

Analyzing Impact of Money Supply and Foreign Reserves on Economic Growth in Iraq for 2004-2021

<https://doi.org/10.29124/kjeas.1651.15>

Falah thamer alwan

Middle technical university, Technical Institute of kut , Department of Accounting

Abstract:

Monetary policy is one of the most important economic policies in various countries. Its importance is evident through its basic variables and the effectiveness of its impact on economic activity. The focus in this study has been on the money supply and foreign reserves as independent variables and their impact on economic growth rates in Iraq for the period 2004-2021. Based on the ARDL standard model, through which the path of the relationship between these variables and economic growth and its reflection on growth rates was determined. And effective monetary policies are those policies that are characterized by transferring their effects to the economy with the least risks. The analytical approach was followed to clarify the impact of these variables on economic growth, represented by the variable of gross domestic product. And then extract the most important main results and important recommendations.

Keywords :money supply ; foreign reserves; economic growth ; ARDL standard

1.0 Introduction

The monetary authorities and the various economies focus on achieving monetary stability and controlling the flow of the money supply, to match the real potential of the sector in increasing the commodity supply to meet the pressures of domestic demand. As well as raising the rate of accumulation of foreign reserves to face external and domestic shocks and / or reduce their impact. and reduce losses to the local economy. Hence, reaching

globally acceptable rates of economic growth. The study dealt with the Iraqi reality, which is characterized by rentier and one-sided dependence on oil revenues, and the weakness of the contribution of other productive sectors outside the rentier oil sector in the formation of the gross domestic product. Which increases his exposure to risks and facing crises. Therefore, monetary policy makers in the country are required to take measures that stimulate growth and reduce the impact of shocks that the local economy may be exposed to (Al-Tamimi et al, 2022).

The importance of the study is to clarify the concept of money supply and foreign reserves. And analyze the values of GDP data as an indicator of economic growth. By following the appropriate quantitative methods. And then provide appropriate recommendations to policy makers to correct the course and in line with the main requirements of the local economy (Doan Van, 2020).

The problem of the study revolves around the fluctuations in the money supply and its incompatibility with the commodity supply of the real sector, as well as how to access the accumulation of foreign reserves. It serves as a safety valve to achieve monetary stability and avoid economic crises.

2. Literature review

2.1 The concept of money supply and its components

The concepts of money supply are related to the diversity and multiplicity of assets in the financial market of the country concerned and their impact on economic activity. As well as the directions of monetary policies and the nature of economic problems. The money supply is the amount of money available in a country during a given period of time. determined by the monetary authority (Yusuf et al, 2021). The different payment methods. It is possible to distinguish between concepts and my words:

A- Money supply in the narrow sense, M1: which consists of the currency in circulation plus demand deposits. Considering here the supply of money from a limited functional point of view, and that it is a general means of the purchasing power of money in obtaining goods and services (Rasool et al , 2021).

B- Money supply in the broad sense, M2: which is called in some economic literature - the Chicago method - which confirms that the total money stock is not limited to M1. So that

the narrow concept of money supply does not accurately reflect the amount of money available in the economy. Therefore, it requires that it include other assets whose liquidity is similar or close to the cash currency. Which is equal to M1 plus time deposits, savings accounts, and special savings deposits with commercial banks. The monetaryists assert that the broad concept of the money supply determines the total volume of money, based on the financial development witnessed by the advanced industrial economies. Through the diversification of assets produced by these developments and the possibility of converting them into appropriate means of payment in the local economy (Shobande, 2019).

C- Money supply in the broadest sense, M3: which included, in addition to M1 and M2, other close substitutes for money. Savings deposits of individuals with savings institutions, loan associations and savings funds. Stocks and credit institutions and bonds. The presentation of this is called the approach - Gurley and Shaw - whose analytical importance lies in determining the role played by financial intermediaries. In particular, non-banking in financing economic activity. So that the diversification of financial assets is necessary and necessary to achieve economic growth(Angelina et al, 2020).

H- Money supply with the M4 liquidity scale: which includes M3 plus non-banking securities such as savings bonds and short-term treasury bonds. And commercial papers, and bank acceptances. That is, monetary and financial assets with high liquidity, and this is what is called in advanced economies with high growth rates the central bank approach.

The close correlation between money supply and real output is evident to ensure a positive indicator of monetary stability. As some specialists in monetary affairs assert that there are two criteria that indicate the state of monetary stability in the country concerned. So that the cash flows are proportional to the commodity flows, and my words:

The first: is represented by the $M2/GDP$ ratio. The high percentage indicates the ability of the central bank and its control over the sources of liquidity and reduce the intensity of inflation resulting from the pressure of aggregate spending (Marhasova et al, 2020) .

The second: It is represented in the ratio of monetary issuance / GDP, as the closeness of this ratio to international standards reflects monetary stability in the local economy. It is also evident through this the extent to which the cash flow can cover the commodity flow, and then as an indicator to measure the speed of money circulation.

Second: foreign reserves

1- Concept: Foreign reserves are defined, according to the International Monetary Fund experts in a country, as ((the external assets available at the disposal of the monetary authorities and subject to their control to meet the needs of financing the balance of payments, or to intervene in the exchange markets, to influence the exchange rate of the currency, or other Related purposes, such as maintaining confidence in the local currency, and forming a basis for external borrowing))(2). And the volatility in foreign reserves is one of the most important determinants of credit and financing risks, and is a sensitive indicator of the nature of this risk. This is what characterizes the Iraqi economy, as it is located in a low credit rating. It is not considered as an indicator in terms of creditworthiness to deal with the outside world properly and naturally. Which portends financial problems and crises that may occur in the future (Mishchenko et al, 2019).

