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Assessment of the Impact of the Economic Potential of Regions on the Living Standards of the Population

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ABSTRACT

The **purpose** of the paper is to assess the impact of the region's economic potential on the standard of living and to develop tools to improve the efficiency of using the financial potential of a constituent entity of the Russian Federation. The object of the study is the regions of the Russian Federation, and the subject is their economic potential and standard of living. At the first stage, we considered the impact of the resource potential of the regions of the Central and Northwestern Federal Districts based on the use of correlation and regression analysis. Modeling has shown that for the regions of the Central and Northwestern Federal Districts, the most significant impact on the standard of living is provided by investment and innovation potentials. In addition, for the Central Federal District, production and labor potentials also have a significant impact, and for the Northwestern Federal District, the general economic potential, represented by the GRP indicator, is significant. In the second stage, we used the k-means method to cluster 85 regions based on the size of their resource potential and standard of living. The analysis showed that most regions have a standard of living that corresponds to and even exceeds the existing economic potential. This situation seems quite natural, since the standard of living in a region is determined not only by the potential of the territory, but also by the potential of the state as a whole. The assessment of the financial reserve available to the regions is based on the concept of fiscal space, which allows assessing the possibilities of mobilizing additional own and borrowed financial resources to address priority issues of the socio-economic development of the territory. The proposed typology of regions by standard of living and by the size of the fiscal space can be used as a tool for assessing the potential of the fiscal space of the region to address the current socio-economic problems of the territory.

Keywords: budget potential; regional differentiation; cluster; region; standard of living; debt level; financial potential; economic potential; fiscal space

INTRODUCTION

The high level of differentiation in the socio-economic development of regions is one of the problems of ensuring the economic security of the Russian Federation and a restraining factor for the development of the state. In the Economic Security Strategy, "the uneven spatial development of the Russian Federation, the increasing differentiation of regions and municipalities in terms of the level and pace of socio-economic development" is considered a threat.[1]

Thus, in 2021, the average per capita GDP across the Russian Federation amounted to 830 792.7 rubles. Meanwhile, the GRP in Moscow was 1 935 204.5 rubles, in the Tyumen region — 2 992 775.4 rubles, and in the Republic of Ingushetia — only 148 586.8 rubles. Therefore, the difference in average per capita GRP is more than 20 times. Significant differentiation also occurs between neighboring regions within the same federal district. In the Northwestern Federal District, GRP per capita in St. Petersburg is five times higher than in the neighboring Pskov region. At the same time, reducing interregional disparities in the level and quality of life of the population is an important factor in ensuring sustainable and balanced spatial development of the Russian Federation.[2]

A high level of differentiation is also manifested in the financial sphere [1]. The low level of budget revenues for a significant portion of the subjects of the Russian Federation leads to a high level of their dependence on subsidies from the federal budget, a lack of resources for financing the development of the economy and the social sphere, and also creates problems for the sustainable development of all areas of the population's life activities in the territory [2]. High differentiation is caused by both objective factors and problems in conducting regional policy. The main factor in this is the significantly varying level of resource provision of the regions.

An important direction for solving the problem of reducing the level of differentiation, as well as other priority issues in the regions, is to increase the efficiency of their budgetary and tax policy. At the same time, the evaluation of this policy should be carried out, first and foremost, from the perspective of improving the standard of living of the population as the ultimate consumer of budget-funded services [3]. In the strategic documents of the subjects of the Russian Federation, improving the quality of life of the population is defined as the main goal of socio-economic policy. Therefore, the implementation of all types of policies: investment, industrial, budgetary and tax, etc., should be aimed at achieving this main goal.

At the same time, the diversity of Russian regions in terms of resource availability imposes certain limitations on the possibilities of conducting budgetary and tax policy. In this situation, the issues of assessing the resource potential of regions and developing tools to enhance the efficiency of its use become particularly relevant. The solution to this task is especially important in the financial sector, as it ultimately determines the standard of living of the population in the subjects of the Russian Federation.

The purpose of the paper is to assess the impact of the region's economic potential on the population's standard of living and to develop tools for improving the efficiency of using the financial potential of the Russian Federation's constituent entities. In achieving this purpose, the following tasks are addressed:

• assess the impact of the economic potential of regions in terms of its main types on the standard of living of the population;

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[1] The Economic Security Strategy of the Russian Federation for the period up to 2030. URL: http://docs.cntd.ru/document/420398070 (accessed on 09.04.2024).

[2] Government Decree of the Russian Federation from 13.02.2019 No. 207 "On the Approval of the Spatial Development Strategy of the Russian Federation for the Period up to 2025".

