Methodological Assessment Aspects of Region Economic Security

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Abstract — **In this study we examine methodological approaches to assessing the economic security of regions developed by both individual authors and public authorities. An author's the region economic security assessment methodology is proposed based on a refined system of indicators of economic security and comparison with their threshold values. Economic security indicators are grouped according to the substantive characteristics into the following blocks: human capital, industrial, financial, social, innovative and digital development. Based on the results of determining deviations of actual values from thresholds, a score is made for each indicator, and the total amount of points characterizes the achieved level of security. Based on the methodology, the economic security of the Voronezh region was assessed in comparison with data on the Central Federal District and Russia. The proposed methodology can be used by regional authorities to assess the economic security of regions.**

Keywords — economic security, regional economic security, indicators of the region's economic security, thresholds, indicators of economic security.

I. INTRODUCTION

In a changing geopolitical situation, economic instability is growing; the unpredictability of the economic conditions of the constituent entities of the Russian Federation is increasing, so it is important to assess their ability to withstand adverse factors [6, p. 5].

The economic security of the Russian Federation should be ensured by all its subjects. According to the Economic Security Strategy of the Russian Federation for the period until 2030, economic security is understood as "the state of protection of the national economy from external and internal threats, which ensures the country's economic sovereignty, the unity of its economic space, and conditions for the implementation of Russia's strategic national priorities" [1]. The Strategy enshrines the concepts in the field of ensuring economic security, defines the goals and objectives of state policy in the field of economic security, and also establishes a system of indicators for assessing the state of economic security. It is noted that it can be specified by monitoring results. Since the economic security of the country and its constituent regions are closely interconnected, the understanding of the terms and indicators of economic security should be uniform or logically connected at the federal and regional levels.

At the same time, the full list of indicators is presented in the Strategy cannot be applied to individual regions; therefore, there is a need to use a methodological approach and a system of evaluation indicators to assess the economic security of the constituent entities of the Federation.

II. MATERIALS

In the economic literature on issues of assessing the level of regional economic security, there are several methodological approaches:

- a dynamic approach (assessment of the dynamics of the development of the region according to the growth rate of its main macroeconomic indicators). According to T. Yu. Feofilova the economic security of the region as an evaluation category characterizes socio-economic development and the criterion for its assessment is the satisfaction of the needs of the population. The author notes that the needs of the population are differentiated in different social and ethnic groups, therefore, in each region a certain minimum needs of the population should be fixed, and the monitoring problem should be the responsibility of government bodies [12].

V.A. Tsvetkov, M.N. Dudin, N.V. Lyasnikov proposed an indicative dynamic technique that allows assessing the changes in the security state of regional economy. The authors summarized the factors that have a formative and destructive effect on the economy of the region and suggest a set of indicators reflecting changes in the level of the region economic security. The methodology highlights the following indicators: the quality of economic growth, the quality of entrepreneurial activity, diversification of the economy, and an indicator of the welfare of the population. Safety assessment is based on an analysis of the dynamics of indicators [13, p. 10].

- econometric approach (assessment based on multivariate statistical analysis, least squares method, etc.). D.V. Dianov, E.A. Radugina have developed a method for statistical research of the economic security of a region. At each stage of the analysis, an extensive block of statistical tools is used, represented by the methods of the general theory of statistics and mathematical statistics, including multidimensional groupings – cluster analysis, correlation and regression methods. The conclusion is made on the basis of the dynamics of the studied indicators [2].

A. Yu. Yudintsev and G. N. Troshkina have proposed an original methodology for assessing the similarity of the regions of the Russian Federation by the level of economic security based on the system of indicators of the macroeconomic model of economic security by A. A. Karpov and V. V. Korableva [4].

- macroeconomic approach (comparison of the main macroeconomic indicators with their threshold values). In particular, many scientists apply a number of indicators proposed by S. Yu. Glazyev. So, I.V. Novikova and N.V. Krasnikov to group the indicators of economic security of the region in the following areas of the economy: industrial, food, financial, social, infrastructure, information technology and innovation. For each area, the authors determined a number of indicators and set threshold values [7, p. 134].

