ASSESSING THE SOCIOECONOMIC DEVELOPMENT OF A REGION UNDER RISK CONDITIONS

AVALIAÇÃO DO DESENVOLVIMENTO SOCIOECONÔMICO DE UMA REGIÃO SOB CONDIÇÕES DE RISCO

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ABSTRACT

Objective: To evaluate the socioeconomic development of the Stavropol Territory within the North Caucasus Federal District of Russia, considering the impact of risks and uncertainties on its progress.

Methods: The study integrates a variety of economic and statistical methods to analyze sustainability and risk factors affecting regional development. This includes analyzing absolute and relative indicators of volatility and sustainability, using data from official statistical sources and regional economic reports.

Results: The findings indicate that despite challenges such as economic sanctions and the disruption of international cooperation, the Stavropol Territory has shown resilience. The region has maintained a diversified economic structure with significant contributions from agriculture and industry, which have demonstrated growth even under increased risk conditions.

Conclusion: The study underscores the necessity for proactive regional economic management strategies that incorporate both the potential of local resources and effective responses to structural changes. These strategies are essential to enhance the region's capacity to manage risks and capitalize on growth opportunities.

Keywords: Regional development; Socioeconomic assessment; Risk management; Stavropol Territory; Economic sustainability.

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RESUMO

Objetivo: Avaliar o desenvolvimento socioeconômico do Território de Stavropol dentro do Distrito Federal do Cáucaso Norte da Rússia, considerando o impacto de riscos e incertezas em seu progresso.

Métodos: O estudo integra uma variedade de métodos econômicos e estatísticos para analisar os fatores de sustentabilidade e risco que afetam o desenvolvimento regional. Isso inclui a análise de indicadores absolutos e relativos de volatilidade e sustentabilidade, utilizando dados de fontes estatísticas oficiais e relatórios econômicos regionais.

Resultados: Os achados indicam que, apesar dos desafios como sanções econômicas e a interrupção da cooperação internacional, o Território de Stavropol mostrou resiliência. A região manteve uma estrutura econômica diversificada com contribuições significativas da agricultura e indústria, que demonstraram crescimento mesmo sob condições de risco aumentado.

Conclusão: O estudo sublinha a necessidade de estratégias proativas de gestão econômica regional que incorporem tanto o potencial dos recursos locais quanto respostas eficazes às mudanças estruturais. Essas estratégias são essenciais para aumentar a capacidade da região de gerenciar riscos e capitalizar oportunidades de crescimento.

Palavras-chave: Desenvolvimento regional; avaliação socioeconómica; Gestão de riscos; Território de Stavropol; Sustentabilidade econômica.

1. INTRODUCTION

In the current conditions of increased economic uncertainty, the task of ensuring sustainable development of regions acquires special relevance. The creation of an effective organizational and economic mechanism that ensures balanced and sustainable dynamics of a territorial entity largely depends on developing optimal regional and sectoral strategies associated with differences in natural, social, financial, technological, technical, institutional, and other factors that predetermine the functioning of a region. Based on the period, the influence of certain factors becomes decisive in shaping the trends of its development. The effectiveness of regional economy depends both on its previous state and external changes. As a result, the development of a territorial entity cannot be spontaneous. There is only some freedom conditioned by the specified determinants.

The scientific problem and its significance are largely conditioned by the debatable nature of managing the socioeconomic development of a region from the standpoint of risk theory in the context of ensuring sustainable economic growth in the long term. This study aims to substantiate methodological provisions and tools for

making strategic decisions that contribute to the development of systemic measures to reduce the negative impact of risk on the dynamics of a territorial entity.

The results lay the instrumental basis for expanding scientific ways to substantiate alternatives for the socioeconomic development of regions under conditions of increased uncertainty and risk.