• conduct clustering of regions based on resource potential indicators and the standard of living of the population;

• propose tools for managing the financial potential of a subject of the Russian Federation.

In the scientific literature, a wide range of opinions on the structure of regional systems' potential is presented. For example, in the paper [4], the following types of territorial potential are identified:

• spheres of material production;
• non-material sphere;
• service sector;
• social service sectors;
• natural resource;
• demographic;
• labor;
• recreational;
• innovative.

A somewhat different approach to identifying the main types of resource potential is presented in the paper [5]:

• infrastructural;
• natural resource;
• investment;
• personnel;
• economic.

In a number of papers, resource potential is identified with economic potential. For example, in the paper [6], indicators of material and technical, financial and economic, and innovative and institutional potentials are used to assess economic potential. The authors of the paper [7] highlight the following main elements of economic potential:

• natural resource;
• labor;
• production;
• infrastructural;
• innovative.

To assess production potential, indicators of the industrial production index and the volume of shipped goods are used [8]. The paper [9] emphasizes the role of human potential in territorial development. As indicators of labor potential, most authors use the level of employment, wages, and education [10]. To evaluate the effectiveness of the use of economic potential as a whole, indicators of GRP, investments, innovations, as well as budget payments are used.

Effective management of all types of economic potential of a territory implies their monetization, which can be assessed by the size of the financial potential [11]. Its structure includes the following main elements:

• budgetary and tax;
• financial and credit system of the region;
• financial potentials of the population and businesses [12].

The resource-based and process-based approaches to interpreting the financial potential of a region are presented in the paper [13]. Within the framework of the first approach, these are the financial resources obtained by the economic entities operating in the region, and within the framework of the second approach, these are the part of the financial resources actually used to achieve the development goals of the region. Financial potential is the most mobile type of potential, as it can be quite rapidly altered within the framework of the public debt management policy of the Russian Federation entity.

The economic potential has a decisive influence on the standard of living of the region's population, which is assessed using wages, pension amounts, consumer spending, and the share of the population with incomes below the subsistence minimum [14, 15].

Thus, the assessment of potential plays an important role in studying the possibilities and prospects of the socio-economic development of a region. At the same time, the large number of regions and the high level of differentiation in their economic potential highlight the task of clustering, which allows for the division of regions into relatively homogeneous groups. For this purpose, the main indicators of regional development are most often used: GRP, investments, budget expenditures, living standards, as well as

Evaluation of the Impact of Indicators of the Main Types of Regional Potential on the Standard of Living (Correlation Coefficients)

Indicators of main types of potential	The ratio of income to the subsistence minimum (Income Y1)		The share of the population with monetary incomes below the subsistence minimum (Poverty Y2)	
	CFD	NFD	CFD	NFD
GDP per capita (GDP, *X*1)	**0.83**	**0.66**	**−0.68**	**−0.62**
Investments per capita (Investments, *X*2)	**0.85**	0.31	**−0.74**	−0.59
Expenditures of the consolidated budget of the Russian Federation subject per capita (Budget, *X*3)	0.74	0.35	−0.59	−0.41
The share of organizations that implemented technological innovations (Innovations, *X*4)	0.62	**0.77**	−0.59	**−0.64**
The volume of shipped goods from manufacturing industries and mineral extraction per capita (Production, *X*5)	0.50	0.21	−0.61	−0.37
The employment rate of the region's population (Labor, *X*6)	0.67	**0.76**	−0.62	**−0.77**

Source: Compiled by the authors based on Rosstat data. URL: https://rosstat.gov.ru/folder/210/document/13204 (accessed on 09.04.2024).

demographic indicators. According to the author of the paper [16], for clustering purposes, it is also advisable to use indicators of industrial production and innovative activities. When typologizing regions by the level of financial independence, indicators characterizing the potential of regional and municipal taxes, as well as the tax burden on the economy, are used [17].

The typology of the regions of the Northwestern Federal District from the perspective of ensuring sustainable development is presented in the paper [18]. To address the task, the authors used indicators such as the debt level of the constituent entity of the Russian Federation, GRP, population size, per capita income, as well as expenditures on debt repayment and servicing. The paper also concludes that the negative effect of high debt burden begins at levels of about 5% relative to GRP and about 43% relative to the own revenues of the budget of the constituent entity of the Russian Federation.

In recent years, the Government of the Russian Federation has also been using classification tools to assess the debt sustainability of the subjects of the Russian Federation.[3] However, the methodology used does not allow for the alignment of debt indicators and the standard of living of the population in the regions.

