



ECONOMIC ANNALS-XXI

ISSN 1728-6239 (Online)
ISSN 1728-6220 (Print)
<https://doi.org/10.21003/ea>
<http://ea21journal.world>

Volume 193 Issue (9-10)'2021

Citation information: Bondareva, Y., Vaganova, O., Vladyka, M., Kamyshanchenko, E., & Stryabkova, E. (2021). Theoretical and methodological approaches to assessing the quality of regional economic space. *Economic Annals-XXI*, 193(9-10), 152-160. doi: <https://doi.org/10.21003/ea.V193-19>



Yana Bondareva

PhD (Economics), Associate Professor of the Department of Applied Economics and Economic Security, Belgorod National Research University, 85 Pobedy Str., Belgorod, 308000, Russian Federation
Bondareva_ya@bsu.edu.ru
ORCID ID: <https://orcid.org/0000-0003-2883-9169>



Oksana Vaganova

D.Sc. (Economics), Head, Department of Innovative Economics and Finance, Belgorod National Research University, 85 Pobedy Str., Belgorod, 308000, Russian Federation
vaganova@bsu.edu.ru
ORCID ID: <https://orcid.org/0000-0001-7609-8153>



Marina Vladyka

D.Sc. (Economics), Professor of the Department of Applied Economics and Economic Security, Belgorod National Research University, 85 Pobedy Str., Belgorod, 308000, Russian Federation
vladyka@bsu.edu.ru
ORCID ID: <https://orcid.org/0000-0002-8700-7584>



Elena Kamyschanchenko

D.Sc. (Pedagogy), Head, Department of World Economy, Belgorod National Research University, 85 Pobedy Str., Belgorod, 308000, Russian Federation
kamyschanchenko_e@bsu.edu.ru
ORCID ID: <https://orcid.org/0000-0003-1414-4542>



Elena Stryabkova

D.Sc. (Economics), Head, Department of Applied Economics and Economic Security, Belgorod National Research University, 85 Pobedy Str., Belgorod, 308000, Russian Federation
stryabkova@bsu.edu.ru
ORCID ID: <https://orcid.org/0000-0002-6067-1434>

Theoretical and methodological approaches to assessing the quality of regional economic space

Abstract. Today, the problems of spatial development of territories require new thinking, as they still remain unresolved in Russia. The problems are inefficient regional economic structure, enormous internal contrasts and disparities, population decline and economic marginalisation of peripheral areas of the country, and a shrinking zone of political and economic influence on the world stage. Importantly, there is a growing threat to the integrity of the space due to the intensified internal socio-economic disparities of the country in the course of the current political and economic trends. Emerging territorial disparities, determined by the value of deviations from the average values of regional development, are the main problem of sustainable spatial development of territories. For the decision of problems of spatial-territorial development of innovation system of region it is necessary to realize estimation of quality of economic space on the basis of different indexes. These indicators can include territorial ones, used as tools to assess the innovation subsystem of the regional economy, as well as various approaches to the analysis of spatial factors considered in assessing the types of economic space in the region.

The analysis of existing approaches to the assessment of the quality of economic space has shown that to date there is no universal approach. This fact confirms the statement that the study of such category as economic space, assessing its quality is a complex and multitask process.

Keywords: Quality Assessment; Economic Space; Spatial Structure; Socio-Economic Development; Spatial Development

JEL Classifications: A14; A12; C40; I18

Acknowledgements and Funding: The authors received no direct funding for this research.

Contribution: The authors contributed equally to this work.

Data Availability Statement: The dataset is available from the authors upon request.

DOI: <https://doi.org/10.21003/ea.V193-19>

Бондарева Я. Ю.

кандидат економічних наук, доцент кафедри прикладної економіки та економічної безпеки, Білгородський національний дослідницький університет, Білгород, Російська Федерація

Ваганова О. В.

доктор економічних наук, завідувачка, кафедра інноваційної економіки та фінансів, Білгородський національний дослідницький університет, Білгород, Російська Федерація

Владика М. С.

доктор економічних наук, професор кафедри прикладної економіки та економічної безпеки, Білгородський національний дослідницький університет, Білгород, Російська Федерація

Камищанченко О. М.

доктор педагогічних наук, завідувачка, кафедра світової економіки, Білгородський національний дослідницький університет, Білгород, Російська Федерація

Стрябкова О. О.

