UDC 332.02 + 338.2

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THE METHODOLOGY FOR ASSESSING THE PROJECTS OF SPATIAL DEVELOPMENT BASED ON INTERREGIONAL INTEGRATION [1]

In order to search for the effective ways of developing the regional socio-economic space, the article examines the model of its organization in accordance with the Concept of the Spatial Development Strategy of the Russian Federation until 2030. The authors conduct a comparative analysis of polarized and diversified spatial growth scenarios. The study provides a brief overview of the concepts describing the polarized and endogenous growth in the studies of international authors. This study proposes a methodology to assess the development of macro-regions and the improve the case for the projects of interregional integration. To develop this methodology, we formulate scientific principles and indirect criteria of success for the projects relying on the use of regional integration theory. In addition to territorial commonality and complementarity of development potentials, the integration of regions should be built on the principles of security, network organization, limited number and awareness of potential project participants. It should ensure the synergistic effects and take into account the cultural and historical proximity manifested in the shared mentality and established economic ties between the regions. The results of calculations presented in the article are based on indirect criteria and have been obtained by using the methods of typology and spatial correlation. For the subjects of the Russian Federation included in the Ural Federal District (UFD), the study confirmed the hypothesis about the expediency of establishing the West Siberian and Ural macro-regions based on the number of participants and criteria of economic development, economic integration, similarity of regional spaces as a habitat. The projection of international economic integration patterns on the interregional level allows to forecast the maximum probability of success for the cooperation of highly developed regions in Western Siberia. The high degree of synchronization between the economies of Sverdlovsk and Chelyabinsk regions identified with the methodology developed by the authors. This synchronization increases chances for their successful integration in the combined Ural macro-region. The same criteria allowed to identify the economic grounds for the development of fruitful cooperation between the Sverdlovsk region and the Yamalo-Nenets Autonomous District. The typology of regions by their mental characteristics gives fewer grounds for optimistic forecasts on the implementation of social projects in the area of interregional integration.

Keywords: spatial development, strategy, polarized development, endogenous growth, macro-regions, interregional projects, methodological principles, assessment criteria, integration, typology of regions

Introduction

At the current stage, the spatial development strategy is the foundation for implementing the state regional policy. In accordance with the Spatial Development Strategy, the sustainable socio-economic development of the subjects of the Russian Federation will be achieved by removing the infrastructural constraints and maximizing the potential of regions and cities [2].

The relevance of addressing the objectives for progressive change in the spatial organization of the Russian economy is caused by a number of objective factors and trends in the post-crisis period. The peculiarities of Russia's economic and geographic position related to the vastness of its surface area, which is 1.7 times larger than the one of China or Canada, ensured that the country is endowed with the natural resource capital that exceeds the world's average. At the same time, the population density of the Russian space is far below the population density in most other countries. The characteristics of Russia's historical path led to the formation of the resource-based export-oriented economy that can be described by uneven territorial development and insufficient communication connectivity (in terms of transport, energy, information) of its regional space.

The disproportions existing in the territorial organization of the Russian economy intensified in the 1990's, while the external and internal problems emerging after 2008–2009 crisis aggravated the

[1] © E. V. Kurushina, M. B. Petrov, Text. 2018.

[2] Srtategiya prostranstvennogo razvitiya [The Spatial Development Strategy]. Minekonomrazvitiya [The Ministry of Economic Development of Russia]. Retrieved from: http://economy.gov.ru/minec/activity/sections/число planning/sd (date of access: 7/15/2017). (In Russ).

situation. The negative trends that currently threaten the economic security of Russia include the following:

1) Outflow of mobile factors of production (first of all, the population) from the subjects of the Russian Federation with a low density of economic activities.

2) Reduced contribution of remote regions to the national economy of Russia.

3) Increased interregional differentiation.

4) Imposition of economic sanctions against Russia restricting the entrepreneurial activity in external markets.

5) Higher demographic pressure in the border areas.

These trends determined the shrinkage and extreme polarization of the economic space within the European part of Russia. The impact of the centripetal vector that emerged following the spontaneous self-organization of the economy caused the decline of economic activity and population density in Northern and Eastern regions. The crisis phenomena have been overcome due to the concentration and involvement of "second nature" factors, such as the agglomeration, infrastructure, human capital, innovation, and institutions[3] in the process of economic development.

To address the existing problems and achieve the goals of balanced social and economic development of territories, ensure the economic security and improve the international status of Russia, the Concept of the Spatial Development Strategy of the Russian Federation until 2030 provides for the following:

1) Establishing macro-regions as the strategic management entities for the comprehensive realization of the development potential in the territories.

2) Creating conditions for the development of urbanized areas and urban agglomerations, improving the quality of living environment and accessibility to social services in order to enhance the population settlement system.

