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Measuring the Impact of Structural Changes to the Components of Monetary Sterilization on the Exchange Rate after Applying the Electronic Platform in Iraq for the Period (2021-2024)

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Abstract

This study examines the impact of structural changes to the components of the monetary sterilization policy on the exchange rate after the implementation of the electronic platform in Iraq for the period 2021-2024.The Central Bank borrows a portion of the excess liquidity and accumulates it on its balance sheet as interest-bearing liabilities. This process may involve raising the legal reserve ratios, as well as the Central Bank's intervention in the exchange market by purchasing foreign currency. The Central Bank absorbs the impact of this purchase on local liquidity, offering deposit facilities for banks with interest. and offering its transfers to banks in the secondary market. All these actions are called the sterilization policy.The external financial constraint represented by the electronic platform has led to the emergence of a new international policy that can be described as a near transformation or confiscation of the foreign currency sale mechanism. Under this policy, exchange rate movements are directly linked to the amount of foreign currency held by the sending banks, specifically those that are logistically accepted within the framework of the U.S. financial system. These banks operate through the Office of Foreign Assets Control (OFAC) within the U.S. Department of the Treasury The research concludes that the monetary sterilization process, or the sterilization intervention of local liquidity, is divided into two windows. The first is internal, (i.e., the window of the Central Bank to buy dollars from the government from oil revenues in exchange for issuing the dinar). The second is external (i.e., to pay foreign currency for the credit lines granted to local banks). Between these two windows, there may be a certain time delay or a time race, both of which affect the exchange rate in the Iraqi economy.

Keywords: *Structural Changes, Monetary Sterilization, Exchange Rate, Electronic Platform.*

Introduction

The electronic platform for foreign transfers, managed by the Central Bank of Iraq, was introduced at the end of 2022 as a first phase of reorganizing financial transfers. Its purpose is to ensure proactive control over transfers instead of subsequent control by the Federal Reserve auditing daily transfers. This was an exceptional procedure because the Federal Reserve does not usually take such measures. A gradual shift was planned towards establishing direct relationships between Iraqi banks and accredited correspondent foreign banks. This transition will be facilitated by an international auditing firm, which will conduct pre-audit checks on transfers before they are executed by the correspondent banks.

In oil-producing countries such as Iraq, oil supplier exports are in foreign currency. The government sells the foreign currency that exceeds the market's capacity to absorb to the Central Bank. This process involves two steps: The first is expanding the monetary base by the value of the foreign currency purchased by the Central Bank, and the second is reducing the monetary base by the amount of private sector purchases. The difference is the addition to the net assets of the Central Bank in foreign currency, which is offset by an increase in the monetary base. The fear of excessive liquidity pushes the bank to sterilize and to disable a part of it in the Central Bank. This is done through the window of banks in Iraq, depositing with the Central Bank at interest or selling their transfers to banks.

Sterilization refers to the policy adopted by the Central Bank of Iraq to control the impact of oil price fluctuations on the monetary base by managing levels of excess liquidity in the financial system. The degree of sterilization is measured by the change in net domestic credit as a result of changes in net foreign assets (components of the monetary base on the asset side), with an inverse relationship between the two.

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Sterilization can also be gauged through the ratio of net foreign assets to the monetary base; when this ratio exceeds one, it indicates active sterilization.

Study Problem

Despite all the measures taken by the government and the Central Bank of Iraq, and the negotiations with the United States of America, there are fluctuations in the exchange markets, specifically in the parallel exchange market, and there are differences between the central and the parallel rate of about 20 points after the implementation of the electronic platform. Therefore, the problem of the study is to answer the following questions:

Are the measures of the Central Bank insufficient to reduce the difference between the official and parallel exchange rates?

Will the Central Bank of Iraq be able, through monetary sterilization procedures, to influence the exchange rate after the implementation of the electronic platform?

The importance of the study:

It explains the impact of hard currency monetization through monetary sterilization policy to control excess liquidity using the newly developed intermediate monetary instruments.

It attempts to evaluate the impact of structural changes in the components of monetary sterilization on the exchange rate in the Iraqi economy after implementing the electronic platform.

The Study Objective

This study aims to identify the determinants of the monetary sterilization policy after the implementation of the electronic platform, to accurately estimate the relationship's course and its impact on the exchange rate in Iraq for the period 2021-2024.

The Study Assumptions

This study is based on the hypothesis that, following the implementation of the electronic platform and the international compliance requirements imposed on Iraq in mobilizing its reserve funds to finance foreign trade, monetary sterilization or liquidity intervention is conducted through two channels. The first is internal, where the Central Bank purchases dollars from the government using oil revenues in exchange for issuing dinars. The second is external, involving the disbursement of foreign currency for lines of credit granted to local banks. Occasionally, a time lag or, conversely, a timing mismatch occurs between these channels, impacting the gap between the official exchange rate and the parallel market rate in the Iraqi economy.