2- The importance of foreign reserves: The countries of the world give basic interest to reserves. Which is considered a safety liquidity for the economy in the central bank's coffers. Its rise is a positive and precautionary indicator used to face economic crises. The most important of these reserves are the following:

Allowing the monetary authority freedom to intervene in the exchange market, in order to avoid some economic crises or reduce their risk. Especially when the concerned state adopts the method of exchange control.

Central banks need reserves. To provide loans to major banks with high foreign exchange liabilities, especially in light of the dollar-pegged financial systems (Shabbir et al, 2021).

- Governments may resort to relying on foreign reserves to meet basic obligations, such as covering the deficit in imports, or filling external debt obligations.

So the access to a high accumulation in foreign reserves. And a monetary policy managed by an efficient professional authority that may secure the country's financial capabilities, the strength of its sovereignty, and its dealings with the outside world. As the accumulation of reserves is mainly generated by the movement of the balance of payments. Which reflects the local economy's connection with the outside world, in addition to being a tool to deter or mitigate shocks and crises that the local economy may be exposed to.

Third: economic growth (1)

Economic growth is a concept that reflects the relative increase in the productivity of the domestic economy. Which is the main factor for achieving profits for the institutions. Hence the increase in accumulation and investment expansion. And stimulating aggregate demand, by creating job and employment opportunities, which increases the purchasing power of the consumer sector, and thus revitalizing the economy. The gross domestic product is considered as the preferred indicator for measuring the rate of economic growth.

Therefore, the rate of economic growth is evident through the ability of the country concerned to raise the rate of its production of goods and services to meet the pressures of domestic and external demand. Therefore, the issue of developing productivity is considered one of the most important sources of growth, and countries are constantly keen. Especially advanced countries to improve their productivity, and tend to expand their interests in innovations in the products and services sector and increase their allocations from the budget, in order to meet demand and achieve the satisfaction of their citizens. Thus promoting economic growth, and consumption is one of the components of aggregate demand and the main catalyst for growth in many countries. As governments seek to meet the shortage in demand, especially in times of crisis. This was evident in the horror caused by the Covid-19 pandemic to humanity and the deterioration in the economic growth path of the entire world, as it greatly affected consumer spending and its growth rates. Therefore, it is believed that it is likely that investment, both public and private, will be a major and important source of economic growth in some countries during the coming years, in addition to the contribution of basic sectors such as services and manufacturing. Which depend on knowledge and technological developments, as well as interest in human capital constitutes an essential point in achieving this, and therefore the sources of economic growth include four main components and are considered as the most important determinants of it, including:

Labor and human resources.

-Natural Resources.

Accumulative capital formation.

Technical change and innovation.

Therefore, it can be said that the Iraqi economy is marred by various distortions in the productive structures, and it is a rentier economy with severe and rooted unilateralism. In addition to a pastoral economic policy of a consumerist nature in employment and compensation. As a result, it led to the crystallization of a case of hedging from the risks of internal displacement of the banking or financial sector, represented by the interest gap, while the case of hedging was crystallized for the real sector, by maximizing wages in exchange for low productivity, by working in the sectors of foreign trade, especially consumerism and its accompanying services, and the excess supply of money is reflected in the high demand for foreign currency. Consequently, reserves are reduced, and among the repercussions of this is the fading of investment channels in the environment of real activity, which stimulates economic growth.

3.0 Research methodology

3.1 Study hypothesis

The study assumes that the money supply and foreign reserves have an interrelated and fundamental impact on economic growth in Iraq. The course of this relationship is determined by the monetary authority's orientations and its independence in carrying out its tasks and achieving its economic goals.

3.2 Determine the nature of the study variables and formulate the model

It was adopted in interpreting the relationship between the supply of economic growth as a dependent variable and each of the money supply and foreign reserves as independent variables and for the period 2004-2021, as the model was formulated in the following form:

Where each of:

(GDP) Gross Domestic Product

(FR) Foreign Cash Reserves

(CS) Cash supply

The data was obtained through the websites of the Central Statistical Organization and the Central Bank of Iraq in addition to other supporting sites, and then the researcher proceeded to transfer the data to quarterly or quarterly in order to work to increase the area of data,

which he can analyze more accurately when treated standardly and statistically so that it simulates the economic reality Al-Iraqi, and it was converted into quarterly data after it was annual.

