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*As a manuscript*

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**ASSESSMENT OF THE LEVEL OF ECONOMIC SECURITY OF  
THE RUSSIAN FEDERATION ON THE BASIS OF THE NON-  
PARAMETRIC METHOD**

Specialty: 5.2.3. «Regional and sectoral economics»

**Abstract**

dissertation for the degree  
of Candidate of Economic Sciences

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**Relevance of the research topic.** Today, in the conditions of financial and economic instability, expressed in a number of negative consequences of restrictive measures, there is a need to focus on ensuring economic security. The high dependence of the Russian budget on the commodity market and exchange rate volatility undermines the stability of the Russian economy and thus creates a threat to economic security, which manifests itself in a decrease in the standard of living of the population, a drop in disposable income, an increase in the number of bankruptcies of enterprises, especially small ones, and a decrease in the availability of loans. and many other adverse effects. Such an impact of the economic crisis is reflected on all participants in economic relations, both on individuals, commercial enterprises in particular, and on society as a whole.

Considering that, in accordance with the Strategy for the Economic Security of the Russian Federation for the period up to 2030 (hereinafter referred to as the "Strategy"), improving the level of public welfare of the population and creating favorable conditions for doing business are among the tasks of the state policy in the field of ensuring economic security, the effective implementation of this policy of the Government The Russian Federation should contribute to the stabilization of the socio-economic situation in society.

All this requires a timely, effective and appropriate approach on the part of the state in the field of ensuring economic security. As in any management activity, so in the activities of the state to ensure economic security, an important stage preceding the development of measures to ensure economic security is the assessment stage.

Despite the presence in the Economic Security Strategy adopted in 2017 of a wide list of indicators of economic security, the issue of methods for its assessment is acute. The currently available assessment methods, repeatedly criticized for a high degree of subjectivity, need additional research, and also determine the search for new methods. The scientific relevance of the study of methods for assessing economic security is also of high practical importance, since the use of new approaches and assessment methods will contribute to the formation of an adequate

information base for forecasting and developing future measures to ensure economic security.

Existing methods for assessing economic security, in particular, one of the most common methods - the indicative assessment method, are not able to form target values of economic security indicators. The target values would make it possible to quantify what should be strived for in order to increase the level of Russia's economic security.

The need to form target values of indicators of economic security is confirmed by the corresponding conclusion of the Federal State Budgetary Institution VoIRC RAS on the Strategy for Economic Security of Russia for the period up to 2030 and the results of research by domestic scientists in the field of ensuring economic security. The absence in the Strategy of any threshold and target values of indicators does not allow for a reliable assessment of Russia's economic security.

The non-parametric assessment method (data envelopment analysis) proposed for assessing the economic security of Russia has the capabilities necessary to form the target values of indicators of the economic security of Russia, and also allows you to form the value of the integral indicator of economic security and determine the level of economic security.

Refinement of the methodology for assessing the economic security of Russia, based on new assessment methods that allow the formation of target values of indicators, is essential for the national economy, which determines the relevance of the dissertation research.

**Purpose and tasks of the dissertation research.** The purpose of the dissertation research is to adapt the non-parametric method to assess the level of security of Russia's economic security.

To achieve the goal, the following **tasks** were set:

1. To reveal the theoretical and methodological foundations of economic security, as well as to analyze foreign concepts of economic security.
2. Analyze methods for assessing the economic security of Russia and form an empirical basis for assessment.



3. To carry out a procedure for assessing the level of economic security in Russia based on a non-parametric assessment method (data envelopment analysis) using the indicators of the Strategy, to propose on this basis options for increasing the level of economic security.

4. Justify the reliability of the proposed method for assessing the level of economic security in Russia and the formed target values of indicators.

**The object of the study** is a set of organizational and economic relations that arise in connection with ensuring the economic security of the Russian Federation.

**The subject of the study** is methods for assessing the level of economic security in Russia.

**Theoretical and methodological basis of the study.** The theoretical basis of the dissertation research was the scientific works of domestic and foreign scientists in the field of economic security and on monitoring and modeling economic processes.

**The methodological basis of the study** is represented by a number of general scientific methods, such as analysis, synthesis and modeling, as well as statistical methods: factor and cluster analysis.

**The scientific novelty of the research** is as follows:

- substantiated the concept of “the level of economic security of Russia”;
- a system of representative indicators of Russia's economic security was developed;
- a method for calculating the quantitative component of the criterion for ensuring economic security is proposed, taking into account the change in the situation in the economy;
- developed a methodical approach to assessing the level of economic security, including the algorithm of factorial and cluster analysis, as well as a non-parametric method based on solving a linear programming problem.

**The main scientific results obtained by the author:**

1. "The level of economic security in Russia" develops a categorical and methodological apparatus for assessing the level of economic security in terms of reflecting the effectiveness of the activities of economic security entities, expressed in an integral indicator that makes it possible to judge the protection of interests from threats. The integral indicator of economic security, the value of which corresponds to a scale from zero to one, is quantitative in nature and is determined by calculation based on representative indicators using the data envelopment analysis (DEA) method.

2. The system of criteria (qualitative and quantitative) for determining the level of economic security is based on the nature of the measures used by the subjects of ensuring economic security to neutralize threats to the protection of national interests.

The qualitative criterion is based on the nature of certain managerial decisions taken by the subjects of ensuring economic security to prevent the deterioration of the situation, as well as structural and institutional measures.