The Study Method

Given the nature of the subject, the study followed a descriptive and analytical approach by presenting the theoretical aspects and using data and digital indicators to clarify the impact of the monetary sterilization policy on the exchange rate after implementing the electronic platform. It also used standard methods, taking into account the data and figures which are the result of a set of activities, policies, and decisions, relying on scientific sources, publications, and official statistics to support the hypothesis and achieve the objective of the study.

Study Axes

To complete this, the study was divided into the following:

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First: The concept of monetary sterilization policy.

This part of the study provides a brief overview of the definition of the monetary sterilization policy, and measuring the degree of sterilization as follows:

Definition of Monetary Sterilization Policy

Money sterilization is a form of monetary work, also called the operational objectives of monetary policy, through which the central bank seeks to limit the impact of incoming and outgoing capital flows on the money supply. Sterilization often involves the purchase or sale of financial assets by the central bank to control local liquidity levels, and is designed to offset the impact of foreign exchange intervention. This process is used to influence the value of the local currency relative to others, such as the dollar (Saleh, 2024, 4-5).

It can be said that monetary sterilization policy is the monetary process that aims to control the rise in net foreign assets by reducing net local assets, thus keeping the reserve monetary base stable. This is achieved through the intervention of central banks through several means, including open market operations, increasing the required reserve, and stabilizing the monetary multiplier (Aizenman, 2009, 779). Sterilization policy is defined as the operations undertaken by central banks in response to an increase in international reserves, which also results in an increase in money supply. This occurs because central banks purchase foreign currency with the local currency, leading to an increase in reserve money on the liabilities side, including the currency issued and bank reserves held at the central bank. Through the money multiplier effect, the money supply then expands. In such cases, countries face excess liquidity in the banking system. To manage this, they adopt a sterilization policy, where the central bank borrows part of the excess liquidity, accumulating it on the liabilities side of its balance sheet and bearing the associated interest costs. Sometimes, mandatory reserve ratios are also raised as part of this policy. (Ali, 2015, 222).

When the balance of payments of a particular economy is in a deficit, the central bank intervenes to buy the local currency and sells the necessary international reserves. If the central bank does not carry out any other operation, the monetary base decreases (Lee, 1997, 17). The tools of the sterilization policy followed in the Iraqi economy include open market operations, rediscounting and direct lending policy, mandatory reserves, and foreign currency sale window. Selling international assets in exchange for assets in local currency maintains monetary stability in two wats; firstly, by absorbing excess liquidity through the reserve money equation, and secondly, through banks that invest in the Central Bank at interest to cancel the effect part of foreign reserves on reserve money, or pressure the multiplier by reducing the amount of money prepared for lending. As a result, the money supply becomes close to the monetary base. When the Central Bank reduces local credit through the sterilization policy, foreign reserves increase through the exchange rate stability index. So, the function of foreign reserves depends on the monetary basis, and in the end, the increasing demand for local money leads to an increase in foreign reserves through the current account surplus, while the excess supply of local money conversely leads to a decrease in reserves and the monetary basis (Ali, 2018, 237-240).

Measuring the Degree of Monetary Sterilization.

The degree of monetary sterilization can be measured based on the following equation (Mansour: 2012, 5):

$$\beta = \frac{R}{M_0}$$

Whereas:

R: Foreign reserves.

M_0: Monetary base.

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β: Monetary sterilization value.

If the value of the sterilization coefficient is (β=1), then we are facing a case of a complete sterilization, in which the change in net foreign assets is equal to the change in the monetary base. However, if it is (β=0), it means there is no sterilization policy, and the slightest change in foreign reserves directly affects the monetary base.

Finally, if it is (1<β>0), we are dealing with a case of partial sterilization. In this situation, the central bank's response to capital flows, whether inward or outward, is with a low sterilization coefficient, meaning it allows for relative expansion or contraction of the monetary base depending on the flow condition. That is, when the central bank buys or sells one unit of foreign assets, it may reduce or increase local assets by less than one unit.

Second: The Conceptual Approach to the Mechanism of the Impact of Monetary Sterilization Components on the Exchange Rate in the Iraqi Economy after the Implementation of the Electronic Platform.

