economic cooperation", classified qualitative characteristics and quantitative indicators of the interregional economic interaction scope of engagement. Methodological approach to assessment of the specific structure of the gross regional product in the context of interregional interaction has been evaluated by the authors on the materials of the Siberian Federal District. The results of the testing enable to consider the focus of the regions on interregional economic interaction as beneficial.

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## 5. Conclusions

The authors proved the role of interregional economic interaction as a driver of social and economic development of the Siberian Federal District subjects, which manifests itself in enhancement of efficiency regional resources utilization and securing the competitiveness of the national economy.

The authors have proposed their own definition of the concept "interregional economic interaction», taking into account the goal and the main integration processes. Elaborated instrument for assessment of the background for interregional economic cooperation can be used to conduct analysis and management of interregional economic interaction processes between the subjects of the Russian Federation.

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## Bibliographic references

Bakumenko, O. A. (2016). Interregional cooperation as a factor of regional socio-economic development (on the example of the north west federal district) *Herald of Pskov State University. Series "Economics, Law and Management"*, 4, 32-47.

Bergman, E. M. & Feser, E. J. (1999). *Industrial and Regional Cluster: Concepts and Comparative Applications*. URL: <http://www.rri.wv.edu/WebBook/Bergman-Feser/contents.htm> (date of access: 12.12.2017).

Butakova, M. M., Mamchenko, O. P. & Sokolova, O. N. (2006). Economics and Industry of the Region: An Innovative Aspect of Development. *Fundamental Research*, 6, 68-69.

- Butakova, M. M., Sokolova, O. N. & Bezmaternykh, N. S. (2017). The level analysis of structural changes in the economy. *Economy. Business. Banks*, 3(20), 54-68.
- Chizhankova, I. V., Novikova, N. V., Povorina, E. V., Duplij, E. V. & Androsova, I.V. (2017). Clusters in the system of interindustry regional integration. *International Journal of Applied Business and Economic Research*, 13, 23-30
- Dubrovskaya, Y. V. (2016). Interregional cooperation as a tool for managing differentiation of regional socio-economic systems: the cluster approach. *Perm National University herald. Series Economics*, 4(31), 117-126.
- Feser, E.J. (1998). Old and new theories of industry clusters. Clusters and Regional Specialisation. *On Geography, Technology, and Networks*, 8, 18-40.
- Kvon, G.M., Lushchik, I.V., Karpenko, M.A., Zaitseva, N.A., Kulkov, A.A., Galushkin, A.A., Yakupova, N.M. (2017). Regional investment policy: Analysis and assessment of the investment environment state. *Eurasian Journal of Analytical Chemistry*, 12(5), 835-853.
- Lindqvist, G., Ketels, C. & Orjan, S. O. (2013). The Cluster Initiative Greenbook 2.0 Stockholm: Ivory Tower Publishers. URL: <http://cluster.hse.ru/doc/getpdf.pdf>
- Lubnina, A. A., Shinkevich, M. V., Ashmarina, S. I., Zaitseva, N. A., Sayfutdinova, G. B. & Ishmuradova, I. I. (2016). Resource saving innovative forms of the industrial enterprises. *International Journal of Economics and Financial Issues*, 6(2), 479-483.
- Oreshina, O., Povorina, E. V. & Vinogradova, M. V. (2017). Adaptation of Macro-Economic Models to Solving the Problem of Countries Differentiation in Global Economy. In: Popkova E., Sukhova V., Rogachev A., Tyurina Y., Boris O., Parakhina V. (Eds). *Integration and Clustering for Sustainable Economic Growth. Contributions to Economics*. Cham: Springer.
- Păuna, C. B. (2015). Cross-sectoral Cooperation vs. Cluster Development at European Level. *Procedia Economics and Finance*, 22, 175-183
- Petrovskaya, M. V., Larionova, A. A., Zaitseva, N. A., Bondarchuk, N. V. & Grigorieva, E. M. (2016). Methodical approaches to determine the level of risk associated with the formation of the capital structure in conditions of unsteady economy. *International Journal Of Environmental & Science Education*, 11(11), 4005-4014.
- Polozhentseva, Y. S. (2013). Regulation of integration processes of regional economic systems interaction on the basis of competitiveness assessment . *News of the south western state university. series: economics. sociology. Management*, 2, 44 - 48
- Polyakova, A. G. & Simarova, I. S. (2014). The conceptual model of a region development administration considering the level of spatial relatedness. *The Economy of the Region*, 2, 32-41.
- Rosstat. (2017). Regions of Russia. Socio-economic indicators. URL: [http://www.gks.ru/wps/wcm/connect/rosstat\\_main/rosstat/en/main/](http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/en/main/)
- Rosstat. (2016). Regions of Russia. The main characteristics of the subjects of the Russian Federation. URL: [http://www.gks.ru/wps/wcm/connect/rosstat\\_main/rosstat/en/main/](http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/en/main/)
- Rey, S. J. (2001). Spatial empirics for economic growth and convergence *Geographical Analysis*, 33(3), 194-214.
- Rodionova, N. D. (2015). The economic space of the region in the networking cooperation of the subjects of the regional innovation system. *Herald of the Rostov State University of Economics (RSUE)*, 1(49), 131-138.
- Sadyrtidinov, R. & Rodnyansky, D. (2015). Openness of the Regional Economy and its Dependence on Interregional and Foreign Trade: Case of the Republic of Tatarstan. *Procedia Economics and Finance*, 23, 936-941
- Sannikova, I. N., Rudakova, T. A. & Kozhevina, O. V. (2015). Risks of the real sector of economy in the context of the region's economic stability. Barnaul: Publishing house of the Altai State University.
- Sarafopoulos, G. & Ioannidis, P. (2015). Interregional Cooperation, Local Welfare and Social Capital. *Procedia Economics and Finance*, 33, 219-225

- Tokarev, N. Kh. & Marzoev, V. O. (2012). Trends and problems of interregional economic interaction. *Khetagurov North Ossetian State University herald. Social Sciences*, 2, 455-458.
- Trotskovskiy, A. Y. & Nazemtseva, U. U. (2014). Research and regulation of spatial aspects of economic development at the regional level. Barnaul: Publishing house of the Altai State University.
- Woodward, D. P. (2012). Industry Location, Economic Development Incentives, and Clusters *The Review of Regional Studies*, 42, 5-23.
- Zaitseva, N. A., Semenova, L. V., Garifullina, I. V., Larionova, A. A. & Trufanova, S. N. (2016). Transfrontier cooperation strategy development based on utilization efficiency increase of tourism and recreational territory potential. *International Electronic Journal of Mathematics Education*, 11, 2537-2546
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