According to D.Yu. Treschevsky, a set of regional indicators characterizes processes similar to federal ones, using this hypothesis the author has proposed a set of indicators [16, p. 67].

V.P. Salnikov proposes to assess the level of economic security of the region on the basis of indicators such as "the cost of living, the number of registered unemployed, the number of identified economic crimes, the need for workers (vacancies), and others. Threshold values are set for the indicators, and unfavorable deviations from the limit values indicate instability and the possibility of social conflicts in the region [9].

- expert-rating approach (rating, scoring and expert assessments when ranking regions by threat level). In the framework of this approach, V.S. Udovin, M.V. Bakun and E.A. Borkova propose ranking and calculating weight coefficients for indicators of threats to the economic security of the region (the authors identified 6 threats: socioeconomic inequality,

reduction in the degree of population provision in the region, growth of unemployment, corruption, percentage of the shadow economy, crime rate in society). The main methods of work are questionnaires, which help determine the degree of significance of the above threats, and a comparative rating system [15].

The Centre for Macroeconomic Research, Special Projects and Economic Security of ANO "Centre for Strategic Studies of the Ulyanovsk Region" has introduced a methodology for assessing the level of economic security of municipalities of the Ulyanovsk Region to be used in the management practice of the Ulyanovsk Region. Assessment of the level of economic security is carried out according to a 3-point system, based on a system of indicators developed by experts of the Security Council of the Russian Federation and used to assess economic security [17].

- indicative approach. According to the methodology of the Ministry of Economic Development of Russia (Order of the Ministry of Economic Development of Russia dated 03.10.2018 N 532 (as amended on 04.02.2019) "On the organizing the monitoring and assessment of the state of economic security of the Russian Federation in the Ministry of Economic Development of Russia") monitoring the state of economic security consists in determining the actually achieved values indicators, analysis of their dynamics during the current calendar year, including a comparison of actually achieved, forecasted and maximum permissible values of indicators, in identifying short short-term trends, threats and risks. In order to ensure methodological unity and continuity of monitoring mechanisms at the federal, sector wide and regional levels, the Ministry of Economic Development of Russia, in collaboration with participants in monitoring economic security, is developing economic security indicators certificates.[8].

A.I. Khorev, E.V. Gorkovenko, I.V. Platonova developed a comprehensive indicative approach to assessing regional economic security. The most important, according to the authors, are the following characteristics of the regional economy: the ability of the regional economy to sustainable growth, the stability of the financial system, the support of scientific potential, the dependence of the regional economy on imports of the most important types of products, the level and quality of life of the population, demography [14, p. 370].

Thus, in modern economic science there is no unified approach to assessing the economic security of a region. The methods proposed by the authors vary significantly both in the number and composition of the studied indicators, and in the methods of processing analytical data. The table 1 systemizes the information on the key characteristics presented in this study.

The data presented in table 1 indicate that none of the presented methods takes into account the full range of indicators.

Therefore, in most methods of assessing regional economic security, a group of indicators of the state of the

innovation and information environment is ignored, in connection with which we included indicators such as: the internal costs of research and development in the total volume of GRP / GDP, the proportion of innovative goods, works, services in the total volume of GRP / GDP, the proportion of expenses for technological innovations in the total volume of GRP / GDP, the proportion of organizations engaged in technological, marketing, and organizational innovations in the total number of organizations surveyed, the proportion of organizations that used cloud services in the total number of organizations surveyed, the increase in high productivity jobs.

TABLE I.   COMPARATIVE ANALYSIS OF THE METHODOLOGY FOR ASSESSING AND MONITORING THE ECONOMIC SECURITY OF THE REGION

Methodology	Methods Indicator Groups				
	Social, Political	*Institutional, Information*	*Productive*	*Human resources*	*Economic and Financial*
Feofilova T.Yu				+	
Tsvetkov V.A., Dudin M.N., Lyasnikov N.V.				+	+
Dianov D.V., Radugina E.A	+		+	+	+
Dolmatova I.V.					
Karpov V.V., Korableva A.A.	+		+		+
Novikova I.V., Krasnikov N.V.	+	+	+		+
Salnikov V.P.	+				+
Udovin V.S., Bakun M.V., Borkova E.A.	+				+
ANO "Center for Strategic Studies of the Ulyanovsk region"	+		+		+
Ministry of Economic Development of Russia	+		+	+	+
Khorev A.I., Gorkovenko E.V., Platonova I.V	+		+	+	+

The inclusion of a wide range of indicators is due to the fact that the modern development of the economy is impossible without the active introduction of innovations and digitalization.