METHODS

The subject of the research in this paper is the subjects of the Russian Federation, and the object is the economic potential of the regions in relation to the standard of living of the population. The information base includes data from the Ministry of Finance and statistical collections of Rosstat "Regions of Russia". To assess the overall economic potential, indicators of GRP and investments

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[3] Resolution of the Government of the Russian Federation from 04.03.2020 No. 227 "On the Approval of the Rules for Assessing the Debt Sustainability of Subjects of the Russian Federation".

Matrix of Paired Correlation Coefficients for the Regions of the Central Federal District

Indicators	Y1	Y2	X1	X2	X3	X4	X5	X6
Y1	1.00							
Y2	−0.85	1.00						
X1	0.83	−0.68	1.00					
X2	0.85	−0.74	0.90	1.00				
X3	0.74	−0.59	0.97	0.87	1.00			
X4	0.62	−0.59	0.68	0.58	0.60	1.00		
X5	0.50	−0.61	0.63	0.60	0.55	0.59	1.00	
X6	0.67	−0.62	0.72	0.63	0.67	0.60	0.60	1.00

Source: Compiled by the authors based on Rosstat data. URL: https://rosstat.gov.ru/folder/210/document/13204 (accessed on 09.04.2024).

in fixed capital are used, as well as these indicators per capita. The expenditures of consolidated budgets as a whole and per capita determine:

• the amount of budget potential; the share of organizations that implemented technological innovations; the volume of innovative goods, works, services — innovative potential;

• the volume of shipped goods from manufacturing industries; the extraction of mineral resources in the region as a whole and per capita — production potential;

• indicators of the average annual number of employed and the level of employment of the population — labor potential of the territory.

To assess the standard of living of the population, two indicators are used: the first is the ratio of per capita monetary income of the population to the subsistence minimum in the region; the second is the share of the population with monetary income below the poverty line. For analyzing the impact of potential components on the standard of living and constructing a mathematical model across federal districts, correlation-regression analysis and panel data for the period 2017–2021,

presented as relative indicators of potential components, are used. The task of clustering regions by the size of resource potential and the standard of living of the population is solved based on the K-means method using absolute values of potential indicators for 2021. To assess the size of the fiscal space, indicators of debt in relation to tax and non-tax revenues and the size of GRP are used.

MAIN RESULTS

At the first stage, we will consider the task of assessing the impact of the economic potential of the regions of the Central Federal District (CFD) and the Northwestern Federal District (NFD) in terms of its main types on the standard of living of the population (*Table 1*). The assessment was carried out based on the calculation of correlation coefficients using panel data for the period 2017–2021.

The analysis shows that almost all the presented types of regional potential have a strong, or at least moderate, impact on the population's standard of living.

At the same time, there are certain differences between the federal districts. Thus, in the Central Federal District (CFD), the indicators of GRP and investments have

Matrix of Paired Correlation Coefficients for NFD Regions

Indicator	Y1	Y2	X1	X2	X3	X4	X5	X6
Y1	1.00							
Y2	−0.87	1.00						
X1	0.66	−0.62	1.00					
X2	0.31	−0.59	0.64	1.00				
X3	0.35	−0.41	0.72	0.51	1.00			
X4	0.77	−0.64	0.45	0.12	0.09	1.00		
X5	0.21	−0.37	0.76	0.79	0.66	0.06	1.00	
X6	0.76	−0.77	0.62	0.52	0.46	0.64	0.38	1.00

Source: Compiled by the authors based on Rosstat data. URL: https://rosstat.gov.ru/folder/210/document/13204 (accessed on 09.04.2024).

a fairly strong influence on both income and poverty. The level of influence of other types of potential is average. For the Northwestern Federal District (NFD), the most significant indicators are GRP, innovation, and labor potential. At the same time, the influence of production potential on the indicators of the population's standard of living is weak for the NFD and average for the CFD.

The significant difference in the impact of potential components on the standard of living of the population in the regions of the Central Federal District (CFD) and the Northwestern Federal District (NFD) justifies the feasibility of constructing separate models for the federal districts.

To build the model for the Central Federal District (CFD), we will consider the matrix of pairwise correlation coefficients (*Table 2*).

The indicators of GRP and budget expenditures have a high level of correlation with the more significant investment indicator, and we exclude them from further analysis. Thus, the formation of the model for the Central Federal District will be based on the following types of potential: investments (X2), innovations (X4), production (X5), and labor (X6). The analysis of the regression

equation, obtained based on the indicators of investments, innovations, and production, showed that, according to the Student's t-test, only two types of potential are significant — investments and labor. Taking this into account, the model of the dependence of the income indicator on investments X2 and labor X6 will have the form:

$$Y1 = 0{,}179 + 0{,}0069 \times X2 + 0{,}037 \times X6. \quad (1)$$

According to the Student's t-test, factors X2 and X6 are significant, and based on Fisher's criterion, the regression equation is considered statistically significant. The coefficient of determination for this model is 0.75, which means the model quality is quite high.

