

THE IMPACT OF MONETARY POLICY ON THE INDICATORS OF ECONOMIC STABILITY IN IRAQ FOR THE PERIOD (2005-2015)

MOHAMMED JUMAAH ALWAN¹ and AHMED HACHICHA²

¹ Candidate student at Professor at FSEG Sfax - Faculté des Sciences Économiques et de Gestion de Sfax, Tunisia. Email: mohmedjomaa70@gmail.com

² Professor at FSEG Sfax - Faculté des Sciences Économiques et de Gestion de Sfax, Tunisia. Email: ahmedhachicha20@yahoo.fr Orcid: <https://orcid.org/0000-0002-0617-2044>

Abstract

This study aims to show the importance and role of monetary policy in Iraq and analyze and measure the relationship between monetary policy and economic stability indicators in Iraq using econometric models, and using the Autoregressive Distributed Lag ARDL model and the Bound Test The relationship between the selected indicators (consumer price index) as a dependent variable and (money supply, GDP, interest rate and exchange rate) as independent variables, was measured for the period 2005-2015. As a result, the study reached the most important results of the positive relationship between the general level of prices, money supply, and GDP with a direct relationship compatible with economic theory, and a negative relationship between the general level of prices, interest rates and the exchange rate, which requires the effective use of monetary policy tools within the Iraqi economy.

Keywords: economic stability, monetary policy, money supply, exchange rate, ARDL

JEL Classification: C10, E51, E52.

Introduction

Monetary policy occupies a privileged position among the economic policies that have been used to solve the growing economic problems since the beginning of this century (twenty-one). The end of the last century, especially the eighties and nineties in many Arab countries, has witnessed a growing focus and interest in reforming and redirecting the economic path, especially when it comes to the emergence of global financial and economic crises and the worsening of many economic problems including unemployment, inflation, the increasing volume of external indebtedness, and public debt service. In addition, the budget deficit and the imbalance in the balance of payments, all these variables affected the indicators of economic stability, and led to the difference of ideas and divergence of monetary policy, which led to the emergence of monetary policy with a new appearance, and this appearance had a great impact in highlighting the role and importance of the monetary authority in influencing the rate of economic stability and growth, and there is no doubt that the central bank has the ability, monetary power and legal authority that enables it to issue many laws and legislation that will determine monetary manifestations For monetary policy in the Iraqi economy, whether it concerns the amount of credit granted to economic units, or the prevailing interest rate at the level of the monetary market and the amount of means of money available, and that one of the most important aspects that those in charge of monetary policy in any country of the world are interested in is to ensure the effectiveness of the monetary policy tools used by central banks

to achieve the economic and social goals that governments aspire to and plan to achieve a certain degree of economic stability and growth, and to achieve those goals. To achieve them, the Central Bank, responsible for drawing up and implementing monetary policy, must use quantitative and qualitative tools. Therefore, monetary policy affects all sectors and all individuals, and everything related to the economy and society. For the state to achieve its objectives, it must manage monetary policy at a high level and use specialists and experts when drawing the parameters of monetary policy to achieve the desired goals.

This leads us to the research problem the Monetary Authority in Iraq is currently facing major challenges in the process of achieving economic stability and promoting development in an accelerated manner, and bringing about a fundamental improvement in the standard of living, especially in light of the unstable security situation and the weak coordination between monetary and fiscal policy has greatly affected the speed and effectiveness of the tools used and the measures are taken, which raises the question: What is the relationship between monetary policy and economic stability? Is there an impact of this policy on stability in Iraq, and how much is its impact? To what extent has the Monetary Authority been successful in using its new instruments (such as foreign exchange auctions?)

Based on the research problem, we built the following hypotheses:

- 1- The study hypothesizes that monetary policy impacts the process of achieving economic stability; if used correctly, it will positively impact stability and vice versa.
- 2- What is the impact of monetary policy on the indicators of economic stability in Iraq under Law 56 of 2004, through which monetary policy began to emerge and develop qualitatively, which provided for a high degree of independence of the Central Bank in the work of its monetary policy.

