Assessment of Social Security of the Population of Federal Districts

Nadezhda K. Savelyeva and Victoria A. Saidakova

Abstract

The paper aims to verify the hypothesis put forward by the authors and assess the social security of the federal districts of the Russian Federation as an object of research. As part of the research, the authors calculated the index of residents' social security (IRSS), which considers the criteria of education, health, and income of the population, as well as budget expenditures. The main research methods include the integral method, comparative analysis, synthesis, and correlation analysis. Based on the IRSS value, the authors ranked federal districts according to the level of social security. During correlation analysis, it became necessary to exclude one of the parameters of the index calculation methodology due to a weak correlation relationship. The authors proposed another parameter for the IRSS calculation, which strongly affects the change in the resulting factor. This change did not lead to significant changes in the grouping of federal districts by the level of social security. The research results can be applied in the design of the socio-economic policy of the state and its subjects, as well as in the development of regulations on the provision of social guarantees. The research has tested the chosen assessment methodology in the macro-regions of Russia and adjusted the methodology based on the features of this research.

Keywords

Social security · Integral indicator · Socio-economic development · Ranking

JEL Codes

C12 · C15 · E24 · I31 · O18 · R11 · R50 · R580

N. K. Savelyeva (✉) · V. A. Saidakova
Vyatka State University, Kirov, Russia
e-mail: nk_savelyeva@vyatsu.ru

1 Introduction

The current economic situation dictates new conditions for ensuring and evaluating favorable living conditions for the population. The issues of regulation, provision, and evaluation of the population with social benefits are becoming relevant again because the COVID-19 pandemic caused the greatest harm to socio-economic development (death of the population, rising unemployment, falling income levels, and inability to receive health services).

According to the National Security Strategy operating on the territory of the Russian Federation, the central aspects of the socio-economic policy aim to ensure a decent life for the population, create the necessary environment for maintaining health, and increase opportunities for acquiring quality education (Presidential Executive Office, 2021). Socio-economic development has a significant impact on the development and implementation of public policy. Its main component is the social sphere, which characterizes the level of social security. Ensuring social security implies the social provision of the population with vital benefits.

However, the level of development of social security in the regions and, consequently, in the federal districts is heterogeneous. Accordingly, it is necessary to study the level of social security of the population in Russia at the level of federal districts (macro-regions).

2 Methodology

Contemporary science has no unified approach to assessing the level of social security. The issues of social security of the population and its assessment are studied in the works of foreign and Russian authors.

Thus, the assessment of human capital in the mid-twentieth century was based on the theory of G. S. Becker (1964), J. Mincer (1958), and T. W. Schultz (1961). This theory consists in considering human capital as a factor

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of production. In the 1990s, the UN developed an index that allows comparing the level of poverty, literacy, and life expectancy. It was named the Human Development Index. In addition to this indicator, an index of human poverty has also been developed, which characterizes the numerous types of deprivations of the population that they face in the areas of health, education, and living standards (Eliseeva et al., 2016; UNDP, n.d.).

The current view on the issues of social security and its assessment also does not have a single point of view. Nevertheless, there is an extensive research base. Interregional inequality as one of the problems of social security of the population is reflected in the work of V. Bobkov and A. Gulyugina, who analyze the criteria of inequality in quality and standard of living in relation to the level of economic development of the territory (Bobkov & Gulyugina, 2012). A. E. Serkova notes the concern of the public and authorities with social problems. Their solution is of a long-term nature because there is no basis to assess the current state of development of the social sphere (Serkova, 2021).

It should be noted that social security is based on political stability and support. This is shown by the study of R. Beetsma et al. (2021). They consider the point of view that financing social security involves an uneven distribution of costs and benefits between groups of the population, while future recipients of social benefits acquire more net benefits. K. McKiernan, in turn, proposes to abolish the payroll tax, which increases the welfare of the population and, consequently, social security (McKiernan, 2021). T. Dijkhoff emphasizes the relevance of an integrated approach to social protection and security for the harmonized coordination of various areas of territorial policy (Dijkhoff, 2019).