3) Developing progressive forms of spatial organization of the economy (as clusters, priority development areas, etc.) to improve the competitiveness of the economy and rational distribution of productive forces.

4) Implementing the infrastructure projects (of various scale [1, p. 183]), aimed at improving the transport, energy, information connectivity of the space and population mobility in order to strengthen the interregional integration.

To implement these measures involving the consolidation of space management entities and use of interregional and inter-municipal cooperation forms, the Concept of the Spatial Development Strategy provides for the networking- and project-based approach. The time horizon contemplated for the transition from fragmented, polarized, opportunistic, and unsustainable use of the territory to holistic socio-ecological-economic development determines the timeliness and relevance of discussing the issues related to harnessing the potential of interregional integration, proposals for establishing the principles and criteria to assess the long-term mega-projects that go beyond the individual subjects of the Russian Federation.

Theoretical Foundations of Spatial Development

The search for the ways of spatial development is based on modern theories and models for the territorial organization of economy and society. The Concept of the Spatial Development Strategy proposes three scenarios (strategies) of spatial growth. Two of them are the most interesting, as they are characterized by intense dynamics and progressive change in the quality of space[4]. These scenarios rely on two approaches to the organization of the Russian space, the comparative characteristics of which are presented in Table 1.

These development models have the following characteristics:

1) The number and evenness of distribution of economic growth centers across the territory of the country (10–12 base regions in the strategy of polarized growth/network of macro-regions across the entire country in case of diversified spatial growth).

2) The extent of state regulation in the economy (mostly market self-organization/higher degree of administration by the state).

[3] Kontseptsiya Strategii prostranstvennogo razvitiya Rossiyskoy Federatsii na period do 2030 goda [The Concept of Spatial Development Strategy of the Russian Federation for the Period until 2030], (2016). Moscow, 21–25. Retrieved from: http://карьеры-евразии.рф/uploadedFiles/files/Kontseptsiya_ SPR.pdf (date of access: 7/15/2017). (In Russ.)

[4] The third (conservative) scenario is built on the current trends in spatial development.

Table 1

The characteristics of alternative models for the organization of the Russian space*

Characteristic	Model of Space Organization	
	Market-Based Organization of the Space	**State-Based Preservation (Retention) of the Space**
1. Approach to spatial development	World Bank	EU and OECD
2. Spatial factor of growth	Competitive regions as the engines of growth possessing the production resources	Territory as an inherent value with historical and national-cultural identity
3. Regional economic policy	Development of economic integration, incentives for private business activities in leading cities and mobility of production factors	Realization of underutilized potential of the regions, formation of their tangible and intangible capital, incentives for innovative business and management practices
4. Regulation of spatial development	Mitigation of spatial differences in quality of life by using the redistribution mechanism	Mitigation of differences in economic activity indicators, redistribution of value added
5. Factors of economic growth	Institutions; infrastructure; improved communications and market access; movement of production factors to centers of economic growth	Region-specific factors, including human capital, geographic location, innovation potential, institutional environment; modernization of regional assets
Concentration; agglomeration effects; connectivity		
6. Focus on sources of growth	External economic activity in the context of economic openness	Internal sources of growth in each region (sufficient potential for self-development)
7. Development concept	Concept of polarized spatial development (for other regions, the concept of controlled shrinkage)	Concept of endogenous economic growth (growth in all regions)
8. Scenarios of spatial development	Competitive or polarized growth	Diversified spatial growth

* Prepared on the basis of the Concept of Spatial Development Strategy of the Russian Federation for the Period until 2030. Moscow, 2016, p. 111. Retrieved from: http://карьеры-евразии.рф/uploadedFiles/files/Kontseptsiya_ SPR.pdf (date of access: 7/15/2017). (In Russ)

3) The balance of external and internal factors involved in self-development of territories (high level of economic openness and integration/reproduction provided primarily by internal resources).

4) Development targets (economic growth/sustainable development).

Despite the differences, the proposed models are not mutually exclusive. First, the Concept of the Spatial Development Strategy points out to the productivity of using multiple models for the main areas of spatial development. The improvement of settlement systems provides for preserving their diversity based on a differentiated approach, which implies the use of the following:

— network-based cluster model for the formation of macro-regions;

— polarized polycentric model for the development of agglomerations;

— evenly hierarchical model for the development of non-urban areas[5].

The principle of coordinated coexistence of center-periphery and network-based models in the organization of the Russian space was proclaimed for the spatial dimension of innovative modernization in the Russian economy. To reduce the "sprawling economic periphery," it was proposed to supplement (rather than replace!) the current algorithm of public administration for network-based (polycentric) levels of federal, regional, and municipal districts[6]. From the standpoint of spatial structure, the polycentrism implies an even distribution of urban areas, urban agglomerations, and big cities across the country [2, p. 45].