Table 1. Data (Money Supply, Reserves, Gross Domestic Product)

| Years | GDP | FR | CS |
|--------|---------|-------|----------|
| 2004Q1 | 7088.70 | 3.83 | 7132.19 |
| 2004Q2 | 7017.57 | 5.25 | 6950.31 |
| 2004Q3 | 6973.55 | 6.71 | 6893.66 |
| 2004Q4 | 6956.62 | 8.21 | 6962.23 |
| 2005Q1 | 6966.80 | 9.74 | 7156.03 |
| 2005Q2 | 7004.07 | 11.30 | 7475.05 |
| 2005Q3 | 7068.45 | 12.90 | 7919.29 |
| 2005Q4 | 7159.92 | 14.54 | 8488.76 |
| 2006Q1 | 7208.33 | 15.50 | 8873.01 |
| 2006Q2 | 7382.07 | 17.49 | 9817.11 |
| 2006Q3 | 7610.97 | 19.81 | 11010.60 |
| 2006Q4 | 7895.03 | 22.44 | 12453.48 |
| 2007Q1 | 8378.79 | 25.11 | 14839.18 |
| 2007Q2 | 8715.37 | 28.50 | 16503.50 |
| 2007Q3 | 9049.31 | 32.33 | 18139.86 |
| 2007Q4 | 9380.60 | 36.59 | 19748.26 |
| 2008Q1 | 9834.41 | 46.10 | 20957.36 |

| | | | |
|--------|-----------|-------|----------|
| 2008Q2 | 10110.34 | 49.30 | 22658.37 |
| 2008Q3 | 10333.57 | 51.01 | 24479.96 |
| 2008Q4 | 10504.08 | 51.23 | 26422.11 |
| 2009Q1 | 10457.78 | 44.45 | 27386.53 |
| 2009Q2 | 10588.52 | 43.89 | 30009.15 |
| 2009Q3 | 10732.20 | 44.04 | 33191.67 |
| 2009Q4 | 10888.82 | 44.90 | 36934.09 |
| 2010Q1 | -6087.68 | 47.64 | 44652.13 |
| 2010Q2 | 953.24 | 49.45 | 48148.05 |
| 2010Q3 | 14865.52 | 51.52 | 50837.57 |
| 2010Q4 | 35649.17 | 53.83 | 52720.69 |
| 2011Q1 | 95023.05 | 57.17 | 52256.79 |
| 2011Q2 | 116861.87 | 59.66 | 53143.37 |
| 2011Q3 | 132884.51 | 62.09 | 53839.81 |
| 2011Q4 | 143090.97 | 64.44 | 54346.10 |
| 2012Q1 | 134266.18 | 66.86 | 53031.54 |
| 2012Q2 | 138126.29 | 69.04 | 53809.82 |
| 2012Q3 | 141456.23 | 71.10 | 55050.24 |
| 2012Q4 | 144256.02 | 73.04 | 56752.79 |
| 2013Q1 | 162835.16 | 77.50 | 61758.72 |
| 2013Q2 | 158050.81 | 78.16 | 63249.05 |
| 2013Q3 | 146212.50 | 77.66 | 64065.03 |

| | | | |
|--------|-----------|-------|----------|
| 2013Q4 | 127320.21 | 76.00 | 64206.65 |
| 2014Q1 | 50621.90 | 70.36 | 62624.00 |
| 2014Q2 | 37922.50 | 67.48 | 61836.87 |
| 2014Q3 | 38469.96 | 64.56 | 60795.36 |
| 2014Q4 | 52264.28 | 61.60 | 59499.45 |
| 2015Q1 | 127035.34 | 58.04 | 55646.04 |
| 2015Q2 | 148231.41 | 55.22 | 54762.61 |
| 2015Q3 | 163582.37 | 52.58 | 54546.03 |
| 2015Q4 | 173088.24 | 50.13 | 54996.32 |
| 2016Q1 | 164216.40 | 46.29 | 57791.64 |
| 2016Q2 | 167045.10 | 44.83 | 58904.37 |
| 2016Q3 | 169041.74 | 44.18 | 60012.68 |
| 2016Q4 | 170206.32 | 44.34 | 61116.59 |
| 2017Q1 | 167422.59 | 45.47 | 62650.31 |
| 2017Q2 | 168169.54 | 47.19 | 63571.69 |
| 2017Q3 | 169330.91 | 49.67 | 64314.96 |
| 2017Q4 | 170906.72 | 52.90 | 64880.12 |
| 2018Q1 | 173652.73 | 60.80 | 63889.72 |
| 2018Q2 | 175755.09 | 63.97 | 64649.65 |
| 2018Q3 | 177969.57 | 66.32 | 65782.47 |
| 2018Q4 | 180296.18 | 67.86 | 67288.16 |
| 2019Q1 | 188724.17 | 67.56 | 69558.35 |

| | | | |
|--------|-----------|-------|----------|
| 2019Q2 | 188879.32 | 67.88 | 71653.16 |
| 2019Q3 | 186750.87 | 67.79 | 73964.21 |
| 2019Q4 | 182338.84 | 67.29 | 76491.49 |
| 2020Q1 | 169064.30 | 64.60 | 81761.77 |
| 2020Q2 | 162716.66 | 64.01 | 83710.82 |
| 2020Q3 | 156717.01 | 63.72 | 84865.39 |
| 2020Q4 | 151065.35 | 63.74 | 85225.50 |
| 2021Q1 | 145761.66 | 64.07 | 84791.14 |
| 2021Q2 | 140805.97 | 64.71 | 83562.31 |
| 2021Q3 | 136198.25 | 65.66 | 81539.02 |
| 2021Q4 | 131938.52 | 66.91 | 78721.25 |

4.0 Results and discussion

4.1 Time Series Stability Tests

The research data was subjected to static and stability tests in order to find out the degree of stability with which the variable should be stable, which are the gross domestic product, foreign reserves and money supply. In this regard, two methods of static tests were used. Small or observations that are less than 60 observations. As for what is more than that, it can be described as large chains, which can be used using the extended Dickie Feller test and standing on the degree of inductiveness. It has been shown that the variables are of varying degrees, as in the following table:

Table 2. The stability of the data (GDP, foreign reserves, money supply)

| UNIT ROOT TEST TABLE (PP) | | | | |
|----------------------------------|---------------|----------------------------|-----------------|-----------------------------------|
| | | | <u>At Level</u> | |
| FR | CS | GDP | | |
| -2.1402 | -1.0969 | -1.4946 | t-Statistic | With Constant |
| 0.2299 | 0.7129 | 0.5306 | Prob. | |
| n0 | n0 | n0 | | |
| -1.7424 | -1.4806 | -2.2748 | t-Statistic | With Constant & Trend |
| 0.7219 | 0.8272 | 0.4417 | Prob. | |
| n0 | n0 | n0 | | |
| 0.5396 | 1.7202 | -0.4318 | t-Statistic | Without Constant & Trend |
| 0.8303 | 0.9785 | 0.5237 | Prob. | |
| n0 | n0 | n0 | | |
| | | | | |
| | | <u>At First Difference</u> | | |
| d(FR) | d(CS) | d(GDP) | | |
| -3.4740 | -3.4198 | -4.9135 | t-Statistic | With |

| | | | | |
|-----------------------------------|---------------|---------------|-----------------|-----------------------------------|
| | | | | Constant |
| 0.0116 | 0.0135 | 0.0001 | Prob. | |
| ** | ** | *** | | |
| -3.6026 | -3.4723 | -4.8938 | t-Statistic | With Constant & Trend |
| 0.0368 | 0.0504 | 0.0009 | Prob. | |
| ** | * | *** | | |
| -3.2622 | -2.9299 | -4.9204 | t-Statistic | Without Constant & Trend |
| 0.0014 | 0.0039 | 0.0000 | Prob. | |
| *** | *** | *** | | |
| UNIT ROOT TEST TABLE (ADF) | | | | |
| | | | | |
| | | | <u>At Level</u> | |
| FR | CS | GDP | | |
| -2.2094 | -2.2647 | -1.5135 | t-Statistic | With Constant |
| 0.2049 | 0.1865 | 0.5207 | Prob. | |
| n0 | n0 | n0 | | |

| | | | | |
|---------------|---------------|-----------------------------------|--------------|-----------------------------------|
| -2.2469 | -2.3284 | -2.5626 | t-Statistic | With Constant & Trend |
| 0.4566 | 0.4127 | 0.2984 | Prob. | |
| n0 | n0 | n0 | | |
| 0.2031 | -0.2371 | -0.3565 | t-Statistic | Without Constant & Trend |
| 0.7423 | 0.5968 | 0.5527 | Prob. | |
| n0 | n0 | n0 | | |
| | | | | |
| | | <u>At First Difference</u> | | |
| d(FR) | d(CS) | d(GDP) | | |
| -3.4195 | -1.4536 | -3.2015 | t-Statistic | With Constant |
| 0.0135 | 0.5503 | 0.0243 | Prob. | |
| ** | n0 | ** | | |
| -3.5274 | -1.8552 | -3.2315 | t-Statistic | With Constant & Trend |
| 0.0442 | 0.6655 | 0.0873 | Prob. | |
| ** | n0 | * | | |

| | | | | |
|--|---------------|---------------|--------------|-----------------------------------|
| -3.2438 | -1.0323 | -3.1450 | t-Statistic | Without Constant & Trend |
| 0.0015 | 0.2688 | 0.0021 | Prob. | |
| *** | n0 | *** | | |
| Notes: (*)Significant at the 10%; (**)Significant at the 5%; (***) Significant at the 1%. and (no) Not Significant | | | | |
| *MacKinnon (1996) one-sided p-values. | | | | |

Source: The work of the researcher based on the results of the program Eviews 12.0

4.2 Estimating the appropriate model

Estimating the parameters of the model: based on the results of static or stability, the regression model was chosen for the slow distributed gaps. One and similar to the foreign reserves according to the AKIK criterion of $n=$, as the lowest value, and so was the value of F calculated (257.1999) with a probability (0.000). The quality of the selected model was proven, and the results were as follows

Table 3. Elected model according to ARDL

Dependent Variable: GDP

Method: ARDL

Date: 01/04/23 Time: 23:37

Sample (adjusted): 2004Q4 2021Q4

Included observations: 69 after adjustments

Maximum dependent lags: 4 (Automatic selection)

Model selection method: Akaike info criterion (AIC)

Dynamic regressors (4 lags, automatic): CS FR

Fixed regressors: C

Number of models evaluated: 100

Selected Model: ARDL(3, 1, 1)

Note: final equation sample is larger than selection sample

| Prob.* | t-Statistic | Std. Error | Coefficient | Variable |
|---------|--------------------|------------|-------------|-------------|
| 0.0000 | 10.59478 | 0.121450 | 1.286733 | GDP(-1) |
| | | | - | |
| 0.2095 | -1.268268 | 0.199291 | 0.252754 | GDP(-2) |
| | | | - | |
| 0.1187 | -1.582721 | 0.122633 | 0.194093 | GDP(-3) |
| | | | - | |
| 0.2107 | -1.265076 | 0.999341 | 1.264243 | CS |
| 0.0750 | 1.811490 | 0.971860 | 1.760514 | CS(-1) |
| 0.1400 | 1.495340 | 679.0863 | 1015.465 | FR |
| | | | - | |
| 0.0951 | -1.695605 | 673.6713 | 1142.281 | FR(-1) |
| | | | - | |
| 0.7836 | -0.275823 | 5495.389 | 1515.753 | C |
| <hr/> | | | | |
| 96466.3 | | | | |
| 8 | Mean dependent var | 0.967229 | R-squared | |
| 73031.5 | | | | Adjusted R- |
| 6 | S.D. dependent var | 0.963468 | squared | |