Monetary policy in Iraq focuses on implementing sterilized intervention through the central bank's currency sale window via open market operations. The monetary policy in Iraq is governed by the components of reserve money, which are tied to oil revenues through the state's general budget. Reserve money expands with an increase in net domestic credit or net international reserves. If the Central Bank of Iraq excessively expands credit, meaning increasing domestic credit in the context of Iraq and rentier oil-producing countries, this will lead to an increase in money supply, which in turn causes a decrease in the other component of the monetary base, net foreign reserves, because the official exchange rate is fixed in the Iraqi economy. (Neamah, 2022, 573-574). When the central bank enters through the currency sale window and sells foreign currency, reserve money contracts from two sides. The first is that the reduction in the central bank's foreign assets acts as a sterilization policy to counter monetary expansion on the asset side. The second is that this process leads to a decrease in domestic credit by absorbing local currency. Therefore, sterilization policy, in all its forms, is a process of transferring non-cash liabilities and capital on the central bank's balance sheet to the asset side with a negative sign.This sterilization procedure affects the concept of net domestic assets, making it negative (as it is transferred to the asset side), counterbalanced by net foreign reserves. Hence, the central bank cannot directly control the issued currency because it depends on public demand, which is determined by public spending, and the latter is constrained by known and limited oil revenues. As a result, the monetary base increases with an increase in bank reserves or their deposits at the central bank (reserve money), which is reflected on the asset side by an increase in foreign reserves. Therefore, the money supply will increase to align with the new level of the monetary base, but this expansion is linked to sterilization policy when banks are financed through central bank issuance of transfer orders that banks purchase (Ali, 2018, 261-262). One of the goals of the sterilization policy is to control the general rise in prices by monitoring the relative price of money within the Iraqi economy, (i.e., in the sense of the stability of real money), which is a function that is inversely related to inflation and directly to the money supply. Thus, monetary policy resorts to sterilization procedures to control liquidity levels by repurchasing the largest part of the local currency as a result of the increase in effective aggregate demand (the government's sale of foreign currency). Due to the inflexibility of the production system, the rise in the price level will be an issue for the economy, so that part of the price increase will be absorbed through imports, and the other part through the sterilization policy to control the reserve money resources represented by cash reserves and surplus reserves deposited by commercial banks with the Central Bank. In order to maintain the exchange rate as a nominal stabilizer of inflation, monetary policy resorts to the monetary sterilization policy through its tools (Saleh, 2023, 2).

Third: Analysis of the Impact of Monetary Sterilization Components on the Exchange Rate after Implementing the Electronic Platform in the Iraqi Economy for the Period (2021-2024).

According to the exchange rate systems followed, sterilization policies differ from one country to another. In the case of countries that follow a fixed price system, they often face sterilization of the effects of monetary policy on a deficit or surplus in the balance of payments. This is due to the impact on the size of the reserve held by banking institutions through the official sale of foreign currency, which reduces the size

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of high-powered money and the money supply multiplier. To avoid causing a recession in the economy, the monetary authority may sterilize the deficit resulting from deflationary policy by selling local securities, and then it can restore high-powered money by re-accumulating the local currency with the equivalent amount of foreign exchange that was sold. In general, monetary sterilization ultimately takes several forms, and the amount of cash reserves held by the public varies (Baida, 2020, 14). Table (1) shows an analysis of the impact of the monetary sterilization policy on the exchange rate after implementing the electronic platform in the Iraqi economy for the period 2021-2024. It shows the impact of monetary sterilization through foreign assets on the exchange rate, especially after the weak contribution of commercial banks to the growth and contribution of the private sector to the gross domestic product, which forced the Central Bank to use all intermediary tools to control the levels of excess liquidity through what is known as the monetary sterilization policy. This policy had a set of goals, the most important of which was maintaining monetary stability in the Iraqi economy by confronting fluctuations in global oil prices, which play the largest role in the economy and the components of the gross domestic product.

Table (1). Analysis of the Impact of Monetary Sterilization Components on the Exchange Rate After Implementing The Electronic Platform in the Iraqi Economy for the Period 2021-2024

Time period	Cash basis (billion dinars)	Foreign reserves (billion dinars)	Sterilization value	Parallel exchange rate	Time period	Cash basis (billion dinars)	Foreign reserves (billion dinars)	Sterilization value	Parallel exchange rate
Jan,2021	92,237	80,286	1.15	1,452	Oct,2022	124,699	126,810	0.98	1,471
Feb,2021	95,548	81,609	1.17	1,450	Nov,2022	129,344	133,908	0.97	1,480
Mar,2021	99,436	84,779	1.17	1,450	Dec,2022	145,242	140,086	1.04	1,512
Apr,2021	100,922	86,406	1.17	1,474	Jan,2023	149,051	148,414	1.01	1,598
May,2021	102,094	88,642	1.15	1,486	Feb,2023	150,021	134,397	1.12	1,526
Jun,2021	100,449	87,020	1.15	1,487	Mar,2023	152,727	141,849	1.08	1,558
Jul,2021	101,531	87,085	1.17	1,475	Apr,2023	153,331	143,118	1.07	1,455
Aug,2021	104,222	86,781	1.2	1,475	May,2023	155,603	141,900	1.1	1,455
Sep,2021	103,963	86,409	1.2	1,474	Jun,2023	156,140	142,105	1.1	1,471
Oct,2021	105,936	90,985	1.16	1,474	Jul,2023	147,706	142,451	1.04	1,498
Nov,2021	106,923	91,526	1.17	1,480	Aug,2023	149,788	143,406	1.04	1,519
Dec,2021	110,137	92,526	1.19	1,480	Sep,2023	155,669	143,614	1.08	1,548
Jan,2022	111,139	90,658	1.23	1,482	Oct,2023	163,754	148,323	1.1	1,597
Feb,2022	111,797	94,525	1.18	1,471	Nov,2023	156,538	147,055	1.06	1,603

