

# Exchange Rate Dynamics in the Digital Economy and Impact on the National Economy

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***Abstract-* The rapid expansion of the digital economy is transforming the structure of national economies and reshaping the mechanisms through which exchange rate dynamics affect macroeconomic performance. This paper examines the nature of exchange rate dynamics in the context of the digital economy and assesses their impact on the national economy. The study is based on a conceptual and analytical synthesis of classical exchange rate theories and contemporary digital economy frameworks, with particular attention to digital trade, cross-border e-commerce, fintech development, and digitally mediated capital flows. The research highlights that digitalization alters traditional exchange rate transmission channels by reducing transaction costs, accelerating financial and trade operations, and increasing the sensitivity of economic agents to exchange rate fluctuations. Special emphasis is placed on the dual role of exchange rates in a digital environment: while exchange rate stability supports digital investment, innovation, and export-oriented growth, heightened volatility can amplify risks, uncertainty, and macroeconomic imbalances in digitally interconnected markets. The findings suggest that in the digital economy, exchange rate policy effectiveness increasingly depends on the level of digital infrastructure, financial digitalization, and institutional adaptability. The paper concludes that a coordinated approach combining prudent exchange rate management with policies aimed at strengthening digital transformation enhances economic resilience, competitiveness, and sustainable national economic growth. The results provide useful insights for policymakers and researchers analyzing macroeconomic stability in the era of digitalization.**

***Keywords:*** Digital economy, exchange rate, national economy, foreign economic activity, economic stability, digital financial instruments.

## 1. INTRODUCTION

In the conditions of global financial instability that is emerging in the world, the expansion of the processes of integration of national economies increases the need to constantly analyze the dynamics of the exchange rate. In the conditions of the market economy, the use of the freely fluctuating exchange rate regime in the foreign exchange market creates a risk related to the forecasting of the exchange rate on the open currency position in the subjects of foreign economic activity. Analysis of the exchange rate using various methods is of great importance in order to prevent the change of the exchange rate due to the changes occurring in the country of the main trading partners and their negative impact on the activities of national producers. In this direction, forming a general approach to the analysis of the exchange rate, strengthening continuous monitoring, developing the necessary institutional system for

the implementation of operations in the international currency market, simplifying the selection and use of models for the analysis of exchange rate changes, theoretically deepening the methods for analyzing the dynamics of the exchange rate the relevance of the analysis is increasing [1,2,3].

Ensuring the stability of the national exchange rate and the level corresponding to the price scale is a necessary condition for reducing the level of inflation in the country and developing foreign trade relations. The effective solution of the tasks set in this regard is based on the projects carried out with the participation of foreign investments, linking the prices of goods sold in the territory of the country to foreign currencies and conditional units, taking into account the domestic demand in the formation of the money supply as a mechanism that determines the initial structure of the country's budget, commercial banks market and determining the impact of changes in foreign exchange rates in the open currency position and the significant decrease in the ability to redistribute liquidity in one currency to another currency in the assessment and control of liquidity risk, requires the implementation of scientific research aimed at evaluating the prospective indicators of the dynamics of the exchange rate of the national currency to foreign currency on the country's economy [4,5].

## 2. LITERATURE REVIEW

Specific theoretical and practical aspects of issues of ensuring the stability of the exchange rate of the national currency and its impact on foreign trade relations A. Marshall, A. Lerner, S. Fisher, Rose, Andrew K., REcaves, JAFrankel, RWJones, A. Babula, I. Ötke- Robe, C. Reinhart, K. Rogoff, J. Frankel, J. Williamson, M. Obstfeld, K. Rogoff, R. Hausmann, P. Wickham, H. Poirson, K. Rogoff, A. Husain, A. Mody, R. Brooks, N. Oomes, M. Friedman, R. Mandell, F. Mahlup, etc. have been researched in the scientific research of a number of foreign economists.

Based on our research, tax administration entities and its main participants were classified (Fig. 1) [6].

