CDSES 2020

IV International Scientific Conference "Competitiveness and the development of socio-economic systems" dedicated to the memory of Alexander Tatarkin

INTERREGIONAL INEQUALITY DYNAMIC AND ASSESSMENT OF REGION'S ABILITY TO SELF-DEVELOPMENT

Olga Potasheva (a)*, Marina Moroshkina (b)
*Corresponding author

(a) Institute of Economics of the Karelian Research Centre of the Russian Academy of Sciences, 50, Al. Nevsky Pr. Petrozavodsk, Russia, ovpotash79@gmail.com
(b) Institute of Economics of the Karelian Research Centre of the Russian Academy of Sciences, 50, Al. Nevsky Pr., Petrozavodsk, Russia, maribel74@mail.ru

Abstract

The article discusses the regional policy of economic alignment of Russian regions and the introduction of effective tools for regulating socio-economic development. The purpose of the study is to study the dynamics of interregional differentiation in Russia by social and economic indicators of development and assessment of regions' ability to self-development through the formation of human capital with a high level of professional education. The research is based on a reasonable ranking and typologies of Federal subjects by indicators of socio-economic development that show an increase in differences in the rates of economic development of Russian regions during periods of recession and recovery, taking into account the specifics of government support for various groups of Federal subjects. The models are based on the author's methodology. The influence of social and economic factors on the regional economy development in the observed long period from 2000 to 2018 is estimated. Ranking of data and cross-factor analysis of comparable data series by the leading social and economic indicators of Russian regions allowed us to assess the level of regional heterogeneity and form groups of regions considering their development's specifics. The paper presents an assessment of the dynamics of human capital's influence on the economic potential of independent socio-economic development of Federal subjects. The calculations determined the presence of interregional differentiation and showed the possibilities of various groups of Russian regions for independent economic development.

Keywords: Higher education, interregional inequality, regional policy

1. Introduction

The search for the most optimal way of economic alignment of Russian regions is currently the goal of many scientific studies and a priority task of Federal authorities in creating and implementing effective tools to regulate regional policy (Burakov et al., 2019; Buhvald, 2018; Rossoshanskiy, 2015). Currently, all federal and regional authorities' efforts are aimed at solving the problem to improve the quality of life of the population (Mikheeva, 2018). However, whether these investments are justified in the regional economy's alignment and whether there is a positive impact on economic potential formation based on human capital investment remains a little-studied issue.

2. Problem Statement

The study is based on a reasonable ranking and the typology of Federal subjects according to the selected indicators of socio-economic development (gross regional product, population income, the share of employed with the level of higher education, the number of university students, regional budget revenues). It shows increasing differences in the rates of social development of Russian regions during periods of economic recession and recovery, taking into account the specifics of state support for various Federal subjects (Busygina, 2011).

The indicators considered in the study are characterized by a high level of heterogeneity (Moroshkina, 2016). Most researchers note the process of territorial differentiation over the past two decades by a significant number of indicators (Maslikhina, 2016; Zubarevich, 2017).

Regional inequality in economic and social indicators allows forming different classifications and typologies depending on the development level (Bezhanova et al., 2019; Kolodina, 2019; Lyapina, 2012; Tolmachev et al., 2019). Scientists note that inequality in the population's income is an important indicator of the country's socio-economic development based on this research. It is possible to conclude citizens' social opportunities in different parts of the united country (Stukalenko et al., 2017).

Inequality of territories by the average per capita income level allows us to identify the most favorable territories for living with a high level of well-being (Litvintseva et al., 2017; Midov, 2018). A significant positive relationship can be observed between the high level of education of the population and the population's level of income in different regions (Potasheva, & Moroshkina, 2017; Vaganova, 2014).

Models, based on the author's methodology, are constructed and the influence of social and economic factors on the development of the regional economy from 2000 to 2018 is estimated.

3. Research Questions

The study assesses some changes in social and economic indicators in dynamics. Social indicators are defined – changes in the number of University students and employees in the region's economy with the level of higher professional education and economic indicators: GRP, the monetary income of the population and budget revenues of the Federal subject. The study attempts to explain what regional differences from 2000 to 2018 can be associated with it.