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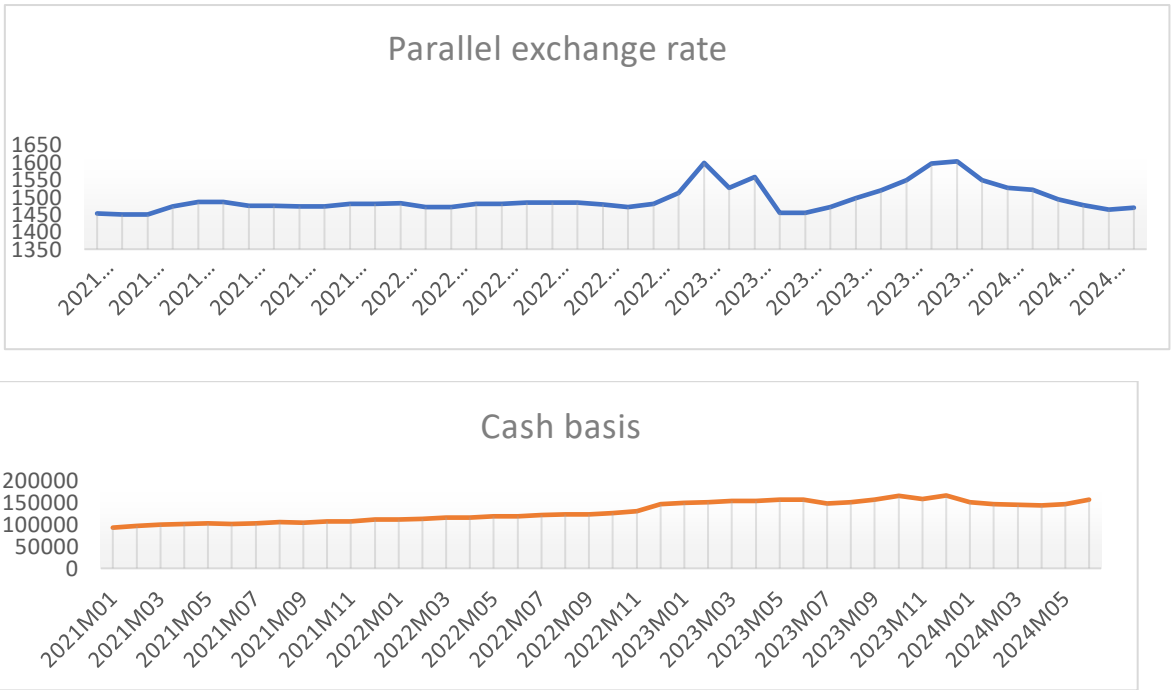
Mar,2022	114,403	97,361	1.18	1,471	Dec,2023	165,155	145,257	1.14	1,548
Apr,2022	114,738	102,112	1.12	1,480	Jan,2024	149,482	140,529	1.06	1,527
May,2022	117,863	109,145	1.08	1,480	Feb,2024	145,272	138,572	1.05	1,522
Jun,2022	118,490	108,440	1.09	1,485	Mar,2024	144,666	141,693	1.02	1,494
Jul,2022	121,065	114,948	1.05	1,485	Apr,2024	143,059	142,534	1.01	1,476
Aug,2022	122,159	118,709	1.03	1,485	May,2024	145,407	141,728	1.03	1,464
Sep,2022	121,647	121,363	1.03	1,478	Jun,2024	155,673	142,274	1.09	1,469

Source:

Central Bank of Iraq, Statistics and Reports, Annual Bulletins (2021-2024).

Central Statistical Organization, Monthly Reports on Dollar Exchange Rates for the Year (2024).

Figure (1). Trends Of Monetary Sterilization Components and Exchange Rate in the Iraqi Economy for the Period 2021-2024