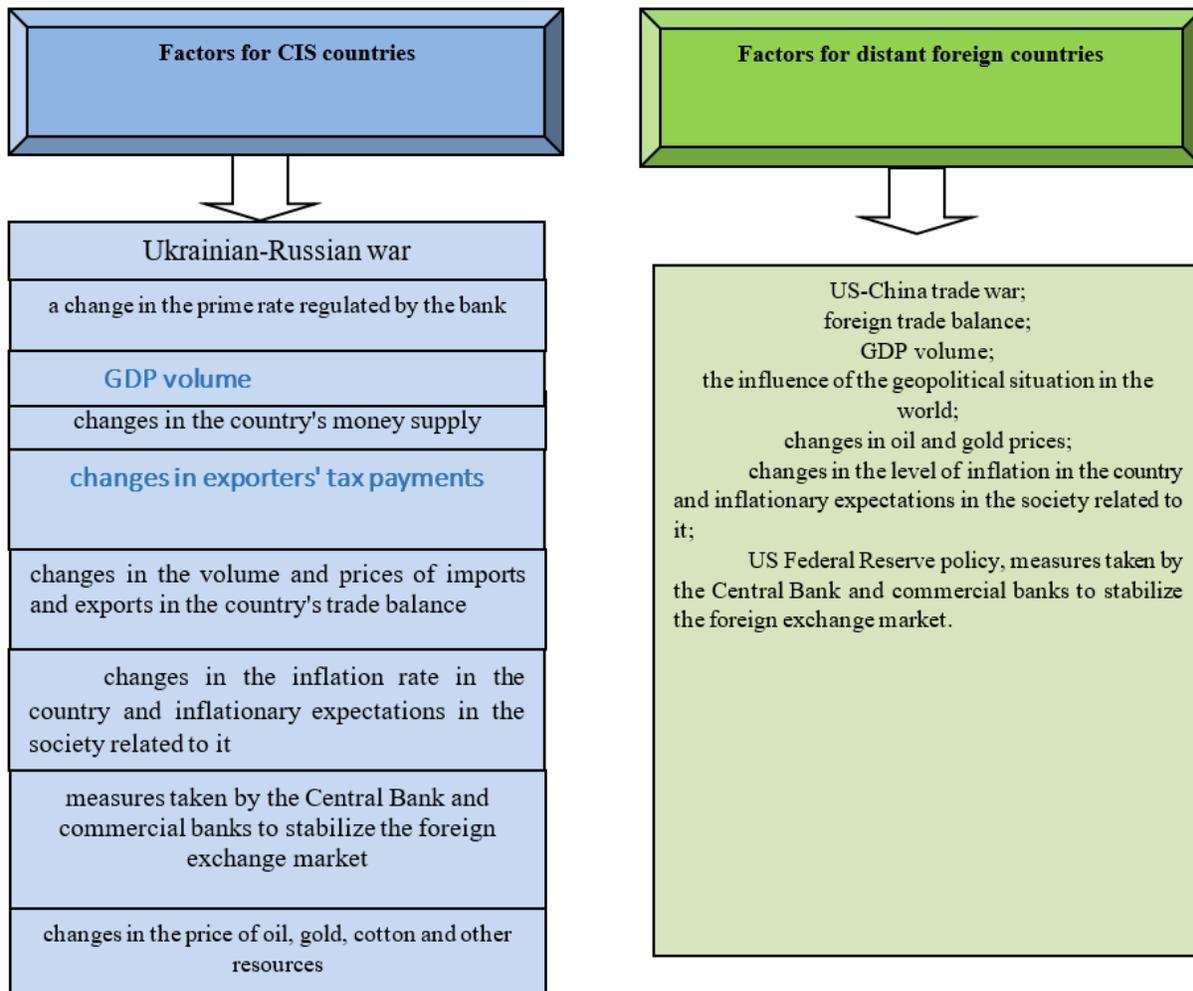


Figure 1. Classification of factors affecting the dynamics of the exchange rate in the international currency markets

In general, in the classification of factors affecting the dynamics of the exchange rate in the international currency markets, the CIS and foreign countries were divided into separate groups. Here, factors are divided into groups based on geopolitical location, level of economic development, national interests and other criteria. In this dissertation, on the basis of empirical research, we determine the factors affecting the dynamics of the international currency exchange rate in our country on the basis of econometric analysis.

### 3. RESEARCH METHODOLOGY.

In many countries in transition, we can see that the initial stages of economic reforms have a direct impact on the level of the exchange rate along with the gross domestic product. Despite the existence of restrictions on the movement of capital in a transformational economy, the interest rate differential affects the transfer of resources from the national asset market to the foreign exchange market. The state of the trade balance is of great importance for the stability of the currency and financial market of the transit economy. Thus, the long-term factors of the exchange rate, which are characteristic of the market economy, although they have their own characteristics, do not lose their importance in the conditions of the transit economy.

Economist J. Analyzing the financial crisis in East Asia, Stiglitz found that the reason for the liberalization of financial markets in these countries in the early 1990s, which later led to the catastrophe of 1997, was not the fact that the liberalization process in these countries did not require foreign investment (the share of savings in GDP was 30% or more), mentions that it was implemented as a result of international pressure [7,8].

Economist T.S. We should mention Rasulov's analysis of the development of currency relations in Uzbekistan into stages based on the internal balance model [9,10]:

The first stage, in 1992-1993 - implementation of measures related to the country's exit from the ruble zone.