This paper objective to demonstrate the importance and role of monetary policy in Iraq and analyze and measure the relationship between monetary policy and indicators of economic stability in Iraq.

The importance of the paper lies in the importance of the study comes in the statement of the role of monetary policy in achieving general economic stability and improving economic activity and thus bringing about economic stability in Iraq as one of the economic policies that have been used in achieving economic stability.

Previous studies

A study by Bassem Khamis Obaid Al-Shammari (2008) the aim of the study was to show the effectiveness of monetary policy in achieving economic stability within the limits of its traditional tools and the novelties it has created for these tools to reach the state of economic stability.

The study found that monetary policy was not able, through its direct qualitative tools, to control inflation due to the new monetary issuance in the nineties to meet government expenditures for the reconstruction of infrastructure that collapsed due to the wars in Iraq and the economic blockade imposed on it, but monetary policy after (2003) was able to maintain a

good exchange rate of the Iraqi dinar against the US dollar through foreign currency auctions compared to the previous period.

The study of Abdallah Khader Abtan (2008) the study aims to analyze the impact of monetary policy with its various tools in reducing inflation by analyzing the impact of monetary variables on the problem of inflation, and the study concluded that the ratio of the legal reserve is the quantitative tool through which monetary policy affects the overall national economy and is the most effective and influential policy in the money supply and inflation rates, especially in developing countries.

The study also found that the different exchange policies affect in different ways negatively and positively the flexibility of the national economy of foreign reserves and the development of banking and financial sectors, as it was positive to influence eleven countries and negative in the last two countries.

The study of Hamid Hassan Khalaf Al-Jubouri (2010) aimed to identify the trends and features of the new monetary policy in Iraq after the issuance of the last Law No. (56) Of (2004) and compare them with the trends before the issuance of the Law in light of the banking and monetary characteristics that characterize Iraq.

The study found that the Monetary Authority in Iraq, especially after the issuance of Law (56) of (2004), was able to reduce the rates of hyperinflation from (33.6%) in 2003 to (2.7%) in (2008), meaning that the Central Bank was able to after the issuance of its last Law and obtaining independence in the management of its monetary instruments by activating its indirect tools in reducing inflation and achieving relative stability in the general level of prices and improving the exchange rate of the Iraqi dinar against the US dollar, thus enhancing confidence. In addition, the public is in local currency. Therefore, it somewhat reduces the dollarization phenomenon using foreign currency auctions, remittance auctions, the open market process, and the liberalization of interest rates.

Monetary Policy in Iraq for the Period (2005-2015)

First: The reality of monetary policy in pre-Iraq (2003).

We can say that direct or qualitative tools are used more to reach the objectives required by the pre-2003 monetary policy, as the monetary policy in Iraq in the period before 2003 witnessed submission to the decisions of the political authority, especially concerning the policy of excessive monetary issuance followed by the Central Bank because Iraq is economically besieged, as the Central Bank represented (leverage) to cover the budget deficit unconditionally and excessively, which resulted in high inflation rates. The budget deficit in the state for 2002 amounted to (547160) million dinars, and the excessive cash issuance to finance the budget deficit or the so-called cheap cash led to a decrease in economic growth rates in real sectors and increased inflation rates, and adds that the economic environment in Iraq was unsuitable for foreign or domestic investments and repellent of real production and was an attractive arena for speculation due to high rates of inflation, as well as About the Iraqi economy, which is called one-sided because of its dependence on oil exports, whose revenues constitute more than