| | | | |
|---------|--------------------|----------|--------------------|
| 22.0342 | Akaike info | | |
| 5 | criterion | 13958.71 | S.E. of regression |
| 22.2932 | | 1.19E+1 | |
| 7 | Schwarz criterion | 0 | Sum squared resid |
| 22.1370 | Hannan-Quinn | - | |
| 1 | criter. | 752.1815 | Log likelihood |
| 1.94525 | | | |
| 9 | Durbin-Watson stat | 257.1999 | F-statistic |
| | | 0.000000 | Prob(F-statistic) |

*Note: p-values and any subsequent tests do not account for model

selection.

Source: The work of the researcher based on the results of the program Eviews 12.0

Model (3, 1, 1) ,The ARDL method is based on selecting a specific model from among 20 proposed models. This model is the one with the shortest longitudinal wave, and it is the shortest and first model from the lower left side, according to the AkIkriterion, as follows:

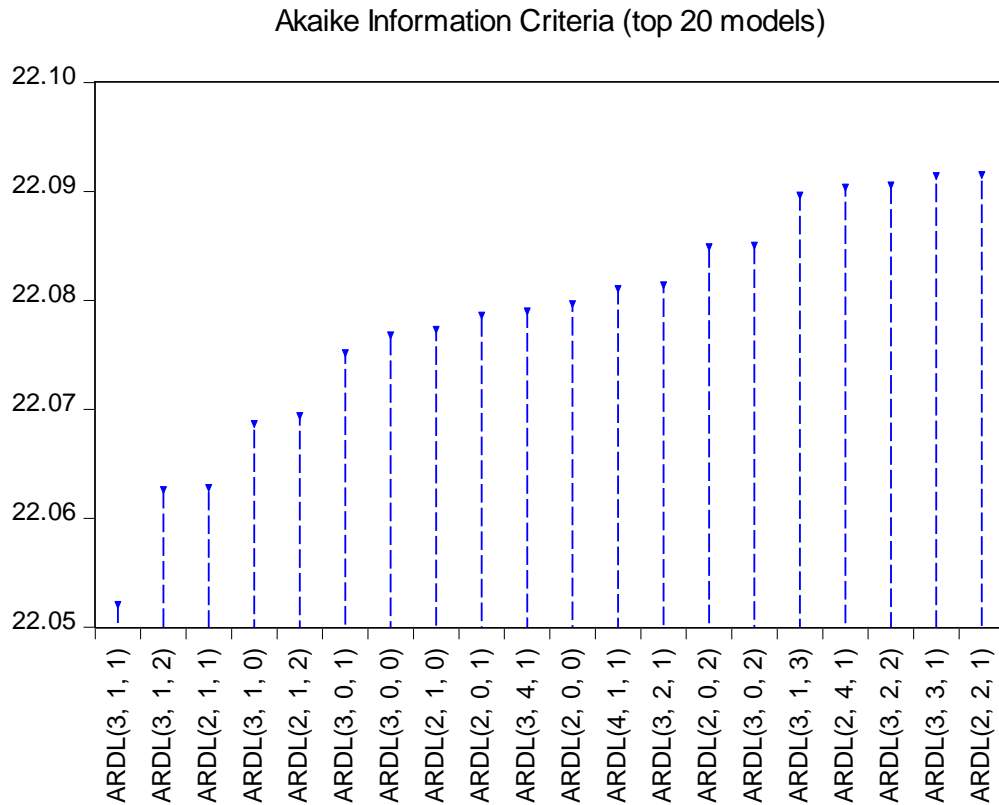


Figure 1. The longitudinal wave of the selected model

4.3 Boundary test

The following table shows the limits test, which is one of the two main tests on which the ARDL model is based. It can be seen that the F value calculated according to the limits test, which amounts to (3.199768), falls within the 10% significant level for medium and large samples, as follows:

Table 4. Boundary test

ARDL Long Run Form and Bounds Test

Dependent Variable: D(GDP)

Selected Model: ARDL(3, 1, 1)

Case 2: Restricted Constant and No Trend

Date: 01/04/23 Time: 23:39

Sample: 2004Q1 2021Q4

Included observations: 69

Conditional Error Correction Regression

| Prob. | t-Statistic | Std. Error | Coefficient | Variable |
|--------|-------------|------------|-------------|------------|
| 0.7836 | -0.275823 | 5495.389 | 1515.753 | C |
| 0.0010 | -3.453674 | 0.046361 | 0.160115 | GDP(-1)* |
| 0.0161 | 2.475992 | 0.200433 | 0.496271 | CS(-1) |
| 0.4746 | -0.719419 | 176.2755 | 126.8159 | FR(-1) |
| 0.0002 | 3.905932 | 0.114402 | 0.446847 | D(GDP(-1)) |
| 0.1187 | 1.582721 | 0.122633 | 0.194093 | D(GDP(-2)) |
| 0.2107 | -1.265076 | 0.999341 | 1.264243 | D(CS) |
| 0.1400 | 1.495340 | 679.0863 | 1015.465 | D(FR) |

* p-value incompatible with t-Bounds distribution.

