

Measuring the Impact of the Central Bank's Financial Position Statement on the Money Supply – Using the NARDL Standard Model

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ABSTRACT

The analysis of the Central Bank's financial position statement, and the changes in its items in the aspects of assets and liabilities, is an essential entry point to understand the nature of the Central Bank's activity, its monetary policy directions, and the extent of its powers in performing its main functions.) to measure the equilibrium and causal relationships between the variables of the list, represented by net foreign assets, net domestic assets, and the monetary base, and their effect on the money supply (M2) in the short and long term, and the stability of the money supply function was also tested to verify the stability of the relationship during the study period.

The importance of this research is highlighted in its connection between the structural and qualitative analysis of the statement of the financial position of the Central Bank and the quantitative analysis of the behavior of the money supply, which contributes to deepening the understanding of the mechanism of the influence of the components of the list on monetary variables and in the formulation of macroeconomic policy.

Keywords: Financial Position Statement, Money Supply, Central Bank, NARDL.

INTRODUCTION

The statement of financial position of the Central Bank represents the main framework through which the components of assets and liabilities appear, in which change is the main determinant of the movement of the money supply, where the monetary base generated from net foreign assets and net domestic assets represents the main factor in determining the size and trends of the money supply, which makes the analysis of the items of the list items an essential tool for understanding how cash liquidity is formed and its movement to the banking sector and the economy.

The importance of this research comes from its efforts to determine the impact of the components of the statement of financial position on the money supply, and to measure the nature of the equilibrium and dynamic relationship between them, which shows the ability of the Central Bank to manage liquidity by moving these items.

The research was organized as follows: the first section deals with the structure of the research, the second section presents a brief review of the literature related to the statement of financial position and the money supply, the third section presents the study variables and the causal relationship between them, while the fourth section deals with the relationship analysis using the nonlinear distributed slowdown autoregression model (NARDL), and the research concludes in the fifth section with the most prominent conclusions and recommendations.

Research Structure

Problem

Controlling the money supply is one of the most important goals of central banks in all countries of the world, as the quality and size of assets affect the levels of the monetary base and thus the money supply.

- How much does the change in the balance sheet affect the money supply?
- Do changes in both sides of the statement of financial position affect the money supply?

Hypothesis

Changes in the assets and liabilities of the Central Bank of Iraq's statement of financial position have affected the level of the money supply during the years (2005-2024)

Goal:

- 1- Highlight the central bank's ability to control the money supply.
- 2- Knowing the type and trend of the financial position and its impact between the items of the statement of financial position and the money supply.
- 3- Interpret and analyze the statement of the financial position in Iraq and indicate the extent to which the Central Bank is able to control the money supply.

Importance:

- 1- Explain the role of the Central Bank in addressing crises by controlling the money supply.
- 2- Knowledge of the Central Bank's obligations.
- 3- A statement of the financial position statement items in providing stability in the money supply.

Theoretical Understanding of the Central Bank's Financial Position Statement and Money Supply

Previous Studies

A number of Arab and foreign studies have dealt with the issue of the money supply and the role of the Central Bank in controlling it and achieving monetary stability in Iraq, including the following:

1. The study of Hamad Abdul Wahid Jias and Sahar Qasim (2016) entitled "The Money Supply and the Factors Affecting it and the Role of the Central Bank of Iraq in Controlling it", an applied research in the Central Bank of Iraq for the period (2003-2012)", aimed to explain the role adopted by the Central Bank of Iraq in controlling the money supply. It concluded that the expansion of the sources and uses of the Central Bank's funds is linked to the expansion of the state's general budget, given that economic activity is largely dependent on the flow of oil financial resources, which contribute more than 90% of government revenues.

2. The study of Idris Ramadan Hajji and Mohammed Salman Mohammed (2022) entitled "Measuring and Analyzing the Impact of the Central Bank's Instruments in Achieving Monetary Stability in Iraq for the Period (1988-2019)", the study sought to determine the impact of the quantitative and qualitative instruments adopted by the Central Bank of Iraq in achieving monetary stability, and the results showed that the use of modern quantitative tools in addition to traditional instruments clearly contributed to achieving monetary stability, which reflects the development of the effectiveness of monetary policy in the face of Economic fluctuations.

3. Ali Hussein Nouri Al-Ami's (2017) study entitled "The Legal Reserve and its Impact on the Tight Money Supply - An Applied Research in the Central Bank of Iraq", aimed to determine the nature of the relationship between legal reserves and the tight money supply, and concluded that the Central Bank of Iraq was able to influence the tight money supply by 60% to 82% for the years 2010 and 2011, which confirms the effectiveness of the legal reserve policy as a tool to control liquidity in that period.