A team of authors from the Vyatka State University focuses on the development of the unemployment social insurance system because this process significantly affects the decision-making of territorial authorities within the framework of social security of the population (Bespyatykh et al., 2022; Ganebnykh et al., 2021).

E. Hunt and F. Caliendo investigate the population's welfare. Social security acts as a key aspect in solving the problem of insufficiency and the level of well-being (Hunt & Caliendo, 2022).

A. A. Kuklin, S. E. Shipitsyna, and K. S. Naslunga propose to investigate the social component of the policy using an indicative method by comparing the social security criteria with the level of budget financing, which, in turn, will reveal destabilizing factors (Kuklin et al., 2016).

V. N. Bobkov and E. V. Odintsova analyzed social inequality in Russia by income level, consumption of goods, accessibility of social infrastructure, population structure, place of residence, age, and digitalization. The research resulted in developing a program to increase the social security of the country's population, which is relevant in the context of the pandemic and global crises (Bobkov & Odintsova, 2020).

A new approach to assessing social security and, accordingly, human capital was proposed in the scientific work by S. G. Shulgin and Yu. V. Zinkina, consisting of the development and testing of the indicator of human life (2021).

O. V. Zaborovskaya, E. V. Plotnikova, and E. E. Sharafanova assessed the conditions for the formation and development of human capital in Russia through the use of economic and mathematical methods (2015).

After analyzing scientific sources, the authors hypothesized that the assessment of social security of the population of the federal districts of the Russian Federation could be carried out through the use of an integral criterion—the index of residents; social security. The proof is the result of testing the methodology in federal districts.

The scientific novelty of this research lies in the approbation of the chosen methodology for assessing social security at the level of macro-regions of Russia.

Therefore, the research purpose implies testing the hypothesis and assessing the level of social security, which will allow adjusting the state socio-economic policy in the future through neutralizing the identified destabilizing factors. The basis of this research was economic-statistical methods and general scientific methods. As part of the analysis of the level of social security of residents of federal districts (FD), the authors applied a method based on the calculation of the index of residents' social security (IRSS) (Oleinik, 2009) developed by O. S. Oleinik. The indicator covers the financial component of the population's livelihood, the level of education, health care, and the budget sphere.

The index should be calculated as a ratio of the actual value of the district indicators for the studied period to the optimal level for the analyzed set of districts, the sum of which is subsequently divided by the number of criteria. Six statistical indicators are used to calculate it:

1. Average per capita monetary income of the population;
2. Gross coverage rate of children (1–6 years old) with preschool education;
3. The number of students receiving education in secondary vocational and higher educational institutions, per ten thousand people;
4. Capacity of outpatient polyclinic organizations for ten thousand people;
5. The number of hospital beds per ten thousand people;
6. Expenditure items of the consolidated budget of the macro-region (the amount of funds spent by the consolidated budgets of the regions of the district) for housing and communal services (HCS) and socio-cultural events.

The optimal value of these indicators will be the limit (maximum) level in the studied set of districts. The IRSS level allows ranking and grouping of federal districts:

- High level of social security of the population (the range of IRSS values—≥0.800);
- Medium level of social security of the population (0.500–0.800);
- Low level of social security of the population (<0.500).

Statistical data from the Federal State Statistics Service of the Russian Federation was used as part of the research (Federal State Statistics Service of the Russian Federation, n.d.).

3 Data Availability

The data on the results of the correlation analysis of the components of the IRSS for 2016–2020, which are described in the following section of the study, is available at https://figshare.com/ with the id https://doi.org/10.6084/m9.figshare.20025149.

4 Results

The calculated data showed that there are significant differences between the federal districts of the Russian Federation within the analyzed period. The maximum level of deviations between the maximum and minimum levels of the index was noted in 2019 (Table 1).

According to this criterion, the authors made a grouping according to the IRSS value, based on the data in Table 1. Thus, the group of regions with a high level of social security of the population includes the CFD and the NWFD during the study period. This category also included the FEFD in 2016–2017 and the VFD in 2020. The regions with an average level of security include the SthFD, the NCFD, the VFD (up to 2019 inclusive), the UFD, the SbFD, and the FEFD (since 2018). It is noteworthy that the analysis did not reveal macro-regions with a low level of social security.