Regarding the model of the standard of living based on the indicator of the share of the population with incomes below the subsistence minimum (poverty), in this case, the most significant factors are investments X2 and production potential X5. The model satisfying the Student's t-test and Fisher's criterion will have the following form:

$$Y2 = 14{,}68 - 0{,}028 \times X2 - 0{,}003 \times X5. \quad (2)$$

The coefficient of determination for this model is 0.59, i.e., the quality of the model is average.

Let's further consider the model of the impact of the components of economic potential on the standard of living of the population in the regions of the Northwestern Federal District (*Table 3*).

The analysis of the pairwise correlation coefficient matrix shows that the least significant factor is the production potential, which also has a strong correlation with GRP and investments.

At the same time, an adequate model of the dependence of the standard of living, represented by the income indicator for the Northwestern Federal District, includes the factors GRP X1 and innovations X4 and has the following form:

$$Y1 = 1,44 + 0,00077 \times X1 - 0,045 \times X4. \qquad (3)$$

The coefficient of determination for this model is 0.72, i.e., the quality of the model is quite high.

A similar model for the poverty indicator will have the following form:

$$Y2 = 20,61 - 0,025 \times X2 - 0,26 \times X4, \qquad (4)$$

where $X2$ and $X4$ are the indicators of investments and innovations, respectively.

For this model, the coefficient of determination is 0.67, i.e., the quality of the model is also quite high.

Thus, the modeling showed that for the regions of the Central Federal District (CFD) and the Northwestern Federal District (NFD), the most significant impact on the standard of living is exerted by investment and innovation potentials. In addition, for the CFD, production and labor potentials also have a significant impact, while for the NFD, the overall economic potential represented by the gross regional product (GRP) is significant. The practical significance of the obtained results is determined by the possibility of their use in setting priorities for socio-economic policy.

To solve the problem of clustering regions of the Russian Federation, we will examine the relationship between the main indicators of potential and the standard of living of the population for 85 subjects of the Russian Federation based on data from 2021. The analysis shows that all components of the region's potential have a significant impact on the standard of living indicator, which is presented as the ratio of per capita income to the regional subsistence minimum. As for the poverty level indicator in the region, the degree of influence here is somewhat lower. At the same time, the most significant impact on the standard of living of the population in the regions is exerted by the production potential.

For an adequate assessment of the potential of regions, we will conduct clustering based on the absolute values of indicators using the *k*-means method, which allows us to divide the clustering objects (85 regions) into a specified number of clusters. The potential indicators of the regions have different units of measurement and vary significantly in magnitude. For this reason, their standardization is carried out using the following expression:

$$X_{\text{ст}} = (X_i - X_{\text{ср}}) / S, \qquad (5)$$

where X_i — the value of the potential indicator of the *i*-th clustering object (region), X_{av} — average value of the indicator, S — standard deviation of the indicator for 85 regions.

At the first stage, we will consider the clustering of regions by resource potential (*Table 4*).

The quality of clustering is assessed by the explained variance ratio, which should be more than 0.9. The resulting division of regions into 6 clusters yielded a value of 0.9471 for this indicator, indicating a high quality of clustering. The first three clusters include 6 regions with particularly high and high potential. A relatively small group

Table 4

Clustering of Regions of the Russian Federation by Resource Potential

Clusters	Potential
Moscow	Especially high
Moscow Region, St. Petersburg, Republic of Tatarstan	High 1
Khanty-Mansi Autonomous District, Yamalo-Nenets Autonomous District	High 2
Krasnodar, Rostov, Republic of Bashkortostan, Nizhny Novgorod, Samara, Sverdlovsk, Chelyabinsk region, Krasnoyarsk, Kemerovo	Average
Belgorod, Voronezh, Kaluga, Lipetsk, Tula, Vologda egion, Leningrad, Murmansk, Volgograd, Republic of Dagestan, Stavropol, Udmurt Republic, Perm, Orenburg, Saratov, Tyumen, Altai, Irkutsk, Novosibirsk, Omsk, Republic of Sakha (Yakutia), Primorsky region, Khabarovsk, Sakhalin	Below average
Bryansk, Vladimir, Ivanovo, Kostroma, Kursk, Oryol, Ryazan, Smolensk, Tambov, Tver, Yaroslavl, Republic of Karelia, Republic of Komi, Nenets Autonomous District, Arkhangelsk, Kaliningrad, Novgorod, Pskov, Republic of Adygea, Republic of Kalmykia, Republic of Crimea, Astrakhan, Sevastopol, Republic of Ingushetia, Republic of Kabardino-Balkaria, Republic of Karachay-Cherkessia, Republic of North Ossetia, Chechen Republic, Republic of Mari El, Republic of Mordovia, Chuvash Republic, Kirov, Penza, Ulyanovsk, Kurgan, Republic of Altai, Republic of Tuva, Republic of Khakassia, Tomsk, Republic of Buryatia, Zabaykalsky region, Kamchatka region, Amur region, Magadan region, Jewish Autonomous region, Chukotka Autonomous District	Low