4. Jafar Haghghat's study titled "How Much Control Does the Central Bank of Iran Have Over Money Supply", The results indicated that Iran's money supply was influenced by external factors such as exports, imports, and trade policies, and that changes in the monetary base led to expected changes in the money supply.

5. Gradimir Kožetinac 'بعضوان' 'The Role of Money in Making Monetary Policy' دراسة

The study aimed to highlight the role of money in central banks' monetary policy, and the study confirmed the existence of a long-term positive relationship between monetary growth and inflation, which reinforces the importance of controlling the money supply to achieve price stability.

6. Andrzej Jędruchiewicz's study entitled "Money Supply as the Target of the Central Bank", aimed to analyze the adoption of the money supply as a mediating objective in monetary policy from the perspective of the Austrian school, and concluded that an increase in the money supply temporarily leads to an economic improvement, but its continuation causes structural imbalances in the absence of an increase in real savings.

7. András Komáromi's study titled "The Effect of the Monetary Base on Money Supply Does the Quantity of Central Bank Money Carry Any Information?" The study also examined the limits of the impact of monetary policy, stressing that their actual role is limited to influencing inflation in the medium term, while they do not have

the ability to have a permanent impact on real variables such as GDP or employment. The study concluded that the amount of money the central bank has is not a reliable indicator of understanding the true position of monetary policy, and that it is more important to follow the movements of interest rates and other guidance tools used by central banks.

A review of the Arab and foreign literature shows that the central bank's ability to control the money supply is relative rather than absolute, as it is influenced by internal and external structural factors such as fiscal policies, trade openness, and oil price fluctuations.

Most studies indicate that the stability of the money supply represents an essential condition for achieving monetary and price stability, but the effectiveness of the central bank depends on the extent to which it controls the monetary base and the monetary multiplier together, and this is central to the analysis of the impact of changes in the statement of the central bank's financial position on monetary policy, as it reflects the limits of monetary independence in an economic environment that depends on rentier resources and financial openness.

The concept of money supply and statement of financial position

The concept of the cash supply and its components

The money supply is defined as the total amount of ready-made or semi-ready means of payment available in the economy, which can be used directly in the settlement of payments and the purchase of goods and services, and is one of the main indicators for measuring the amount of liquidity in the economy and the ability of the banking system to create money (Andrzej Jędruchiewicz, 2014, 117).

The money supply consists of three main levels:

1- Money Supply in the narrow sense (M1): Includes currency in circulation outside the banking system in addition to the current demand deposits of the private sector with commercial banks that can be withdrawn by cheques.

2- Money supply in the broad sense (M2): It is sometimes called domestic liquidity and consists of currency in circulation and current deposits, in addition to time (term) deposits and special savings deposits with commercial banks. In other words, it is the elements of the narrow concept (M1) in addition to non-current deposits or so-called semi-money deposits in commercial banks.

3- Money supply in the broader sense (M3): It means extending the concept of money supply to include domestic liquidity (M2) in addition to other financial assets owned by non-banking economic units, such as public securities and bonds issued by specialty investment firms (Dagher, 2019, 253).

The Concept of the Central Bank's Financial Statement

The statement of the financial position of the Central Bank is one of the most important lists that reflect the financial position of the Monetary Authority, as it shows in the first side assets (assets) and liabilities (liabilities) in the second side, which shows how the Central Bank manages its resources and uses them to achieve the objectives of monetary policy and maintain monetary stability. (Blake, 2001, p. 15)

On the asset side, foreign reserves, which represent a prudential response to emergencies and guarantee to cover external liabilities and enhance confidence in the national currency, include gold in cash, convertible foreign currencies, special drawing rights (SDRs), deposits with foreign banks, contributions to international institutions and debt to the outside world. Assets also include rights over the government resulting from financing its expenditures with advances or the purchase of bonds, rights over commercial banks representing credit granted to them, debts to other financial institutions, as well as other assets that include fixed assets and other unclassified items (Ali, 2021, 150-152).

The liabilities side consists mainly of the issued currency and bank reserves, which are the monetary base on which the banking system relies to create money, and this aspect also includes the government's deposits with the Central Bank as its financial agent, banks' investments in the monetary policy instruments issued by the Central Bank to absorb liquidity, in addition to foreign liabilities arising from the bank's obligations to the outside world, and capital accounts that represent the bank's own resources of paid-up capital and reserves (Al-Dulaimi, 1990, 299).