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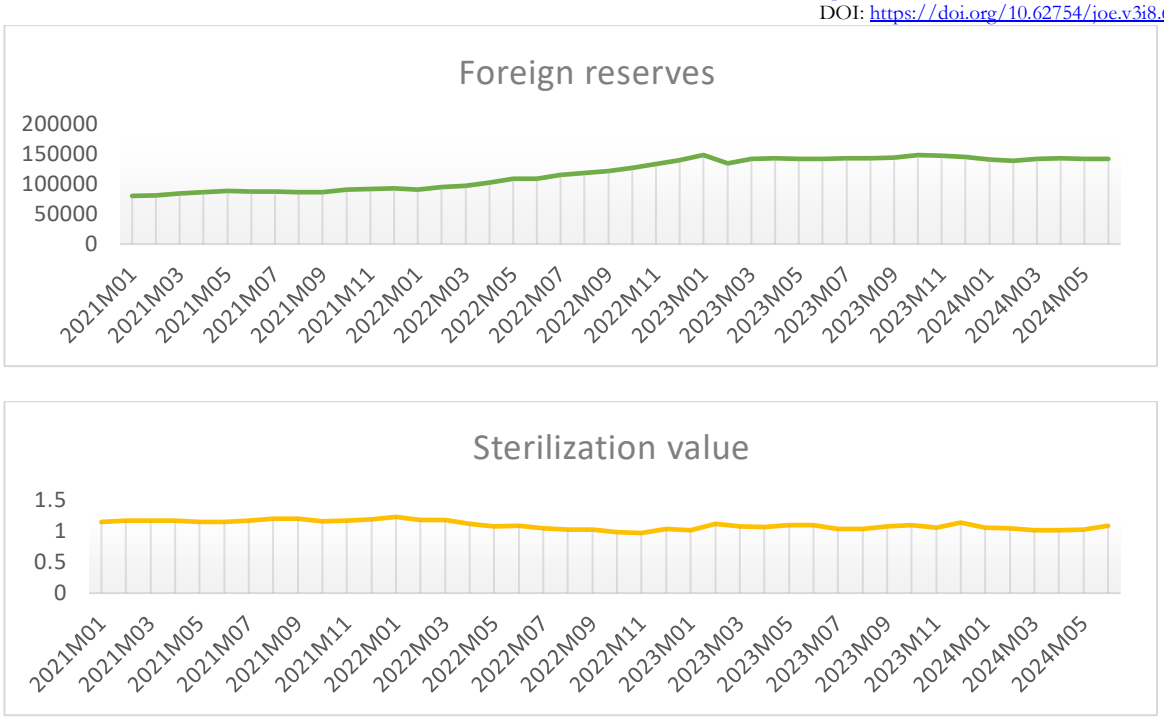

Source: Researchers' work based on data from Table (1).

It is noted from Table (1) that the Central Bank has an active monetary sterilization policy, and due to the increase in the size of Iraq's monetary reserves, part of the monetary base changes as a result of the non-sterilized portion of the Central Bank's foreign reserves, which increased due to the rise in global oil prices. It is noted from the data in the table that the amount of foreign reserves exceeded the monetary base in the last months of 2022, and therefore the monetary base is fully guaranteed by net foreign assets. The sterilization value reached 0.98 during October 2022. It is noted that the monetary policy was able to practice sterilization policies, particularly through intervention in the exchange market and containing inflationary expectations in the country, thus providing stability in exchange rates. In light of the continuous fears of inflationary expectations that led to the exchange rate in the parallel market moving away from the official price before the decision to raise the dinar exchange rate in February 2023, the Monetary Authority, accordingly, in consultation with the Ministry of Finance, decided to adjust the exchange rate of the Iraqi dinar by one dinar against the dollar, changing it from 1450 dinars to 1300 dinars per dollar.

However, the paradox that occurred in the monetary sterilization policy is that there was a continued increase in foreign currency flows in favor of general budget revenues and an increase in the state's foreign currency reserves without the ability to practice sterilization and withdraw the increasing liquidity within the monetary base itself. This was due to the replacement of the regulatory applications followed after implementing the procedures of the electronic platform for selling foreign currency that were adopted by the Central Bank's window for buying and selling foreign currency in late 2022. This created a parallel sterilization in the exchange markets, meaning that the parallel market disposes of liquidity levels according to the degree of rise or fall (a liquidity trap in foreign currency), that affects cash dollar or public deposits, even in foreign banks in foreign currency, during buying and selling operations. This occurred under the influence of an information market where conditions for information efficiency or the ability to provide rational expectations are lacking due to the presence of uncontrolled internal and external information that leads in all cases to directional deviations in parallel market exchange rates. This is what specifically occurred during the period between October 2022 and February 2023 (i.e., before raising the value of the Iraqi dinar exchange rate).

Fourth: Measuring the Impact of Structural Changes in the Components of Monetary Sterilization on the Exchange Rate after Implementing the Electronic Platform in Iraq for the Period 2021-2024

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Due to the severe rentiers, the Iraqi economy suffers from economic problems that rely heavily on oil production and export to generate the gross domestic product, in the absence of significant contributions from other sectors. Therefore, any measures taken by monetary policy in light of these imbalances and their recurrence will lead to side effects on the economy. The monthly data of the Central Bank of Iraq and the Central Statistical Organization were used for each of the study variables, which are the parallel exchange rate (EX), monetary base (M0), and foreign reserves (R).

Results of the Unit Root Test with Structural Fracture

In this part of the study, unit root tests were conducted with consideration for structural fracture to analyze the stability property (static) of the study variables to test their stability over time, and to determine the degree of their stability using the Augmented Dickey-Fuller (ADF) test, taking into account the possibility of the presence of structural fracture. The Schwarz criterion was selected to determine the optimal lag periods. The test results are shown in table (2):

Table (2). Summary of the Results of the Unit Root Test with Structural Fraction for the Study Variables.

Root with Break Point Test (ADF)				
evel				
		EX	M_0	R
d and intercept	**istic**	3349	4203	3809
		1	6	6
	k Date	M02	M12	M06
rst Difference				
		X)	**$_0$)**	)
d and intercept	**istic**	2855	2516	4360
		1	1	1
	k Date	M01	M12	M01

Source: Researchers' work based on Eviews 13.