The second stage was the adoption of our national currency "sوم" during 1994-1996 and the implementation of the first liberalization processes in the country's foreign exchange market.

The third stage, during 1997-1999 - implementation of restrictions aimed at the development and improvement of the foreign exchange market.

In the fourth stage, in 2000-2003, a number of measures aimed at liberalizing the country's foreign exchange market were implemented and restrictions on current operations were abolished.

The fifth stage, from 2004 to the present, covers the processes of the development of the foreign exchange market after the adoption of obligations under Article VIII of the IMF. In addition, in 2004-2016, the fifth stage of development of the foreign exchange market continued in our country. Since September 2016, new changes have been introduced. In particular, the exchange rate of the national currency in 2017 was equalized to the market rate [9,10].

### 4. ANALYSIS AND RESULTS.

In the republic, necessary measures are being implemented in order to develop and stable operation of the over-the-counter foreign exchange market. In this case, conversion of سوم funds into freely exchangeable currency is carried out directly by authorized banks. Until now, a number of measures on the liberalization of the domestic currency market have been implemented in the Republic of Uzbekistan. As a result of this, within the framework of the step-by-step set of measures, a significant part of the exchange of سوم funds into foreign currency was transferred to the over-the-counter currency market.

Below is a statistical analysis of the dynamics of the exchange rate in the country. We begin our analysis by looking at the historical dynamics of the Uzbek سوم against the US dollar (see Figure 2).

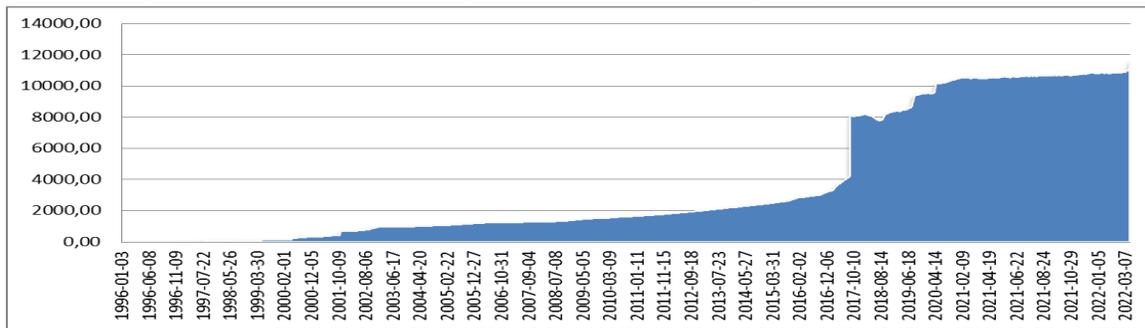


Fig.2. General dynamics of the USD/UZS exchange rate (1996-2022)

In the dynamics of the above exchange rates, in 1996 the national currency rate was 36.5 soums, and by 2000 it was 142.8 soums. In this case, we can observe a price increase of almost 3.5 times the 5-year trend. By 2010, the exchange rate was 1,513.6 soums. In 2015, as a result of the devaluation of the kuzi, it reached 2,424.33 soums.

During January-August 2017, as a result of rapid devaluation of the currency rate, the exchange rate of the national currency against the US dollar decreased by 31% in trades at the Republican Currency Exchange. Since September 2017, due to the transition of the national currency exchange rate to the determination of the national currency based on market mechanisms, as a result of the sharp decrease in its value and the reciprocal formation of demand and supply for foreign currency in the currency market during September-December of the reporting year, the exchange rate of the national currency against the US dollar has stabilized during this period. , varied between 8049.0 and 8138.0 soums (1 percent).