Thus, the statement of the financial position of the Central Bank reflects the nature of the relationship between assets and liabilities and their role in managing liquidity, implementing monetary policy, and achieving monetary and financial stability in the national economy.

Table (1) Statement of the Financial Position of the Central Bank

Liabilities	Assets
Reserve cash, including: - Currency in circulation. - Bank reserves Mandatory Surplus Government Deposits. Foreign Liabilities - IMF account. - Bilateral payment agreement balances. Cash that can be collected later. Capital and reserves. .Other liabilities	Foreign assets, including: -Gold. - Foreign Currencies. - SDR. - Investments in foreign banks. Local credit, including: - Government bonds and remittances. - Loans and advances to government institutions. Debts to commercial banks, including: -Loans. -Predecessor. Other assets.

Source: (Blake, Understanding the central bank, 2015, p. 8)

The Supply of Money and the Foundations of its Composition in the Light of the Role of the Central Bank

Money in its contemporary sense is a group of liabilities to the central bank, banks and financial institutions that play the role of financial intermediary or acceptance of deposits, and these liabilities include currency in circulation and current deposits with consumers and business institutions, and another class of money is called super-strong money, and it represents direct liabilities to the central bank by the public and banks, and is also known as the monetary base (B) which consists of the currency in circulation (C and bank reserves (R) and these reserves are divided into mandatory reserves imposed by the Central Bank, and surplus reserves held by banks to meet the demands of their customers (Dagher, 2018, 261)

$$B = C + R$$

The relationship between the money supply (M) and the monetary base (B) is determined by the monetary multiplier (U): expressed by the relationship (

$$MU = M \div B \quad M = MU \times MB$$

This relationship indicates that the central bank can influence the money supply by changing the size of the monetary base, because the monetary basis on the liabilities side is offset by foreign assets and domestic credit in the statement of the financial position of the central bank and is divided into two groups, namely net foreign assets and net domestic credit. However, the effectiveness of this effect depends on the stability of the monetary multiplier, as its instability leads to a weakening of the central bank's ability to control the money supply (Daniels and VanHooos, 2010, 368) and this is often related to fluctuations in reserve ratios, especially surpluses ones, as was the case in Iraq until 2015, when the increase in the size of excess reserves led to a weak response of the money supply to increase the monetary base, as a result of banks refraining from using their surplus reserves to grant credit or expand the creation of deposits (Ali 2021, 4).

Table (2) The Central Bank's Cash Sheet

Liabilities (MB Uses)	Assets (MB resources)
- Monetary Base - Currency in circulation Commercial Banks Reserves -	- Net Foreign Assets - Local Credit Assets For the government and banks - Net Other Assets

Source: (Ouanes & Thakur, 1997)

Statement of Financial Position and Trend of Causal Relationship with Money Supply

In economic measurement models, variables are usually classified into two types of internal and external variables, and the variable is considered internal when its movement is explained through its interactions with the rest of the variables within the economic model, while it is considered external when it is taken as a data from outside the system, and in standard analysis, it refers to cases in which the external variable is influential in the internal without being mutually affected by it in what is known as weak causality. The question arises as to whether the money supply is an internal or external variable in developing economies, including Iraq, as the classification here depends on the extent to which the central bank is able to control the existing variables or through instruments, or whether the money supply automatically responds to the movement of other variables, especially foreign reserves, net domestic assets, and the monetary base. The money supply is seen as external, when the central bank controls its size through open market operations and the determination of interest rates and statutory reserves, while it is considered internal when it is determined primarily by bank credit and the response of the banking system to liquidity needs in particular and the economy in general (Ali, 2021, 6).

In the Iraqi economy, the causal relationship between the money supply and the factors affecting it is manifested as dual in nature, as the money supply is affected by the movement of the net foreign assets of the Central Bank, which changes according to the fluctuations of oil revenues and operations related to the exchange market, making a large part of the money supply dependent on external factors on the one hand. On the other hand, domestic items in the balance sheet of financial position, such as net domestic credit and bank reserves, contribute to determining the size of internal liquidity, which gives the money supply an internal aspect stemming from the interaction of the banking system with the domestic demand for money.