Secondly, both scenarios of spatial development provide for improving the competitiveness of territories based on the higher order advantages ("second nature" factors), including the following:

[5] Kontseptsiya Strategii prostranstvennogo razvitiya Rossiyskoy Federatsii na period do 2030 goda [The Concept of Spatial Development Strategy of the Russian Federation for the Period until 2030]. (2016). Moscow, 51–53. Retrieved from: http://карьеры-евразии.рф/uploadedFiles/files/Kontseptsiya_ SPR.pdf (date of access: 7/15/2017). (In Russ.)

[6] Ibid., p. 58.

1) achieving synergistic effects from agglomeration and integration by the formation of "supra-agglomeration" structures;

2) concentrating human capital, innovation capacity, and economic activities (in the growth centers/macro-regions);

3) improving the connectivity of spaces by implementing interregional and inter-municipal integration projects (infrastructure, social, innovation, and other projects).

The theoretical foundations describing the influence of agglomeration on economic growth were laid as early as by A. Weber (1909), who identified the factor of the concentration of enterprises near the markets, auxiliary sectors, and cheap labor as a favorable factor for a business environment that provides the economies of scale [3]. The scientific ideas on the impact of uneven space on economic growth were further developed in cumulative growth theories. In accordance with the concept of circular cumulative causation developed by G. Myrdal (1957), the advantage of the territory is created by specialization and the economy of scale [4].

The concept of growth poles, which provides the basis for competitive (polarized) growth scenario, has emerged due to the works of F. Perroux (1950) and J. Budeville (1966). In the context of their concentration in a particular area, the uneven distribution of factors of production and existence of propulsive sectors (growth poles) [5] create a polarized space, in which the high degree of polarization allows to develop the territories in an autonomous way (by determining the potential for self-development — note by the authors) [6]. In accordance with the concept of development axes proposed by P. Pottier (1963), the territories located between the growth poles receive an additional impulse from transport and information communications [7]. The concept of growth poles is further developed by contribution made by contemporary studies. J. Drucker and E. Fraser (2012) proved empirically that concentration makes a positive impact on productivity when the level of agglomeration in the economy is low and produces negative effects where the concentration of the economy is high [8]. The non-linear nature of the impact made by the concentration on economic development also applies to the formation of business networks and knowledge spillovers between the firms (M. Carree and R. Thurik, 1999 [9]; A. Malmberg and P. Maskell, 2002 [10]). The results of studies provide a rationale for implementing the cascade development projects in the Moscow agglomeration, forming new agglomerations and "supra-agglomeration" structures in a sparse economic space of other Russian territories.

The concept of endogenous economic growth, which underpins the scenario of diversified spatial development, is based on the ideas of F. Knight (1944) on the possibility of unlimited growth associated with investment, including the investment in human capital [11]. The first models of endogenous economic growth based on dissemination of knowledge and benefits associated with the human capital were built by K. Arrow (1962) [12], H. Uzawa (1965) [13], E. Sheshinski (1967) [14], P. Romer (1986) [15], R. Lucas (1988) [16], and S. Rebelo (1991) [17]. In the works of P. Romer (1990) [18], G. Grossman, and E. Helpman (1991) [19], F. Aghion and P. Howitt (1992) [20], where the research activity is a source of progress, the long-term pace of growth depends on infrastructural and institutional factors, including taxation, market regulation, legal environment, etc.

In accordance with the concept of endogenous economic growth, the self-development of territories depends on the value of human capital that generates the effect of increasing returns. Amid its deficit, according to V. Henderson (2003), a more efficient use of human capital can be achieved through agglomeration [21]. The impact produced by the concentration of human capital on regional economic growth is confirmed by numerous studies, including those made by E. Glaeser and J. Shapiro (2003) [22], N. Gennaioli, and others (2011) [23]. Important results were obtained by F. Yuming and A. Stuart (2012), who used the case of Chinese provinces to empirically find that the agglomeration centers attract highly skilled migrants to a greater extent than the low-skilled ones [24]. According to the studies of J. Shapiro (2006), the concentration of human capital contributes to the development of consumer services and culture, which makes the territory attractive for the population with a certain level of education and skills [25]. Therefore, the endogenous growth (self-development of territories) depends on the value of human capital and its increasing returns, and the migrants with high qualifications go to agglomerations, which contributes to the concentration of human capital.

"The closed process of cumulative causality" was noted by P. Krugman and M. Obstfeld (1997) in the study of agglomeration effects, because the effect of the market size can be amplified by other effects caused, in particular, by "the flow of scientific knowledge and the benefits of vast labor markets" [26, p. 181]. The relationship and stronger effects confirm the validity of using both conceptual

approaches, including the one of polarized and endogenous spatial growth, the implementation of which requires to create the institutional and infrastructural conditions for regional integration and "supra-agglomeration" structures.