Levels Equation

Case 2: Restricted Constant and No Trend

| Prob. | t-Statistic | Std. Error | Coefficient | Variable |
|-------|-------------|------------|-------------|----------|
|-------|-------------|------------|-------------|----------|

| | | | | |
|---|-----------|----------|----------|----|
| 0.0007 | 3.575888 | 0.866772 | 3.099478 | CS |
| | | | - | |
| 0.4672 | -0.731697 | 1082.459 | 792.0325 | FR |
| | | | - | |
| 0.7804 | -0.280010 | 33808.30 | 9466.678 | C |
| <hr/> | | | | |
| EC = GDP - (3.0995*CS -792.0325*FR - 9466.6781) | | | | |
| <hr/> | | | | |

Null Hypothesis: No levels
relationship F-Bounds Test

| I(1) | I(0) | Signif. | Value | Test Statistic |
|-----------|------|---------|---------|--------------------|
| Asymptoti | | | | |
| c: n=1000 | | | | |
| | | | 3.19976 | |
| 3.35 | 2.63 | 10% | 8 | F-statistic |
| 3.87 | 3.1 | 5% | 2 | k |
| 4.38 | 3.55 | 2.5% | | |
| 5 | 4.13 | 1% | | |
| Finite | | | | |
| Sample: | | | | |
| | n=70 | | 69 | Actual Sample Size |
| 3.445 | 2.73 | 10% | | |

| | | |
|---------------------------|-------|-----|
| 4.043 | 3.243 | 5% |
| 5.463 | 4.398 | 1% |
| Finite Sample: n=65 | | |
| 3.455 | 2.74 | 10% |
| 4.07 | 3.285 | 5% |
| 5.475 | 4.538 | 1% |

Source: The work of the researcher based on the results of the program Eviews 12.0

complement to the other tests, the significance of the integration parameter was proven. in addition to being negative, and this is the important thing in addition to the rest of the indicators that indicate the quality of the previously elected model, as follows:

Table 5. Long term form and significant integration parameter

ARDL Error Correction Regression

Dependent Variable: D(GDP)

Selected Model: ARDL(3, 1, 1)

Case 2: Restricted Constant and No Trend

Date: 01/04/23 Time: 23:40

Sample: 2004Q1 2021Q4

Included observations: 69

ECM Regression

Case 2: Restricted Constant and No Trend

| Prob. | t-Statistic | Std. Error | Coefficient | Variable |
|---------|--------------------|------------|-------------|--------------------|
| 0.0002 | 4.014880 | 0.111298 | 0.446847 | D(GDP(-1)) |
| 0.1078 | 1.632152 | 0.118919 | 0.194093 | D(GDP(-2)) |
| | | | - | |
| 0.1387 | -1.500468 | 0.842565 | 1.264243 | D(CS) |
| 0.1072 | 1.635141 | 621.0257 | 1015.465 | D(FR) |
| | | | - | |
| 0.0005 | -3.664496 | 0.043693 | 0.160115 | CointEq(-1)* |
| <hr/> | | | | |
| 1811.08 | | | | |
| 7 | Mean dependent var | | 0.383419 | R-squared |
| 16836.8 | | | | |
| 4 | S.D. dependent var | | 0.344882 | Adjusted R-squared |
| 21.9472 | Akaike info | | | |
| 9 | criterion | | 13627.63 | S.E. of regression |
| 22.1091 | | | 1.19E+1 | |
| 8 | Schwarz criterion | | 0 | Sum squared resid |
| 22.0115 | Hannan-Quinn | | - | |
| 2 | criter. | | 752.1815 | Log likelihood |
| | | | 1.945259 | Durbin-Watson stat |

* p-value incompatible with t-Bounds distribution.

Null Hypothesis: No levels
relationship F-Bounds Test

| I(1) | I(0) | Signif. | Value | Test Statistic |
|------|------|---------|---------|----------------|
| | | | 3.19976 | |
| 3.35 | 2.63 | 10% | 8 | F-statistic |
| 3.87 | 3.1 | 5% | 2 | K |
| 4.38 | 3.55 | 2.5% | | |
| 5 | 4.13 | 1% | | |

Source: The work of the researcher based on the results of the program Eviews 12.

4.4 Jarque-Bera test

The Jarque-Bera test shows that the values of the model are distributed normally.