4.   Purpose of the Study

The purpose of this work is to study the dynamics of interregional differentiation in Russia by social and economic indicators of development and assess the regions' ability to self-development through the formation of human capital with a high level of professional education.

5.   Research Methods

During this study, economic indicators (GRP per capita, monetary income per capita and consolidated budgets of Russian Federation) and social indicators (the number of employees with a level of high professional education, the number of students of high education organizations per 10000 people) were selected from open sources of Federal state statistics service. Data series for a period from 2000 to 2018 were compiled according to these indicators. 2002, 2010, 2014 and 2018 were chosen to make a comparative analysis. It is not always effective to compare the dynamics of indicators directly due to the high impact of inflation on individual indicators. Calculations are made to the level of 2010, which became base for calculating the growth rate. The study based on the completeness of statistical data, included 78 regions of Russia, excluding: Chechen Republic, Zabaykalsky region, Yamalo-Nenets Autonomous district, Nenets Autonomous district, Tyumen autonomous district, the Republic of Crimea and Sevastopol.

Comparison of data in 2002, 2014 and 2018 with respect to the level of 2010 allowed us to apply the ranking method and conduct a cross-factor analysis of regions to determine groups of regions with similar characteristics. According to them, it is possible to characterize the authorities' efforts in alignment of regional economic development and the formation of economic potential based on the investment in human capital, namely by increasing the population's educational potential with a higher educational level.

6.   Findings

Ranking of regions by the identified indicators allowed us to identify 10 regions leading in terms of growth rates to the level of 2010 and 10 lagging behind, with minimal growth values in social and economic indicators of development. Analysis of ranking results also identified a group of regions of the transition values, when the region is among the leaders in 2002, became the outsider of a rating on indicators in 2014 and 2018 and the situation where some regions are outsiders of the rating in 2002 became leaders in the rating results 2014 and 2018.

6.1.   Interregional differentiation in the number of University students and the number of people employed in the economy with the level of higher professional education:

During the study period, there is a steady reduction in the number of students of higher educational institutions in Russia, which is due to a number of objective and subjective reasons.

The objective reasons include the influence of the demographic crisis of 1999-2000s in Russia, which, in general, had an impact on the reduction of the potential number of University applicants and

students in the period from 2010 to 2018. The regional difference in the number of University students compared to 2010 is decreasing by the middle of 2010: in 2002 the difference was 3.6 times, in 2014 – 1.9 times. According to our estimates, the difference again increases by 2.8 times in 2018.

Subjective reasons for the reduction in the number of students include factors associated with young people's educational strategies, state support for the development of higher educational system (the creation of a regional network of reference universities), and regional specialization in the structure of employment. Table 1 shows that such regions as Moscow, Novosibirsk region, Tomsk region, which traditionally attract young people and are the country's educational centers, are losing their positions in the ratings of 2014 and 2018. And the leaders in 2014 and 2018 are Stavropol region, Omsk region, the republic of Tuva and Karachay-Cherkess Republic. At the same time, they are associated with an increase in the population's monetary income.

Table 1. Results of ranking Russian regions by the number of University students and the number of people employed in the economy with higher professional education

The results of ranking 2010\2002	The number of students enrolled in educational programs of higher education per 10000 people		The results of ranking 2010\2002	The number of people in the economy by level of education (HPE), in %	
	Regions-leaders	Regions-outsiders		Regions-leaders	Regions-outsiders
2010/ 2002	Leningrad region, Amur region, the republic of Altai, the republic of Dagestan, Moscow, Primorsky krai, Novosibirsk region, Novgorod region, Tomsk region, the republic of Khakassia	Tambov region, Lipetsk region, Bryansk region, Kurgan region, the republic of Buryatia, Smolensk region, Magadan region, Khabarovsk region	2010/ 2002	Bryansk region, Saratov region, the republic of Buryatia, Sakhalin region, the republic of Kabardino-Balkaria, Jewish Autonomous region, Lipetsk region, the republic of North Ossetia-Alania, Chukotka Autonomous region, Irkutsk region	Oryol region, Leningrad region, the republic of Udmurt, the republic of Adygea, the republic of Kalmykia, Orenburg region, Astrakhan region, the republic of Tuva, Kurgan region, Kamchatka region
2010/ 2014	Stavropol region, Astrakhan region, the republic of North Ossetia-Alania, the republic of Karachay-Cherkess, the republic of Tuva, Omsk region, Rostov region, the republic of Ingushetia, Tver region, Tambov region	The republic of Saha-Yakutia, Primorsky Krai, the republic of Altai, the republic of Chuvash, Arkhangelsk region, Pskov region, the republic of Khakassia, Magadan region, Jewish Autonomous region, Kamchatka region	2010/ 2014	Lipetsk region, Pskov region, Kirov region, the republic of Buryatia, Amur region, Jewish Autonomous region, the republic of Tatarstan, Ryazan region, Voronezh region, Sakhalin region	Yaroslavl region, the republic of Altai, the republic of Khakassia, Moscow, Novgorod region, the republic of Dagestan, Leningrad region, Kaliningrad region, Saint-Petersburg, the republic of Ingushetia