Thus, the statement of financial position of the Central Bank is the accounting framework in which the causal relationship of the money supply is embodied, as the asset side represents a source of its formation through net domestic and foreign assets, while the liabilities side reflects its currency components in circulation and bank reserves. In the event of a decrease in these assets, the monetary base shrinks and the money supply decreases, which highlights the causal trend from the outside inwards, and the impact of the internal aspect of the relationship cannot be overlooked, as the behavior of commercial banks in lending and maintaining reserves will affect the size of the monetary base through the refinancing operations carried out by the Central Bank, so the causal relationship between the money supply and the statement of financial position is an interactive relationship, controlled by two main factors. They are net foreign assets, which reflect external influence, and net domestic assets, which reflect domestic credit activity, and any change in one of these components will be directly reflected in liabilities-side items and thus the money supply in circulation in the economy (Ouanes & Thakur, 1997,12).

It can be said that the list represents the main pillar through which the causal relationship of the money supply is characterized, as it is the link between the external factors that generate liquidity and the internal factors responsible for its distribution, and given the dominance of external variables, foremost of which are oil revenues and foreign reserves, the money supply in Iraq shows a causality in which the external influence predominates on the internal one, that is, the change in the size of the monetary mass, expansion or contraction, as it is initially related to the movement of foreign assets, and then its repercussions are transferred to. Therefore, the Central Bank's ability to manage the money supply remains limited by the limits imposed by the Statement of Fiscal Position itself, which simultaneously reflects the sources of money creation and its uses, and reveals the limitations of monetary independence in the Iraqi economy (Al-Allaq, 2022, 160).

Measuring the relationship between some components of the Central Bank of Iraq's financial position and the money supply

Model Description

The money supply (MS) represents the dependent variable, while the components of the central bank's financial position statement represent the independent variables, and include net domestic assets (NDA), net foreign assets (NFA), currency in circulation (CIRC), and bank reserves (BR), which reflect the level of central bank monetary capacity.

The model can be formulated as follows:

$$MS = f(NDA, NFA, CIRC, BR)$$

Under the regression model, the model can be written as follows:

$$MS_t = \alpha_0 + \sum_{\{i=1\}}^{\{p\}} \alpha_1^i MS_{t-i} + \sum_{\{i=0\}}^{\{q\}} \beta_1^i NDA_{t-i}^+ + \sum_{\{i=0\}}^{\{q\}} \beta_2^i NDA_{t-i}^- + \sum_{\{i=0\}}^{\{q\}} \gamma_1^i NFA_{t-i}^+ + \sum_{\{i=0\}}^{\{q\}} \gamma_2^i NFA_{t-i}^- \\ + \sum_{\{i=0\}}^{\{q\}} \delta_1^i CIRC_{t-i}^+ + \sum_{\{i=0\}}^{\{q\}} \delta_2^i CIRC_{t-i}^- + \sum_{\{i=0\}}^{\{q\}} \theta_1^i BR_{t-i}^+ + \sum_{\{i=0\}}^{\{q\}} \theta_2^i BR_{t-i}^- + \mu_t$$

Interpretation Of Symbols:

MS_t = Cash supply at time t (dependent variable)

$NDA, NFA, CIRC, BR$ = Independent variables (net domestic assets, net foreign assets, currency in circulation, bank reserves)

Σ is the sum mark, used to add effects over the specified number of delays.

A constant (intercept) in the model, represents the MS value when all independent variables are zero.

X^+, X^- = Positive and negative changes for each independent variable

$p = q$, the number of optimal delays for both dependent and independent variables

μ_t = Random error limit

Stationarity Tests

All variables will initially undergo stationarity tests to verify their suitability for the application of the NARDL model, and after confirming that they are stable at the level or at the first difference, the transition is to estimate the dynamic relationship in the short and long term, as well as to analyze the asymmetric effect of the components of the financial position on the financial position that contributes to providing a more accurate understanding of the changes in the elements of the list in monetary policy (MS).

Unit root test to check for dormancy

After the independent variables in the previous model have been examined and found to be dormant in the first team, we proceed to examine the MS dependent variable to ensure that it is dormant at the original level or the first difference, allowing the NARDL model to be applied or not if it is dormant in the second team.

Table 3 PP Test Results

At the first difference 5% Critical Value (Probability Value)			At the level of 5% of critical value (probability value)			Variant Name
Without a fixed limit or a general trend	Fixed limit and general trend	Fixed limit only	Without a fixed limit or a general trend	Fixed limit and general trend	Fixed limit only	
0.0000	0.0000	0.0000	0.6824	0.9126	0.9190	MS

Source: EViews Program Outputs 13.

