An innovative component of the integration process of the resource potential of the regions of the Siberian Federal District

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Abstract. The article contains the results of a study of the resource and innovation potentials of the regions of the Siberian Federal District as the basis for their integration. The authors develop the idea of the necessity and expediency of using the innovation component in the interaction of regions with different potential.

1. Introduction
In the conditions of increasing competition between organizations, regions and entire states, the search for sources of their development, determining the competitive advantages of subjects, plays an important role. One of such sources is the processes of integration of resource potentials of regions, allowing to provide synergistic effect from interaction. In a considerable part of empirical research, when analyzing domestic and foreign experience, the high significance of integration interactions is noted, and the problems constraining the development of integration interactions are highlighted [1-3]. As of today, a differentiated assessment of the regions, taking into account the resource, innovation potential as the basis of the integration processes is important.

The problem of finding sources of development that can provide competitive advantages to the subjects is of particular relevance for cross-border regions. These regions are threatened with penetration of finished products and capital into their labor markets by neighboring regions of neighboring countries [4].

2. Materials and Methods
The research conducted by domestic and foreign scholars in the field of regional economics, interregional interaction, vertical and horizontal integration, and innovative development formed the methodological basis of the study. In order to identify the development features of the resource and innovation potential of the regional economies of the Siberian Federal District of the Russian Federation (SFD of RF), the authors used the methods of economic and statistical analysis. Official statistics served as the source of primary data used for analysis (Rosstat, 2017). The authors analyzed the possibilities of effective integration on the materials of the Siberian Federal District, consisting of 12 subjects, which are significantly different in size of territories and indicators of socio-economic development. To compare the regions, the authors relied on characteristics that reflect their resource and innovative potential. The authors believe that the analysis of the selected characteristics will make
it possible to substantiate possible approaches to the integration of the resource potential of the regions, taking into account the innovation component.

3. Results
In the course of the study, the authors analyzed the regional structure of the resource potential of the Siberian Federal District. Table 1 presents the subjects of the Siberian Federal District of the Russian Federation are presented in descending order of their share in the structure of the main characteristics of the resource potential.

| Subjects                  | Mining, million rubles | Electricity production, billion kWh | Production of agricultural products, million rubles |
|---------------------------|------------------------|-------------------------------------|-----------------------------------------------|
| Kemerovo region           | 38.5                   | 11.6                                | 8.3                                           |
| Krasnoyarsk region        | 23.7                   | 31.7                                | 12.5                                          |
| Irkutsk region            | 19.5                   | 23.0                                | 10.7                                          |
| Tomsk region              | 7.7                    | 1.8                                 | 5.0                                           |
| Altai region              | 0.3                    | 3.5                                 | 21.8                                          |
| Novosibirsk region        | 2.2                    | 6.5                                 | 14.1                                          |
| Omsk region               | 0.1                    | 3.3                                 | 15.7                                          |
| The Republic of Khakassia | 2.3                    | 12.1                                | 2.6                                           |
| Transbaikal region        | 3.5                    | 3.4                                 | 3.9                                           |
| The Republic of Buryatia  | 1.1                    | 3.0                                 | 2.6                                           |
| Tyva Republic             | 1.0                    | 0.0                                 | 1.0                                           |
| Altai Republic            | 0.2                    | 0.0                                 | 1.9                                           |

Source: Calculated by the authors according to the Federal State Statistics Service [11].

As the main characteristics of the resource potential, such areas as mining, electricity production, and agricultural production were studied. This made it possible to assess the level of provision of the regions with raw materials, energy and food resources. In our opinion, it is this approach, without calculating the integral coefficient of the resource potential, that shows the diverse aspects of the regional structure of the resource potential of the SFD. In 2017, the Kemerovo and the Krasnoyarsk Regions played a dominant role in the extraction of minerals; the Krasnoyarsk and the Irkutsk regions led the production of electricity; the Altai region was the leader in the production of agricultural products.

Further, the authors analyzed the regional structure of the innovation potential of the Siberian Federal District. Table 2 presents the subjects of the SFD RF in their decreasing order according to the share in the structure of the main characteristics of the innovation potential.