The theory of regional integration was developing mainly in the context of international economic relations. The experience of integration projects, which received a powerful impetus in the second half of the 20th century following the formation and development of interstate economic associations, was reflected in the theories of foreign direct investment and regional integration.

In the model of H. Richardson (1973), the agglomeration effect and personal preferences of investors come as the key element of regional growth [27]. Among the characteristics and the factors that make a positive impact on investment flows between the countries (and direction of trade flows), A. Kuznetsov (2013) highlights the following: 1) high consumer potential of the territories; 2) developed infrastructure; 3) favorable investment legislation; 4) cheap labor force; 5) neighborhood effect; 6) ethnic, cultural, and historical proximity; 7) awareness of potential investors [28, pp. 64–65].

The neighborhood effect as a factor promoting the integration was reflected and confirmed in the trade flow model developed by J. Tinbergen [29]. In the gravity model of foreign trade developed in 1962, the factor of distance (the opposite of neighborhood) makes a negative impact on the trade flow between two countries, while the volume of GNP has a positive effect.

The factors facilitating and impeding successful integration were identified by A. Libman (2015). The econometric analysis of large dataset on regional economic associations shows that the greatest impact on the success of integration between the countries is made by the level of their development estimated by GDP per capita. The result from the implementation of joint projects will be tangible if the economies of participating states are highly developed, the economic space is effectively regulated, and the best practices are shared. A lesser but positive impact is made by the organization age factor (the duration of integration ties, Authors' note). The increase in the number of participants significantly impedes the real integration and turns the joint project into a "discussion forum" [30].

The use of theoretical provisions and laws describing the processes of regional integration in order to substantiate the interregional and inter-municipal projects aimed at overcoming the fragmentation of the Russian economic space will allow to improve the ability to control the territorial development.

Defining the objective

The development of the Spatial Development Strategy, which in accordance with the Decree of Government of the Russian Federation No. 870 provides for the involvement of scientific, design, and research organizations, [7]has intensified the process of scientific research on the formation of "supra-agglomeration" spatial entities. The initiatives on the spatial development that attracted great interest on the part of the scientific community include the projects for the formation of conurbations[8] (conglomerates of agglomerations). The Center for Infrastructure Economics defined the boundaries of 8 promising conurbations (or urbanized areas), including the Central, Central Black-Earth, North Western, Ural, Volga, South Siberian, Southern and North Caucasus urbanized areas. The strategic guidelines for implementing the projects of conurbations by integration of municipalities are as follows:

1) Concentration of the population and businesses.

2) Better connectivity of territories based on transport accessibility and cooperation at different hierarchical levels.

[7] O soderzhanii, sostave, poryadke razrabotki i utverzhdeniya strategii prostranstvennogo razvitiya Rossiyskoy Federatsii, a takzhe o poryadke osushchestvleniya monitoringa i kontrolya ee realizatsii. Postanovlenie Pravitelstva RF ot 20 avg. 2015 g. № 870 [On the content, composition, procedure for elaboration and approval of the spatial development strategy of the Russian Federation and on procedures for monitoring and controlling its implementation. The Decree of the Government of the Russian Federation No. 870 of August 20, 2015]. Sistema GARANT [GARANT System]. Retrieved from: http://base.garant.ru/71170676/#ixzz44wUtWNdx (date of access: 5/15/2016). (In Russ.)

[8] Grudinin, M. Yu. (2016, July 14). Kompleksnyy podkhod k prostranstvennomu razvitiyu. Strategiya — territoriya — investitsii. [A Comprehensive Approach to Spatial Development: Strategy — Territory — Investments]. A report presented at the workshop on Strategic Planning in the Russian Federation: New Approaches and Methods held during INNOPROM 2016, an International Industrial Exhibition. Ekaterinburg, 7/14/2016. Retrieved from: https://drive.google.com/file/d/0B7GEA-M58qzPUWpzYllPbGl5bmc/view (date of access). (In Russ); Chistyakov, P. Vklad strategii prostranstvennogo razvitiya v sotsialno-ekonomicheskoye razvitie Rossii [The Contribution of the Spatial Development Strategy to Socio-Economic Development of Russia]. A report presented at the 15th All-Russian Forum for Strategic Planning in the Regions and Cities of Russia. St. Petersburg, 10/25/2017. Retrieved from: http://www.forumstrategov.ru/rus//doc.html (date of access: 1/28/2016). (In Russ).

3) Specialization of territories in accordance with their objective geographic characteristics.