The results of the Phillips-Perón (PP) test show that the money supply variable becomes static at the first difference, which means that it is of type I(1) and accordingly, the conditions for the application of the NARDL model become available, as the model can be estimated when there are static variables at the level and static variables at the first difference.

Standard Model Safety Test

The standard model integrity test aims to verify that the model is free of the problem of spurious regression and to ensure that the results obtained are accurate and reliable, and its findings indicate that the real relationship between the variables is weak, leading to misleading results that make the model unusable in economic analysis.

Table 4: NARDL Standard Model Safety Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
MS(-1)	1.068084	0.075551	14.13733	0.0000
MS(-2)	-0.041657	0.080788	-0.515636	0.6083
MS(-3)	0.276521	0.075804	3.647850	0.0006
NDA_POS	10184.40	818.2821	12.44607	0.0000
NDA_POS(-1)	-11745.97	1023.050	-11.48122	0.0000
NDA_NEG	4192.768	1351.090	3.103249	0.0031
NDA_NEG(-1)	-6275.476	2055.649	-3.052795	0.0035
NDA_NEG(-2)	3078.226	1280.396	2.404120	0.0197
NFA_POS	4907.024	1282.995	3.824664	0.0003
NFA_POS(-1)	-7264.835	1946.436	-3.732378	0.0005
NFA_POS(-2)	2921.322	1187.550	2.459957	0.0172
NFA_NEG	10916.26	1059.862	10.29970	0.0000
NFA_NEG(-1)	-12386.09	1435.119	-8.630701	0.0000
CIC_POS	-6509.143	1582.899	-4.112167	0.0001
CIC_POS(-1)	6394.587	2059.890	3.104334	0.0031
CIC_POS(-2)	2094.396	1308.205	1.600970	0.1153
CIC_NEG	2972.772	1979.382	1.501869	0.1391
CIC_NEG(-1)	-5757.527	2066.831	-2.785679	0.0074
BR_POS	-5151.362	1625.878	-3.168358	0.0025
BR_POS(-1)	7728.899	2373.327	3.256567	0.0020
BR_POS(-2)	-3642.835	1517.483	-2.400578	0.0199
BR_NEG	-9181.825	1445.587	-6.351623	0.0000
BR_NEG(-1)	10502.14	1609.902	6.523467	0.0000
C	1682900.	3208189.	0.524564	0.6021
R-squared	0.984916	Mean dependent var	16176504	
Adjusted R-squared	0.978371	S.D. dependent var	47590018	
S.E. of regression	6999028.	Akaike info criterion	34.61030	
Sum squared resid	2.60E+15	Schwarz criterion	35.34084	
Log likelihood	-1308.497	Hannan-Quinn criter.	34.90251	
F-statistic	150.4670	Durbin-Watson stat	2.150260	
Prob(F-statistic)	0.000000			

Source: EVIEWS Program Outputs 13.

The results of the standard model integrity show the following:

- The coefficient of determination (R-squared) was = 0.984, which means that the model explains 98.4% of the change in the dependent variable, which is evidence of the power of interpretation.
- The Durbin Watson value was = 2.1, indicating that there was no self-binding in the residues.
- The $F = 150.4$ statistic was recorded with a high significance, which confirms the strength of the effect of independent variables in the interpretation of changes in the dependent variable.

Thus, it is clear that the model is statistically sound and reliable, and the examination of the four economic problems must be completed to ensure the validity of the results.

Bounds Test Results

The Bounds Test, developed by Pesaran, Shin & Smith (2001), is used to verify the existence of a long-term relationship between variables in the NARDL model regardless of their degree of integration.

Table (5) Results of the Boundary Test Assessment

Test Statistic	Value
F-statistic	16.376004

Bounds Critical Values						
Sample ...	10%		5%		1%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
75	2.103	3.111	2.449	3.550	3.219	4.526
80	2.088	3.103	2.431	3.518	3.173	4.485
Asymptotic	1.990	2.940	2.270	3.280	2.880	3.990

* I(0) and I(1) are respectively the stationary and non-stationary bounds.

Source: EViews 13 PROGRAM OUTPUT.

The Bounds Test in the NARDL model showed that the F value was 16.3, exceeding the upper critical values, confirming a long-term balance between the money supply and the independent variables (CIC, NDA, NFA, BR) while observing an asymmetry in the response between the increases and decreases in these variables.

Results of estimating long-term and short-term NARDL transactions

In the NARDL, long-term coefficients show the asymmetry between the increases and decreases of the variables, i.e. the increase of the variable may affect the money supply differently than the decrease in the money supply.

