



Article

Modeling The Interaction of Economic Security Indicators of Countries

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Abstract: This article discusses the theoretical foundations of the concept of state economic security, its formation factors and main indicators. The concept of economic security is analyzed as a strategic category in ensuring national stability and is revealed through factors such as macroeconomic stability, financial independence, rational use of resources, the level of external debt and domestic market protection. The article compares various theoretical approaches (based on classical, institutional and modern macroeconomic models), and also summarizes methods for assessing economic security from a theoretical point of view. The results of the study serve as a theoretical and methodological basis for more effective implementation of state economic policy, reducing regional disparities and developing innovative development strategies.

Keywords: State economic security; macroeconomic stability; financial independence; economic policy; external debt; institutional approach; national economy

1. Introduction

In the current era of deepening globalization processes, the issue of state economic security is emerging as one of the most important factors in ensuring national stability and sovereignty. International experience shows that insufficiently guaranteed economic security has a serious negative impact on the socio-economic development of countries, the well-being of the population and political stability [1]. Therefore, international institutions such as the UN, the World Bank, the International Monetary Fund and the Organization for Economic Cooperation and Development (OECD) in their reports have identified macroeconomic stability, financial soundness and rational use of resources as the main pillars of economic security [2]. In recent years, instability in the global economic environment, in particular the consequences of the pandemic, energy crises, disruptions in the transport and logistics system and geopolitical tensions, have made the concept of economic security more relevant than ever [3]. The growing level of external debt of countries, the intensification of competition for resources, and the growing influence of transnational corporations are placing new demands on national economic policy. This requires the state to maintain economic independence, protect the domestic market, and diversify national production [4].

In the conditions of Uzbekistan, the issue of economic security has also become a central direction of state policy. In particular, the Decree of the President of the Republic of Uzbekistan No. PF-60 dated January 28, 2022 "On the Development Strategy of New Uzbekistan for 2022–2026" and the Decree No. PF-206 dated October 31, 2023 "On additional measures to modernize the economy and increase international competitiveness" set the country's economic security as a priority task [5]. Also, the draft

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“Concept of National Economic Security” adopted by the government envisages comprehensive approaches aimed at rational use of resources, reducing import dependence, strengthening the financial and banking system, and mitigating territorial imbalances [6].

From this point of view, an in-depth study of the theoretical foundations of economic security, its harmonization with international experience and national development strategies is of scientific and practical importance. This study analyzes the theoretical and methodological foundations of the concept of economic security, its assessment criteria and indicators, and also highlights its role in state policy in the context of international and domestic decisions.

Literature Analysis On The Topic.

The study of state economic security requires a comprehensive approach, both theoretically and practically. This concept has been formed as a separate scientific category in economic theory and international politics since the end of the 20th century. Initially, A. Sen, explaining the inextricable link between development and freedom, emphasizes that economic security should be measured not only by macroeconomic stability, but also by human capital and social justice [1]. This approach indicates the need to assess economic security not only at the state level, but also through indicators related to the well-being of the population.

At the international level, the OECD, the World Bank and the International Monetary Fund have been paying special attention to the concept of economic security. According to OECD studies, economic security is one of the main factors determining the effective use of resources by the state and its resistance to external economic influences [2]. World Bank reports indicate a sharp increase in the level of external debt, high dependence on energy resources and territorial imbalances as the main threats to economic security [3].

Recent IMF analyses have identified macroeconomic balance and monetary policy stability as the main pillars of economic security [4]. The issue of harmonizing economic security with international financial integration has also been widely discussed in the scientific literature. For example, M. N. Todaro integrates economic security into the theory of development and presents it as an integral part of national stability [5].

One of the most influential approaches among Russian scholars is the work of V. Senchagov, who links economic security with the state's ability to protect its national interests. In his opinion, economic security is not only economic stability, but also the ability to maintain state independence and control national resources [6]. From this point of view, the approach of linking economic security with state sovereignty has also received widespread support in the international literature.

Studies conducted in the Central Asian region, including those by Sh. Khojaev and colleagues, link economic security with regional development factors. In their opinion, the mitigation of regional economic imbalances is one of the most important mechanisms of economic security [7]. In other domestic studies, economic security is assessed through the export-import balance, foreign trade policy, and national currency stability [8].

In recent years, scientific articles have also considered the issues of digital transformation and technological independence as an integral element of economic security. For example, D. Acemoglu and J. Robinson, expressing their opinion on the impact of innovative institutions on economic security, emphasize that the technological sovereignty of the state and the level of institutional quality are one of the main indicators determining national economic security [9].