In Table 2, it is clear from the data that, according to the Augmented Dickey-Fuller (ADF) test, and considering the possibility of a structural fracture in the time series of the variables (foreign reserves R, monetary basis M0), they do not exhibit an identical stationary at the level, (i.e., they contain a unit root. However, they become identical after taking their first difference, with the occurrence of a structural change on a known date for the entire series, as shown above. This indicates that they are integrated to the first degree (integrated of the first order?) . As for the variable parallel exchange rate EX, it is stable (stationary?) at the level. Therefore, the study will use the regression model, considering the effect of structural changes.

Estimation of the Study Model Using the Regression Method with Structural Changes.

The regression model for the parallel exchange rate in Iraq will be estimated after testing the stability of the time series that accounts for the structural break in the study variables, taking into account the presence of structural changes in the model using indicator saturation methods. The step indicator saturation (SIS) method will be used to detect location shifts (changes in the previous unconditional average), which are considered structural changes. These shifts were included in the model after estimation using the automatic model selection algorithm using the statistical program EViews 13. After performing the model estimation process, the results shown in the following table were obtained:

Table (3). Estimating The Study Model Results, Using the Regression Method with Structural Changes.

endent Variable: EX		
od: Least Squares		
09/06/24 Time: 04:19		

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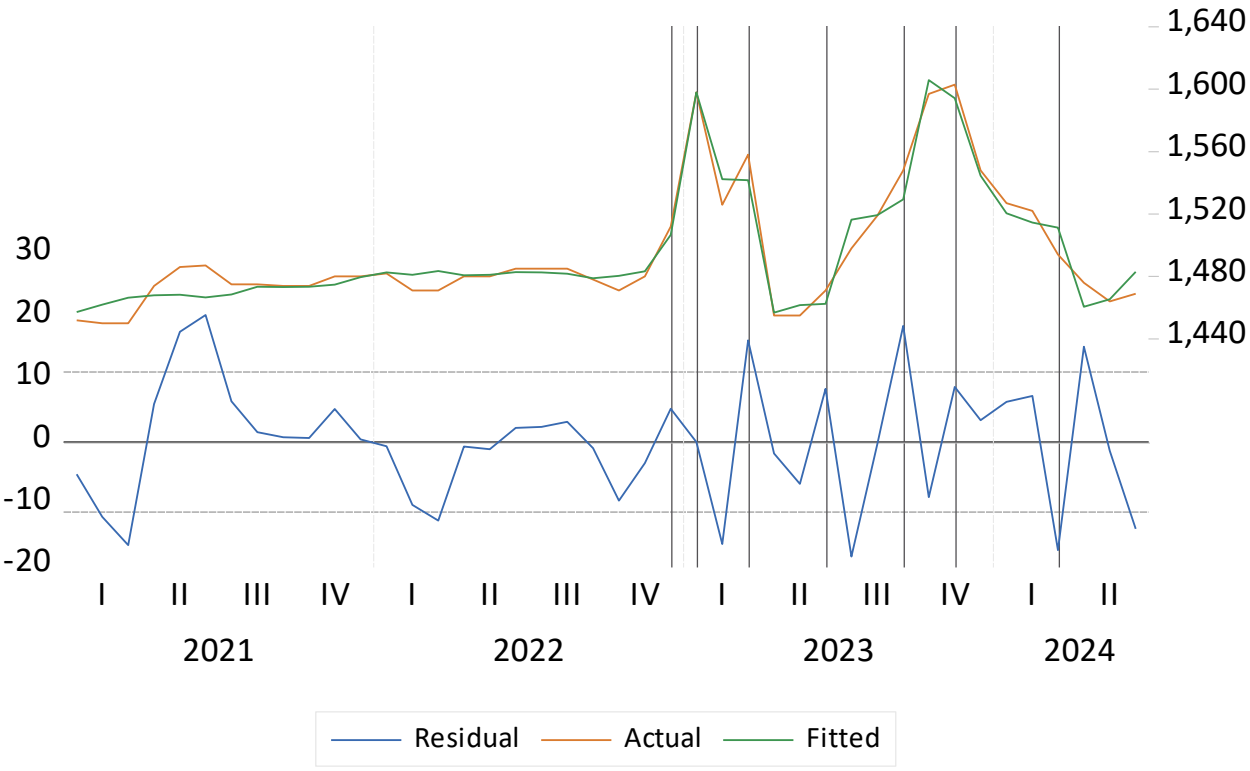
le: 2021M01 2024M06				
ded observations: 42				
ator Saturation: SIS, 41 indicators searched over 2 blocks				
variables detected				
ble	**ficient**	**Error**	**istic**	**.**
	744	451	723	5
	0718	333	3757	9
	954	671	756	0
TER("2023M01")	153	772	589	0
TER("2023M02")	3521	670	7575	1
TER("2023M04")	3124	278	3608	0
TER("2023M07")	767	522	709	0
TER("2023M10")	321	217	976	0
TER("2023M12")	3570	270	1615	0
TER("2024M04")	0480	431	0586	0
ıared	591	dependent var		405
sted R-squared	757	lependent var		048
of regression	759	e info criterion		317
squared resid	525	arz criterion		048
ikelihood	3817	an-Quinn criter.		966
istic	751	in-Watson stat		228
F-statistic)	000			

Source: Researchers' work based on Eviews 13.