доктор економічних наук, завідувачка, кафедра прикладної економіки та економічної безпеки, Білгородський національний дослідницький університет, Білгород, Російська Федерація

Теоретико-методологічні підходи до оцінки якості регіонального економічного простору

Анотація. Сьогодні проблеми просторового розвитку територій вимагають нового осмислення, оскільки досі залишаються невирішеними в Росії, зокрема, неефективна регіональна економічна структура, величезні внутрішні контрасти та диспропорції, скорочення населення та економічна маргіналізація периферійних районів країни, скорочення зони політичного та економічного впливу на світовій арені. Важливо, що зростає загроза цілісності простору через посилення внутрішніх соціально-економічних диспропорцій країни в ході сучасних політичних та економічних тенденцій. Територіальні диспропорції, що визначаються величиною відхилень від середніх значень регіонального розвитку, є основною проблемою сталого просторового розвитку територій. Для вирішення проблем просторово-територіального розвитку інноваційної системи регіону необхідно здійснити оцінку якості економічного простору на основі різних показників. До таких показників можна віднести територіальні, які використовуються як інструменти оцінки інноваційної підсистеми регіональної економіки, а також різні підходи до аналізу просторових факторів, які враховуються при оцінці типів економічного простору регіону.

Ключові слова: оцінка якості; економічний простір; просторова структура; соціально-економічний розвиток; просторовий розвиток.

Бондарева Я. Ю.

кандидат экономических наук, доцент кафедры прикладной экономики и экономической безопасности, Белгородский национальный исследовательский университет, Белгород, Российская Федерация

Ваганова О. В.

доктор экономических наук, заведующая, кафедра инновационной экономики и финансов, Белгородский национальный исследовательский университет, Белгород, Российская Федерация

Владыка М. В.

доктор экономических наук, профессор кафедры прикладной экономики и экономической безопасности, Белгородский национальный исследовательский университет, Белгород, Российская Федерация

Камыщанченко Е. Н.

доктор педагогических наук, заведующая, кафедра мировой экономики, Белгородский национальный исследовательский университет, Белгород, Российская Федерация

Стрябкова Е. А.

доктор экономических наук, заведующая, кафедра прикладной экономики и экономической безопасности, Белгородский национальный исследовательский университет, Белгород, Российская Федерация

Теоретико-методологические подходы к оценке качества регионального экономического пространства

Аннотация. Сегодня проблемы пространственного развития территорий требуют нового осмысления, так как до сих пор остаются нерешенными в России. Проблемы заключаются в неэффективной региональной экономической структуре, огромных внутренних контрастах и диспропорциях, убыли населения и экономической маргинализации периферийных районов страны, сужении зоны политического и экономического влияния на мировой арене. Важно отметить, что нарастает угроза целостности пространства в связи с усилением внутренних социально-экономических диспропорций страны в русле современных политических и экономических тенденций. Возникающие территориальные диспропорции, определяемые величиной отклонений от средних значений регионального развития, являются основной проблемой устойчивого пространственного развития территорий. Для решения задач пространственно-территориального развития инновационной

системы региона необходимо осуществлять оценку качества экономического пространства на основе различных показателей. К таким показателям можно отнести территориальные, используемые в качестве инструментов оценки инновационной подсистемы региональной экономики, а также различные подходы к анализу пространственных факторов, учитываемых при оценке видов экономического пространства региона.

Ключевые слова: оценка качества; экономическое пространство; пространственная структура; социально-экономическое развитие; пространственное развитие.

1. Introduction

Despite the diversity of existing conceptual-theoretical and practical approaches to the study of the issues developed in this thesis, it should be noted that the studies cited do not, as a rule, substantiate and specify the impact of the quality parameters and homogeneity of economic space on the degree of development of interaction between subjects of regional innovation systems (Kirsanova et al., 2020).

At the same time economic space is a defining environment of realization of various forms of interaction and connections of all subjects of the regional economy, and in the innovative sphere its properties even more influence dynamics and costs of realized transactions. The lack of a holistic, systemic representation and a unified theoretical and methodological approach to the study of various forms of network interaction of economic subjects of the regional innovation system. The problems of forming the unified economic space, the evaluation of the quality of the regional economic space are considered in the fundamental works of well-known domestic and foreign scientists: Cowan & Jonard (2004), Kroll (2015), Shibusawa (2000), Vardomsky (2006), and Granberg (2011).