90% of the treasury expenditures, and therefore any exposure to oil prices reflects negatively on the Iraqi economy and on the general budget of the state, which is called the shock of the external model, and shows its impact on the public budget through high inflation rates, which is reflected on the value of the local currency and decreased its purchasing power, which leads to the transition of individuals to use other assets as a store of value. Instead of the dinar, the prevailing situation in Iraq is the use of the US dollar in foreign exchanges or its use as a store of value, which is called monetary substitution or dollarization of the economy, i.e. the use of foreign currency in place of the local currency and the Iraqi economy is called the dollarized economy, and this added another challenge to the monetary authorities, for which the central bank is responsible and to find a way out and radical solutions, and with the weak possibility of monetary policy before (2003) can be summarized a number of economic indicators in that period, The growth rate of the money supply was 56.13%, the annual growth rate of inflation was equivalent to 43.18%, the growth rate of the nominal exchange rate was 65.60%, and the internal public debt of 2001 (3552885) million dinars (Khazraji, 2010, 7).

Monetary policy has also been constrained by factors over five decades (Abdulhamid, 2001, 130).

1- The rentier nature of the Iraqi economy or the so-called unilateral economy, especially the oil ones, which made the money supply automatically linked to the financial position of the state and its spending policies

2 - The lack of coordination between the fiscal and monetary policies or the weak coordination between them, as the monetary policy has become in line with the fiscal policy and, at the same time, has been working to mitigate the negative effects on the Iraqi economy.

Second: The reality of monetary policy in Iraq after the year (2003)

Within the framework of the economic changes experienced by Iraq and the Iraqi economy after 2003 and the promulgation of the Central Bank Law No. 56 of 2004, which replaced the old Law of the Central Bank of Iraq No. 64 of 1976, the Central Bank took the lead and the Board of Directors of the Central Bank of Iraq issued instructions and directives and identified mechanisms, directives and instructions for monetary policy in Iraq to reach the basic central objectives, including raising the purchasing power of the Iraqi dinar, raising its value and maintaining its balance. Foreign currencies, especially against the US dollar, as well as one of the main objectives is to reduce inflation rates as well; and the formation and management of foreign reserves are responsible for issuing the currency and maintaining its value inside and outside Iraq (Al Doski et al., 2011). The Central Bank aims to maintain the value and stability of the Iraqi dinar in accordance with its Law No. (56) of (2004), and to maintain a stable and competitive monetary system based on the market and achieve stability, economic reform, welfare, and promotion. The economic growth in Iraq, which is a watershed in the legal, and regulatory framework of the financial system that operates positively by the Central Bank of Iraq, and Article (26/Section IV/Order 56/2004) states that the Central Bank is not allowed to provide direct or indirect credit to the government or any public institution except what is provided to liquidity by government commercial banks unlike the old Law of (1976) No. (64),

as well as the abolition of mandatory credit, and the establishment of a financial services court to consider decisions and orders issued by The Central Bank of Iraq, allowing external transfer and abolishing all restrictions and control over external transfers stipulated in the previous Law provided that the Anti-Money Laundering Law (No. 93 / 2004) is not violated, and as a result of the change in the objectives of the Central Bank in accordance with Law (56 of 2004), a change in the use of monetary policy tools in Iraq has changed and there has begun a clear trend in the use of quantitative instruments as monetary functions of the Central Bank of Iraq, Adoption and application of international standards through the preparation of statements and reports evaluated by the Central Bank of Iraq The financial situation in Iraq, the legislation of the Anti-Money Laundering Law (No. 93 of 2004) and for the first time in Iraq which is to protect financial institutions with regard to money laundering, terrorist financing and crime as a key factor in their financial transactions at the domestic and international levels, especially with the increasing external openness and rapid progress in capital transfers (Al Wadi et al., 2013)

Methodology and Data

The descriptive approach and legal analysis were followed because they are in line with the nature of the subject and the use of the necessary standard and statistical methods to study the relationship between the variables of monetary policy in order to reach certain results according to scientific criteria in order to interpret and analyze the most important monetary variables and use the program (EViews 10).