Source: Compiled by the authors based on Rosstat data. URL: https://rosstat.gov.ru/folder/210/document/13204 (accessed on 09.04.2024).

of nine regions constitutes the medium potential group. The cluster with below-average potential includes 24 regions, and the low potential cluster includes 46 regions. Thus, more than half of Russia's regions have a low level of economic potential. It should be noted that this assessment is relative and obtained by comparing with the potential of other regions.

Next, let's consider the clustering of regions by the standard of living of the population, represented by the ratios of per capita income to the regional subsistence minimum and the number of people with monetary incomes below the poverty line.

Using the *k*-means method, the minimum number of clusters at which the explained variance is at least 90% is 6. In our case, this figure is 92.3%, indicating a high quality of the obtained clustering.

The results of the clustering of Russian regions are presented in *Table 5*. Regions with the highest standard of living are represented in the first cluster (3 regions). Regions with a high standard of living are included in the second cluster (14 regions). The third cluster (11 regions) is characterized by an average standard of living. The fourth cluster, whose regions have a below-average standard of living (36 regions), is somewhat lagging behind. The fifth cluster

Table 5

Clustering of Regions of the Russian Federation by Standard of Living of the Population

Clusters	Standard of living
Moscow, St. Petersburg, Yamalo-Nenets Autonomous District	Especially high
Belgorod, Voronezh, Lipetsk, Moscow, Yamalo-Nenets Autonomous District, Republic of Adygea, Krasnodar, Republic of Tatarstan, Nizhny Novgorod, Sverdlovsk, Khanty-Mansi Autonomous District, Magadan, Sakhalin, Chukotka Autonomous District	High
Kaluga, Kursk, Tambov, Tula, Yaroslavl, Leningrad, Murmansk, Rostov, Sevastopol, Republic of Bashkortostan, Samara	Average
Bryansk, Vladimir, Ivanovo, Kostroma, Oryol blast, Ryazan, Smolensk, Tver, Republic of Karelia, Republic of Komi, Arkhangelsk, Vologda, Kaliningrad, Novgorod, Pskov, Volgograd, Republic of Dagestan, Republic of North Ossetia, Stavropol, Udmurt Republic, Kirov, Perm, Orenburg, Penza, Saratov, Ulyanovsk, Tyumen, Chelyabinsk, Kemerovo, Novosibirsk, Omsk, Tomsk, Kamchatka region, Primorsky region, Khabarovsk, Amur	Below average
Republic of Crimea, Astrakhan, Republic of Kabardino-Balkaria, Chechen Republic, Republic of Mari El, Republic of Mordovia, Chuvash Republic, Kurgan region, Republic of Khakassia, Altai, Krasnoyarsk, Irkutsk, Republic of Buryatia, Republic of Sakha (Yakutia), Zabaykalsky region	Low
Republic of Kalmykia, Republic of Ingushetia, Republic of Karachay-Cherkessia, Republic of Altai, Republic of Tuva, Jewish Autonomous District	Poor

Source: Compiled by the authors based on Rosstat data. URL: https://rosstat.gov.ru/folder/210/document/13204 (accessed on 09.04.2024).
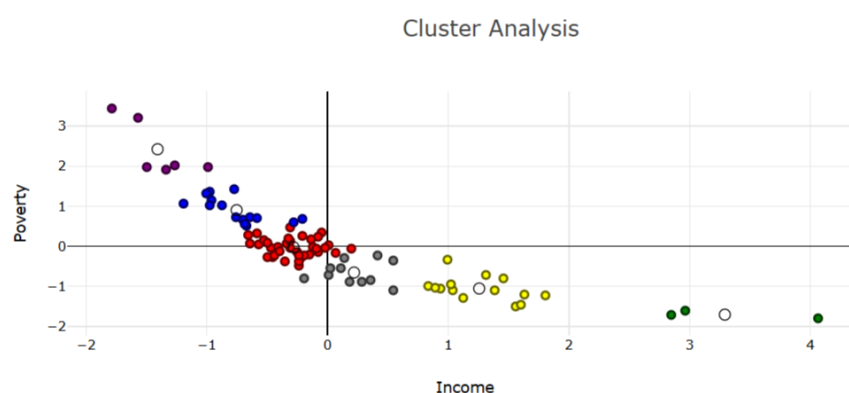
Fig. 1. Clustering of Regions of the Russian Federation by Living Standards

Source: Author's calculations.