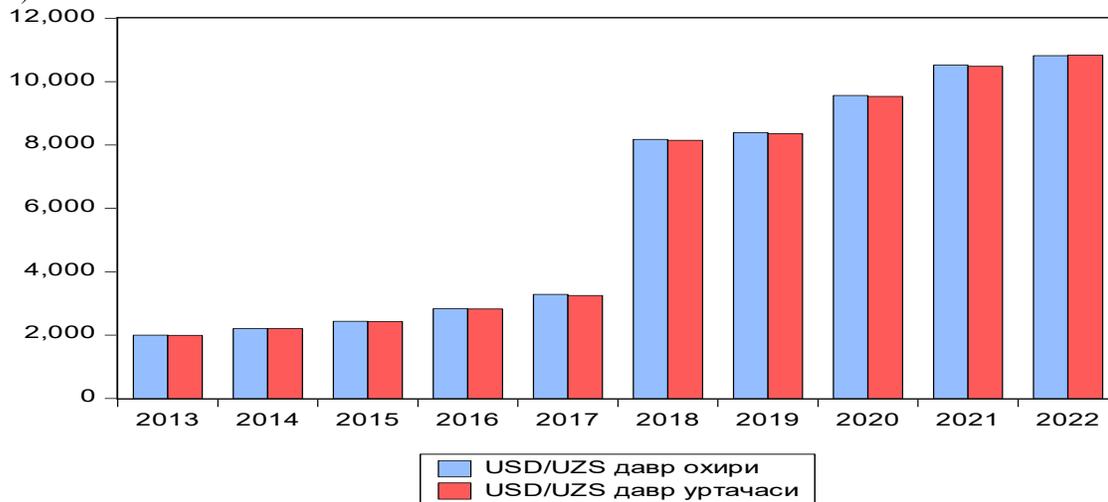


Fig.3. Exchange rate of the national currency against the US dollar (2013-2022)

By the end of 2018, the exchange rate of the national currency decreased by 2.7% compared to the beginning of the year (from 8,120 soums to 8,339 soums), while the change of the exchange rate between the minimum and maximum amount during the year was 7.3% (in August - 7,781 soums, in December - 8,348 soums) (Fig. 3) .

During 2019, the dynamics of the national currency exchange rate was formed based on the mutual ratio of supply and demand in the foreign exchange market and under the influence of internal and external factors affecting the supply and demand of foreign currency. At the same time, in the context of the simultaneous increase in demand and supply in the foreign exchange market, the national currency - the soum - depreciated by 2.8% against the US dollar during the trading sessions of the currency exchange during the first half of 2019 [7,8].

In July and August, the devaluation of the currencies of some partner countries and the resulting increase in devaluation expectations, as well as the increase in the demand for foreign currency in the domestic currency market, accelerated the devaluation of the national currency exchange rate by 10.2% .

Table 1: Official exchange rates of foreign currencies against the soum (2017-2021)

The date	1 USD	1 EURO	1 Russian ruble
December 31, 2017	8 120.07	9,624.72	139.30
December 31, 2018	8 339.55	9,479.57	120.91
December 31, 2019	9,507.56	10,624.70	153.17
December 31, 2020	10,476.92	12,786.03	141.27
December 31, 2021	10,837.66	12,224.88	147.07

In the last months of 2019, the exchange rate of the soum was relatively stable, while it depreciated by 1.3% during September-November, it strengthened by 0.1% in December. In general, during 2019, the exchange rate of the national currency against the US dollar depreciated by 13.9 percent (from 8,341 soums to 9,501 soums) compared to the beginning of the year. (Table 1).

During 2020, the dynamics of the national currency exchange rate was formed under the influence of internal and external factors based on the mutual ratio of supply and demand in the currency market. The national currency depreciated by 7.2% under the influence of factors such as the change in external and internal economic conditions due to the pandemic, the increase in devaluation expectations due to the sharp depreciation of the currencies of the main trading partners, as well as the increase in the demand for foreign currency in the domestic currency market. In the second half of the year, the exchange rate of the soum showed relatively stable dynamics and depreciated by 2.7%. In general, during 2020, the exchange rate of the national currency against the US dollar depreciated by 10.1 percent (from 9,501 soums to 10,461 soums) compared to the beginning of the year.

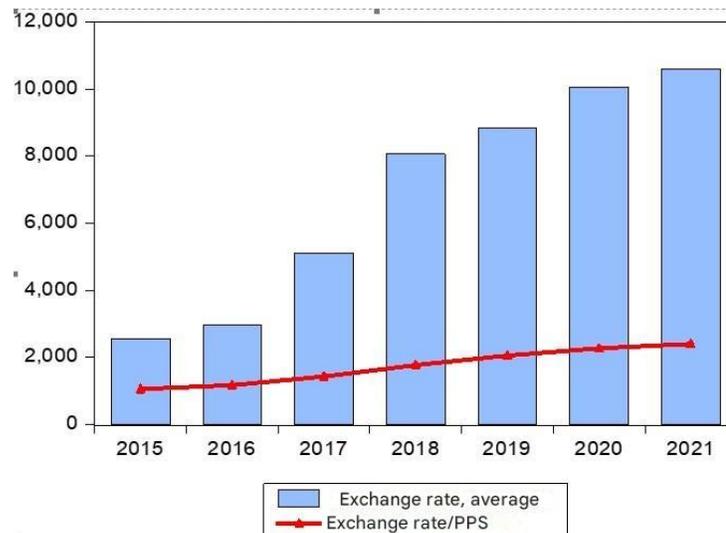


Figure 4. Solvency Parity (PPS) and Exchange Rate

In Figure 4 above, we have shown the country's solvency parity, average exchange rate and their ratios in the period 2015-2021 in order to expand our analysis. According to it, in 2015 and 2016, the average exchange rate was 2,568.7 and 2,965.7, respectively, while the ratio of exchange rate and solvency parity was 1,059 and 1,180.1, respectively.