A slightly different approach to improve the integration of the Russian space is adopted in the Concept of the Spatial Development Strategy of the Russian Federation. The two methodological principles used for the formation of macro-regions include the territorial commonality of the regions and mutual complementarity of the development potentials in the subjects of the Russian Federation that make up the macro-region. The pilot projects scheduled for implementation by 2020 provide for the formation of four macro-regions, including 1) Capital city (Moscow and Moscow region); 2) the Far East and Baikal region; 3) North Western; 4) Azov and the Black Sea. The following five macro-regions are considered to be promising and may be established by 2030: 5) Volga; 6) Ural; 7) Western Siberian; 8) South Siberian; 9) Eastern (Central) Siberian. Other regions (Central and Siberian Federal Districts) are planned to be combined into macro-regions in the period of 2040–2050.

This indicates that the formation of "supra-agglomeration" spatial structures may involve various principles of combining the regions, which affect the results of zoning. For example, in the above typologies, the regions of Western Siberia (Tyumen region, Khanty-Mansiysk Autonomous District — Yugra, and Yamalo-Nenets Autonomous District) refer to different "supra-agglomeration" structures.

The formation of interregional spatial structures, as provided by the Concept of the Spatial Development Strategy, implies a typology of regions based on conceptual and the essential multidimensionality of the space. This strategic planning document provides for two typologies, including 1) structural and sectoral typology; 2) problem-oriented typology that allows to identify the groups of regions with systemic nature of economic and social problems. For the adequate management of spatial development, the Concept of the Spatial Development Strategy proposes the approach of "integrated variable-base zoning," which requires the formation of several regional cross-sections and typologies.

The extent of addressing the strategic tasks in the area of spatial development is largely determined by the selection of criteria for the assessment of integration projects and the participants (among the subjects of the Russian Federation and municipalities). For the comprehensive assessment of economic and social effects of the spatial development, the Concept of the Spatial Development Strategy provides more than twenty indicators, including the volume and structure of *GRP*, real income, provision of the population with infrastructure facilities and availability of services, innovation and investment activity, other absolute and relative indicators[9]. At the same time, the Russian practice of implementing large-scale projects, such as the Industrial Urals — Polar Urals[10] is not always successful, despite their great economic potential, given the estimates based on direct economic criteria.

To improve the methodology of the project-based approach adapted to the implementation of interregional projects of spatial development, a task was set to elaborate the principles of combining the territories into "supra-agglomeration" structures and criteria of successful regional integration.

Methodology of Project-Based Approach in Spatial Development

To elaborate the principles and criteria for successful implementation of interregional projects of spatial development, this study used the theory of regional integration and empirical patterns identified at the inter-state level. The comparability of integration processes was substantiated by P. Krugman and M. Obstfeld (1997) based on the general nature of driving forces. The main difference is "in the degree of factor mobility." Moreover, for the interregional level of integration, it is greater, while it is smaller for the inter-state level [26, p. 177].

The use of the project-based approach to manage the territorial development amid the fragmentation of the space and insufficient resources implies the improvement of its methodology from the standpoint of successful implementation of interregional integration projects, including the formation of "supra-agglomeration structures." The following two methodological principles were used for the formation of macro-regions in the Concept of Spatial Development Strategy:

[9] Kontseptsiya Strategii prostranstvennogo razvitiya Rossiyskoy Federatsii na period do 2030 goda [The Concept of Spatial Development Strategy of the Russian Federation for the Period until 2030]. (2016). Moscow, 108. Retrieved from: http://карьеры-евразии.рф/uploadedFiles/files/Kontseptsiya_SPR.pdf (date of access: 7/15/2017). (In Russ.)

[10] The work on the project "Industrial Urals — Polar Urals" began in 2006, its shareholders are 5 subjects of the Russian Federation, including the Khanty-Mansiysk Autonomous District — Yugra, Yamalo-Nenets Autonomous District, Tyumen region, Sverdlovsk region, and Chelyabinsk region.

1. Territorial commonality of regions:

1.1. Geographical proximity.

1.2. Common infrastructure.

2. Mutual complementarity of development potentials:

2.1. Specialization.

2.2. Cooperation.

To improve the case for and successful implementation of projects in the area of interregional integration, we suggest to complement the list of methodological principles with the following:

3. Synergy of effects generated by mutual strengthening of the benefits resulting from agglomeration, integration, connectivity, etc., because the projects should start the process of "cumulative causation."

4. Security, including against global illegal takeovers [31, p. 50]. This principle excludes the processes of depopulation and economic desolation of the territories as a result of asymmetric integration and provides for ensuring the harmonious development based on economic and socio-nature values.

5. Network organization involving the consistency of state interests (at the level of federal, regional, and municipal authorities), businesses (large corporations and small enterprises), society (civil society communities and population), use of public-private partnership in the implementation of projects.