2. Materials and Methods

The methods of data classification and systematization, construction of composite indicators, synthesis of actual and theoretical data, material, tabular and graphical methods of visualization were used as research tools. The analysis of existing approaches to assessing the quality of economic space was carried out and two directions were identified: the construction of systems of indicators for assessing the quality of economic space of a region using the system-structural approach, and the construction of the integral index reflecting the level of quality of economic space of the region, the use of elasticity coefficient for detailed study of the specified problems.

3. Results and Discussion

The current approaches to assessing the quality of economic space in a region can be grouped into two areas (Figure 1).

On the basis of the analysis of the works devoted to the issue of assessing the quality of economic space of a region the studies considered within the framework of the system-structural approach, typical for the representatives of the regional economy, should be referred to the first direction. Within the framework of this approach the quality of economic space can be considered as one of the territorial indicators (Figure 2).

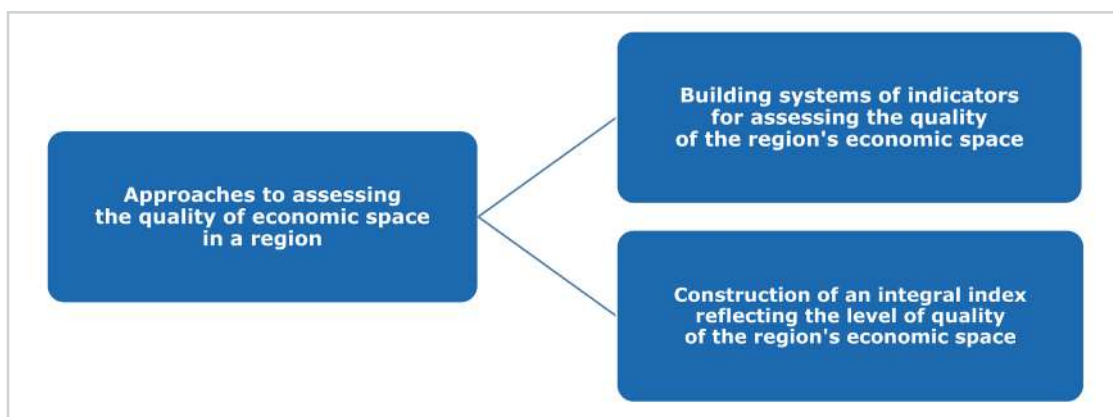


Figure 1:
Directions for assessing the quality of economic space of a region

Source: Grouped by the authors

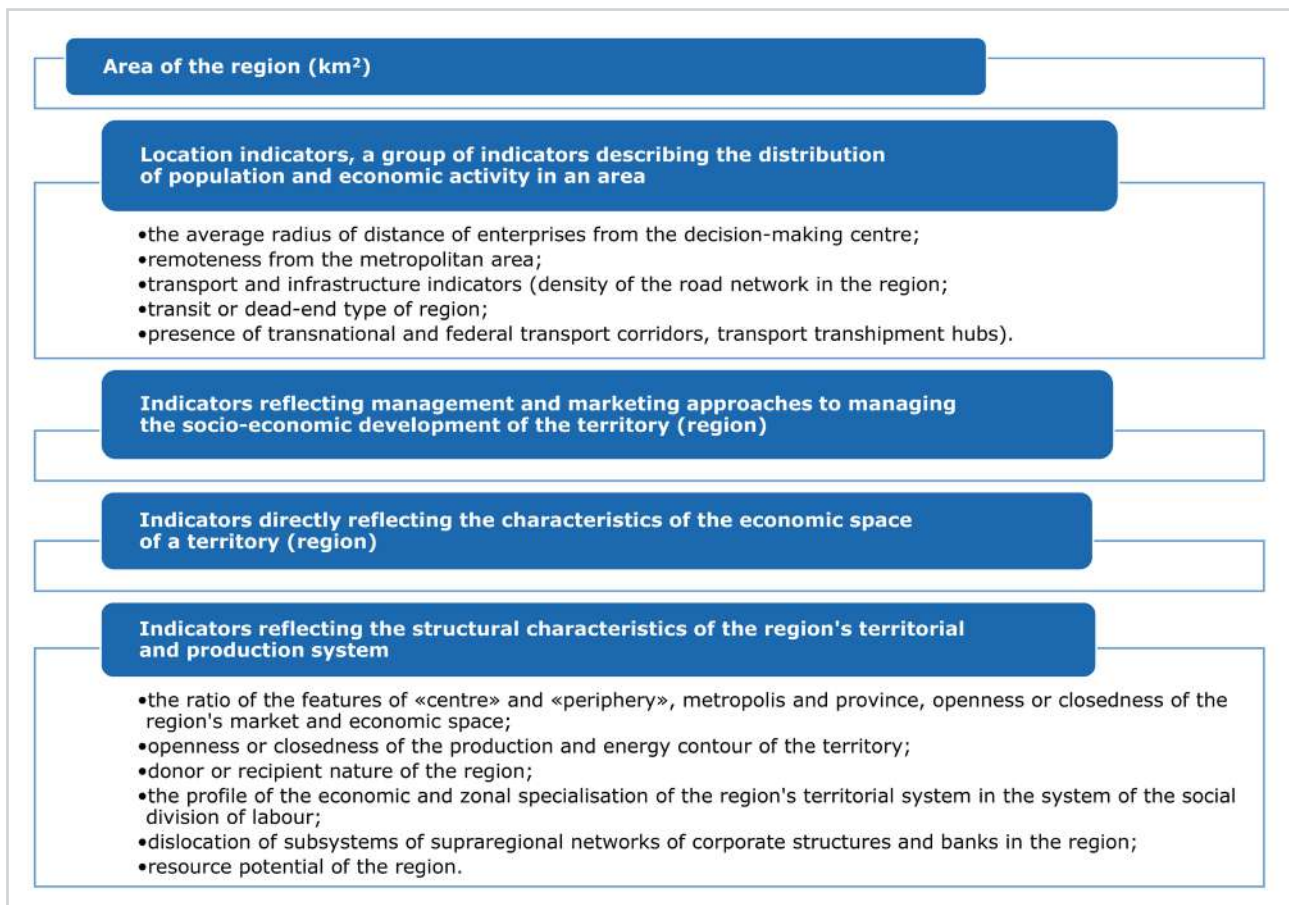


Figure 2:
Territorial indicators

Source: Compiled by the authors based on existing research approaches

When estimating the quality of the region's economic space, it is necessary to determine the type of spatial structure the territory in question belongs to. As of today, the territory of the Russian Federation can be divided into several types of spatial structure (Figure 3).

The study of spatial structures is necessary for resource-oriented regions, because in their territory there are processes of imbalance in the development of the center and periphery, entailing problems and inequalities in economic development. The dependence of the periphery on the center arises, which in turn intensifies the problems and does not allow for quick solutions.

It is necessary to consider methodologies that allow us to systematize the factors that have the greatest impact on the quality of economic space. Thus, the methodology developed by M. N. Chuvashova (2014) suggests that the quality of economic space of a resource-oriented region is influenced by the following factors (Figure 4).



Figure 3:

Classification of the Russian Federation's territory according to the type of spatial structure