Between 2017 and 2019, we can observe that the exchange rate ranged from 5,121.1 to 8,839, while the exchange rate and solvency parity ratios ranged from 1,434.9 to 2,058.9. By 2020 and 2021, these indicators made the average exchange rate from 10,055.8 to 10,610, and its ratio to solvency parity was 2,271.1.

Exchange rate policy is an integral part of macroeconomic regulation, and its role in the transition to a market economy is extremely important. It is known that developing countries and countries in transition are characterized by an undervaluation of the exchange rate relative to purchasing power parity. This shows the uniqueness of the impact of the exchange rate on macroeconomic indicators in the transition economy. We will consider them in detail below: The impact of the exchange rate on the inflation rate. Economist Moiseev S.R. According to , one of the only macroeconomic indicators that can be affected by the exchange rate is the price index. The researcher came to this conclusion after conducting a regression-correlation evaluation of the real exchange rate, and its dynamics were studied as a stationary process, and temporary shocks had an extremely insignificant effect on it.

In addition, Moiseev S.R. Based on the exchange rate transmission theory, he also analyzed the effect of nominal exchange rate devaluation on inflation. According to him, the effect of changes in the exchange rate on the price structure of the national economy is reflected. We believe that changes in the exchange rate are still able to affect inflation rates.

*The effect of the exchange rate on the money supply.* By itself, changes in the exchange rate do not affect the money supply. However, the exchange rate plays an important role in the development and implementation of monetary policy, because maintaining a certain exchange rate may require the use of official foreign reserves, which affects the money supply in the economy.

The volume of gold-currency reserves, which determines the possibility of interventions; inflation rate; development of the financial market structure and tools that allow expanding the possibilities of "sterilization" of currency interventions; the size of the state budget deficit, as well as sources of its financing; trade balance; amount of external debt; the country's level of dependence on imports and the level of its currency are taken into account. Based on the above priorities, the

monetary policy is formed, which is the main source of the flow of foreign investments and export earnings and the financing of the economy.

The impact of the exchange rate on the components of aggregate demand: trade balance, consumer spending, investments, government spending. The history of crises in developing countries shows that devaluation is only a "temporary stimulus" to growth. The currency crises of the last 30 years in developing countries are characterized by S-shaped dynamics of GDP. On the eve of the currency crisis and during the crisis, the growth rate of the gross domestic product decreases and reaches minimum values, and after the crisis, a significant increase in the growth rate is observed. The post-devaluation period of high growth rates lasts for about three years, and then financing rates fall, approaching the average level typical of countries that have not experienced a currency crisis.

Most of the developing countries in Asia, Latin America, and Eastern Europe that experienced devaluation at the end of the 20th century can be characterized by V-shaped dynamics. In this case, devaluation in real terms ensures the restoration of pre-crisis GDP growth rates.

B.E. Brodsky singles out the weakening of the effect of devaluation on economic growth as the following main reasons:

- *increase the synchronization of cycles between countries.* In this environment, external demand remains low, and devaluation does not have the desired effect on economic growth due to weak promotion of export growth;
- *the effect of lowering real incomes.* The decrease in real income due to the increase in import prices is not compensated by the increase in the volume of net exports;
- *the impact of financial markets.* An increase in interest rates under the influence of external factors causes a decrease in domestic demand and the inflow of financial capital. Concurrent exchange rate appreciation can lead to higher imports, lower net exports, and slower economic growth;
- *flexible delays.* As a result of the somewhat delayed impact of net exports on exchange rate changes, recovery of the economy as a whole takes some time after devaluation.

As we mentioned above, local and foreign scientific circles have made proposals for targeting the exchange rate. Some economists believe that an appreciation of the exchange rate is necessary to encourage foreign investment and ensure price stability, while others believe that it should be devalued to support economic growth and export competitiveness.

Continuing the analysis, the situation of some macroeconomic monetary indicators in the Republic of Uzbekistan for 2017-2021 was studied in Table 2 below.

According to the analysis, the high level of inflation caused the refinancing rate of the Central Bank to be maintained at a high level. This, in turn, led to higher interest rates of commercial banks' loans in national currency. In turn, the high interest rates of commercial bank loans prevent companies and firms from expanding their opportunities to use commercial bank loans. The low level of funding of the economy of the Republic of Uzbekistan makes it necessary to implement an expansionist monetary policy (Table 2).