For a more visual picture of social security in the federal districts, their ranking was carried out, where rank 1 is assigned to the maximum level of the index, and rank 8 is assigned to the minimum (Fig. 1).

According to the sum of the ranks for 2016–2020, the minimum value, and, consequently, a higher level of security, is recorded in the CFD and the NWFD, which take the first two leading places. Simultaneously, the CFD demonstrates the best provision of the population with income and has a significant level of budget expenditures on housing and communal services and socio-cultural events. However, there are not enough hospital beds for the population in the district, which can be attributed to the overpopulation of its constituent regions.

In turn, the NWFD has the best positions among the federal districts in terms of gross coverage of children with preschool education (up to 2018 inclusive) and the capacity of outpatient polyclinic organizations. Therefore, better conditions have been created to maintain public health.

The FEFD is characterized by the largest number of hospital beds per 10,000 people, which indicates the availability of medical facilities to ensure the treatment of the population in relevant institutions. Simultaneously, there are risks associated with the education of the population. The number of students receiving education in secondary vocational and higher educational institutions is one of the lowest among the federal districts. This may be connected with the low level of budget expenditures on housing and communal services and socio-cultural events.

In the UFD, preschool education has been provided in the best way among other districts since 2019. From 2017 to 2019, the federal district did not have high positions in the number of hospital beds for the population in the relevant organizations.

As for the VFD, up to and including 2017, it had available personnel potential because the number of students in secondary vocational and higher educational institutions was

Table 1 ISSR federal districts for 2016–2020

Federal district	2016	2017	2018	2019	2020
CFD	0.916	0.909	0.909	0.917	0.927
NWFD	0.833	0.826	0.826	0.826	0.830
SthFD	0.693	0.693	0.692	0.688	0.689
NCFD	0.571	0.574	0.568	0.571	0.597
VFD	0.787	0.775	0.773	0.770	0.825
UFD	0.796	0.788	0.788	0.787	0.795
SbFD	0.772	0.768	0.767	0.765	0.770
FEFD	0.818	0.812	0.789	0.788	0.785

CFD Central Federal District, *NWFD* Northwestern Federal District, *SthFD* Southern Federal District, *NCFD* North Caucasus Federal District, *VFD* Volga Federal District, *UFD* Ural Federal District, *SbFD* Siberian Federal District, *FEFD* Far Eastern Federal District
Source: Compiled by the authors

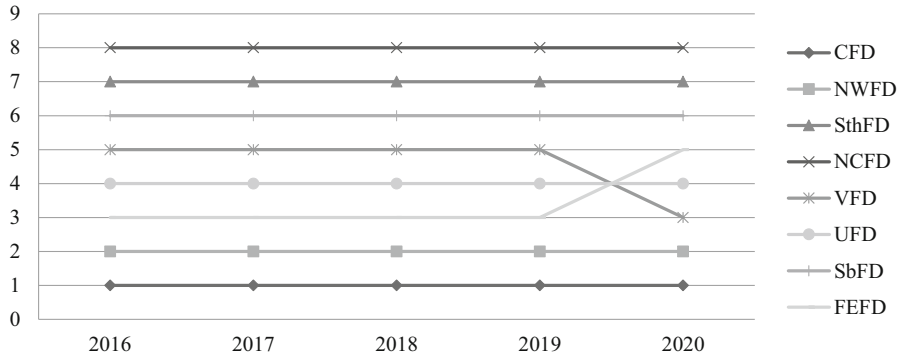

Fig. 1 Ranking of federal districts by IRSS. Source: Compiled by the authors

one of the highest in the country. The high level of budget expenditures on housing and communal services and socio-cultural events should also be noted. Simultaneously, the regions of the Volga Federal District cannot be characterized as having a high level of income of the population, which has consequences in the form of an outflow of population to other districts.

Since 2018, the highest number of students per 10,000 people has been recorded in the SbFD, which makes it possible to develop human resources and innovation potential in the regions of this district. However, the income level of the population in the regions of the SbFD is one of the lowest among other federal districts on an aggregate basis of regions.