2. MATERIALS AND METHODS

In the course of the study, we considered scientific works on socioeconomic development by G.B. Kleiner, V.I. Maevskii, A.I. Tatarkin, A.V. Voloshin, I.S. Polushina, I.G. Altsybeeva, E.V. Dolzhenkova, M.A. Kazakova, etc. (Danova & Sira, 2023; Dolzhenkova & Kazakova, 2015; Karimli, 2022; Kleiner, 2019; Polushina & Altsybeeva, 2013; Tatarkin & Maevskii, 2008; Voloshin, 2023). Growing instability as a factor in sustainable development is indicated by S.I. Grudina (2021) within the "theory of entropy of socioeconomic systems, which is an important basis for the successful implementation of strategies in the field of sustainable development" (p. 25). In modern studies, sustainable development is considered both from the standpoint of sectoral economic development and as a parameter of their state and functioning (Abalkin, 2015; Lavrikova et al., 2021; Masloboev & Tsygichko, 2022; Rudskaia et al., 2021; Rustamov & Suleymanov, 2021; Sukharev & Voronchikhina, 2023; Viktorova et al., 2023; Volkov & Afanasenkova, 2022). An important area of scientific research is the formation of criteria for assessing development and the establishment of dependencies between assessments and indicators of the research object, whose selection is determined by the objectives of the assessment (Aralbaeva & Berikbolova, 2023; Dzhancharova et al., 2023; Gerasimov et al., 2022).

To achieve the objective of this study, we used conceptual provisions from the theory of economic systems, risk theory, and sustainability theory to objectively assess trends in the socioeconomic development of a region in the context of sanctions and emerging industry constraints.

We used economic and statistical methods for assessing sustainability and risk. The range of deviation, the relative amplitude of oscillations, the standard (root mean square) deviation, and the variation coefficient characterize absolute and relative volatility. An increase in the range of oscillations and dispersion indicates an approaching disaster (Proshunin, 2021). The variation coefficient reflects the risk per

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unit of the expected result as the volatility of a series of relative trends. The higher the variation coefficient, the higher the risk and the lower sustainability (Klimuk et al., 2015; Ter-Grigoryants et al., 2023).

An increase in absolute volatility confirms that the risk is increasing, which is not always a negative trend. If an increase in variability is accompanied by an increasing level of the phenomenon under study, stability can increase and the risk can decrease (Ter-Grigoryants et al., 2023; Vasilieva, 2004). As a result, relative volatility decreases, absolute deviations of the indicator increase in certain crisis moments, and an increase in its guaranteed minimum is manifested. Theoretically, a high level of risk can exist even in the case of complete stagnation (the absence of growth in indicators) and even their decrease. A decrease in the risk of growth is evidenced not so much by low fluctuations relative to the trend but by an increasing trend of its manifestation (Ter-Grigoryants et al., 2023).

To analyze the trend of dynamic risks, it is possible to use the growth sustainability coefficient, i.e., Spearman's rank correlation coefficient. If the coefficient value is close to 1, growth sustainability is higher, and the risk of changes is lower. Growth is unstable at zero value of the indicator. In case of negative values, the conclusion is made about the decrease in sustainability and the increase in risk. The indicator in question can characterize stable growth in case of minor deviations from zero. The low level of volatility, which means high stability of the levels of the series, does not allow one to draw a conclusion about its progress (Vasilieva, 2004).

In conditions of increased economic uncertainty, it is important to analyze indicators characterizing dynamic risks. The direction of dynamics can be determined based on the risk aversion coefficient which can be calculated as the ratio of the average annual growth of the trend to the standard deviation. If, according to the calculation, the risk aversion coefficient exceeds 1, this indicates that the levels of the series grow faster than fluctuations, stability increases, and the risk of dynamics decreases (Ter-Grigoryants et al., 2023; Vasilieva, 2004).

3. RESULTS AND DISCUSSION

In the past decade, 2021-2023 were the most difficult years for the Russian Federation from an economic perspective. Multiple sanctions caused disruptions in international cooperation and integration of Russian economic entities, destroyed the

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logistics chains that had been effectively functioning for a long time, and predetermined the outflow of transnational structures, international business, and foreign investment from the country. As a result, new risks and threats emerged in each industry, and significant destabilizing processes manifested themselves in the economy of Russian regions.