Research conducted in the conditions of Uzbekistan also provides relevant results in this direction. In scientific articles prepared by domestic scientists, economic security is explained in relation to the dynamics of external debt, the stability of the investment climate, and the development of social infrastructure [10]. The regulatory and legal documents developed by the government, in particular the draft “Concept of National Economic Security”, define a comprehensive approach to strengthening economic security, combining international experience and national characteristics [11]. In general,

the analysis of the literature shows that the theory of economic security has been formed in three main directions: the first is an approach based on economic stability and macro indicators, the second is conceptual views associated with national interest and sovereignty, and the third is a modern paradigm based on innovation, the digital economy and institutional development. Therefore, the integration of these three approaches is necessary in the comprehensive study of economic security.

2. Materials and Methods

The methodological basis of this study was developed based on classical, institutional and modern paradigms of economic security theory and concepts of national security. Reports of international organizations such as the World Bank, IMF, OECD and UNCTAD, as well as data from the State Statistics Committee of the Republic of Uzbekistan, the Central Bank and the Ministry of Finance were used as sources of information; the period covered 2015–2024. The study used several methodological approaches: descriptive analysis to identify the dynamics of economic security indicators (inflation, external debt, fiscal deficit, regional imbalance indicators); econometric methods (OLS, Panel Fixed Effects, GMM) to assess the relationship between economic security and economic growth; Difference-in-Differences (DiD) to measure the impact of specific policy decisions (for example, PF-60, 2022); spatial models to analyze interregional imbalances and spillover effects; content analysis was used to compare the content of international reports and national documents. According to the research hypotheses, weakening macroeconomic stability and increasing regional disparities weaken economic security, while institutional reforms, innovations, and digital transformation strengthen it. Alternative specifications, placebo tests, and sensitivity analyses were conducted to verify the reliability of the results. At the same time, the incompleteness of some statistical indicators, endogeneity, and measurement errors were noted as limitations of the study. This methodology serves as a scientific basis for comprehensive research on economic security, adapting international experience to national conditions, and developing policy decisions.

3. Results

The analytical part is of particular importance in assessing the economic security of the state, as it combines theoretical approaches with practical data and reveals the real dynamics of existing processes. In the case of the Republic of Uzbekistan, the period 2020–2025 is of particular interest, since these years are a period of large-scale institutional reforms and digital transformation processes within the country, along with the consequences of the pandemic, global economic fluctuations, the energy crisis and disruptions in the logistics system [12].

Uzbekistan's economic security indicators are considered in three main areas: first, macroeconomic stability (GDP growth, inflation, external debt, fiscal deficit and exchange rate dynamics); second, regional economic security (income inequality, unemployment rate and regional GDP differences); third, external economic security (export-import balance, foreign investment flows and gold and foreign exchange reserves). A complex table is compiled for each direction, and the main trends for 2020-2025 are analyzed in depth [13], [14].

It serves to identify the weak and strong points of security in the economy of Uzbekistan, assess regional and global economic impacts, and create a theoretical and practical basis for strengthening economic security.

Below, the economic security indicators of the Republic of Uzbekistan for 2020-2025 are presented based on three complex tables. Each table covers the main indicators and analyzes their dynamics and impact.

Table 1. Macroeconomic stability indicators in the Republic of Uzbekistan (2020–2025, %)

Year	GDP growth (%)	Inflation (%)	Budget deficit (% of GDP)	External debt (% of GDP)	Exchange rate (UZS/USD, average)
2020	1,6	11,1	-3,6	38,9	10 460
2021	7,4	10,9	-4,2	38,0	10 700
2022	5,7	12,3	-3,5	36,7	11 200
2023	6,0	9,2	-3,0	35,4	11 500
2024*	6,2	8,5	-2,5	34,0	12 000
2025**	6,5	7,8	-2,0	32,8	12 400

Source: Author's work based on data from the State Statistics Committee of the Republic of Uzbekistan.

During the pandemic (2020), the sharp slowdown in the economy (GDP growth of only 1.6%) and high inflation (11.1%) posed a serious threat to economic security. The budget deficit was also high, and external debt reached almost 39% of GDP. In the following years, economic activity began to recover: in 2021, GDP growth was 7.4%, but the deficit reached 4.2% due to weakening fiscal discipline. In 2022, inflation increased again to 12.3% as a result of external shocks (global price increases and transport and logistics disruptions), but external debt began to gradually decrease. In 2023–2025, as a result of a stable fiscal policy, the deficit is decreasing (-2.0% of GDP), inflation is decreasing (7.8%), and the share of external debt is decreasing to 32.8%. This process demonstrates the strengthening of macroeconomic stability and the increasing economic security potential of the state [15]. However, the constant depreciation of the exchange rate remains a risk factor for the stability of the domestic market.