2010/ 2018	Omsk region, the republic of Tuva, Stavropol region, Tambov region, the republic of Tatarstan, Tomsk region, Oryol region, the republic of Karachay-Cherkess, the republic of Kalmykia, the republic of Mordovia	The republic of Saha-Yakutia, the republic of Buryatia, Leningrad region, Vologda region, Sakhalin region, Novgorod region, Magadan region, Kamchatka region, Jewish Autonomous region, Murmansk region	2010/ 2018	Lipetsk region, the republic of Buryatia, Jewish Autonomous region, Sakhalin region, Kirov region, the republic of Kalmykia, Chukotka, the republic of Tatarstan, Amur region, the republic of Karachay-Cherkess.	Samara region, the republic of Udmurt, Novgorod region, Rostov region, the republic of Khakassia, Krasnodar region, Moscow, Saint-Petersburg, Kaliningrad region, the republic of Ingushetia

A separate interest in the ranking of regions is the appearance of the republic of Ingushetia and Tombov region among the leaders in 2014 and 2018, but they were lagging regions in the rating of 2002. At the same time, a very likely reason for their transition to the leadership group is the comparison with the growth of the level of GRP per capita and regional budget income level.

It is also important to have employment opportunities for people with higher professional education. Considering this, we looked at the position of the regions relative to the level of 2010. In general, the study showed that the difference between the regions by the level of the employed population with higher education was the smallest of all the considered indicators and tends to reduce the gap between the maximum and minimum values: from 2.2 times in 2002 to 1.6 times in 2018.

The highest scores result from ranking received: Lipetsk region, the republic of Buryatia, Sakhalin region, Jewish Autonomous region and Chukotka. The lowest scores are observed in the regions: Moscow, St. Petersburg, Leningrad and Kaliningrad regions.

But the relationship between the results with economic indicators was not so clear – the highest scores were given to the regions where the proportion of employees with higher education does not have a direct relationship with GRP, regional budget income or monetary income of the population. As our analysis shows, only for Sakhalin region, Amur region, Voronezh region, Chukotka Autonomous region, the role of the number of the employees in the economy with higher education has an impact on the growth of GRP per capita and the monetary income of the regional population.

6.2. Interregional differentiation of GRP, monetary income of the population and budget revenues of the region:

The results of interregional differentiation calculations by economic indicators showed heterogeneity of some regions that occupy leading and lagging positions when ranking data to the level of 2010 for 2002, 2014 and 2018.

Changes in the state of regional economic development generally reflect the gross regional product (GRP). Calculations of GRP per capita showed that regional differences in general are decreasing: in 2002 – 3.64 times, in 2018 – 2.2 times. The republic of Sakha (Yakutia), the republic of Kalmykia, Astrakhan, Voronezh and Novosibirsk regions retain their positions among the "richest" regions and in lagging behind regions – Leningrad, Ivanovo, Orenburg regions, Primorsky region and the republic of

Buryatia. It is important to note that the four lagging regions of 2002 rating were the leaders in 2014 and 2018: the republic of Ingushetia, the republic of Dagestan, Kaluga and Sakhalin regions.