As part of the study of the SthFD and the NCFD, it can be noted that there are acute problems in the field of providing education to preschool children and graduates of general education institutions. The lack of capacity of outpatient clinics and the number of beds challenges the quality of health services provided. The identified problems are confirmed by the low level of budget expenditures for developing these areas.

To assess the correctness of the selected criteria for the study of the IRSS, the authors carried out a correlation analysis to assess the degree of influence of the variable factor on the result. The analysis showed that factor X_5 has a weak influence. Thus, excluding or replacing this criterion in the index model is necessary.

The author's team decided to include a criterion (X_7) in the model, which characterizes the deviation of per capita income from consumer spendings of the population. This difference shows the amount of the population's remaining funds, which they can use to cover loans, increase the level of their own savings, or set aside for pension savings and other social benefits. The correlation coefficient was measured from 0.786 to 0.828, which shows a strong relationship with the resulting factor.

Consequently, this factor implies the exclusion of the variable X_1 from the model of the IRSS because its relationship with the new criterion is multicollinear. Thus, the level of IRSS will change. The new calculation of the index assumes the use of factors X_2–X_4, X_6, and X_7. Then, the level of the IRSS will look modified according to the author's amendment (Table 2).

Similar to Fig. 1, the adjusted index was ranked by federal districts (Fig. 2).

Thus, the presented data of the modified IRSS level showed its change and, as a consequence, the transformation of the ranks of the federal districts. The values of the indicator for the VFD, the UFD, the SFD, and the FEFD have changed most significantly compared to the initial assessment. The research methodology has become more accurate. Thus, this research proved the hypothesis put forward by the authors.

The conducted research revealed shortcomings in the developed methodology for studying the social security of people. The number of hospital beds as a criterion that makes up IRSS does not have a proper impact on social security and, consequently, on the socio-economic development of the territory in today's conditions.

Table 2 Adjusted level ISSR federal districts for 2016–2020

Federal district	2016	2017	2018	2019	2020
CFD	0.929	0.932	0.940	0.940	0.944
NWFD	0.830	0.822	0.825	0.811	0.813
SthFD	0.630	0.630	0.623	0.607	0.607
NCFD	0.520	0.528	0.517	0.516	0.531
VFD	0.768	0.754	0.744	0.738	0.794
UFD	0.792	0.794	0.805	0.798	0.782
SbFD	0.747	0.745	0.753	0.739	0.730
FEFD	0.797	0.793	0.760	0.750	0.738

Source: Compiled by the authors

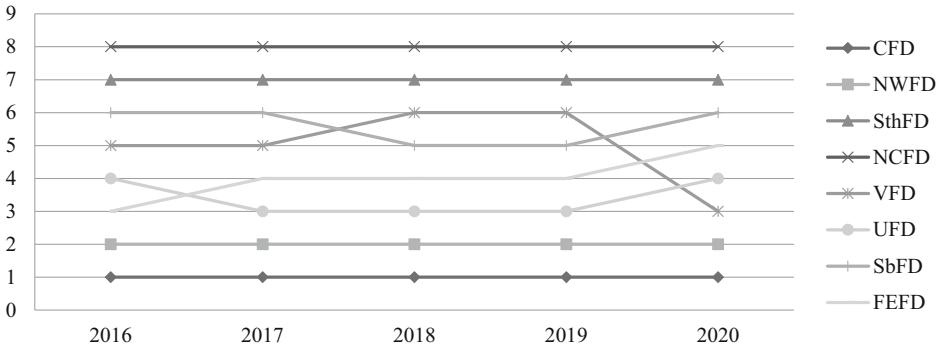

Fig. 2 Ranking of federal districts according to the adjusted IRSS. Source: Compiled by the authors

The testing of this technique at the regional level of the Russian Federation remains a debatable issue in the research framework. Further scientific research will be devoted to this aspect.

5 Conclusion

Thus, the current conditions of socio-economic development of the territory affect the social security of the population. The theoretical basis for assessing the social security of the population is extensive. The authors used the index of residents' social security as a criterion of social security of the territory. Its research is rational when developing measures of socio-economic policy of the state and when conducting a comparative analysis of the level of social security.

The significance of this research lies in the fact that its results contribute to the development of social security as the main criterion for developing a national security strategy and socio-economic development.

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