We analyze the Iraqi economy data for the period from the first quarter of 2005 to the last quarter of 2015, the determinants of fiscal and monetary impacts of inflation are analyzed using the co-integration method. Different tests allow testing the existence or lack of an integration relationship between the variables of an econometric model. However, the Co-Integration by Delay or Auto Regressive distributed Lags (ARDL) approach of co-integration proposed by Pesaran et al., (1999, 2001) is increasingly used in research. This choice is justified by the fact that this technique has the advantage of being more efficient for small sample studies and is applicable to the series to be integrated in order 1, level 0 or mutually integrated; in contrast to traditional integration tests such as those of Engle Granger (1987), the Johansen test (1988) and the Johansen and Juselius' test (1990). However, the technique ceases to be applicable when the series order of integration is greater than 1. Another advantage of this method is that it allows to estimate the long- and short-term dynamics in the same econometric model (Ali and Shoman, 2013). Our data for the ARDL specification of the relationship between the inflation (CPI), public expenditure and money supply is represented by equation 1:

$$\Delta\text{CPI} = c + \lambda\text{CPI}_{t-1} + \beta_1\text{X1}_{t-1} + \beta_1\text{X2}_{t-1} + \beta_1\text{X3}_{t-1} + \beta_1\text{X4}_{t-1} + \sum_{i=1}^n a_1\Delta\text{CPI}_{t-i} + \sum_{i=0}^m a_2\Delta\text{Exp}_{t-i} + a_2\Delta\text{MS}_{t-i} + \mu_t \dots \dots (1)$$

However, using the dependent variable in equation (1) at its long-term equilibrium level may not be immediate due to a possible change in one of its determinants. Thus, the adjustment speed between the short- and the long-term levels of the dependent variables can be captured by estimating the following error correction model (Gujarati DN 2003):

$$\Delta(Y_t) = c + \lambda Y_{t-1} + \beta X_{t-1} + \sum_{i=1}^n a_1 \Delta(Y_{t-i}) + \sum_{i=0}^m a_2 \Delta(X_{t-i}) + \mu_t \dots (1)$$

It is:

Δ =Represents the first difference

c = fixed limit

N, m represents the upper limits of time lag periods for independent and dependent variables.

λ =Error correction marker or percentage of short-term errors that can be corrected in the unit of time in order to return to long-term equilibrium.

β = Long-term models

a2.....1a Long-Term Parameters

i = Time

μ_t Limit Random Error

4.1: Standard test results for study variables using the ARDL model:

4.1.1: Characterization of study variables:

The first equation is presented according to the following formula:

$$Y = f(X1, X2) \dots (3)$$

Table 1: Designation of variables included in the model.

Variable	symbol
(CPI)consumer price index	Y
Extensive Money supply (M2)	X1
GDP	X2
Interest rate	X3
exchange rate	X4

Result and discussion

1. Dependent variable: Consumer price indices (Y): The inflation rate is directly related to the money supply because a greater money supply will lead to a decrease in the purchasing power of money (an increase in the number of monetary units used to buy the commodity itself), i.e.,

a rise in the general level of prices, and the price index is measured in units, and the change in it represents the rate of inflation.

2. Independent Variable Money Supply (1X): Refers to the net currency in circulation plus current deposits in the model being part of the money supply (MS1), which is in a million Iraqi dinars.

3. Gross Domestic Product (X2): It is expressed in GDP and is an aggregation measure of production carried out during a specified period. This variable is measured in a million Iraqi dinars and at constant prices for 2007.

4. Interest rate (X3): The cost of holding money is related to an inverse and direct relationship with the money supply—the more money supply, the lower the interest rate, which is a percentage.

4. Nominal exchange rate (X4): Measures the relationship between the local currency of the country and foreign currencies, and the increase in the money supply means the devaluation of the local currency against foreign currencies and means the number of units of the local currency paid for one currency of foreign currency will become larger, measured in Iraqi dinars.

