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FORMATION OF AN ECONOMETRIC MODEL FOR CHANGES IN THE NATIONAL EXCHANGE RATE

Yuldashev Temurbek Odiljon o‘g‘li
Tashkent University of Economics and Technologies
temurbek09711@gmail.com

Annotatsiya. This research paper examines the identification of key macroeconomic factors influencing the dynamics of the national exchange rate and models their interdependencies econometrically. The study analyzes exchange rate fluctuations in relation to fundamental variables such as the inflation rate, trade balance, GDP growth rate, refinancing rate, and foreign exchange reserves. Utilizing multi-factor linear and dynamic econometric models (e.g., ARDL or VAR models), both short-term and long-term effects are evaluated. Based on the findings, practical proposals and recommendations are developed to ensure the stability of the national currency and forecast its trend movements for future periods.

Keywords: national exchange rate, econometric model, macroeconomic factors, forecasting, inflation, trade balance, multiple regression, currency stability.

Introduction

Relevance of the Topic. Under the conditions of modern globalization and international economic integration, the national exchange rate of any state serves as one of the most critical indicators determining macroeconomic stability. Fluctuations in the national exchange rate directly impact foreign trade turnover, the inflation rate, the investment climate, and ultimately, the population's standard of living. Particularly in times of volatility in global markets, geopolitical shifts, and structural changes in the export-import balance, anticipating the trends of national exchange rate movements becomes a primary factor in ensuring economic security.

The formation of an exchange rate is intricately linked with a vast number of internal and external economic factors, and assessing their degree of influence using simple methods does not yield sufficient effectiveness. Therefore, analyzing and forecasting exchange rate dynamics through mathematical-statistical methods and modern computer software—specifically via econometric modeling—presents a highly relevant task for both economic science and practice.

Literature Review. The study of the exchange rate, the factors influencing it, and its modeling have been extensively researched by foreign and domestic economists. While classical economists such as J.M. Keynes, M. Friedman, and R. Dornbusch laid the foundations of exchange rate theories, contemporary econometric analyses widely utilize VAR, ARDL, and GARCH models. Similarly, economists within our republic have been actively researching the stability of the national currency market. However, today's rapidly changing external economic conditions and new macroeconomic realities necessitate a systematic re-modeling of national exchange rate dynamics using updated data.

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Research Objectives and Tasks. The primary objective of this research is to identify the fundamental macroeconomic factors affecting national exchange rate fluctuations, build an econometric model that reflects their interdependencies, and develop forecast indicators for future periods based on the obtained results. To achieve this objective, the following tasks have been set:

- Studying the theoretical and methodological foundations of exchange rate formation;
- Selecting the primary factors influencing the national exchange rate dynamics (inflation, GDP, foreign trade, interest rates, etc.) and building the database;

- Analyzing the relationships between the selected factors using multi-factor regression and dynamic models;
- Verifying the statistical reliability and adequacy of the model;
- Forecasting short-term and medium-term exchange rate fluctuation scenarios based on the formulated model.

Object and Subject of the Research. The object of the research is the country's foreign exchange market and the processes of national exchange rate formation. The subject of the research comprises the economic-mathematical and econometric relations between exchange rate movements and the influencing macroeconomic factors.

Research Methods. Economic analysis, a systems approach, correlation and regression analysis, econometric modeling (using computer software), and forecasting methods were utilized to conduct this study. As we know, changes in the degree of dependence of the Uzbek Soum on foreign currencies have turned it into a crucial macroeconomic indicator. The exchange rate directly affects the competitiveness of the national economy, the stability of the banking system, and the efficiency of financial flows. Over the past five years, the steady growth of the US Dollar exchange rate against the national currency, variations in export-import volumes, and the Central Bank's interest rate have evolved as interconnected processes. As the share of credit lines attracted from abroad, foreign assets, investments, and the volume of foreign exchange operations increases, the necessity to manage the foreign currency component of bank balance sheets intensifies. Consequently, in this study, an Econometric Model is constructed and an empirical analysis is carried out to model exchange rate fluctuations.

Scientific Novelty and Practical Significance of the Research. During the research, the fluctuations of the Uzbek Soum (UZS) against the US Dollar (USD) were investigated, and analyses were conducted based on the developed Econometric Model. Based on the obtained results, policy and managerial recommendations have been formulated for banks.