Figure (2). The Spread of Residuals for the Estimated Model to Measure the Impact of Structural Changes in the Components of Monetary Sterilization on the Exchange Rate After Implementing the Electronic Platform in Iraq for the Period (2021-2024)



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Source: Researchers' work based on Eviews 13.

In light of the estimation results shown in Table (3), the following becomes clear to us:

Regarding the significance test of the regression equation, it is noted that the calculated F-statistic value is F-statistic=52.51751, which is a significant value at any significant level. This confirms (or this is confirmed by?) the probability value (P-Value=0.000000), allowing us to reject the null hypothesis and accept the alternative hypothesis, which states that at least one of the regression coefficients differs significantly from zero. Thus, the equation as a whole is significant in influencing the dependent variable (parallel exchange rate).

Regarding the extent to which the explanatory variables (foreign reserves R, monetary basis M0) contribute to determining the behavior of the dependent variable (parallel exchange rate EX), it becomes clear from the value of the corrected determination coefficient (Adjusted R-squared=0.91) that 91% of the changes that occur in the dependent variable are due to the explanatory variables, while the remainder is due to variables that cannot be measured or errors in estimation.

The Durbin-Watson statistic value reached 1.987228, which is a value close to 2. This implies accepting the null hypothesis, i.e., there is no autocorrelation among the residuals, and the alternative hypothesis is rejected.

From the data in Table 3, it is clear that there is a direct and statistically significant relationship, indicated by P-Value=0.0005, between the parallel exchange rate and the monetary base, as the value of t=3.869723. This indicates that the fixed nominal exchange rate does not imply the stability of the real exchange rate, which moves with the difference between the internal and external inflation rates. As the monetary base increases, the real exchange rate of the foreign currency decreases, leading to an increase in the demand for foreign currency, while the effects of other factors remain stable; thus, the parallel exchange rate increases.

It is noted that the relationship is inverse and statistically significant, as indicated by P-Value=0.0389, between the parallel exchange rate and foreign reserves, with a value of t=-2.153757. Oil revenues represent the main source of growth in Iraq's foreign exchange reserves, and these reserves increase with the increase in the oil assets cycle. All of these factors lead to an increase in the efficiency indicators of foreign exchange reserves, whether commercial efficiency is sufficient to cover the stated reserves for several months of Iraq's imports or whether it can cover the money supply, which represents the Iraqi dinar exchange rate stabilization fund that the country's monetary policy defends as assets or liabilities that correspond to the national currency issued. The dinar is sufficiently backed to ensure its stability.

Through the results of adding structural changes to the estimated model, it is noted that they are statistically significant, as indicated by the P-Value, which came equal to zero. Therefore, in influencing the parallel exchange rate in Iraq, there is a close link between the growth of the monetary base and foreign reserves. The most important general financial effects on monetary policy are the link between the money supply and government spending, which is an indicator of financial dominance over the monetary base. Any structural change (increase) in foreign reserves will increase the monetary base, and subsequently, the money supply.

Another restriction is added, which is restricting the monetary sterilization process of the local currency through the restrictions imposed by the electronic platform on the Central Bank's foreign exchange sales window. This has significantly impacted the monetary base due to the increase in money supply through the decrease in the amount of money withdrawn from circulation, leading to a decrease in the cash holdings of the local currency at the Central Bank. As a result, this restriction has led to inflation in economic activity. Therefore, the relationship between the monetary base and foreign reserves is linked; whenever government spending increases, it follows the same direction through the implementation of the budget, because the exchange restriction of foreign reserves determines the money supply through the monetary base, which is derived from the liabilities side through the issued currency. The relationship is clearly defined through the exchange rate gap, which expands whenever foreign reserves are restricted.

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The Estimated Model Quality Tests

To ensure the quality of the model used to measure the impact of structural changes in the components of monetary sterilization on the exchange rate after implementing the electronic platform in Iraq for the period 2021-2024, and its freedom from standard problems, diagnostic tests must be performed as shown in the following Table (4):

Table (4). The Results of the Study Model Quality Tests Summary

istic		ator	Test
047	9	Breusch-Godfrey Serial Correlation LM Test	Correlation Test
842	0	Breusch-Pagan-Godfrey	oskedasticity Test
818	6	Jarque Bera	hality Test

Source: Researchers' work based on Eviews 13.