6. Cultural and historical proximity, which is not necessarily a part of the territorial proximity:

6.1. Historical integration ties between the regions (economic, cultural, etc.)

6.2. Common mentality.

7. Limited number of participants.

8. Awareness of potential participants. The principle implies successful regional branding, the openness of information that increases the interest of participants in the implementation of the joint project.

These principles are the methodological basis to build the system for the assessment of interregional projects. The current system of criteria used for the assessment of the projects of spatial development includes the direct (main) criteria. Among them, we can identify the regulatory criteria (approved in the official methodologies) and search criteria used by research organizations with non-traditional methodologies, the examples of which are provided below.

1. Direct criteria for assessing interregional projects.

1.1. The criteria provided by the Methodology for calculation of indicators of efficiency of regional investment projects[11]:

— conformity of the project to the strategy of socio-economic development of the Russian Federation[12];

— positive social effects related to the implementation of the project;

— financial and budget effectiveness (including the criterion of net present value and the criterion of internal rate of return);

— economic efficiency (reflecting the dynamics of *GRP*);

— criteria related to the financial constraints of the regional investment project.

1.2. Criteria for assessing the agglomeration and other synergistic effects, applied by research organizations, for example, the criterion of *GRP* growth as a result of the following:

— agglomeration effects from changes in population, the establishment of conurbations;

— effects from the employment of population in more productive sectors, from the development of the logistical specialization of the territories, and from the increasing specialization of small towns and villages;

— Multiplier effects from investments in housing and utilities sector[13].

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[11] On approval of the Methodology for calculation of indicators and applications of criteria of efficiency of regional investment projects eligible to state support from budgetary appropriations of the Investment Fund of the Russian Federation. The Order of the Ministry of Regional Development of the Russian Federation No. 493 of October 30, 2009.

[12] This criterion should be supplemented by the criterion of the project's conformity to the Concept of the Spatial Development Strategy of the Russian Federation for the period until 2030, which established more than twenty indicators for assessing the socio-economic effects.

[13] Chistyakov, P. Vklad strategii prostranstvennogo razvitiya v sotsialno-ekonomicheskye razvitie Rossii. [The Contribution of the Spatial Development Strategy to Socio-Economic Development of Russia]. A report presented at the 15th All-Russian Forum for Strategic Planning in the Regions and Cities of Russia. St. Petersburg, 10/25/2016. Retrieved from: http://www.forumstrategov.ru/rus//doc.html (date of access: 1/28/2017). (In Russ.)

The use of only direct criteria is a necessary but not sufficient condition for successful implementation of integration projects. To provide the rationale for alternative interregional projects of spatial development, we suggest to use additional indirect criteria presented below.

2. Indirect criteria for assessing the interregional projects:

2.1. Objective economic criteria of regional development:

— economic and regional development (per capita *GRP*);

— integration of regional economies.

2.2. Objective socio-economic criteria for assessing the similarity of regional spaces (in terms of population, corporations, and the state[14]).

2.3. Subjective criteria:

— minimum number of participants in the integration project;

— similarity of spaces by type of economic behavior demonstrated by the agents (migrants, investors, entrepreneurs, and other actors).

The list of subjective criteria may be supplemented by the criteria of a successful regional brand, social integration of the population of the regions, balancing the interests of government, businesses, and society, experience and conditions for implementation of public-private partnership mechanisms, and other criteria in accordance with the stated methodological principles.

Results and Discussions

The proposed methodology of the project-based approach to the justification of interregional initiatives was tested in the subjects of the Russian Federation included in the Ural Federal District in order to obtain additional substantiating materials for formation of "supra-agglomeration" structures. In the Concept of the Spatial Development Strategy, the expediency of establishing two macro-regions (West Siberian and Ural[15]) from the subjects of the Russian Federation included in the Ural Federal district is substantiated on the basis of direct regulatory criteria, which imply that the project meets the methodological principles laid down in the strategic planning documents.

The assessment of regions by indirect criteria led to the following results.

1. In terms of the economic development, the subjects of the Russian Federation included in the Ural Federal district are heterogeneous. Table 2 shows that the variation coefficient for per capita *GRP* is around 110 %. In terms of the economic development, the rating of the Ural Federal District is led by Yamalo-Nenets Autonomous District, Khanty-Mansiysk Autonomous District — Yugra, and Tyumen region, which indicates a high probability of their successful integration in case of formation of the West Siberian region.

2. The second indirect objective economic criterion is the extent of regional economic integration, which can be estimated by using various approaches. Among them, we can emphasize the assessment by following indicators: 1) scale of flows in goods, services, labour, and capital; 2) convergence of prices; 3) correlation of consumer behavior; 4) scale of regional specialization; 5) convergence or spatial correlation of growth; 6) gravity regression of trade flows [32, pp. 15–17].