It can be seen from Table 2 that during the studied period, the refinancing rate of the Central Bank of our country, the inflation rate, and the average annual interest rate of loans given by commercial banks in soums decreased. This indicates that the monetary policy aimed at stimulating general demand was carried out during this period.

Table 2.: Some macroeconomic monetary in the Republic of Uzbekistan status of indicators

Year	Annual rate of inflation	Central bank again financing rate	Commercial banks in soums average of loans granted annual interest rate	Required Reserve Rate
2017	14.4	14.0	18.5	12.5
2018	14.3	16.0	20.5	9.0
2019	15.2	16.0	24.2	9.0
2020	11.1	14.0	22.3	9.0
2021	10.0	14.0	20.8	9.0

Nevertheless, it can be recognized as a negative situation that the coefficient of financing the economy is lower than 20 percent in 2017-2021. In particular, the fact that the required reserve ratio is relatively high has a negative impact on the credit potential of commercial banks and the level of the economy's liquidity. Therefore, the study and generalization of scientific-theoretical views on the issue of monetary policy and its role in ensuring macroeconomic stability and their use in the development of monetary policy is important in improving monetary policy.

Below, in order to analyze the impact of annual exchange rate changes on macroeconomic indicators, we will consider a set of statistical data. It presents the nominal exchange rate, money supply, consumer price index, GDP, refinancing rate, trade balance to GDP ratio, balance of payments to GDP ratio, external debt to GDP ratio for 2017-2021 (Table 3).

Table 3: Impact of exchange rate changes on macroeconomic indicators

Year	Nominal exchange rate at the end of the year	Money supply at the end of the year	Consumer price index, % compared to December last year	Real. GDP year-end	Refinancing rate, at the end of the year, %	Annual trade balance, mln. in US dollars	Annual balance of payments, mln. in US dollars	External debt at the end of the year, mln. in US dollars
2017	8 120	70 816	14	266 648	14	-1 459	1 478	17 235
2018	8 340	80 165	14	334 477	16	-5 449	-3 593	18,750
2019	9 508	91 266	15	448 979	16	-6 374	-3 366	26 331
2020	10 477	107 604	11	539 384	14	-6 044	-3 007	36 333
2021	10,838	140 184	10	646 876	14	-8 850	-4 583	41 619.3

In order to expand our analysis, in our next table 4, we present the rate of change of the nominal exchange rate, money supply, consumer price index, GDP, refinancing rate, trade balance to GDP ratio, balance of payments to GDP ratio, external debt to GDP ratio in 2017-2021.

Table 4: Impact of exchange rate changes on macroeconomic indicators (in % compared to last year)

Year	Nominal exchange rate	Money supply	Consumer price index	GDP	Refinancing rate	Ratio of trade balance to GDP	Ratio of balance of payments to GDP	External debt to GDP ratio
2017	151.3	41.0	14.4	4.4	14.0	-2.4	2.4	27.8
2018	2.7	13.2	14.3	5.4	16.0	-10.4	-6.8	35.6
2019	14.0	13.8	15.2	5.7	16.0	-10.6	-5.6	44.0
2020	10.2	17.9	11.1	1.9	14.0	-10.1	-5.0	60.7
2021	3.4	30.3	10.0	7.4	14.0	-12.8	-6.6	60.1

As can be seen from the table, the rates of change of the main macroeconomic indicators have a high correlation, that is, our opinions about the direct and indirect influence of macroeconomic indicators on the exchange rate are confirmed by statistical data.

Based on our analysis, we created a correlation matrix of the impact of the national currency exchange rate change on macroeconomic indicators using these indicators (see Table 5). This, in turn, provides an opportunity to determine

the degree of dependence and influence of macroeconomic indicators.

Table 5: Correlation matrix of national currency exchange rate and macroeconomic indicators

	Nominal exchange rate	Money supply	Consumer price index	GDP	Refinancing rate	Ratio of trade balance to GDP	Ratio of balance of payments to GDP	External debt to GDP ratio
Nominal exchange rate	1.000000	0.802712	0.365596	-0.182366	-0.396280	0.969800	0.990489	-0.674696
Money supply	0.802712	1.000000	-0.178924	0.129332	-0.735465	0.654272	0.778730	-0.253235
Consumer price index	0.365596	-0.178924	1.000000	-0.009145	0.695563	0.472706	0.326757	-0.845260
GDP	-0.182366	0.129332	-0.009145	1.000000	0.259922	-0.353134	-0.297012	-0.048314
Refinancing rate	-0.396280	-0.735465	0.695563	0.259922	1.000000	-0.286051	-0.448611	-0.364304
Ratio of trade balance to GDP	0.969800	0.654272	0.472706	-0.353134	-0.286051	1.000000	0.971853	-0.741202
Ratio of balance of payments to GDP	0.990489	0.778730	0.326757	-0.297012	-0.448611	0.971853	1.000000	-0.607025
External debt to GDP ratio	-0.674696	-0.253235	-0.845260	-0.048314	-0.364304	-0.741202	-0.607025	1.000000