Source: Compiled by the authors

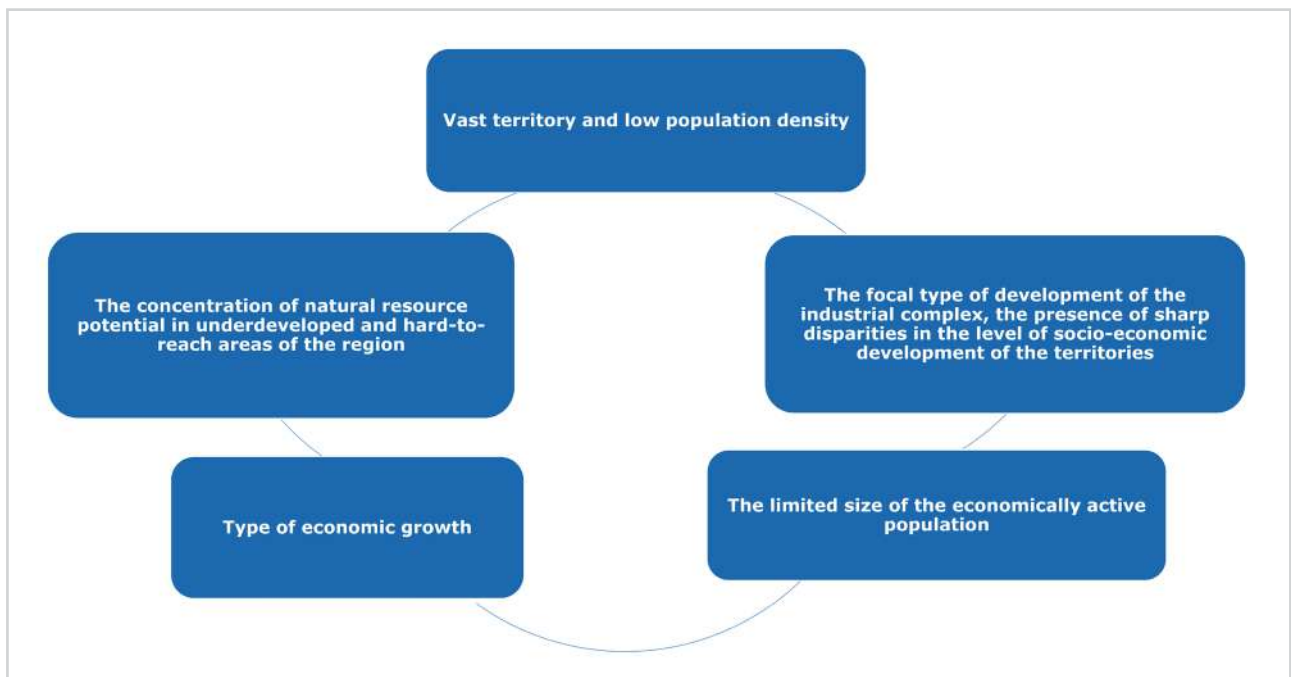


Figure 4:
Factors affecting the quality of economic space of resource-oriented region
 Source: Chuvashova (2014)

The systematic impact of these factors in conjunction with external (global, national) trends in the absence of sound structural policy reinforces the inefficient structure of the economic space of resource-oriented regions, which leads to relevant problems in their development. Table 1 presents the results of systematization of the factors, which reflects the degree of influence of Chuvashova (2014), which reflects the degree of influence of a particular factor on the economic space of a resource-oriented region.

As we can see in Table 1, all factors are divided into negative and positive ones, it is also possible to estimate the degree of influence of each factor on the economic space of the region. While considering indicators that reveal marketing approach and managerial approach to socio-economic development of the region it is necessary to highlight branding of the territory, creation of positive image and prestige of the territory as well as formation of intraregional system of marketing. Formation of an attractive image of the territory in the national and world markets.

The connectivity of space allows characterizing the degree of development of different types of links available in a certain territory, which arise between separate parts and elements of that territory. The existing connections between the participants of economic activities allow the exchange of material, financial, labour, information, labour, intellectual resources and technologies and other resources, and the connectivity of space characterises the level of development of these

Table 1:
Systematization of factors affecting the quality of economic space of resource-oriented regions

Factor name
Positive factors
Rational use of mineral resources
Increase of innovation activity and investments
Developed transport communications system
Foreign economic relations
Highly qualified personnel
Increased efficiency of factor inputs
Negative factors
Physical and moral obsolete fixed assets and technologies
Low quality and competitiveness of many products and services
Insufficiently favourable investment climate
Lack of growth in the efficiency of the use of production factors
Unchanged structure of production
Concentration of natural resources potential in underdeveloped areas of the region

Source: Compiled by the authors based on Chuvashova (2014)

connections. The existence of strong connections will allow a more rational and efficient use of resources in order to achieve the set goals.

The territories with low level of connectivity, high disconnection between the participants of economic activity are characterized by the breakdown of inter-regional ties and strengthening of differential regional development. That is, reducing the level of connectivity of the economic space can lead to the increase of its heterogeneity, and as a consequence, to the deterioration of its structure.