Table 6

Typology of Regions of the Russian Federation by Standard of Living and Resource Potential

Standard of living	Potential					
	Especially high	High 1	High 2	Average	Below average	Low
Especially high	Moscow	St. Petersburg	Yamalo-Nenets Autonomous District			
High		Moscow Region, Republic of Tatarstan	Khanty-Mansi Autonomous District	Krasnodar Nizhny Novgorod Sverdlovsk	Belgorod, Voronezh, Lipetsk, Sakhalin	Yamalo-Nenets Autonomous District, Republic of Adygea, Magadan, Chukotka
Average				Rostov Bashkortostan Samara	Kaluga Tula Leningrad Murmansk	Kursk, Tambov Yaroslavl, Sevastopol
Below average				Chelyabinsk Kemerovo	Vologda Volgograd Republic of Dagestan Stavropol Udmurt Republic Perm Orenburg Saratov Tyumen Novosibirsk Omsk Primorsky region Khabarovsk region	Bryansk, Vladimir Ivanovo, Kostroma Oryol, Ryazan, Smolensk, Tver Republic of Karelia Republic of Komi Arkhangelsk, Kaliningrad, Novgorod, Pskov North Ossetia Kirov, Penza Ulyanovsk, Tomsk, Kamchatka, Amur
Low				Krasnoyarsk	Altai Irkutsk Republic of Sakha (Yakutia)	Republic of Crimea Astrakhan, Kabardino-Balkar Republic, Chechen Republic, Mari El Republic, Republic of Mordovia, Chuvash Republic, Kurgan, Republic of Khakassia, Republic of Buryatia, Trans-Baikal Territory

Table 6 (continued)

Standard of living	Potential					
	Especially high	High 1	High 2	Average	Below average	Low
Poor						Republic of Kalmykia, Republic of Ingushetia, Republic of Karachay-Cherkessia, Republic of Altai, Republic of Tuva, Jewish Autonomous District

Source: Compiled by the authors.

Table 7

Clustering of Regions of the Russian Federation by Debt Level

Clusters	Debt level
Vladimir, Kursk, Lipetsk, Nenets Autonomous District, Moscow, Vologda, Leningrad, Murmansk, St. Petersburg, Republic of Crimea, Sevastopol, Perm, Khanty-Mansi Autonomous District, Yamalo-Nenets Autonomous District, Tyumen, Chelyabinsk, Altai, Irkutsk, Primorsky region, Sakhalin	Low
Belgorod, Bryansk, Voronezh, Ivanovo, Tver, Tula, Republic of Adygea, Rostov, Republic of Dagestan, Chechen Republic, Republic of Bashkortostan, Chuvash Republic, Orenburg, Samara, Republic of Altai, Krasnoyarsk, Kemerovo, Novosibirsk, Republic of Sakha (Yakutia), Kamchatka	Below average
Kaluga, Moscow region, Ryazan, Republic of Karelia, Republic of Komi, Kaliningrad, Novgorod, Krasnodar, Astrakhan, Republic of Ingushetia, Republic of North Ossetia, Stavropol, Republic of Mari El, Republic of Tatarstan, Kirov, Penza, Sverdlovsk, Republic of Tuva, Republic of Buryatia, Amur region, Magadan, Chukotka Autonomous District	Average
Kostroma, Smolensk, Tambov, Yaroslavl, Arkhangelsk, Volgograd, Kabardino-Balkar Republic, Karachay-Cherkess Republic, Nizhny Novgorod, Saratov, Kurgan, Omsk, Zabaykalsky region, Khabarovsk, Jewish Autonomous District	Above average
Oryol, Pskov, Republic of Kalmykia, Udmurt Republic, Ulyanovsk, Republic of Khakassia, Tomsk	High
Republic of Mordovia	Especially high

Source: Compiled by the authors based on data from the Ministry of Finance. URL: https://www.iminfin.ru/areas-of-analysis/budget/gosudarstvennyj-dolg-sub-ektov-rf?territory=45000000 (accessed on 23.04.2024).