It appears that there is no problem of serial autocorrelation between the values of the residuals of the estimated model, as indicated by the data mentioned in Table 4 above, as shown by the Breusch-Godfrey Serial Correlation LM Test, where the value of Prob. Chi-Square = 0.8069 is greater than 0.05, which means accepting the null hypothesis and rejecting the alternative hypothesis. In addition, as shown by the Breusch-Pagan-Godfrey test, the residuals of the estimated model do not suffer from the problem of instability of variance homogeneity, where the value of Prob Obs*R-squared=0.1330 is greater than 0.05, which means accepting the null hypothesis and rejecting the alternative hypothesis. Meanwhile, the residuals of the model are normally distributed, as shown by the Jarque Bera test, where the value of JB=0.318818 and the value of Prob = 0.8526 is greater than 0.05, which means accepting the null hypothesis and rejecting the alternative hypothesis.

Fifth: Conclusions

After implementing the electronic platform, there is a division in the monetary sterilization process, or the sterilization intervention of local liquidity, with two windows: one of which is internal, (i.e. the Central Bank window to buy dollars from the government from oil revenues in exchange for issuing the dinar), and the other is external (to pay foreign currency for credit lines granted to local banks). Between them, there is sometimes a time delay or sometimes a time race, which affects the exchange rate in the Iraqi economy.

The monetary sterilization policy followed by the Central Bank of Iraq is through the sources of the monetary base, represented by net foreign reserves. This means that every increase in the monetary base (monetary basis) due to net foreign reserves is sterilized by net local credit.

The external financial constraint represented by the electronic platform has led to the adoption of a new international policy that can be described as a near transformation or seizure of the foreign currency sale window. Under this policy, exchange rate movements are directly linked to the amount of foreign currency held by banks, specifically those that are logistically approved within the U.S. financial system. This means these banks facilitate operations through the Office of Foreign Assets Control (OFAC) of the U.S. Treasury Department.

The exchange rate signal became under the influence and pressure of an external variable generated by the policies of foreign correspondent banks, within the operational objectives of monetary policy following the implementation of the electronic platform.

There is a close relationship between the growth of the monetary base and foreign reserves in influencing the parallel exchange rate in the Iraqi economy during the study period. The most important general financial effects on monetary policy are related to the link between the money supply and government spending, and this is an indicator of financial dominance over the monetary base. Therefore, any structural

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change (increase) in foreign reserves will increase the monetary base and then the money supply, adding another restriction: the restriction of the process of monetary sterilization of the local currency through the restrictions of the electronic platform.

Sixth: Suggestions

Through the financial market, there must be a suitable environment for open market operations to increase demand for local currency by mobilizing savings and directing them to investment. This would make monetary policy less interventionist in the monetary sterilization market (i.e., the market's ability to absorb excess liquidity by adding foreign assets to the monetary base at a lower level).

There is a need to activate additional channels for the monetary sterilization policy by establishing a system to manage the government's general budget cash flow. This can be achieved by monetizing oil dollar revenues into surplus dinar balances in a special account at the Central Bank of Iraq, through coordination between fiscal and monetary policies. In return, the Central Bank of Iraq would provide certain facilities to support fiscal policy without resorting to issuing central bank bonds, which incur interest costs.

When the monetary sterilization policy exists with the presence of oil financial dominance over the monetary base in the Iraqi economy, and the government represents the source of foreign currency, the effects of financial discipline on the level of effective aggregate demand must be carefully monitored compared to its effect on poverty and unemployment rates. Therefore, it is necessary to harmonize the monetary sterilization policy with its effect on macroeconomic variables.

References

Central Bank of Iraq, Statistics and Reports, Annual Bulletins (2021-2024).
Central Statistical Organization, Monthly Reports on Dollar Exchange Rates for the Year 2024.
Saleh, Mazhar Muhammad, The Paradox of Monetary Sterilization: Antidotes to Monetary Policy, Iraqi Economists Network, 2023.
Saleh, Mazhar Muhammad, The Problem of Monetary Duality in Iraq: Between Parallel Sterilization and the Demand for Money, Iraqi Economists Network, 2024.
Ali, Ahmed Ibrihi, Monetary Economics: Facts, Theories and Policies, First Edition, Dar Al-Kutub, Iraq, 2015.
Ali, Ahmed Ibrihi, Financing, Foreign Exchange Market and Development in an Oil Economy, Second Edition, Dar Al-Ayyam for Publishing and Distribution, Amman, Jordan, 2018.
Bida, Sabreen Qasim, The Role of Foreign Reserves in Strengthening the Sterilization Policy in Iraq after 2003, Master's Thesis, University of Baghdad, 2020.
Aizenman, Joshua, Reuven Glick, Sterilization, Monetary Policy, and Global Financial Integration, Review of International Economics, 17(4),2009,
lee, Jang Yung " Sterilization capital inflows", international Monetary fund, Economic issues,1997.
Mansour, Layal, " Hoarding of International Reserves and Sterilization in Dollarized and Indebted Countries: an effective monetary policy", GATE Group D'analyse et de Theorie Economique Lyon-St Etienne, WP,1208, 2012.
Neamah, f. Sameer, Akram S. Yousif, Predicting the Effect of Sterilization Policy on the Reserved Money in the Iraqi Economy Using ARIMA and ANN Models, Humanities Journal of University of Zakho,2022.