To assess the real level of integration, we used our own methodology for synchronization of economic dynamics based on the fifth approach [33]. The results indicate that the economic integration of the Sverdlovsk and Chelyabinsk regions provides the core for the formation of the Ural macro-region. The synchronization of economic dynamics assessed by the pair correlation coefficient of the relative *GRP* growth rate (development acceleration indicators) is more than 0.9, which indicates really strong integration ties guaranteeing the success of "supra-agglomeration" structures created on their basis and synergistic effects. This criterion allows to conclude on the expediency of forming two macro-regions from the subjects of the Russian Federation included in the Ural Federal District, as provided by the Concept of the Spatial Development Strategy. At the same time, we should mention the prospects for transition to the "models of the interrelated development of the Arctic[16] with the

[14] The Concept of the Spatial Development Strategy of the Russian Federation provides for a problem-oriented typology, which allows to identify five groups of Russian regions with systemic nature of economic and social problems. It can be used as a methodological toolkit to assess the similarity of regional spaces as the entities of public administration.

[15] In accordance with the Concept of the Spatial Development Strategy, the Ural macro-region may include the Sverdlovsk and Chelyabinsk regions (subjects of the Russian Federation included in the Ural Federal District), as well as the Perm Krai, Orenburg region, Republic of Bashkortostan, and Udmurt Republic (the subjects of the Russian Federation included in the Volga Federal District).

[16] This includes the development of Sabetta, the multifunctional port on the Yamal Peninsula.

Table 2

The indicators describing success of regional integration by indirect economic criteria

Indicator	UFD	Macro-regions in accordance with the Concept of the Spatial Development Strategy	
		West Siberian region	Ural region
Criterion of economic development (per capita GRP)			
Average value of the indicator in 2014, thousand rubles/person	1,021.7	1,756.2	333.1
Maximum value, thousand rubles/person	2,985.3 (Yamalo-Nenets Autonomous District)	2,985.3 (Yamalo-Nenets Autonomous District)	384.2 (Sverdlovsk region)
Minimum value, thousand rubles/person	193.4 (Kurgan region)	522 (Tyumen region)	284.2 (Chelyabinsk region)
Variation range	2,791.9	2,463.3	100.0
Variation coefficient, %	109.8	70.1	13.2
Criterion of economic integration (synchronization coefficient)			
Average value of the indicator for 2000–2014	0.522	0.618	0.689
Maximum economic synchronization coefficient	0.907 (Sverdlovsk region and Chelyabinsk region)	0.699 (Khanty-Mansiysk Autonomous District — Yugra and Tyumen region)	0.907 (Sverdlovsk region and Chelyabinsk region)
Minimum economic synchronization coefficient	0.435 (Tyumen region and Kurgan region)	0.556 (Khanty-Mansiysk Autonomous District — Yugra and Yamalo-Nenets Autonomous District)	0.256 (Orenburg region and Udmurt Republic)
Variation range	0.472	0.143	0.651
Variation coefficient, %	23.4	11.9	21.6

Ural macro-region" [34, p. 105], since the interregional integration between the Sverdlovsk region and Yamalo-Nenets Autonomous District is quite high, given by the synchronization coefficient, which is almost 0.8.

3. The success in the formation of macro-regions by the indirect objective socio-economic criterion of similarity between the regional spaces was assessed by using the typology of territories as a habitat built with multivariate statistics. In accordance with the methodology of the authors [35], the method of hierarchical clustering applied to the array of panel data describing regional socio-economic statistics (by 12 indicators describing the attractiveness of territories[17] for population of the Russian regions) allowed to identify 8 clusters at the fourth level of aggregation, while the principal component method let us to characterize each identified type, as shown in the Figure. The West Siberian cluster combined 4 subjects of the Russian Federation, including Khanty-Mansiysk Autonomous District — Yugra, Yamalo-Nenets Autonomous District, and the Tyumen region. All subjects of the Russian Federation included in the Ural Federal District (Sverdlovsk region and Chelyabinsk regions) and Volga Federal District (Perm Krai, Orenburg region, Republic of Bashkiria, and the Udmurt Republic), that form the Ural macro-region, have become part of the Median Peripheral Cluster, the largest such cluster combining 49 subjects of the Russian Federation, most of which are the old industrial regions.

The identification of two macro-regions in the Ural Federal District in accordance with the Concept of the Spatial Development Strategy of the Russian Federation is justified from the standpoint of the criterion of similarity of spaces as a habitat. Even at a higher level of aggregation of the subjects of the Russian Federation, the regions of Western Siberia with a more attractive economic component and very low socio-nature component are not included into the same cluster with the regions of the Urals and will be combined with the Nenets cluster and North Eastern cluster.