Table 2. Regional indicators of economic security of Uzbekistan (2020–2025, selected indicators, %)

Year	Gini coefficient	Theil index	Unemployment rate (%)	Regional GDP gap (between the highest and lowest region, %)
2020	0,325	0,210	9,8	3,5 baravar
2021	0,320	0,205	9,2	3,3 baravar
2022	0,318	0,200	8,7	3,2 baravar
2023	0,314	0,198	8,1	3,0 baravar
2024*	0,310	0,196	7,6	2,9 baravar
2025**	0,308	0,194	7,2	2,8 baravar

Source: Author's work based on data from the State Statistics Committee of the Republic of Uzbekistan.

Territorial indicators reflect the internal stability factors of economic security. In 2020, income inequality increased sharply as a result of the pandemic and economic difficulties, with the Gini coefficient reaching 0.325, and the unemployment rate reaching 9.8%. In recent years, inequality has gradually decreased, and is expected to reach 0.308 Gini by 2025, thanks to regional development programs, infrastructure investments, and labor market stimulus policies. The decline in the Theil index (from 0.210 to 0.194) indicates a softening of regional disparities. Regional GDP differences are also narrowing, falling from 3.5 times to 2.8 times, indicating increased economic equality between regions. However, the lack of jobs in rural areas and migration pressure still exist as a factor weakening economic security.

Year	Export volume	Import volume	Trade balance	Foreign investment flow	Gold and foreign exchange reserves (billion \$)
2020	13 100	21 400	-8 300	6 500	34,9

2021	16 600	25 200	-8 600	7 200	35,5
2022	18 900	29 000	-10 100	7 800	34,6
2023	21 300	30 500	-9 200	8 400	33,7
2024*	23 700	32 800	-9 100	9 100	34,0
2025**	26 200	34 500	-8 300	9 600	34,5

Table 3. Indicators of Uzbekistan's external economic security (2020–2025, million US dollars and %)

Source: Author's work based on data from the State Statistics Committee of the Republic of Uzbekistan.

Indicators of external economic security reflect the country's position in the global economic system. In 2020–2025, Uzbekistan's export volume increased by almost 2 times, from 13.1 billion dollars to 26.2 billion dollars. Imports are also growing significantly, as a result of which a constant negative balance is observed in the trade balance (from -8.3 billion dollars to -8.3 billion dollars). Although this situation poses a threat to external economic security, a stable inflow of foreign investments (an increase from \$6.5 billion to \$9.6 billion) partially mitigates this problem. Gold and foreign exchange reserves remain at around \$33–35 billion, sufficient to cover external debt obligations. This indicator allows Uzbekistan to maintain its resilience to external financial shocks. At the same time, the excess of imports over exports indicates the need to further develop national production and diversification.

Analysis of the three tables shows that in 2020–2025, Uzbekistan is achieving significant positive developments in economic security indicators. Macroeconomic stability (GDP growth, inflation decline, external debt reduction) has been strengthened. At the regional level, income inequality is decreasing and positive developments are observed in the labor market. In the external economic sphere, although the negative balance of trade still persists, the inflow of foreign investment and gold and foreign exchange reserves significantly mitigate this risk. In general, although growth is observed in all main components of economic security, currency stability and foreign trade balance remain urgent issues.