Being a part of the North Caucasus Federal District, the Stavropol Territory is one of the largest agro-industrial regions in Russia. Its economy can be characterized as diversified. Its structure includes industry, agriculture, wholesale and retail trade, and repair of motor vehicles and motorcycles (22.1, 14.4, and 13.0% of the gross regional product (GRP) as of 2022, respectively). The agricultural sector is dominated by crop production. The region's industry is formed by extractive industries, mechanical engineering and metalworking, chemical and petrochemical production, and production of electrical equipment, furniture, and glass. Figure 1 indicates that there was stable growth in agriculture and industry in the Stavropol Territory in 2020-2022.
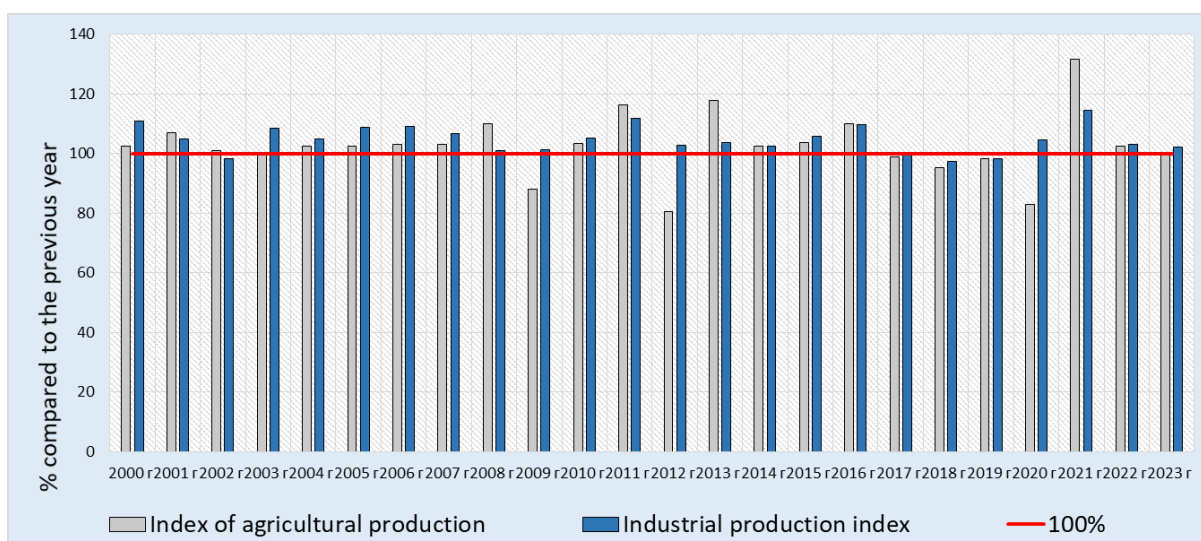

Figure 1. The dynamics of production in the main sectors of the Stavropol Territory's economy in 2000-2022
Compiled by the authors according to the official website of the Federal State Statistics Service (Rosstat) (Federalnaya sluzhba gosudarstvennoi statistiki, n.d.), the official website of the Office of the Federal State Statistics Service for the North Caucasus Federal District (Upravleniye Federal'noy sluzhby gosudarstvennoy statistiki po Severo-Kavkazskomu federal'nomu okrugu, n.d.)

In 2002, 2018, and 2019, the industrial production index was below 100%, which characterizes a decrease in industrial performance. Agricultural production in the region by farms of all categories (in comparable prices) was characterized by negative dynamics compared to 2003, 2009, 2012, 2017, 2018, 2019, and 2020. The data

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indicate that the probability of achieving the industrial production index reflecting positive dynamics is about 90%, while in agriculture the chance is only 70%.

The main indicator characterizing the level of regional socioeconomic development is the GRP, which is the final result of the economic activity of institutional units. The GRP is also a measure of differentiation of the economic development of regions (Baranov & Skufina, 2005). For 2013-2022, the GRP of the Stavropol Territory in basic prices increased more than two times, as evidenced by the analytical data presented in Figure 2.
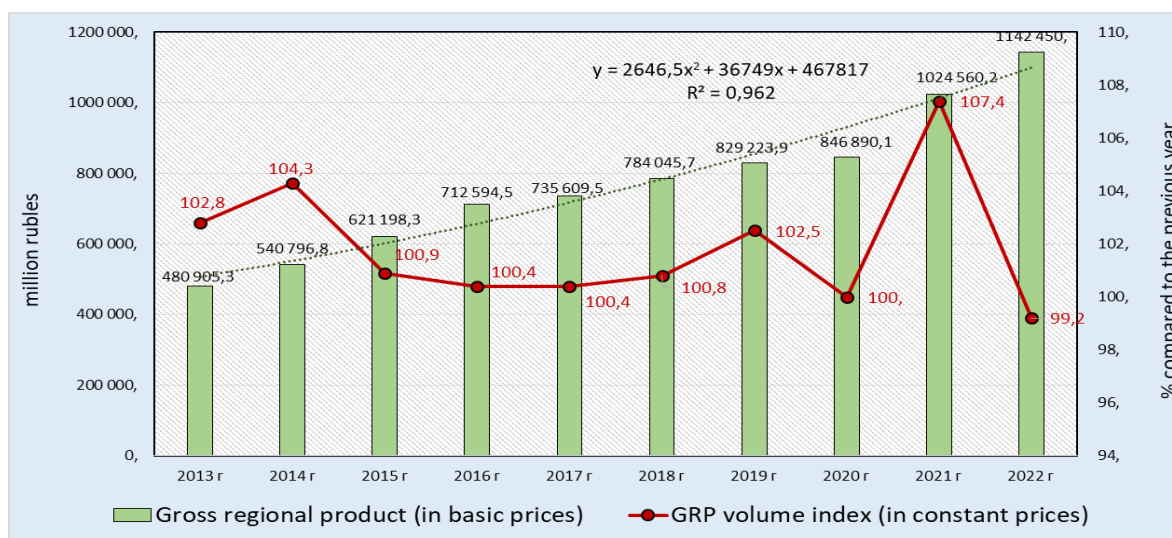