Third: Study variables: The study variables consist of a time series as follows:

1- Time series stability test for study variables by Dickey-Fuller augmented (ADF).

The extended Dickey-Fuller test will be performed to see if the time series of variables used in the model is static or not, as shown in the following appendix (1):

From the Appendix (2) on the results of the stability of the time series of the study variables it is shown that the time series of the variable (Y) dependent variable which represents inflation is unstable at the level and after taking the first difference stabilized by the presence of a cutter and without a cutter and a general trend at a significant level (1%) while the time series of independent variables (X1, X2, X3) are stable at the level, with a cutter and without a cutter and a general trend at a significant level (1%, 5% and 10%), As for the variable (X4) did not stabilize at the level but stabilized after taking the first difference with a cutter and a cutter and a direction and without a cutter and direction at a significant level (1%, 5% and 10) through the results of the stability test for the above time series it was found that they stabilized at the level and at the first difference, so we conclude that the best model to test these variables is the model (ARDL) self-regression of distributed slowdown

Third: Bound Test Results

To test the extent to which there is a long-term equilibrium relationship (the existence of a common integration) between (Y) as a dependent variable and independent variables (x1,x2,x3,x4), a statistic (F) was calculated by testing the boundaries as shown in the table below:

Table 2: Results of the Joint Integration Test of Study Variables According to the Boundary Test

K (number of independent variables)	Value	Test Statistic
4	10.52	F-statistic
I1 Bound	I0 Bound	Level of morale
3.2	2.37	10%
3.67	2.79	5%
4.08	3.15	2.5%

It is noted from the table (2) above that the calculated value of (F) amounted to (10.52), which is greater than the maximum and minimum tabular value at a significant level (1%), which means that we reject the null hypothesis and accept the alternative hypothesis, meaning that there is a common integration relationship between the independent variables (X1, X2, X3, X4) and the dependent variable (Y), that is, the existence of a long-term equilibrium relationship.

Fourth: Results of estimating the parameters (flexibilities) of the short and long-term and the error correction parameter

After ascertaining the existence of a long-term equilibrium relationship between variables according to the boundary test, the short- and long-term estimates of the parameters of the estimated model and the error correction parameter should now be obtained.

Table 3: Results of short-term estimation

Level of significance Prob.	T-test value	Standard error	Flexibilities	Variables
0.0000	-5.079525	0.000162	1.65	X1
0.0174	-2.466584	0.000344	3.76	X2
0.0748	0.322357	0.000150	-2.09	X3
0.0837	-1.944681	0.000223	-0.134	X4
0.0000	-7.564230	0.004398	-0.033266	CointEq(-1)
R²= 0.64 Adj.R²= 0.62				

From the results of the above table of the results of estimating the relationship between the indices (Y) as a dependent variable and the independent variables (X1, X2, X3, X4) in the short term, it was shown that the relationship between (X1) and (Y) is direct and significant at the level of (1%), that is, the increase in the money supply by one monetary unit leads to an increase in the index by (1.65). In comparison, the relationship between (X2)) and (Y) is direct and significant at the level of (5%), i.e., increasing GDP by a monetary unit leads to an increase in

the index by (3). 76); as for the relationship between (X3) and (Y), it is inverse and significant at the level of (10%), i.e., increasing the interest rate by one monetary unit leads to a decrease in the index by -2.09), while the variable (X4) is related to an inverse relationship with variable (Y), i.e., the increase in the exchange rate By one monetary unit leads to a decrease in the index to (-0.134)

The error correction parameter (CointEq(-1) was found to be negative and significant and amounted to (-0.033266), meaning that (3.32%) of short-term errors are automatically corrected over time to reach long-term equilibrium, or in other words, about (3.32%) of the imbalance in the last year's shock was corrected in the current year which means that there is a long-term equilibrium relationship between the study variables, We also note that the explanatory force (Adj.R²) of the estimated model was (0.62), i.e., the independent variables included in the estimated model (X1, X2, X3, X4,) explain about (62%) of the changes in the dependent variable (Y) and the remaining (38%) are random variables that the model did not take into account, and these variables represent the effects of the random variable on the dependent variable