Table (5). Estimation of long-term coefficients

Cointegrating Coefficients				
Variable *	Coefficient	Std. Error	t-Statistic	Prob.
NDA_POS(-1)	5154.607	2042.792	2.523315	0.0140
NDA_NEG(-1)	-3286.105	2125.950	-1.545711	0.1268
NFA_POS(-1)	-1860.093	1740.732	-1.068569	0.2890
NFA_NEG(-1)	4851.761	2021.101	2.400554	0.0191
CIC_POS(-1)	-6535.254	2539.645	-2.573295	0.0123
CIC_NEG(-1)	9192.196	7841.692	1.172221	0.2452
BR_POS(-1)	3516.443	2503.270	1.404740	0.1647
BR_NEG(-1)	-4358.239	2028.190	-2.148831	0.0352
C	-5555084.	11022185	-0.503991	0.6159

Note: * Coefficients derived from the CEC regression.

Source: EViews Program Outputs 13.

The long-term coefficients extracted from the NARDL model show a nonlinear and asymmetric relationship between the components of the bank's financial position and the money supply in Iraq, and the table shows that:

1- **Rising Net Domestic Assets (NDA) Leads to Monetary Expansion:** Net domestic assets often rise as a result of the central bank financing government spending. This financing increases the monetary base, which is directly reflected in the increase in the money supply as a result of the monetary expansion associated with fiscal requirements.

2- **An increase in net foreign assets contributes to an increase in the money supply:** When foreign assets with a central bank rise, often due to higher oil revenues, the central bank criticizes the foreign currency and converts it into domestic liquidity. This infusion of liquidity leads to a clear monetary expansion, which is reflected in an increase in the money supply (MS).

3- **The rise of the currency in circulation outside the banking system negatively affects the ability of banks to create credit:** an increase in currency in circulation outside banks raises the money supply (M0 and M1) because it is a direct part of the components of the money supply. But this increase draws liquidity from banks, reducing their reserves and reducing their ability to grant credit, thus weakening the future growth of the bank (credit) money supply via a decrease in the monetary multiplier, in other words. The current currency increases the money supply now, but it reduces its ability to expand later, this differentiation between the level and the ability to increase.

4- **Declining bank reserves leads to a decline in the money supply:** when the central bank's reserves fall, their lending capacity declines, and thus the creation of bank credit shrinks, leading to a decrease in the money supply.

Table (6). Results of estimating short-term parameters

Error Correction				
Dependent Variable: D(MS)				
Method: ARDL				
Date: 11/15/25 Time: 00:05				
Sample: 2005Q4 2024Q4				
Included observations: 77				
Dependent lags: 3 (Automatic)				
Automatic-lag linear regressors (2 max. lags): NDA_POS NDA_NEG				
NFA_POS NFA_NEG CIC_POS CIC_NEG BR_POS BR_NEG				
Deterministics: Restricted constant and no trend (Case 2)				
Model selection method: Akaike info criterion (AIC)				
Number of models evaluated: 19683				
Selected model: ARDL(3,1,2,2,1,2,1,2,1)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
COINTEQ*	0.302948	0.021888	13.84082	0.0000
D(MS(-1))	-0.234864	0.050861	-4.617752	0.0000
D(MS(-2))	-0.276521	0.052599	-5.257175	0.0000
D(NDA_POS)	10184.40	617.1554	16.50216	0.0000
D(NDA_NEG)	4192.768	1063.748	3.941504	0.0002
D(NDA_NEG(-1))	-3078.226	1006.340	-3.058834	0.0033
D(NFA_POS)	4907.024	994.4036	4.934640	0.0000
D(NFA_POS(-1))	-2921.322	940.8658	-3.104929	0.0029
D(NFA_NEG)	10916.26	790.6695	13.80635	0.0000
D(CIC_POS)	-6509.143	1015.511	-6.409724	0.0000
D(CIC_POS(-1))	-2094.396	934.9753	-2.240055	0.0287
D(CIC_NEG)	2972.772	1407.495	2.112102	0.0387
D(BR_POS)	-5151.362	1249.518	-4.122680	0.0001
D(BR_POS(-1))	3642.835	1217.029	2.993221	0.0040
D(BR_NEG)	-9181.825	1024.745	-8.960105	0.0000
R-squared	0.883052	Mean dependent var	1984987.	
Adjusted R-squared	0.856644	S.D. dependent var	17091196	
S.E. of regression	6471126.	Akaike info criterion	34.37654	
Sum squared resid	2.60E+15	Schwarz criterion	34.83312	
Log likelihood	-1308.497	Hannan-Quinn criter.	34.55917	
F-statistic	33.43929	Durbin-Watson stat	2.150260	
Prob(F-statistic)	0.000000			
* p-values are incompatible with t-Bounds distribution.				