Let us consider the next indicator that reflects the characteristics of the economic space of the territory. This indicator is the density of economic space. The indicator in question is defined as the ratio of a number of macroindicators (population, gross regional product, natural resources, fixed capital, etc.) to the area of the territory. In some studies, density is defined as «the degree of saturation of the territory of the considered space by any economic objects per unit area». In addition to population, it can be other resources (material, financial), as well as infrastructure facilities and any others that are of interest in terms of analysis of socio-economic processes occurring in a given economic space (Stryabkova et al., 2018).

The density of space should be assessed to determine the degree of involvement of the region's potential in the regional reproduction process. Thus, the higher the density of space, the more subjects of economic activity, infrastructure facilities are concentrated per unit area of the territory.

The index of economic density of a region is considered in the work of Y. S. Kolesnikov as the product of two indicators: population density and the amount of monetary income per capita. If necessary, it is possible to calculate, along with the total density, the economic population density, which represents the presence of economically active population in the territory that can increase the level of economic space. Below are the formulas for calculating the total and economic population densities:

- total population density Dp is calculated by dividing the total population Po by the area in square kilometres S (unit of measure: people per square kilometre) (Anatolievich et al., 2021):

$$Dp = Po / S; \quad (1)$$

- economic population density Dpe is calculated by dividing the total number of economically active population Pe by the area of the territory in square kilometres S (unit of measure: people per square kilometre) (Anatolievich et al., 2021):

$$Dpe = Pe / S. \quad (2)$$

The analysis of the indicators under consideration allows us to form a more complete set of tools for regulating economic space density. The highest density is inherent in large agglomerations and the stimulation of urban areas development will allow to form «growth poles» of the economy of the territory, region.

Analyzing N. T. Avramchikova's research (2012), it should be noted that the presence of the following indicators included in the system of assessing the quality of economic space of the territory, such as the density of communication routes, GRP density - GRP volume per unit area will allow to make more qualitative calculations and form conclusions on their basis. In modern practice, there are several groups of methods for assessing the heterogeneity of territory development (Figure 5).

Some studies consider economic density as one of the characteristics of economic space. Thus, D. P. Shchetinina (cit. by Rodionova, 2014) understands economic density as «a characteristic of differentiation in the level of quality of economic processes in a small neighborhood of economic space. A denser economic environment is defined as an economic environment with a lower level of quality differentiation. The concept of «economic density» of the territory is used as a quantitative measure of potential economic and geopolitical threats, economic activity of the territory. There is a certain relationship between the level of mutual penetration and mutual influence of the bordering territories, on the one hand, and the degree of their economic development and population size, on the other hand, it is the ratio of economic densities that is the most accurate and expressive characteristic of mutual economic and geopolitical pressure» (Rodionova, 2014).

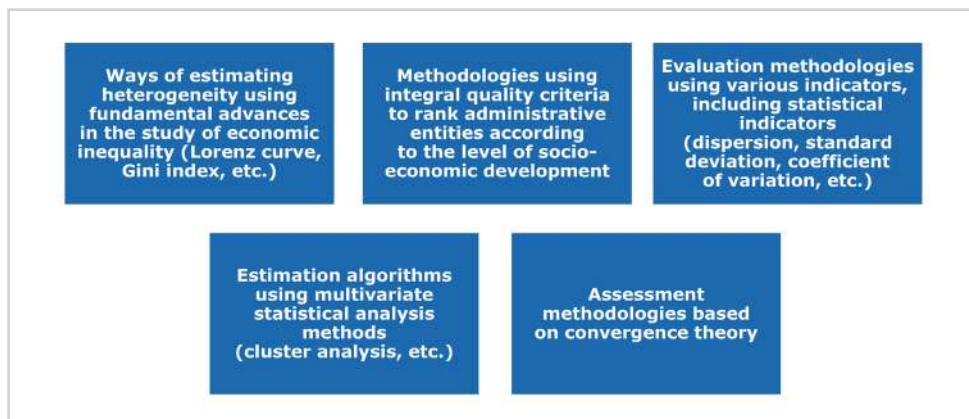


Figure 5:
Methodologies for estimating area heterogeneity
 Source: Compiled by the authors based on Avramchikova (2012)

Thus, spatial indicators are actually one of the blocks characterizing the development of the territory, although in essence the spatial approach can be regarded as broader in relation to the purely territorial one.