Figure 2. Dynamics of the GRP of the Stavropol Territory in 2013-2022, million rubles
Compiled by the authors according to the official website of the Federal State Statistics Service (Rosstat) (Federalnaya sluzhba gosudarstvennoi statistiki, n.d.), the official website of the Office of the Federal State Statistics Service for the North Caucasus Federal District (Upravleniye Federal'noy sluzhby gosudarstvennoy statistiki po Severo-Kavkazskomu federal'nomu okrugu, n.d.)

As of 2022, the GRP of the Stavropol Territory amounted to 1142.5 billion rubles, 117.9 billion rubles or 11.5% more compared to 2021. According to the results of the reporting year, the share of the GRP of the Stavropol Territory in the all-Russian indicator is 0.8%. The study of the GRP dynamics in basic prices indicates its stable annual growth during the study period. The index of the physical volume of GRP in constant prices shows a slight increase in most reporting periods in the situation of economic stagnation that has been manifested since 2015.

During 2013-2022, the index of the physical volume of GRP (in constant prices) of the Stavropol Territory exceeded 100% for nine years (2013-2021), which characterizes the annual increase in the absolute value of GRP compared to the previous year. In 2022, the index in question amounted to 99.2%, which indicates a

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decrease in the physical volume of GRP (in constant prices) during the period of an increased impact of sanctions.

The consideration of regional development issues necessitates the study of social indicators. As of January 1, 2023, the population of the Stavropol Territory was 2,891.2 thousand people and the region ranked 13th among the constituent entities of the Russian Federation. In 2022, the labor force was 1,380 thousand people, and the labor force participation rate reached 60.1%. According to the results of the reporting year, the employment of the working-age population was 75.6%, which is 3.4% lower than the Russian average. At the end of the reporting period, the unemployment rate was 4.3%, with the Russian average amounting to 3.9%. The combined unemployment rate and potential labor force reached 5.3%, which corresponds to the national average. In 2022, the ratio of per capita cash income of the population to the subsistence minimum was 220.5 (259.8 in 2021), while the national average was 322.8.

To objectively assess the development of the region, we consider it necessary to study the dynamics of the GRP per capita (Figure 3).