In addition, in the considered methods there is insufficient number of indicators are used to evaluate human capital [11, p. 1].

Many methods consider unemployment and per capita income indicators, but do not take into account labor productivity and migration indicators, which, in our opinion, are the most important factors of regional economic security. The identified shortcomings necessitated the development of an improved methodology for assessing the economic security of the region, which will allow a comprehensive assessment.

III. METHODOLOGY

Table 2 presents the composition of indicators of economic security of the region, grouped by their meaningful characteristics, threshold values and directions of limitation of indicators. According to the substantive characteristics, indicator groups are identified: human capital assessment indicators, innovative and digital development indicators, social indicators, financial indicators and production indicators.

The widest set of indicators (8 indicators) is included in the unit for assessing human capital, due to the importance of this component.

TABLE II.   SYSTEM OF INDICATORS OF ECONOMIC SECURITY OF THE REGION AND INDICATORS THRESHOLD VALUES

Indicators	Thresold values	Direction of limitations
human capital assessment indicators		
Birth rate, %	8	No less than
Mortality rate, %	8	No more than
Natural growth rate, %	0	No less than
Migration growth rate per 10,000 population	0	No less than
Life expectancy at birth in relation to the average for the Russian Federation,%	85	No less than
Infant mortality rate , %	0,5	No more than
Unemplyment rate , %	7	No more than
Labor productivity growth, %	5	No less than
Level of participation in the workforce of the population aged 15 to 72%	73	No less than
Innovative and digital development indicators		
Domestic expenditure on research and development in the total volume of GRP / GDP	1,5	No less than
Specific volume of innovative goods, works, services in the total volume of GRP / GDP,%	10	No less than
The proportion of costs for technological innovation in the total volume of GRP / GDP,%	2,5	No less than
The proportion of organizations implementing technological, marketing and organizational innovations in the total number of organizations surveyed,% of the national average	10	No less than
The proportion of organizations that used "cloud" services in the total number of organizations surveyed,%	20	No less than
The growth of high-performance jobs, in%, to the average for the Russian Federation	109	No less than
Social indicators		
Number of recorded crimes per 100,000	1500	No more than
Health expenditure as% of GRP	2	No less than
Expenditure on education in% of GRP	4	No less than
Financial indicators		
The state of the regional budget (deficit / surplus), in% of GRP	4	No more than
Average wage in relation to the subsistence minimum	5	No less than
The ratio of the average level of cash income of 10% of the top income segments of the population to 10% of the lowest income segments of the population, the number of times	8	No more than
The proportion of the population with incomes below the subsistence minimum,%	7	No more than
Production indicators		
GRP per capita,% of the national average	100	No less than
Industrial Production Index,%	103	No less than
The degree of depreciation of fixed production capital,%	60	No more than
Investments in fixed assets to GDP,%	40	No less than
The ratio of export to import,%	20	No more than

The assessment of the level of economic security of the region is carried out on the basis of the sum of points (Table 3).

TABLE III.   REGION ECONOMIC SECURITY ASSESSMENT

The level of economic security of the region	The boundaries of the indicators
High	> 73
Above the average	60–73
Low (Average)	40.5–60
Below the average	< 40.5

The assignment of points is carried out in accordance with the favorable dynamics of the indicator, as follows:

- for direct indicators: exceeding the limit value – 3 points; limit value of the indicator is reached – 2 points; the limit value of the indicator is not reached – 1 point;

- for inverse indicators: the actual value is below the limit value – 3 points; the limit value of the indicator is reached – 2 points; above the limit value of the indicator – 1 point.

Considering that both macroeconomic indicators and the situation in the economy of a particular region are not static, the assessment of economic security was carried out in dynamics. Using statistical data will allow reliable assessment of changes and evaluation of its current state.