Table 4: Results of Estimating the Long-Term Function

Level of significance Prob.	T-test value	Standard error	Flexibilities	Variables
0.04718	0.725533	0.010029	4.87	X1
0.04680	-0.731872	0.022787	1.99	X2
0.04230	-0.808438	0.004732	-7.09	X3
0.0590	-2.160897	0.000437	-22.47	X4
0.02924	1.065175	115.2334	122.7438	C

As for the long-term results of estimating the relationship between the variables, the results showed that the impediment between (X1) and (Y) is direct and significant at the level of (5%), while the relationship between (X2) and (Y) is direct and significant at the level of (5%), while the relationship between (X3) and (Y) is inverse and significant at the level of (5%), The relationship between X4 and Y is inverse, in addition to the fact that the constant of the function (C) is also significant at the level of (5%)

Fifth: Self-correlation and heterogeneity test of variance in the ARDL model

The estimated models are tested to ensure that they are free of the problem of self-correlation (sequential correlation between values) using the **Breusch-Godfrey Serial Correlation LM Test** and the use of the **Heteroskedasticity Test: ARCH** to ensure that the estimated models are free of the problem of heterogeneity of variance at a significant level (5%) of the relationship between variables

Table 5: Results of the Self-Correlation and Heterogeneity Test of Variance

Breusch-Godfrey Serial Correlation LM Test			
0.9922	Prop. F	0.343179	F- statistic
0.9617	Prob. Chi-Square	10.33454	Obs*R-squared
Heteroskedasticity Test: ARCH			
0.4086	Prop. F	0.694368	F-statistic
0.3987	Prob. Chi-Square	0.712252	Obs*R-squared

We note from the tables (5) above that the estimated ARDL model is free of the problem of self-correlation according to the **Breusch-Godfrey Serial Correlation LM Test**, i.e., we accept the null hypothesis that states that there is no problem of self-correlation because of the value of (Prop. F) and Prob. Chi-Square) is insignificant at a significant level (5%), and we reject the alternative hypothesis and the absence of the estimated model from the problem of heterogeneity where the values of both Prob. Chi-Square) and (Prop. F) Insignificant at the level of (5%) according to the Heteroskedasticity Test: ARCH.

Sixth: Testing the stability of the estimated model using the CUSUM test, CUSUM Squares)

The stability test of the estimated ARDL model is one of the important tests to ensure that the data used in the study is free of any structural changes in it, using the cumulative sum of residue test (CUSUM), as well as the cumulative sum of the horn squares (CUSUM sum of Squares), and these two tests are one of the most important tests in this field because they clarify two important things, namely the statement of the existence of any structural change in the data, and the stability and harmony of long-term parameters with short parameters In the term, such tests are always associated with the ARDL methodology, so if the graph of both tests (CUSUM SQ) (CUSUM) within the framework of the critical boundary at the level of (5%) means that all the estimated parameters are stable. Therefore, there are no structural changes, and vice versa.

We note from Figure (1) and Part CUSUM) that the cumulative sum of the residues within the limits of critical values at a significant level (5%), and this indicates the stability of the estimated parameters in the short term, while the part (CUSUM of Squares) shows the cumulative sum of the residual squares was within the limits of critical values at a significant level (5%), and it is clear from the tests (CUSUM) and (CUSUM of Squares) that there is stability and harmony in the model between the results of the long term and the results of the short term.