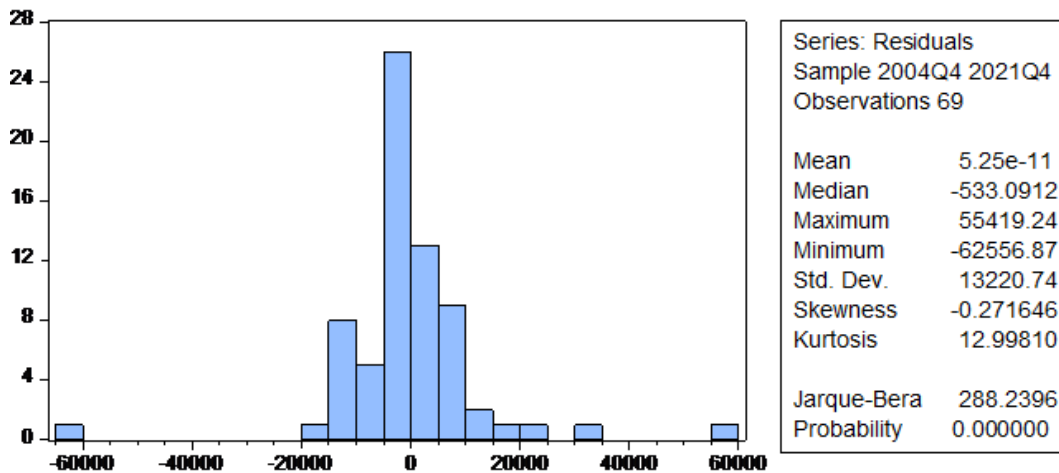


Figure 2. Jarque-Bera test

4.5. LM Test

The following test shows that the selected model does not suffer from the problem of serial correlation between random residues, since the probability value is (0.4432), in other words, we accept the null hypothesis H_0 , which states that the model does not suffer from the problem of autocorrelation, and we reject H_1 , and as In the following table:

Table 6. LM Test

Breusch-Godfrey Serial Correlation LM Test:

Null hypothesis: No serial correlation at up to 2 lags

| | | | |
|--------|---------------------|----------|---------------|
| 0.4432 | Prob. F(2,59) | 0.825099 | F-statistic |
| 0.3911 | Prob. Chi-Square(2) | 1.877382 | Obs*R-squared |

Breusch-Godfrey Serial Correlation LM Test:

Null hypothesis: No serial correlation at up to 2 lags

| | | | |
|--------|---------------------|----------|---------------|
| 0.4432 | Prob. F(2,59) | 0.825099 | F-statistic |
| 0.3911 | Prob. Chi-Square(2) | 1.877382 | Obs*R-squared |

4.6 CUSUM & CUSUM OF SQUARES

The first graph, which is the cumulative sum, shows that the behavior of the phenomenon proceeds within the critical limits, which is a positive indicator, and the researched time series does not suffer from future structural effects that may appear or occur in the near future. The fact that part of the time series has departed from the limits of the two critical paths, and the researcher believes that this comes from two problems, the first is related to data and the problem of obtaining it from its official sources in the Iraqi economy, which often suffers from anomalies because part of this data has been estimated and is not Realistic data, but sometimes government institutions may resort to estimating part of this data in order to secure the required time series as follows:

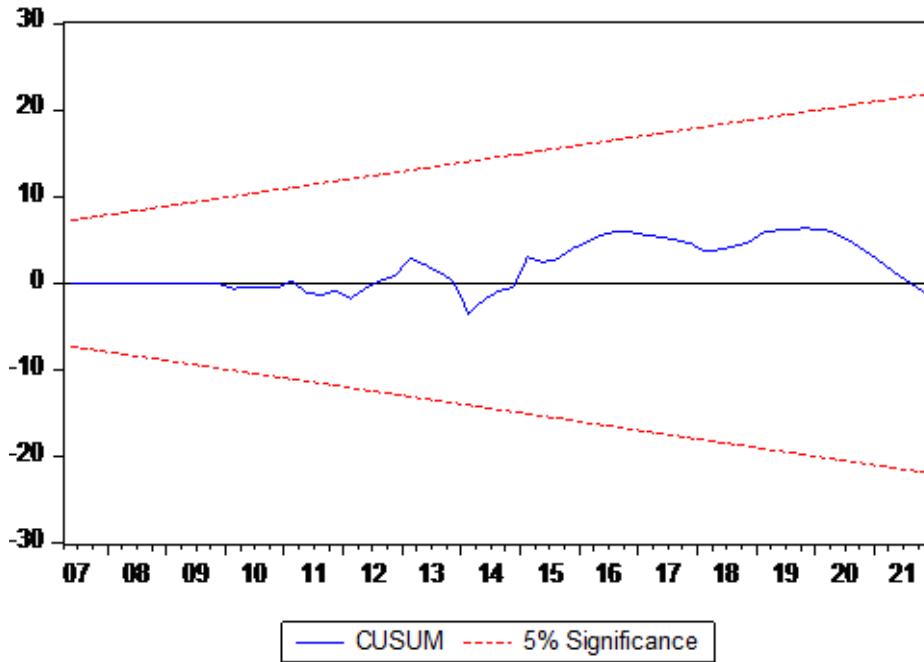


Figure 4. CUSUM

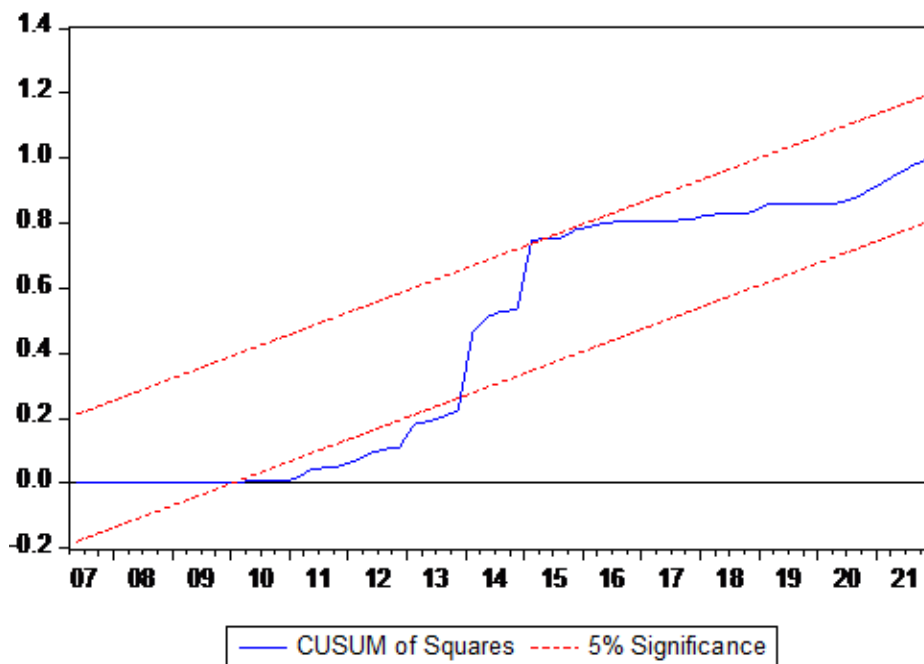


Figure 5. & CUSUM OF SQUARES

4.7 .Analysis and explanation of the results

As we indicated, the study aimed to determine the impact of some economic variables, which are both money supply and foreign reserves, on economic growth in Iraq, as the

(ARDL) model was estimated and statistical tests were used to study time series data. The results of the standard analysis reached the following:

- Through the study of the time series for each of the variables included in the model, which are the gross domestic product as non-dependent, foreign monetary reserves and money supply as independent variables, it was found that they were unstable at the level, which necessitated a slow process to stabilize the time series data, as it was found that the degree of integration was at the difference the first .
- It was found by estimating the model that there is a strong direct relationship between the dependent variable GDP and the independent variables of money supply and monetary reserves, which is consistent with the logic of economic theory.
- It was found through studying the residual tests that they are unbiased and have no effect on the time series, and that their distribution follows the normal distribution. Therefore, we can judge the validity of the estimated model in determining the relationship and indicating the level of effect.
- Based on the foregoing and by estimating the model, the growth of the Iraqi economy can be considered at acceptable levels in light of the problems it suffers from, the most important of which is that it is a unilateral rentier economy dependent on oil exports without relying on real production of goods and services.
- The standard study indicated that there is a close correlation through the coefficient of determination (R) between the amount of foreign exchange, money supply and economic growth. The call for an increase in the volume of oil production and then an increase in oil exports, through which Iraq was able to form cash reserves and thus use this stock to move the wheel of economic growth.

5. Conclusion

1- The close correlation between money supply and real output is a positive indicator of monetary stability.

2- The fluctuation in foreign reserves is one of the most important determinants of credit and financing risks, and is a sensitive indicator of the nature of this risk.

3- Access to a high accumulation of foreign reserves, and a monetary policy managed by an efficient professional authority that may secure the country's financial capabilities, the strength of its sovereignty, and its dealings with the outside world.

4- The issue of developing productivity is one of the most important sources of economic growth.

5- The Iraqi economy is characterized by various distortions in the productive structures, and it is a rentier economy with severe and rooted unilateralism, in addition to a pastoral economic policy with a consumerist nature in terms of employment and compensation.

6- Standard tests show that the selected model does not suffer from the problem of serial correlation between random residues, since the probability value is (0.4432).

7- It was found by estimating the model that there is a strong direct relationship between the dependent variable, GDP, and the independent variables of money supply and monetary reserves, which is consistent with the logic of economic theory.

8- The standard results proved the existence of a close correlation through the coefficient of determination (R), which amounted to 96% between the amount of foreign exchange, money supply and economic growth.

References

- Doan Van, D. (2020). Money supply and inflation impact on economic growth. *Journal of Financial Economic Policy*, 12(1), 121-136.
- Al-Tamimi, S. O. M., &Attia, S. H. R. (2022). The impact of monetary policy on economic growth in Iraq during the period (2003-2020). *Eurasian Journal of History, Geography and Economics*, 13, 79-87.
- Yusuf, A., &Mohd, S. (2021). The impact of government debt on economic growth in Nigeria. *Cogent Economics & Finance*, 9(1), 1946249.
- Rasool, H., Maqbool, S., &Tarique, M. (2021). The relationship between tourism and economic growth among BRICS countries: a panel cointegration analysis. *Future Business Journal*, 7(1), 1-11.

Shobande, O. A. (2019). Monetary policy spillovers through industrial growth in Nigeria: A time series analysis. *Economics and Business*, 33(1), 94-110.

Angelina, S., & Nugraha, N. M. (2020). Effects of Monetary Policy on Inflation and National Economy Based on Analysis of Bank Indonesia Annual Report. *Technium Soc. Sci. J.*, 10, 423.

Marhasova, V., Kovalenko, Y., Bereslavskaya, O., Muravskyi, O., Fedyshyn, M., & Kolesnik, O. (2020). Instruments of monetary-and-credit policy in terms of economic instability. *International Journal of Management*, 11(5).

Mishchenko, S., Naumenkova, S., Mishchenko, V., Ivanov, V., & Lysenko, R. (2019). Growing discoordination between monetary and fiscal policies in Ukraine. *Banks and Bank Systems*, 14(2), 40.

Shabbir, M. S., Bashir, M., Abbasi, H. M., Yahya, G., & Abbasi, B. A. (2021). Effect of domestic and foreign private investment on economic growth of Pakistan. *Transnational Corporations Review*, 13(4), 437-449.