IV.   OUTCOME

The state of economic security of the Voronezh region was selected as the object of study. The choice of this regional socio-economic system is due to the fact that it is a significant industrial and production region in the Central Federal District, and most indicators of the region reflect the average Russian Federation dynamics.

The region is developing dynamically, which contributes to the growth of socio-economic indicators and quality of life, respectively, it is possible to put forward a hypothesis that the Voronezh region demonstrates an upward trend in the level of economic security.

Table 4 presents the calculation output for the Voronezh region.

The results of the assessment of the economic security of the Voronezh region and the Central Federal District for the period 2014–2017 display a decline in the level of economic security. So, in 2014, in the Voronezh region, the integral indicator turned out to be the lowest, and the greatest problems in ensuring economic security are associated with the innovative and digital development indicators. In 2015, the highest level of economic security was noted: the total score for the study period was 48, which corresponds to the average (normal) level of economic security.

TABLE IV.   THE RESULTS OF THE ASSESSMENT OF THE ECONOMIC SECURITY OF THE VORONEZH REGION AND THE CENTRAL FEDERAL DISTRICT FOR THE PERIOD 2014-2017, IN POINTS [CALCULATED BY THE AUTHORS BASED ON DATA [18]

Indicators	2014	2015	2016	2017
Voronezh Region				
Human capital indicators	15	15	17	17
Innovative and digital development indicators	8	13	10	12
Social indicators	7	7	5	3
Financial Indicators	4	4	4	4
Production indicators	8	9	9	9
ИТОГО	42	48	45	45
Central Federal District				
Human capital assessment indicators	17	17	17	17
Innovative and digital development	14	14	14	14
Social indicators	7	5	3	3
Financial indicators	9	10	11	9
Production indicators	4	4	4	4
Total	51	50	49	47

During 2016–2017 there is a decrease in the score to 45 and the level of economic security is stable. The analysis of economic security in the context of the allocated blocks displays that the most alarming situation is with the human capital and the financial assessment indicators. Throughout the entire analyzed period, below the threshold level, there is a coefficient of natural growth and an indicator of growth in labor productivity. The region has a low GRP per capita, in 2017 only 73 % of the average Russian indicator, the maximum value of – 77 % was reached in 2015.

The indicators of innovative and digital development for the study period are also lower than the average for the Central Federal District, but they demonstrate a positive dynamics.

The study of the state of economic security in the Central Federal District allows concluding that there is a negative dynamics of the integral indicator and the level of security is declining. The highest value of the indicator was observed in 2014 – 51 points, which corresponds to the average (normal) level of economic security according to our proposed rating scale. Over the remaining time interval, the level of economic security decreases to 47 points in 2017.

The study of economic security in the context of the structural blocks of indicators allows concluding that the threshold level for social, financial blocks and for a number of indicators of the development of human capital has not been reached. In particular, during the entire study period, threshold values for such indicators as: the state of the regional budget, the ratio of the average level of wages to the subsistence minimum have not been reached; such indicators as the proportion of the population with incomes below the subsistence minimum, expenses for healthcare and education still go beyond the threshold. In the group of indicators reflecting the assessment of human capital, as well as in the Voronezh region, the following indicators remain below the threshold value: natural growth, mortality rate, growth in labor productivity, and more.

The analysis allows concluding that the Voronezh region, like the Central Federal District, and the Russian Federation as a whole, needs to increase the level of economic security,

primarily by improving the conditions for the formation and development of human capital, creating a favorable social environment and increasing financial security. In order to achieve it, a set of measures is being taken at the federal, regional and local levels, in particular, national projects, national programs, and state programs are being implemented, which, first of all, are aimed at the improvement of the conditions for the formation and development of human capital and creating a favorable social environment.

V. CONCLUSION

Based on the analysis of the existing methods for assessing the economic security of the region, the study allows proposing and testing the author's methodology, which is distinguished by a set of indicators that, according to the authors, make it possible to assess the state of the economic security of the region most fully. The assessment of the economic security of a specific region (Voronezh region) and the Central Federal District made it possible to identify areas for improving a number of indicators, which would subsequently lead to an increase in the level of economic security of the region.

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