$$y = 1074{,}6x^2 + 12003x + 168946$$
$$R^2 = 0{,}9608$$
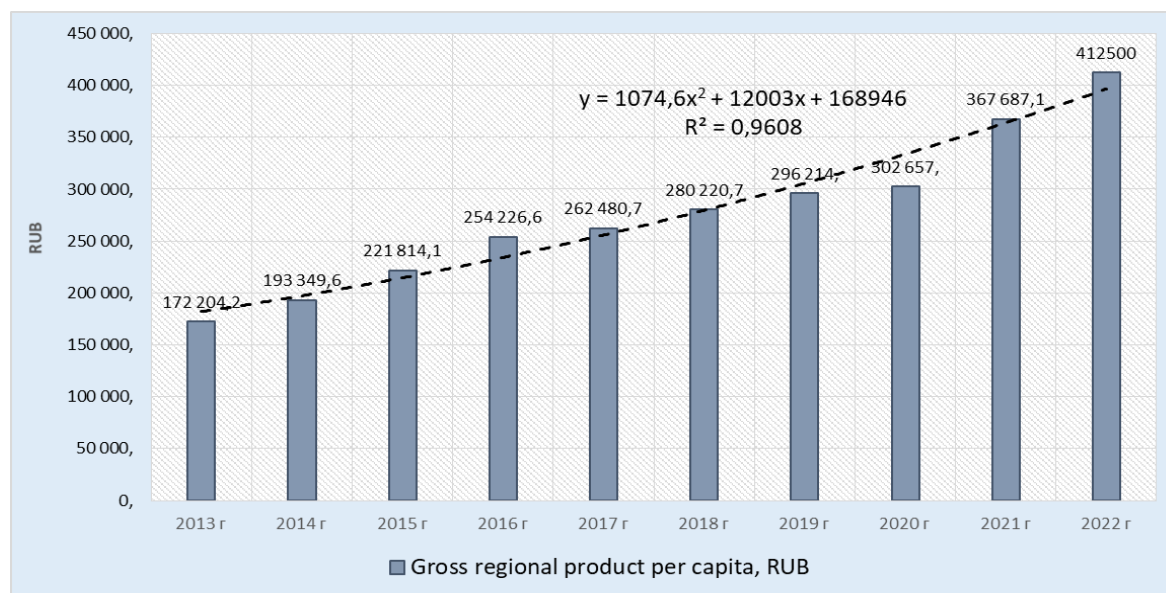
Figure 3. Dynamics of the GRP per capita of the Stavropol Territory in 2013-2022, rubles
Compiled by the authors according to the official website of the Federal State Statistics Service (Rosstat) (Federalnaya sluzhba gosudarstvennoi statistiki, n.d.), the official website of the Office of the Federal State Statistics Service for the North Caucasus Federal District (Upravleniye Federal'noy sluzhby gosudarstvennoy statistiki po Severo-Kavkazskomu federal'nomu okrugu, n.d.)

Figure 3 demonstrates that the Stavropol Territory has seen a stable annual growth in the GRP per capita over the past 10 years. In 2022, its GRP per capita

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amounted to 412.5 thousand rubles, which is almost 2.5 times higher than the value of 2013. In 2022, the increase in the indicator was 12 and 36.3% compared to 2021 and 2020, respectively. The positive trend in the indicators of the socioeconomic development of the region is mainly due to the positive dynamics of the development of the real sector of the economy of the Stavropol Territory.

In the course of the study, we calculated the dynamics of the Stavropol Territory over the past 10 years. The development trends of the region's economy were assessed based on the GRP index (Table 1).

Table 1. Analysis of the risk of development of the Stavropol Territory in terms of the GRP index in 2013-2022

Indicator	2013-2017	2018-2022
Minimum value, %	100.4	99.2
Maximum value, %	104.3	107.4
Average value, %	101.76	101.98
Range of deviation, %	3.9	8.2
Standard deviation, %	1.432	2.376
Oscillation amplitude	0.038	0.080
Variation coefficient	0.014	0.023
Growth sustainability coefficient	-0.829	-0.300
Risk aversion coefficient	0.608	0.072

Calculated by the authors according to the official website of the Federal State Statistics Service (Rosstat) (Federalnaya sluzhba gosudarstvennoi statistiki, n.d.), the official website of the Office of the Federal State Statistics Service for the North Caucasus Federal District (Upravleniye Federal'noy sluzhby gosudarstvennoy statistiki po Severo-Kavkazskomu federal'nomu okrugu, n.d.), the Unified Interdepartmental Information and Statistical System (EMISS) (Edinaya mezhvedomstvennaya informatsionno-statisticheskaya sistema, n.d.)

Table 1 shows that the GRP index in the Stavropol Territory ranged from 100.4 to 104.3% during 2013-2017, with a fluctuation amplitude of 3.8%. In 2018-2022, the average GRP index was 101.98%, which is slightly higher than the average value of the previous period. The variation of this indicator in 2018-2022 is two times higher than its variation in 2013-2017, which indicates a higher risk of regional development in recent years. Relative risk indicators also reveal a prevailing trend of decreasing sustainability of the Stavropol Territory development in 2018-2022. However, the indicators of sustainability and risk based on the GRP per capita do not allow such an unambiguous conclusion (Table 2).