Source: EViews Program Outputs 13

The results of the error correction model show that Iraq's money supply is rapidly adapting towards its long-term equilibrium, with the COINTEQ error factor correcting about 30% of the imbalance during each quarter, and the short-term coefficients show that net domestic assets (NDA) are not the strongest driver of the increase in the money supply, as its increase leads to a relative monetary expansion through local government funding.

Net foreign assets (NFAs) are the main factor in the expansion of the money supply in Iraq, as the growth of foreign assets—as a result of the rise in oil revenues—leads the Central Bank to criticize foreign currencies and inject domestic liquidity, which raises the monetary base and increases the money supply. The decline in NFA usually reflects oil shocks or a decline in foreign currency flows, which leads to a monetary contraction as a result of the reduced liquidity available to the Central Bank. The results also show that the over-the-counter currency (CIC) draws a large part of the liquidity away from the banking system; its rise reduces banks' ability to create credit and lowers the monetary multiplier, thus reducing the bank-measured money supply, while its decline strengthens banks' reserves and raises their lending capacity, leading to an increase in the money supply.

The results also show that bank reserves (BR) clearly affect credit creation, with their rise leading to an increase in the money supply, while their decline leads to a sharp decline in liquidity. Overall, the results indicate that the money supply in Iraq is very sensitive to the fluctuations of domestic and foreign assets, and to the behavior of money circulating abroad, with asymmetric effects reflecting the nature of the Iraqi economy (oil shock, fluctuation in government spending, dollar auction, weak banking sector).

Statistical Test Results

The accuracy and safety of the NARDL model results lies when the probability values for the diagnostic tests below are insignificant (greater than 5%) except for the stability test which falls within the range of (5%).

Serial Correlation Self-Correlation Test Results:

This test can be used to infer whether random residues have a self-binding problem.

Table (7). Results of the Self-Linkage Test

Breusch-Godfrey Serial Correlation LM Test: Null hypothesis: No serial correlation at up to 2 lags			
F-statistic	0.857280	Prob. F(2,51)	0.4303
Obs*R-squared	2.504454	Prob. Chi-Square(2)	0.2859

It is noted that the residuals do not suffer from the problem of self-correlation as the probability value of the OBS*R-squared is greater than 5%), which is an indicator that enhances the degree of reliability and reliability of the estimated model.

RESULTS OF THE CONTRAST HETEROGENEITY TEST

This test can be used to determine whether the model is free of heteroskedasticity.

Table (8). Results of Estimation of Variance Test according to the ARCH Formula

Heteroskedasticity Test: ARCH			
F-statistic	0.939532	Prob. F(1,74)	0.3356
Obs*R-squared	0.952827	Prob. Chi-Square(1)	0.3290

It is noted that the probability value of Obs*R-squared was (0.33), i.e., the model is free of the problem of variance heterogeneity, which serves as an indicator that enhances the degree of reliability and reliability of the estimated model.

Normal Distribution Test Results

The different characteristic of this test is that it tracks the normal distribution of independent and dependent variables.