[17] The system of indicators describing the attractiveness of territories as a habitat includes not only the characteristics reflecting the standard of living, security and accessibility of social benefits, but also the innovation and entrepreneurial environment.

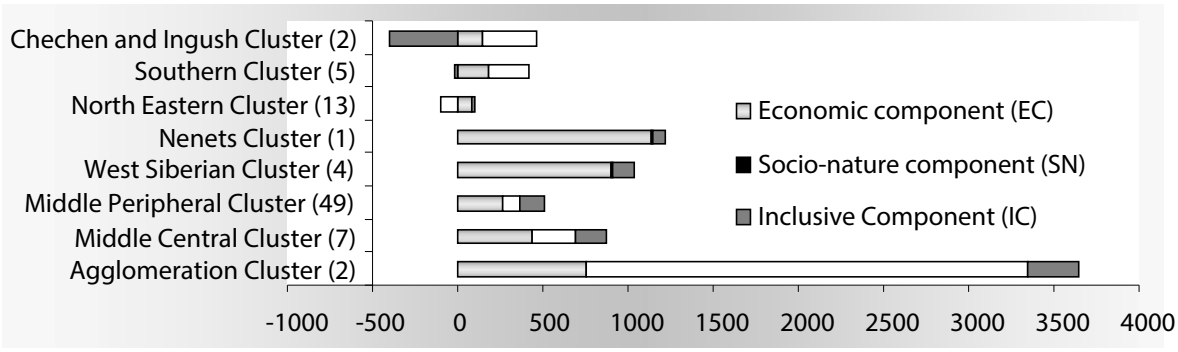

Fig. *The typology of Russian regions according to the characteristics of socio-economic development of the territories as a habitat (The parentheses indicate the number of the subjects of the Russian Federation grouped in a cluster at the fourth level of aggregation. Curly brackets indicate the combination of regions into clusters at a higher level in the hierarchy)*

4. From the standpoint of subjective criterion for the number of participants in interregional project, the formation of macro-regions comprising three subjects of the Russian Federation allows to assess the chances for real integration as high, since the formation of the "supra-agglomeration" structure from a large number of regions poses the risk that it may become not sufficiently efficient.

5. For the subjective criterion of similarity of spaces by type of economic behavior of agents, the success of the project was assessed in accordance with the typology of regions by the rationality of migrant behavior developed by the authors. Based on the hierarchical clustering of indicators describing the "response" of migrants to characteristics of attractiveness of the territories, the subjects of the Russian Federation included in the Ural Federal District form several types of regions: 1) cluster with extremely rational behavior (Tyumen region with the level of rationality at 7.85); 2) cluster with the most rational behavior (Orenburg region; 5.31) 3) cluster with rational behavior (Perm Krai, Sverdlovsk region, and Chelyabinsk region; 3.83); 4) cluster with apathetic behavior (Republic of Bashkortostan, Khanty-Mansiysk Autonomous District — Yugra, and Yamalo-Nenets Autonomous District; 0.96); 5) cluster with the most irrational behavior (Udmurt Republic; –6.05). At the higher level of aggregation, the first three types of regions are combined into a cluster with rational behavior [34]. According to this criterion, there are more grounds for the success of the project to form an urbanized area by combining the Perm Krai, Sverdlovsk region, Chelyabinsk region, Orenburg region, and Tyumen region[18] rather than to establish macro-regions, as provided by the Concept of the Spatial Development Strategy. The assessments for this group of criteria should be supplemented by a typology of territories in terms of the economic behavior demonstrated by other important groups of agents.

Conclusion

The use of the project-based approach to implement the spatial development models based on the concepts of polarized and endogenous growth requires the elaboration of methodological principles and additional criteria for assessing the success of the planned large-scale interregional projects on the basis of regional integration theory. The formation of two macro-regions from the subjects of the Russian Federation included in the Ural Federal District, as provided by the Concept of the Spatial Development Strategy, is well justified in accordance with the proposed indirect criteria, including the level of economic development, extent of regional economic integration, similarity of regional spaces (as a habitat), minimum number of participants. Only for one criterion (the similarity of spaces for the type of behavior of economic agents, as illustrated by the example of migrants), our assessments indicate that it would be not expedient to establish the planned "supra-agglomeration" structures in the form of the Western Siberian and Ural macro-regions.

The methodology proposed for the project-based approach may be further developed to expand the applicable principles and criteria, elaborate the methodological tools for assessing the interregional projects, including the variable-base typologies of the space. It can be used not only to assess the expediency of establishing the macro-regions, but also for any interregional projects aimed at the spatial development.

[18] The findings relate to the projects on social integration and management of human capital concentration based on human-centred approach.

Acknowledgments

The study has been supported by the Grant of the Russian Foundation for Basic Research, Project 16–06–00464 A.

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Translation

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