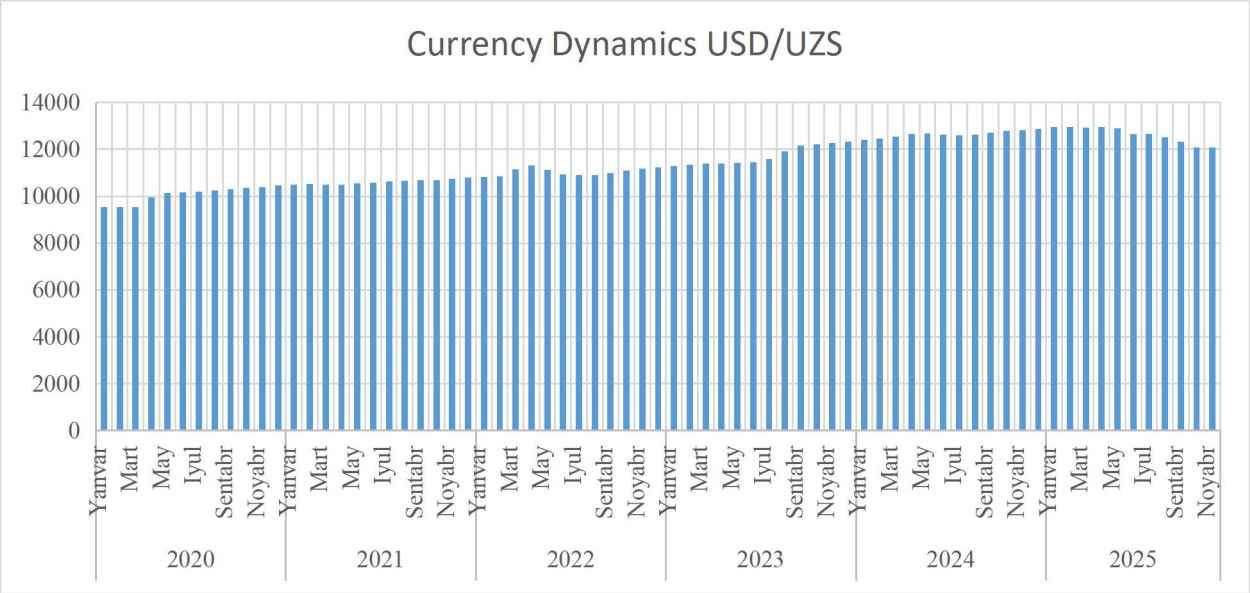


Figure 1. The relationship between the USD and UZS currencies over the last six years.

Results.

We designated the required factors to construct the econometric model. We selected the monthly average exchange rate of the USD/UZS pair as the dependent variable (y). As explanatory factors (independent variables), we gathered monthly average data for:

Export volume (in billion USD) - x_1
Import volume (in billion USD) - x_2
The central bank's main policy rate (%) - x_3
The share of foreign currency in banking assets (%) - x_4

Correlation Analysis.

The quantitative values of the USD and UZS relationship for the years 2020–2025 were examined. Correlation links were identified based on the quantitative values of the factors influencing it, which are presented in Table 1.

(Table 1)

Pair		Correlation Coefficient	Interpretation
Exchange Rate – Export	r_{yx_1}	0,867318905	Strong positive correlation
Exchange Rate – Import	r_{yx_2}	0,933664248	Strong positive correlation
Exchange Rate – Policy Rate	r_{yx_3}	-0,427577073	Moderate inverse (negative) correlation
Exchange Rate – Foreign Assets Share	r_{yx_4}	-0,20070762	Weak inverse (negative) correlation
Export – Import	$r_{x_1x_2}$	0,89148073	Strong positive correlation
Export – Policy Rate	$r_{x_1x_3}$	-0,268279199	Below-moderate inverse correlation
Export – Foreign Assets Share	$r_{x_1x_4}$	-0,20710417	Weak inverse (negative) correlation
Import – Policy Rate	$r_{x_2x_3}$	-0,439162527	Moderate inverse (negative) correlation
Import – Foreign Assets Share	$r_{x_2x_4}$	-0,119984593	Weak inverse (negative) correlation
Policy Rate – Foreign Assets Share	$r_{x_3x_4}$	0,087240433	Weak correlation

Table 1. Correlation between the exchange rate and individual factors, including their interdependencies.

These results indicate that there is a significant positive relationship between changes in export and import volumes and the depreciation of the exchange rate (UZS). Additionally, as the share of foreign assets decreases, the depreciation of the Soum rate accelerates. A strong positive correlation exists between changes in export and import volumes, while the cross-correlations among the factors influencing the exchange rate mostly exhibit weak inverse relationships.

Conclusion

The analytical results of this scientific study demonstrate that the factors influencing economic growth—exports, imports, the main policy rate, and the share of foreign assets—are interconnected.

The share of foreign assets exerts an inverse effect in our model. That is, as the share of assets held in foreign currency (USD) on bank balance sheets increases, fluctuations in the national exchange rate negatively affect the overall value of bank assets.

Import volume has a positive impact on the economy; however, its expansion increases the demand for foreign currency. This, in turn, amplifies exchange rate volatility. If import volumes remain high, banks participate more heavily in foreign transactions, thereby exposing themselves to foreign exchange risks. On the other hand, an increase in export volume boosts the demand for the national currency, which mitigates exchange rate risks and stabilizes banking assets.

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Based on the results of this scientific research, the following recommendations are proposed : it is essential to increase export volumes and maintain a stable import balance. This approach will

successfully minimize foreign exchange risks. To manage foreign exchange risks effectively, commercial banks must actively utilize hedging instruments, currency diversification strategies, and swap operations.

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