As the main characteristics of the innovation potential, the following indicators were analyzed: a number of students enrolled in undergraduate, specialist, graduate programs; a number of organizations performing research and development; internal research and development costs. In our opinion, the selected indicators, not exhausting the whole range of characteristics of the innovation potential, reflect its main components. In 2017, the Novosibirsk region was ranked first in the share in the structure of all analyzed characteristics of the innovative potential of the SFD. The Krasnoyarsk and Tomsk regions immediately follow the leader, with a high value of shares in individual characteristics of the innovative potential of the Omsk and Irkutsk Regions.

The development prospects of the Siberian Federal District are largely determined by the development strategies of its constituent entities. The authors showed and analyzed previously their main provisions [5]. The key drafters of the development strategies of the subjects are unanimous in the opinion that the future of the regions is impossible without the innovation component. The Novosibirsk, Tomsk and Krasnoyarsk regions can become the driver-forming regions in terms of the use of innovative potential.
The analysis made allows to conclude that it is necessary and expedient to use the innovation component in the interaction of regions with different resource and innovation potential. The integration of the economic entities of the mining and processing industries, agriculture, science and education of the regions of the SFD creates additional impulses for their progressive development.

| Subjects                  | Number of students enrolled in undergraduate, specialist, graduate programs, thousand people | Research and development organizations | Domestic costs of research and development, million rubles |
|---------------------------|------------------------------------------------------------------------------------------|---------------------------------------|----------------------------------------------------------|
| Novosibirsk region        | 18.2                                                                                     | 25.8                                  | 31.9                                                     |
| Krasnoyarsk region        | 13.9                                                                                     | 14.7                                  | 23.8                                                     |
| Tomsk region              | 10.7                                                                                     | 13.4                                  | 20.8                                                     |
| Omsk region               | 14.5                                                                                     | 8.5                                   | 8.9                                                      |
| Irkutsk region            | 12.6                                                                                     | 9.8                                   | 6.2                                                      |
| Altai region              | 9.2                                                                                      | 7.2                                   | 2.6                                                      |
| Kemerovo region           | 9.3                                                                                      | 6.6                                   | 3.3                                                      |
| The Republic of Buryatia  | 4.5                                                                                      | 4.7                                   | 1.3                                                      |
| Transbaikal region        | 4.2                                                                                      | 3.4                                   | 0.6                                                      |
| The Republic of Khakassia | 1.5                                                                                      | 3.6                                   | 0.1                                                      |
| Tyva Republic             | 0.8                                                                                      | 2.1                                   | 0.4                                                      |
| Altai Republic            | 0.5                                                                                      | 2.1                                   | 0.1                                                      |

Source: Calculated by the authors according to the Federal State Statistics Service [11].

4. Discussion
In the contemporary scholarly literature, a number of researchers pay serious attention to the issues of ensuring the efficient use of the territories’ resource potentials. N. D. Rodionova [6], A. G. Polyakova, I. S. Simarova [7] studied the spatial connectivity of regions and the forms of their interaction. From the foreign researchers focused on the forms of realization of inter-regional economic interactions, the works of E. M. Bergman, E. J. Feser [8, 9] are of particular interest. S. S. Gubanov [1], S. A. Kozhevnikov [2], Yu. A. Volkova, N. P. Dragun [10] investigated the essence and types of integration. These authors note the existence of different approaches to explaining the nature and essence of vertical integration in neoclassical and neoinstitutional economic theory, draw attention to the emergence of a broader interpretation of integration and related new forms of integration interactions.

Appeals to the subject and content of scientific discussion in the theory of spatial development on the problems of interregional interaction allow to justify the author’s position on the need and desirability of regional integration. Comparing the “soft” and “hard” forms of integration, we consider the “soft” forms of regional integration to be the most acceptable. They are based solely on the contractual relationship between its members (network organizations, clusters, associations, consortia). At the same time, they do not deny the feasibility of forming, in some cases, technological value chains using “hard” forms of vertical integration.

The authors tested a methodical approach to assessing resource and innovation potentials as a condition for the integration of regions on the materials of the Siberian Federal District. The results of the approbation give grounds to consider the integration of the resource and innovation potential of the regions expedient in order to increase the competitiveness of the subjects of the SFD and Russia as a whole.

5. Conclusion
The authors reviewed the theoretical aspects of the integration processes of the regions and analyzed the level of resource and innovation potentials of the SFD subjects. Based on the foregoing, the
authors show the capabilities of the studied regions to integration interactions to improve the efficiency of the using the regional resources and ensuring their competitiveness and the competitiveness of the national economy.

Author’s research confirms the hypothesis of the expediency of integrating regions with different species and level potentials for the development of their territories.

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