A. G. Polyakova (2011) in her study offers an approach to build some generalized integral indicators (indices) of assessing the quality of economic space in the region, based on four private indices obtained by polling the population. The proposed approach shows that the quality of socio-economic space not only affects the interaction of economic agents and links of objects, but also directly affects the population. Moreover, the change in quality is perceived by the population and can be reflected in the results of its survey. The following criteria and indicators were used as the basis for private indexes for composite integral index of economic space quality (Table 2).

Table 2:
Criteria and indicators of the quality of social space for the construction of private indices

Private index number	Quality criteria for socio-economic space	Quality indicators for socio-economic space
I₁	Welfare of population	Income level
		Possibility to save
		Satisfaction with their level of consumption of goods and services («middle class attributes»)
I₂	Quality of work	Quality of work life Prospects for promotion
		Level of protection of employees' rights
		Employability
		Need for overtime work
I₃	Quality of social sphere	Availability of recreational and health services
		Availability of medical services
		Ease of living
I₄	Life safety crime	Level of crime
		Man-made threats
		Nature of environmental conditions

Source: Compiled by the authors based on Polyakova (2011)

The partial indices (I_j) are determined by the following formula, based on data from the population survey:

$$I_j = \sum_{i=1}^n (P - N), \tag{3}$$

where:

- I_j - partial index;
- i - ordinal number of response;
- n - total number of respondents;
- P - positive and average ratings of respondents;
- N - negative ratings of respondents (Polyakova, 2011).

The value of the composite index (I) is defined as the arithmetic mean of the partial indices k :

$$I = \left(\sum_{j=1}^k I_j \right) / k, \quad (4)$$

where:

k is the total number of private indices.

The methodology under consideration allows us to identify negative sides of public opinion, which will be reflected in the negative values of private indices, which in turn will reveal the deviation of public opinion from some ideal model of socio-economic space, which cannot be implemented today due to some circumstances, but rather is a certain strategic guideline of social development.

It should be noted that the considered approaches to assessing the quality of economic space can affect the side of innovation development, but to the full extent these approaches cannot assess the quality in terms of interaction of its economic entities in general and in the innovation sphere in particular.

The approach proposed by Kirsanova et al. (2020) is a solution to the problems of development of the innovation system of the region. In his research the author considers the concept «density of technological space» which is defined as «the degree of technological proximity of two or more technologies that interact directly». According to Kirsanova, «the need to constantly improve product quality and introduce technological innovation is caused not only by the objective development of science and technology, but also by the development of public needs». The existing conditions form the need for innovation, as the real situation does not satisfy the requirements to the consumer properties of the manufactured (Kirsanova et al., 2020).

The existing products and possibilities of their achievement by means of existing technologies; technological possibilities and market requirements to production costs reduction; to the existing range of products and services produced by society.

Thus, «new requirements arise on the basis of already existing and in this sense the evolutionary dynamics of technological changes is set by development of requirements that, however, does not exclude occurrence of essentially new, breakthrough workings out, based on the newest achievements of science. In the latter case there is often a need to completely replace the corresponding links of the technological chains of the previous generation or to implement fundamentally new links» (Kirsanova et al., 2020).

The authors note that «in conjugate technological processes the technical level of the equipment is quite close. Moreover, the closer are the characteristics of the technical level of the technologies interacting, the more smoothly and efficiently the technological chain operates. Conversely, the wider the tolerances of mutual technological requirements, the more difficult it is to ensure the required quality and homogeneity of products» (Stryabkova et al., 2018).

The approach described by Chepik (2013), the approach to assessment of interaction of subjects of economic space, is of great interest, as it suggests the use of statistical methods to study its properties. Economic space is presented as «a complex system of relations, which is formed due to the interaction of economic subjects». The author's statement that economic space disappears with the cessation of interaction becomes interesting. In research proposes to use statistical methods to analyze the interaction of economic relations between municipal districts. Basing his research on the correlation-regression analysis of socio-economic indicators of development of municipal units as a dependent variable y uses indicators of socio-economic development of the leading district, and indicators of socio-economic development of other municipal districts become independent variables x in order to forecast intra-regional interaction.

The elasticity coefficient is used for a detailed study of the mentioned problems:

$$E_x(y) = (x / y) * y', \quad (5)$$

where:

$y = f(x)$ is the regression equation.