Cluster Centers (%)

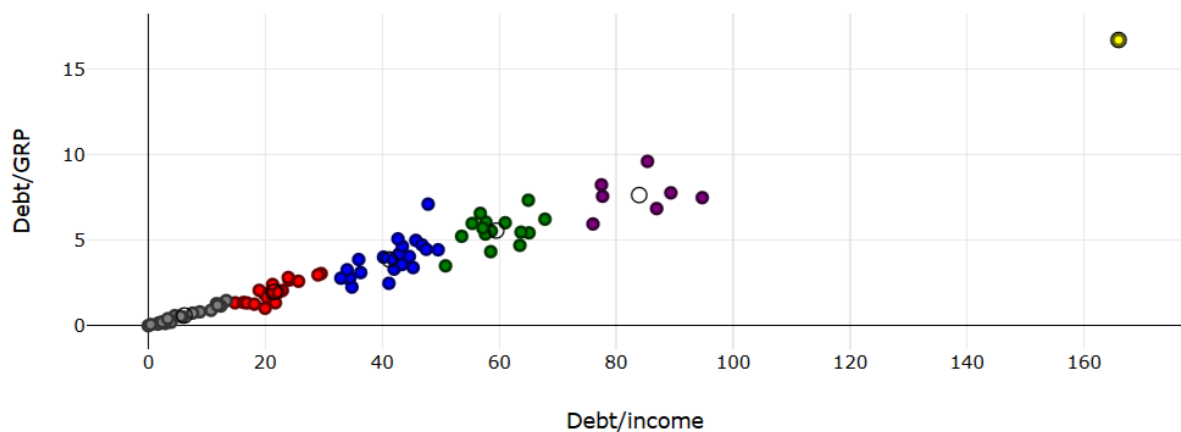| Cluster	Debt/income	Debt/GRP
1	6.1925	0.598
2	21.527	1.977
3	41.2409	3.8764
4	59.508	5.5647
5	83.9371	7.64
6	165.89	16.71

Source: Author's calculations.

Fig. 2. **Clustering of Regions of the Russian Federation by Debt Level, %**

Source: Author's calculations.

is characterized by a low standard of living (15 regions). Regions in the sixth cluster (6 regions) should be considered poor. Thus, in terms of the standard of living, the regions are distributed among the clusters more evenly than by resource potential.

For two indicators characterizing the standard of living, the results of the cluster analysis can be visually presented in the following figure (*Fig. 1*). A comparative analysis of regions based on the standard of living and resource potential has been carried out based on a two-dimensional typology of regions (*Table 6*).

Moscow has an exceptionally high standard of living as well as resource potential. The Moscow region and the Republic of Tatarstan also have a high standard of living and resource potential. As seen in *Table 6*, most regions have a standard of living that corresponds to and even exceeds their existing economic potential. Thus, regions with both high and medium and low levels of potential have a high standard of living. This situation seems quite natural, as the standard of living in a region is determined not only by the potential of the territory but also by the potential of the state as a whole. The authors of the paper [19] note a lower unevenness of regions in social indicators compared to economic ones, which, in their opinion, is due to the implementation of a unified social policy at the national level.

Table 9

Typologization of Regions in Terms of Living Standards and Fiscal Space

Standard of living	Debt (fiscal space)					
	Low (wide 6.2)	Below average (average 21.5)	Average (narrow 41.2)	Above average (absent 59.5)	High (pre-bankruptcy 83.9)	Very high (bankruptcy 165.9)
Especially high	Moscow, Yamalo-Nenets Autonomous District, St. Petersburg					
High	Lipetsk, Nenets Autonomous District, Khanty-Mansi Autonomous District, Sakhalin	Belgorod, Voronezh, Oblast, Republic of Adygea	Moscow Region, Krasnodar, Republic of Tatarstan, Sverdlovsk, Magadan, Chukotka Autonomous District	Nizhny Novgorod		
Average	Kursk, Leningrad, Murmansk, Sevastopol	Tula, Rostov, Republic of Bashkortostan, Samara	Kaluga	Tambov Yaroslavl		
Below average	Vladimir, Vologda, Perm, Tyumen, Chelyabinsk, Primorsky region	Bryansk, Ivanovo, Tver, Republic of Dagestan, Orenburg, Kemerovo, Novosibirsk, Kamchatka	Ryazan, Republic of Karelia, Republic of Komi, Kaliningrad, Novgorod, Republic of North Ossetia, Stavropol, Kirov, Penza, Amur	Kostroma, Smolensk, Arkhangelsk, Volgograd, Saratov, Omsk, Khabarovsk	Oryol, Pskov, Udmurt Republic, Ulyanovsk, Tomsk	
Low	Republic of Crimea, Altai, Irkutsk, Chechen Republic	Chuvash Republic, Krasnoyarsk, Republic of Sakha	Astrakhan, Republic of Mari El, Republic of Buryatia	Kabardino-Balkar Republic, Kurgan, Trans-Baikal Territory	Republic of Khakassia	Republic of Mordovia
Poor		Republic of Altai	Republic of Ingushetia, Republic of Tuva	Republic of Karachay-Cherkessia, Jewish Autonomous District	Republic of Kalmyki	

Source: Compiled by the authors.