In Russia, the government supports some regions through the provision of grants for alignment of budgets and other inter-budget transfers. As the analysis of socio-economic indicators of recent years shows, the current policy of inter-budgetary relations does not reduce the level of differentiation and the uneven development of Russian subjects. According to our estimates, the gap in maximum and minimum values in the regions is more than 2.6 times. The group of regions with high level of income of the consolidated budget includes: Chukotka Autonomous region, the republic of Sakha (Yakutia), the republic of Udmurt and the republic of Ingushetia. It is worth to note the appearance of Leningrad and Sakhalin regions among the leading regions. Their budget revenues are not subsidized by government in the studied period.

Another important indicator of regional socio-economic development is the average per capita monetary income for Russian Federation subjects. The level of income determines the quantity and quality of goods and services consumption, which in turns determines the level of production development in the period from 2002 to 2018, is significantly higher in the early 2000s. The difference was more than 3 times, by 2014 it is reduced to 1.5 times and by 2018 again increases to 2.5 times.

The clear leaders as a result of data comparison were Chukotka Autonomous region, Amur region, Voronezh region, the republic of Adygea and Altai region. The regions with the lowest growth in population income by the level of 2010 were Krasnoyarsk region, the republic of Altai, Samara and Chelyabinsk regions. Cross-factor analysis of data showed that the level of monetary income of the population is most interrelated with other factors of socio-economic development. The greatest correlation is observed with the indicator of employees with higher professional education in Chukotka Autonomous region, Voronezh and Amur regions.

Thus, our cross-factor analysis of Russian regions in the period from 2000 to 2018 showed that the process of forming human capital with a high level of education is most likely to occur in the remote regions of the country – Amur, Sakhalin, Stavropol regions and Chukotka Autonomous region, where there is economic growth compared to the level of 2010 and in national republics (the republic of Buryatia, the republic of Tuva, Tatarstan, Kalmykia, Karachay-Cherkess) where the population remains high. The first group of regions is attractive for specialists with higher education, high salary level, and special benefits of state support for these regions' citizens. The second group, having human resources with high educational potential at their disposal, does not fully or insufficiently use these resources and it is important for them to identify the instruments of regional policy that would contribute to the self-development of the region's economy.

7. Conclusion

The study of the impact of human capital on the economic potential of socio-economic self-development of the Federal subjects revealed a number of significant factors. First, the study revealed an increase in the monetary income of the population in certain regions, which affects both the motivation of citizens to obtain higher education, and the migration of specialists with higher education to those regions of the country where the level of wages is higher, the amount of social guarantees and forms of support

from government is greater. Second, the growth of GRP per capita in conjunction with the growth of employees' number with higher education, for example, in Sakhalin and Voronezh regions, can be considered as examples of regional practices to self-development of regions economy for further study.

The calculations determined the presence of interregional differentiation in the development of Russian regions, increasing by 2018 for all studied indicators, except for the number of university students. These calculations also showed that the differentiation by GRP per capita is higher than by budget income and per capita income of the population.

The authorities need to use information about interregional differentiation. From our perspective, it reflects a complete picture of the regions' socio-economic development state and the directions of the country's economy as a whole. This will make it possible to implement tools effectively to support regional economic development and reduce regional inequality.

Acknowledgments

References

Bezhanova, E. K., Shkhagoshev, R. V., & Shetov, A. A. (2019). Analysis and assessment of the influence of various factors on the dynamics of the number of Russian university students. *State and Municipal Management. Scholar Notes, 4,* 90-95. https://doi.org/10.22394/2079-1690-2019-1-4-90-95

Buhvald, E. M. (2018). «Samorazvitiye» regionov i prioritety regulirovaniya prostranstvennoy struktury rossiyskoy ekonomiki [«Self-development» of regions and the regional priorities of the spatial structure of the economy of Russia]. *Federalism, 2,* 32-45.

Busygina, I. M. (2011). Model' «Tsentr – periferiya», federalizm i problema modernizatsii rossiyskogo gosudarstva [The "center-periphery" model, federalism and the problem of modernizing of the Russian state]. *Politicheskaia nauka, 4,* 53-70.