Thus, the use of elasticity coefficients seems important, as it allows us to determine the mutual influence of different municipal districts on each other, the existing nature of their relationships.

The analysis of existing approaches to the assessment of the quality of economic space has shown that to date there is no universal approach. This fact confirms the statement that the study of such category as economic space, assessing its quality is a complex and multitask process.

4. Conclusion

To sum up, it can be said, that the existing approaches to the evaluation of the quality of the economic space of a region reflect the problems of both innovation development and the development of the interaction between the economic subjects.

However, most often these problems are considered in isolation from each other, and the economic subjects at the regional level are understood as municipalities rather than specific economic entities. Moreover, the interaction between the subjects of the regional innovation system is not considered, although a number of approaches consider the level of innovativeness of the economy as one of the properties, parameters of the quality of economic space. Besides, in the offered approaches there is no possibility to estimate the degree of influence of economic space quality on this interaction that does not allow revealing its most urgent problems.

In this regard, it is necessary to build an independent methodology to assess the impact of the quality of economic space of the region on the interaction of subjects of the regional innovation system.

References

1. Anatolievich, D. Y., Andreyevich, R. A., & Nikolayevna, R. V. (2021). Technological modernisation prospects forecast of the main industries in Russia based on the assessment of the innovative development level. *Journal of Applied Engineering Science*, 19(4), 1143-1149. <https://doi.org/10.5937/jaes0-34688>
2. Avramchikova, N. T. (2012). Theoretical aspects of assessing the quality of economic space. *Regional Economics: Theory and Practice*, 266(35), 2-13. <https://cyberleninka.ru/article/n/teoreticheskie-aspekty-otsenki-kachestva-ekonomicheskogo-prostranstva/viewer> (in Russ.).
3. Chepik, A. E. (2013). Study of properties of the region's economic space with the help of statistical methods. *Russian entrepreneurship*, 266(24), 127-132 (in Russ.).
4. Chuvashova, M. N. (2014). Systematization of factors affecting the quality of economic space of resource-oriented regions. *Vestnik SibSAU*, 57(5), 314-319 (in Russ.).
5. Cowan, R., & Jonard, N. (2004). Network structure and the diffusion of knowledge. *Journal of economic Dynamics and Control*, 28(8), 1557-1575. <https://doi.org/10.1016/j.jedc.2003.04.002>
6. Granberg, A. G. (2011). Is Russia's disintegration or shrinkage possible? *Region, economics and sociology*, 2, 9-18 (in Russ.).
7. Kirsanova, N., Lenkovets, O., & Hafeez, M. (2020). Issue of accumulation and redistribution of oil and gas rental income in the context of exhaustible natural resources in Arctic Zone of Russian Federation. *Journal of Marine Science and Engineering*, 8(12), 1006. <https://doi.org/10.3390/jmse8121006>
8. Kroll, H. (2015). Efforts to implement smart specialization in practice - leading unlike horses to the water. *European Planning Studies*, 23, 2079-2098. <https://doi.org/10.1080/09654313.2014.1003036>
9. Polyakova, A. G. (2011). Estimation of the quality of socio-economic space of the region. *Economics*, 221(6), 59-65 (in Russ.).
10. Rodionova, N. D. (2014). Development of a system of indicators for assessing the quality of economic space in the region. *Terra economicus*, 12(2), 115-119 (in Russ.).
11. Shibusawa, H. (2000). Cyberspace and physical space in an urban economy. *Papers in regional science*, 79(3), 253-270. <https://doi.org/10.1111/j.1435-5597.2000.tb00771.x>
12. Strybkova, E. A., Zakharov, V. M., Vladyka, M. V., Kulik, A. M., Kogteva, A. N., & Nuridzhanov, A. A. (2018). Identification of long range growth poles as a key instrument of the federal policy of Russia's regional territories. *Amazonia Investiga*, 17(7), 433-442. <https://www.amazoniainvestiga.info/index.php/amazonia/article/view/758>
13. Vardomsky, L. B. (2006). Russian economic space: the question of unity in the context of globalization. *Scientific Report*. Institute of economic Sciences, Center of the CIS and Baltic countries. <https://imepi-eurasia.ru/baner/vard1.doc> (in Russ.).

Received 16.06.2021

Received in revised form 19.07.2021

Accepted 24.07.2021

Available online 19.10.2021