Based on the results obtained, it was found that the change of the national currency exchange rate has a significant impact on the indicators of money supply (0.80), balance of trade (0.96) and balance of payments (0.99). Moreover, our analysis showed that the effect of the exchange rate on the consumer price index (0.36) is low.

Below we perform a model analysis of the national currency exchange rate to additional macroeconomic indicators (Table 5). In this case, we used indicators such as: NCR - exchange rate, MO - money supply, CPI - consumer price index, GDP - gross domestic product, INT - refinancing percentage, TB - trade balance, PB - balance of payments, FD - foreign debt.

Table 6: The impact of the exchange rate on macroeconomic indicators

	NCR	MO	CPI	GDP	INT	TB	PB	FD
<b>2017</b>	8 120	70 816	14	266 648	14	-1 459	1 478	17 235
<b>2018</b>	8 340	80 165	14	334 477	16	-5 449	-3 593	18,750
<b>2019</b>	9 508	91 266	15	448 979	16	-6 374	-3 366	26 331
<b>2020</b>	10 477	107 604	11	539 384	14	-6 044	-3 007	36 333
<b>2021</b>	10,838	140 184	10	646 876	14	-8 850	-4 583	41 619

At the same time, we also created a cross-correlation matrix in the analysis of the national currency exchange rate to macroeconomic indicators (Table 6) [19].

Table 6: Exchange rate and macroeconomic indicators correlation matrix

	NCR	MO	CPI	GDP	INT	TB	PB	FD
<b>NCR</b>	1.000000	0.929180	-0.826949	-0.397618	0.984464	-0.817743	-0.652151	0.990946

<b>MO</b>	0.929180	1.000000	-0.881638	-0.411495	0.971452	-0.863196	-0.681634	0.961341
<b>CPI</b>	-0.826949	-0.881638	1.000000	0.695563	-0.831900	0.606702	0.435911	-0.888559
<b>GDP</b>	-0.397618	-0.411495	0.695563	1.000000	-0.331335	-0.094451	-0.334539	-0.469762
<b>INT</b>	0.984464	0.971452	-0.831900	-0.331335	1.000000	-0.890698	-0.732830	0.986682
<b>TB</b>	-0.817743	-0.863196	0.606702	-0.094451	-0.890698	1.000000	0.949712	-0.809482
<b>PB</b>	-0.652151	-0.681634	0.435911	-0.334539	-0.732830	0.949712	1.000000	-0.630806
<b>FD</b>	0.990946	0.961341	-0.888559	-0.469762	0.986682	-0.809482	-0.630806	1.000000

As can be seen from the above correlation matrix, money supply (0.92), interest rate (0.98) and external debt (0.99) showed high correlation with exchange rate.

In addition, in order to extend the model of exchange rate and macroeconomic indicators, below (see Table 7) we have also presented the exchange rate and GDP growth rates and converted them into decimal logarithmic form. It collects data quarterly from 2017 to 2021 to ensure data completeness and reliability. Here, ER is the nominal exchange rate, EG is the GDP growth rate, LNER is the logarithmic nominal exchange rate, LNEG is the logarithmic GDP growth rate.

Table 7: Logarithmic representation of exchange rate and GDP growth

The date	ER	EG	LN ER	LN EG
2017.01	3 352.9	4.8	8,118	1,563
2017.02	3 778.1	4.3	8,237	1,460
2017.03	5 220.6	3.9	8,560	1,371
2017.04	8,079.9	4.4	8,997	1,481
2018.01	8 156.7	5.5	9,007	1,703
2018.02	8 011.8	5.8	8,989	1,753
2018.03	7 848.1	5.5	8,968	1,713
2018.04	8 260.2	5.4	9,019	1,678
2019.01	8 378.3	5.8	9,033	1,754
2019.02	8 474.8	5.8	9,045	1,750
2019.03	9 004.3	5.6	9,105	1,724
2019.04	9 484.7	5.7	9,157	1,742
2020.01	9 529.6	4.6	9,162	1,517
2020.02	10,050.9	1.1	9,215	0.083
2020.03	10 239.1	0.8	9,234	-0.201
2020.04	10 397.8	1.9	9,249	0.635
2021.01	10,506.1	3.0	9,260	1,083
2021.02	10,542.6	6.2	9,263	1,827
2021.03	10,646.1	6.9	9,273	1,937
2021.04	10,742.1	7.4	9,282	2,004

After collecting the necessary data, we need to perform the tests of these indicators before forming the overall exchange rate and economic growth model (see Tables 8 - 10).