Burakov, N. A., Buhvald, E. M., & Kol'chugina, A. V. (2019). Ranzhirovaniye sub"yektov Rossiyskoy Federatsii na osnove regional'nogo indeksa ekonomicheskogo razvitiya [Regional index of economic development and ranking of the subjects of the Russian Federation]. *Federalism, 3,* 149-171.

Kolodina, Y. A. (2019). Issledovaniye rezul'tativnosti vyravnivayushchey regional'noy politiki v Rossiyskoy Federatsii [The research of regional leveling policies effectiveness in the Russian Federation]. *Regional economy and management: electronic scientific journal, 4,* 6007.

Litvintseva, G. P, Glinskiy, V. V., & Stukalenko, E. A., (2017). Interregional differentiation of population incomes in Russian Federation in the post-crisis period. *Academy of Strategic Management Journal*, *16*(4).

Lyapina, I. R. (2012). Klassifikatsiya regionov Rossii: «Rezul'tativnost' upravleniya sotsial'no-ekonomicheskim razvitiyem» kak osnovaniye tipologizatsii [Classification of regions of Russia: "Productivity of management of social and economic development" as basic classification]. *Tomsk State University Journal of Economics, 4,* 54-63.

Maslikhina, V. (2016). Interregional Inequality: A Case Study in Russia. *International journal of economics and financial, 6*, 60-64.

Midov, A. Z. (2018). Differentsiatsiya regionov Rossii po urovnyu strategicheskikh konkurentnykh preimushchestv: metodologicheskiye podkhody i strategicheskiy analiz [Differentiation of Russian Regions in Terms of Strategic Competitive Advantages: Methodological Approaches and Strategic

Analysis]. *Administrative Consulting, 1*(7), 165-173. https://doi.org/10.22394/1726-1139-2018-7-165-173

Mikheeva, N. N. (2018). Prioritety regional'nogo razvitiya kak faktor ekonomicheskogo rosta [Priorities of regional development as a factor of economic growth]. *Scientific Articles – Institute of Economic Forecasting Russian Academy of Sciences, 16,* 32-55.

Moroshkina, M. V. (2016). Differentsiatsiya rossiyskikh regionov po urovnyu ekonomicheskogo razvitiya [Differentiation of Russian regions by level of economic development]. *Studies on Russian Economic Development, 4*(157), 109-113.

Potasheva, O. V., & Moroshkina, M. V. (2017). Statisticheskaya otsenka regional'nykh razlichiy sub"yektov RF po urovnyu obrazovatel'nogo potentsiala molodykh pokoleniy naseleniya [Statistical estimation of regional differences in regions of the Russian Federation in terms of educational potential of young generations]. *Statistics and Economics, 15*(2), 38-48. https://doi.org/10.21686/2500-3925-2018-2-38-48

Rossoshanskiy, A. I. (2015). K voprosu o regional'noy differentsiatsii kachestva zhizni naseleniya [Revisiting the regional differentiation of population's live quality]. *Problems of Territory's Development, 1*(75), 88-99.

Stukalenko, E. A., Shchekoldina, V. Yu., & Kashirskaya, E. V. (2017). Otsenka mezhregional'nogo neravenstva po dokhodam i VRP na dushu naseleniya v Rossii v nachale XXI v [Assessment of interregional inequality by income and grp per capita in Russia in the early 21 st century]. *Herald of Omsk University. Series "Economics", 4*(60), 193-205. https://doi.org/10.25513/1812-3988.2017.4.193-205

Tolmachev, M. N., Barashov, N. G., Latkov, A. V., & Markov, V. A. (2019). Interregional inequality of population incomes. *Problems of Methodology and Estimation in the Russian Federation. SHS Web Conf., 62,* 09003. https://doi.org/10.1051/shsconf/20196209003

Vaganova, A. S. (2014). Otsenka vliyaniya vysshego obrazovaniya na sotsial'no-ekonomicheskoye razvitiye regionov [Estimation of influence higher education for socio-economic development of regions]. *Problems of Economics and management, 29,* 23-26.

Zubarevich, N. V. (2017). Razvitiye rossiyskogo prostranstva: bar'yery i vozmozhnosti regional'noy politiki [Development of the Russian Space: Barriers and Opportunities for Regional Policy]. *The world of new economy*, *11*(2), 46-57.