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Table 2. Analysis of the risk of development of the Stavropol Territory in terms of GRP per capita in 2013-2022

Indicator	2013-2017	2018-2022
Minimum value, rubles	172,204.2	280,220.7
Maximum value, rubles	262,480.7	412,500.0
Average value, rubles	220,815.0	331,855.8
Range of deviation, rubles	90,276.5	132,279.3
Standard deviation, rubles	38,635.2	56,072.4
Oscillation amplitude	0.409	0.398
Variation coefficient	0.175	0.169
Growth sustainability coefficient	1.0	1.0
Risk aversion coefficient	0.625	0.599

Calculated by the authors according to the official website of the Federal State Statistics Service (Rosstat) (Federalnaya sluzhba gosudarstvennoi statistiki, n.d.), the official website of the Office of the Federal State Statistics Service for the North Caucasus Federal District (Upravleniye Federal'noy sluzhby gosudarstvennoy statistiki po Severo-Kavkazskomu federal'nomu okrugu, n.d.), the Unified Interdepartmental Information and Statistical System (EMISS) (Edinaya mezhvedomstvennaya informatsionno-statisticheskaya sistema, n.d.)

The calculation results in Table 2 indicate that the region has been experiencing a stable annual increase in the GRP per capita in 2013-2022. While the GRP growth rate was 137% in 2022 compared to 2013, the population growth was only 2.1%. The growth sustainability in this period is maximum and equal to 1. On average, the GRP per capita amounted to 331,855.8 rubles in 2018-2022, which is almost 50% higher than the average value of 2013-2018. These indicators reveal a decrease in the risk per unit of the expected result and an increase in the risk of socioeconomic development.

The economic development of the region should be regarded as a factor ensuring the quality of life of the population. It is impossible to achieve the dynamics of socioeconomic development in conditions of increased uncertainty without adjusting the mechanism of state management of the regional economy based on the transformation of functional, financial, and institutional relations.

Our study allowed us to identify priority areas of regional economic management for adaptation to risks and threats with due regard to the identified trends in its socioeconomic development (Figure 4).
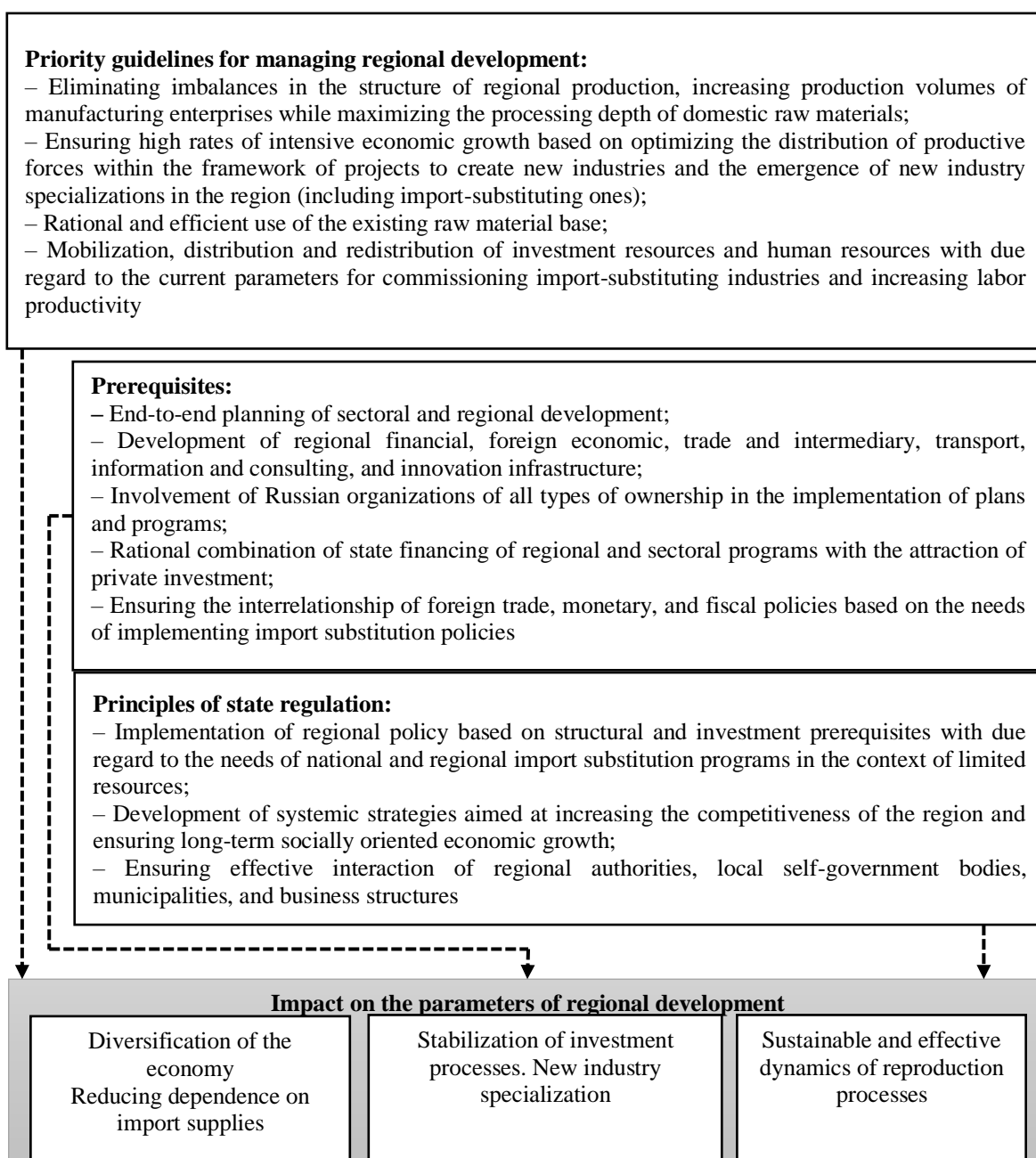
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Priority guidelines for managing regional development:
– Eliminating imbalances in the structure of regional production, increasing production volumes of manufacturing enterprises while maximizing the processing depth of domestic raw materials;
– Ensuring high rates of intensive economic growth based on optimizing the distribution of productive forces within the framework of projects to create new industries and the emergence of new industry specializations in the region (including import-substituting ones);
– Rational and efficient use of the existing raw material base;
– Mobilization, distribution and redistribution of investment resources and human resources with due regard to the current parameters for commissioning import-substituting industries and increasing labor productivity