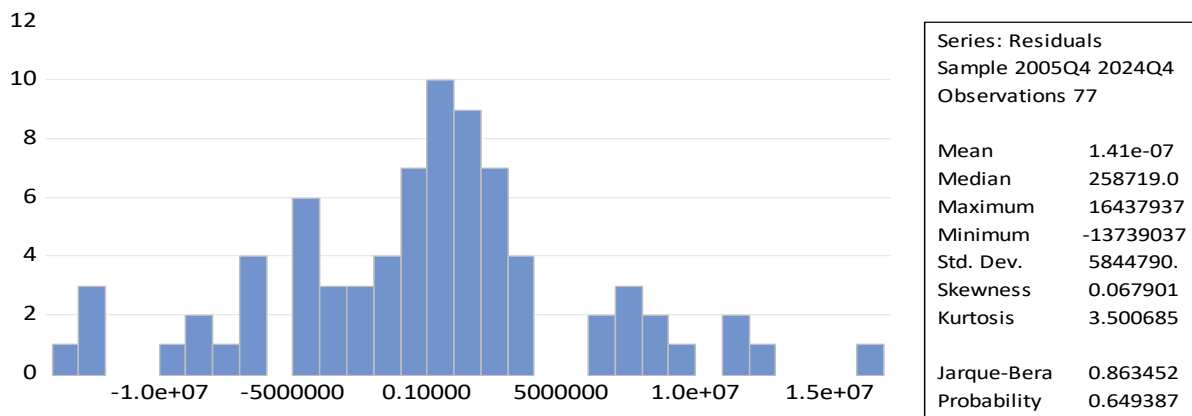


Figure (1). Results of the Jark Beira Test for Normal Distribution

It turns out that the probability values are greater than 5%), which means that there are sufficient grounds to accept the null hypothesis that the residues are naturally distributed, which is an indicator that enhances the degree of reliability and reliability of the estimated model.

2- **Estimated parameter stability test results:** Pesaran andPesaran (1997) proposed the application of the Cumulative Residual Residual Sum (CUSUM) to evaluate the long-term parameter stability (stability) within the critical limit of 5%).

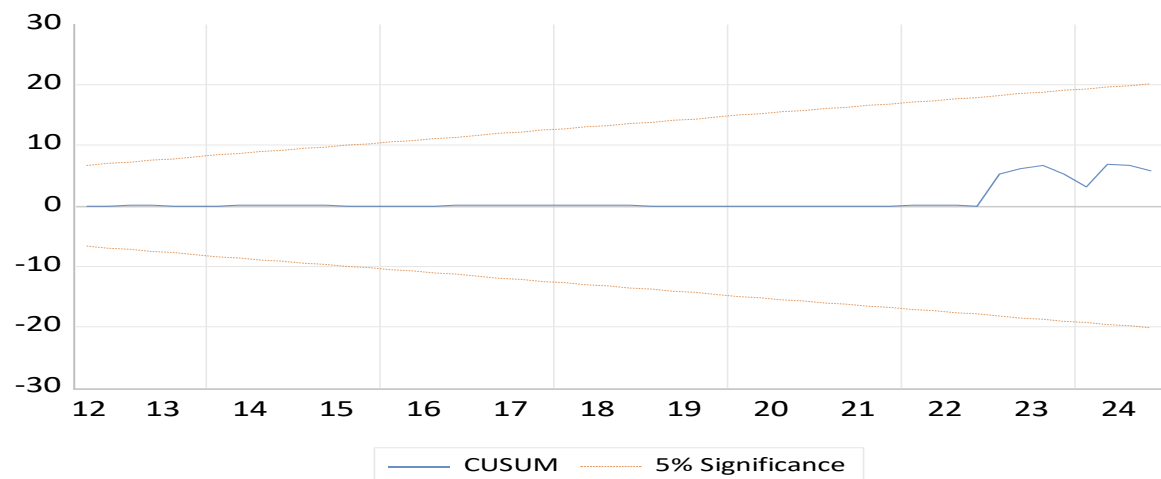


Figure (2).The results of the model stability test according to the CUSUM formula

FINAL RESULTS

The results of the study prove the validity of the hypothesis that the change in the assets and liabilities of the financial position statement of the Central Bank of Iraq has indeed affected the money supply during the study period. Net foreign assets have also been shown to be the main driver of monetary expansion and deflation in Iraq, as its rise enhances the Central Bank's ability to criticize and increase liquidity, while its decline indicates deflationary pressures resulting from external shocks, especially oil shocks.

On the other hand, monetary liabilities, especially currency in circulation and bank reserves, have shown their role as the operational link linking monetary policy to the banking system, as the increase in the currency in circulation draws liquidity from banks, while reserves enhance their ability to create deposits. The structure of the monetary base is also evident from the fact that it is unstable over time as a result of the constant change in the components of assets and liabilities, which is reflected in significant fluctuations in the money supply (M2) that require careful liquidity management.

In standard terms, the estimates of the NARDL model showed an asymmetric effect on the responses to the money supply, as the shocks of increase and decrease in the components of the list do not have the same effect, either in direction or intensity, and the effect of the list items is distributed between short-term and long-term effects, with some items having an immediate impact, such as bank reserves and open market operations, while the effects of other items are gradually crystallized, including net domestic assets. The analysis concluded that foreign reserves (NFAs) are the strongest factor in explaining the fluctuations of the monetary base and money supply in the short and long term, which once again reinforces the validity of the underlying hypothesis and confirms the nature of the close correlation between the items of the balance sheet and the level of liquidity in the Iraqi economy.

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