At the same time, the standard of living in a number of regions does not reach the level of existing potential. These include the Chelyabinsk, Kemerovo, and Irkutsk, the Krasnoyarsk, the Altai, and the Sakha Republic (Yakutia). This situation may indicate the insufficiently effective use of the region's economic potential to ensure a decent standard of living for the population.

To assess the potential use of the financial capacity of the territory for the purpose of improving the population's standard of living, we will consider the clustering of regions by debt level (*Table 7*). The debt indicators used are the ratio of debt to tax and non-tax revenues and to GRP (*Fig. 2*). Due to the sufficient homogeneity of the indicators used, the clustering was performed not on standardized but on actual indicators. The subjects of the Russian Federation are divided into six clusters. The explained variance coefficient for this case is 0.9713, which indicates a very high quality of clustering.

Cluster centers are presented in *Table 8*. The regions included in cluster 1 have a low level of debt, averaging 6.2% of their own revenues and about 0.6% of GRP. Twenty regions in the second cluster have below-average debt, approximately 22% of their own revenues and 2% of GRP. The regions in the third cluster are in a borderline debt situation, with debt approaching a dangerous level. The subjects of the Federation in the fourth and fifth clusters have significant debt problems. The Republic of Mordovia has an exceptionally high level of debt.

The assessment of the financial reserves available to regions will be carried out based on the concept of fiscal space, which allows for the evaluation of the possibilities for mobilizing additional own and borrowed financial resources to address priority issues of socio-economic development in the territory. In Peter Heller's paper, fiscal space is defined as a budgetary reserve created to finance justified government expenditures, formed from either own or borrowed funds [20]. At

the same time, ensuring the sustainability of public finances is of paramount importance. A priority issue is also the creation of a financial reserve to fulfill social obligations in a situation of unstable economic dynamics. The analysis conducted in work [21] showed that, at the regional level, the term "fiscal space" is most often used to denote the ability to finance a deficit without any restrictions, including without a sharp increase in financing costs or unjustified crowding out of private investments.

To assess the scale of the fiscal space of the regions of the Russian Federation, we will consider a two-dimensional typology based on the standard of living and the level of debt (*Table 9*). Three types of regions are distinguished by the size of their fiscal space: those with wide, medium, and narrow financial space. Their debt levels are approximately 6%, 21%, and 41% of their own revenues, respectively. The next three types of regions correspond to the absence of fiscal space, a high probability of bankruptcy, and an actual state of bankruptcy.

The proposed two-dimensional typology of regions based on the standard of living of the population and the size of fiscal space allows for the identification of the financial reserve of a Russian Federation subject and can be considered as a tool for managing the regional public debt with the aim of improving the standard of living in the regions.

In *Table 9*, the regions highlighted in green have this opportunity. Meanwhile, the regions highlighted in red have already exhausted the possibilities of using market-based borrowing to address social issues. The presented typology is based on data from 2021 and should be considered as a tool for assessing the fiscal space potential of a region in addressing current socio-economic problems.

CONCLUSION

Theoretical research, as well as empirical analysis of economic potential, demonstrate its decisive influence on the standard of living

in the regions and on the issue of interregional differentiation. The models obtained through correlation-regression analysis of the impact of the main types of potential on the standard of living can be used to justify the priorities of socio-economic policy in the Central Federal District and the Northwestern Federal District. Clustering regions by the size of economic potential and the standard of living shows that more than half of the subjects of the Russian Federation have a low level of potential. At the same time, most regions have a standard of living that corresponds to and even exceeds the existing economic potential, which is due to the implementation of a unified social policy at the national level. The most mobile type of regional potential is financial potential, the effective use of which allows for both an increase in the standard of living and an enhancement of economic potential through the financing of investment projects for regional development. The presented typologies of regions by standard of living and debt, as well as the two-dimensional typology, allow for the alignment of financial indicators with standard of living indicators and, in the authors' opinion, can be used as tools of debt policy by the subjects of the Russian Federation to enhance the efficiency of using the region's financial potential in the interest of improving the population's standard of living.

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