Prerequisites:
– End-to-end planning of sectoral and regional development;
– Development of regional financial, foreign economic, trade and intermediary, transport, information and consulting, and innovation infrastructure;
– Involvement of Russian organizations of all types of ownership in the implementation of plans and programs;
– Rational combination of state financing of regional and sectoral programs with the attraction of private investment;
– Ensuring the interrelationship of foreign trade, monetary, and fiscal policies based on the needs of implementing import substitution policies

Principles of state regulation:
– Implementation of regional policy based on structural and investment prerequisites with due regard to the needs of national and regional import substitution programs in the context of limited resources;
– Development of systemic strategies aimed at increasing the competitiveness of the region and ensuring long-term socially oriented economic growth;
– Ensuring effective interaction of regional authorities, local self-government bodies, municipalities, and business structures

Impact on the parameters of regional development

| Diversification of the economy Reducing dependence on import supplies | Stabilization of investment processes. New industry specialization | Sustainable and effective dynamics of reproduction processes |

Figure 4. A model representation of the formation of parameters of socioeconomic development of the Stavropol Territory
Developed by the authors

The application of the proposed methodological tools for assessing sustainability and risk is intended to promptly identify problems in the socioeconomic development of the region; provide opportunities to neutralize the negative impact of risks or successfully adapt to them; implement a realistic regional policy based on the optimal ratio of the tasks set and available resources.

4. CONCLUSIONS

The emerging destabilization of the Russian economy and the decline in the effectiveness of traditional measures to counter risks and threats stipulate the urgent need to use a new paradigm for the functioning and development of its constituent entities. The existing management principles should consider numerous and multidirectional changes in historically established forms of economic relations and economic interrelations. The system for managing the socioeconomic development of a region should promptly respond to internal and external changes using a relevant and high-quality information base. The latter provides possibilities of developing rational management decisions in terms of ensuring sustainable and socially oriented economic growth in the future.

Within the framework of this study, a system of absolute and relative indicators was substantiated to assess the stability, dynamics, and trends of a territorial entity. This analytical toolkit creates the basis for developing new ways of responding to the increasing market instability.

The application of the methodological provisions will help adjust the parameters of state regulation of the regional economy. The concept of proactive management of socioeconomic development should combine the rational use of the resource potential of a territorial entity, the effectiveness of structural transformations, and the successful leveling of the negative consequences of emerging risks and threats.

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