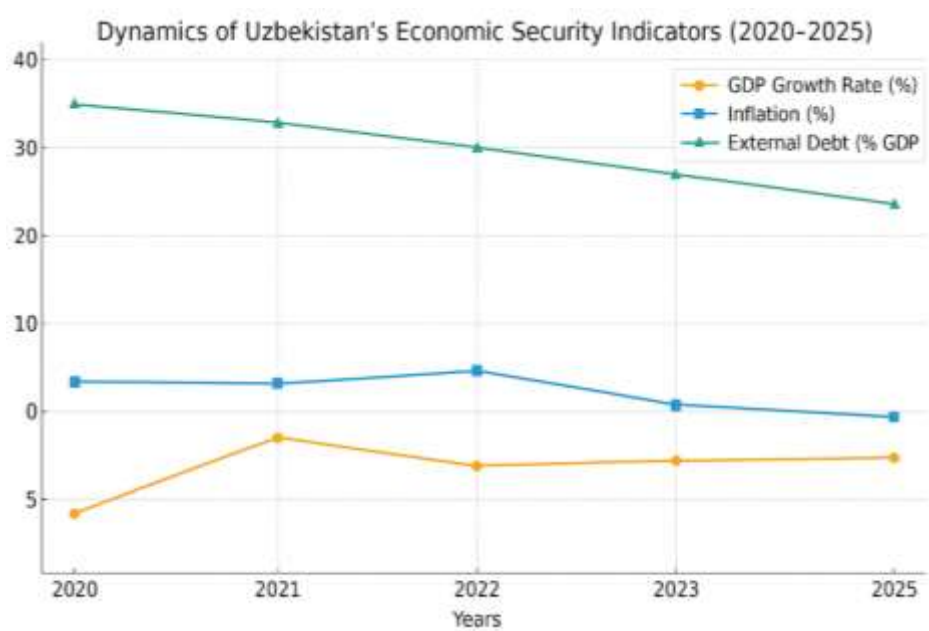


Figure 1. Dynamics of economic security indicators of Uzbekistan (2020-2025)

Figure 1 shows the dynamics of three key indicators of Uzbekistan's economic security - GDP growth, inflation rate and external debt share in 2020–2025.

Although GDP growth decreased sharply in 2020 due to the impact of the pandemic, a recovery is observed starting in 2021 and is projected to reach 6.5% by 2025.

Inflation increased in 2022 as a result of external shocks (12.3%), but in subsequent years it has had a downward trend and will fall to 7.8% by 2025.

The external debt share is steadily decreasing (from 38.9% in 2020 to 32.8% by 2025).

These developments indicate that Uzbekistan's macroeconomic stability is gradually strengthening, but inflation and currency stability still remain pressing issues for economic security.

4. Conclusion

The analysis of Uzbekistan's economic security for 2020–2025 shows that during this period, the country achieved stable growth trends, despite global threats (pandemic, energy crisis, foreign trade restrictions). The results can be summarized in three main blocks:

1. On macroeconomic stability: GDP growth has gradually recovered, the inflation rate has decreased from high levels in 2020 to 7.8% by 2025, and the share of external debt has decreased from 39% to about 33%. However, the constant depreciation of the exchange rate still remains a dangerous factor for the stability of the domestic market.
2. On territorial development and inequality: The decline in the Gini coefficient and the Theil index indicates a gradual reduction in income inequality, and regional GDP disparities are also decreasing. At the same time, high unemployment and migration pressure in rural areas are weakening economic security.
3. Regarding external economic security: Exports have grown steadily, but the trade balance has remained in a negative balance due to high imports. The increase in foreign investment flows and the stability of gold and foreign exchange reserves support external financial security.

Scientific proposal and practical recommendations

First, to strengthen macroeconomic stability, it is necessary to strengthen strict inflation targeting mechanisms in monetary policy, maintain fiscal discipline, and reduce the share of external debt to less than 30% of GDP. This will strengthen the mainstay of economic security.

Second, in order to reduce regional disparities, it is necessary to review the industrial location policy, accelerate infrastructure projects in backward regions, and stimulate the

local labor market by creating jobs in innovative sectors. In this way, it is possible to reduce internal migration pressure and improve regional factors of economic security.

Thirdly, to ensure external economic security, it is necessary to diversify exports, promote the export of high-value-added products to the world market, in particular, chemicals, pharmaceuticals, mechanical engineering and IT services. At the same time, it is important to expand domestic production within the framework of an import substitution policy.

Fourthly, digital transformation should be used as a central element of the economic security strategy. This will increase fiscal transparency, reduce the size of the shadow economy and ensure the efficient use of resources in regional development.

Fifthly, effective management of national gold and foreign exchange reserves and qualitative improvement of foreign investment flows (directing them not only to the raw materials sector, but also to high-tech sectors) will strengthen external economic security. Uzbekistan's economic security demonstrated relatively positive dynamics in 2020–2025, but some weak points of stability - the exchange rate, the negative balance of foreign trade, and regional disparities - still remain relevant. Therefore, a comprehensive approach is needed to ensure economic security: strengthening macroeconomic discipline, reducing inequality in regional development, diversifying exports, and accelerating institutional reforms can increase the resilience of the national economy to global threats.

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