Table 8: Common root test

Common root test				
Variables	ADF (Augmented Dickey Fuller)		PP test (Philips Peron)	
	Degree	1st change	Degree	1st change
EG	0.7043	0.0000	0.0010	0.0697
ER	0.1099	0.1188	0.4230	0.1100

Here, ER is the nominal exchange rate, EG is the GDP growth rate. Economic growth in the Dickey Fuller test (0.70), exchange rate in the Peron test (0.42) showed a common root result with ranks

Table 9: Johansen cointegration test

Johansen cointegration test				
The null hypothesis	Trace statistics		Maximum eigenvalue statistics	
	Test statistics	% 5 critical value	Test statistics	% 5 critical value
r=0	8.532544	12.32090	7.890695	11.22480
r<1	0.641848	4.129906	0.641848	4.129906

In this case, the levels of cointegration were 8.5 (Trace stat) and 7.8 (max. eigenvalue) under the null hypothesis.

Table 10: Granger causality test

Granger causality test			
Null hypothesis:	F-Statistics	P-value	Result
EG does not give Granger causality to ER	0.47394	0.6329	Don't refuse
ER does not give Granger causality to EG	0.34089	0.7173	Refusal

The Granger causality test showed the level of (0.63) effect of the exchange rate on economic growth.

Table 11: Vector error correction model

Vector error correction model			
Variables	Coefficient	T value	Probability
Constanta	(0.00027)	[-1.29694]	0.013
EC	(0.39237)	[ 0.42214]	0.011
ER -1	(0.00050)	[ 0.42225]	0.000
EG-1	(0.29064)	[ 2.31284]	0.000

In our vector error correction test, it showed levels of (0.42214) for the exchange rate and (0.42225) for economic growth.

After testing the variables above, we formed a regression model using the least squares method (see Table 11).

Table 12: Model analysis of the impact of the exchange rate on economic growth

The method of least squares				
Variables	Coefficient	Std. Error	t-statistics	maybe
MO	-0.016391	0.007860	-2.085397	0.2847
INT	118.2744	61.02756	1.938050	0.3033
FD	0.158924	0.020653	7.694933	0.0823
C	4853.962	987.5496	4.915157	0.1278
R-squared	0.997736	Middle garden variable		9456.352
R-squared rect	0.990942	SD garden variable		1223.222
Regression std error	116.4159	Akaike criterion		12.34278
Kvd remains collected	13552.67	Schwarz criterion		12.03033
Log likelihood	-26.85695	Hannan-Quinn Mez.		11.50419
F-statistics	146.8723	Durbin-Watson stat.		3.570208
Ehtm(F-statistic)	0.060565			

Here: NCR - exchange rate, MO - money supply, INT - refinancing rate, FD - external debt, S - variable We used such indicators in our model.

The results of our least-squares model (see Table 12) showed its coefficient of determination  $R^2$  - 0.99, confirming our top scientific opinion. F-statistics - 146.87, regression standard errors - 116.41, Akaike and Schwarz criteria - 12.34 and 12.03, respectively. The sum of squares residuals – 13 552.67, probability level (F-statistics) – 0.06, Durbin-Watson statistics– 3.57, Hannan-Quinn criterion– showed high correlation with 11.50 levels.

## 5. CONCLUSION

there is a positive relationship between the rate of change of the nominal exchange rate and the rate of change of the gross domestic product, industrial production, labor productivity, and the volume of investments in fixed assets. On the other hand, it confirms the previous assumption about the limited impact of devaluation on the state of the trade balance and rejects the opinion of some economists that there is no connection between the dynamics of the exchange rate and the pace of industrial production.

We can say that the change of the national currency exchange rate has a direct and indirect effect on the macroeconomic indicators of the country, confirming our scientific views mentioned above. Therefore, the researched subject is extremely important and relevant for the development of the country.

The analysis shows that the dynamics of the exchange rate in the digital economy has a strong impact on the national economy. as a result of the widespread introduction of digital technologies, new opportunities are being created to ensure stability in foreign economic activity. Fluctuations in exchange rates require a number of measures aimed at ensuring the stability of the national economy. at the same time, through digital financial tools and technologies, exchange rate impacts can be reduced and efficiency and stability in the economy can be achieved.

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