The quantitative criterion of the level of economic security is individual for each area of economic security and is calculated on the basis of the value of the integral indicator of economic security corresponding to the interval on a scale from zero to one. The intervals are dynamic in nature and are calculated for each area of economic security based on the Sturges rule. The levels of economic security are classified into normal, pre-crisis and crisis.

3. The structure of economic security indicators has been optimized. In order to avoid the need to assess the level of economic security for the entire set of indicators, based on the application of the factor analysis method, representative indicators of economic security were determined (the internal debt of the Russian Federation, the share of high-tech products in exports, the share of machinery, equipment and vehicles in the volume of non-primary exports, the share population with incomes below the subsistence level, labor productivity index, greenhouse gas emissions, total fertility rate). The indicator that has the strongest relationship with the component that accounts for the largest share of the explained variance was



selected as a representative indicator. This indicates its greater information content compared to other indicators.

4. An approach to assessing the level of economic security, based on the non-parametric method of data envelopment analysis (DEA), includes:

- replacement of a part of representative indicators with their international counterparts in case of discrepancy between Russian and foreign statistical indicators or their outdated status. The assessment of the level of Russia's economic security by the DEA method is of a comparative nature. The objects of assessment are countries, which requires comparable Russian and foreign indicators. This necessitated the adjustment of the set of representative indicators of economic security;

- formation of a sample of objects of assessment, taking into account the peculiarity of the DEA method, which consists in maximizing the values of indicators: the necessary mathematical transformations were carried out over the values of indicators, the increase of which indicates a negative trend in the economy (total public debt to GDP, Gini coefficient, greenhouse gas emissions);

- grouping of objects of assessment by the method of cluster analysis for each representative indicator, taking into account the specifics of the sphere of economic security. Comparable groups of objects (clusters) were determined by the k-means method, and their optimal number was identified in accordance with the Akaike information criterion, and was also proved by the results of independent calculations;

- assessment of the level of economic security by the DEA method separately for each group of objects. The decrease in the influence of random fluctuations of the sample on the final result of the assessment due to the assessment of the level of economic security within comparable groups of objects has been proven.

As a result of the implementation of the proposed approach to assessing the level of economic security, the target values of representative indicators of Russia's economic security were obtained.

**The information base of the dissertation** was made up of studies by domestic and foreign authors, regulatory legal acts, dissertations and monographs of scientists in the field of studying economic security, statistical data on the socio-economic and financial situation in Russia - data from the Federal State Statistics Service, the Ministry of Finance of the Russian Federation, the Treasury of Russia, the Central Bank of the Russian Federation, data from foreign statistical databases - the Organization for Economic Cooperation and Development (OECD), the World Bank, the UN; scientific articles, reviews, Internet resources and calculation results obtained during the analysis and assessment of economic security.

**The theoretical significance of the dissertation research** is to identify, on the basis of the Strategy for the Economic Security of Russia for the period up to 2030, the key areas of economic security, the integration of the developed and substantiated concept of "the level of security of Russia's economic security" into the system of theoretical assessment of economic security.

**The practical significance of the dissertation research** lies in the substantiation of the method for assessing the level of economic security, the applicability of which improves the reliability of the results obtained, and also allows the formation of target values for indicators of Russia's economic security. The developed target values of economic security indicators can be used to refine the content of the Economic Security Strategy of Russia for the period up to 2030.

Also, in order to expand the list of indicators of economic security, a number of additional indicators have been proposed that characterize the level of security of Russia's economic security.

The evaluation method chosen in the course of the dissertation research can be successfully applied not only at the federal, but also at the regional level, as well as at the level of economic security of enterprises. The results of the dissertation research can be applied in the practice of the Ministry of Economic Development of the Russian Federation, the Ministry of Finance of the Russian Federation, the Federal State Statistics Service in the development of forecasts and strategies for socio-economic development, as well as in the preparation of analytical reviews.



**Compliance of the dissertation with the passport of the scientific specialty.** The study was carried out within the framework of the following points of the passport of the specialty 5.2.3 "Regional and sectoral economics": p. 13.1 "Theoretical and methodological issues of studying the problems of economic security", p. 13.5 "Economic security criteria. Threshold values of economic security criteria and methods for their determination".

**Testing and implementation of research results.** The main results of the dissertation research were reported and discussed at the following conferences:

- X International Scientific and Practical Conference. "State and business. Modern problems of the economy" (St. Petersburg, RANEPA under the President of the Russian Federation, North-Western Institute of Management, April 25-27, 2018).

- X International Scientific and Practical Conference. "State and business. Ecosystem of the Digital Economy" (St. Petersburg, RANEPA under the President of the Russian Federation, North-Western Institute of Management, April 24-26, 2019).

- I International scientific and practical conference "Actual theoretical and applied issues of managing socio-economic systems" (St. Petersburg, December 20, 2019).

**List of publications.** Based on the results of the work, 11 articles were published, including 4 works in peer-reviewed scientific journals recommended by the Higher Attestation Commission under the Ministry of Education and Science of the Russian Federation, and one publication in a publication indexed in the international citation database Web of Science.

**Structure of work.** The dissertation consists of an introduction, three chapters, a conclusion, a list of references and appendices. The content of the work is presented on 165 pages of the main text, illustrated by 12 figures and 47 tables. The appendix contains materials that testify to the practical implementation of the results of research and development of the author. The list of references contains 142 sources of literature, of which 76 are domestic and 32 are foreign authors.