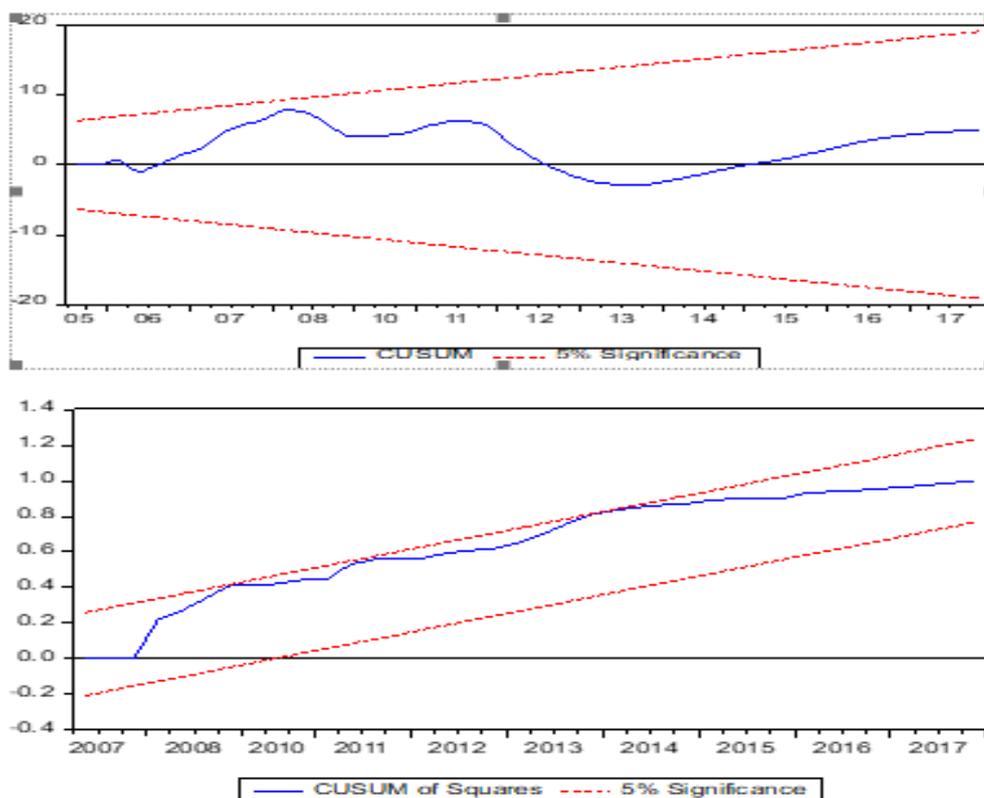


Figure 1: Stability test results of the estimated model

Conclusions:

The tools of monetary policy in Iraq changed after 2003. New tools were used, the most prominent of which are auctions selling foreign currency, and monetary policy in Iraq contributed to increasing the level of inflation through the rise of the general level of prices, and in order to reduce the level of inflation, worked to reduce the nominal exchange rates. In addition, monetary policy in Iraq contributed to increasing the level of investment by lowering the level of interest rate (Taylor's Law), and the results of analysis and measurement represented as follows:

First: The analytical aspect: The results of the analysis of the relationship between monetary policy and economic stability indicators showed the following relationships, the positive reference between the general level of consumer prices and both (money supply as well as GDP), i.e., the relationship between them is direct between them, and the signal is negative between the general level of consumer prices and both interest rates and exchange rates, that is, the inverse relationship between them.

From these conclusions, we suggest the following:

1. The need to use monetary policy tools in parallel and with the least risks in monetary stability to serve the objectives of economic stability, achieving monetary stability, and encouraging elements of aggregate demand for goods and services.
2. The Iraqi economy suffers from structural imbalances, which require activating the role of monetary policy along with economic policies to achieve economic stability.
3. Work to balance the real and monetary sectors by achieving a balance between the monetary mass and GDP.
4. Finding an alternative to the policy of linking the exchange rate of the dinar with the dollar, which is now used as a factor for the basic stability of monetary policy and a fundamental pillar of banking stability, and the alternative is to use the Iraqi dinar in all financial and monetary transactions. The purpose is to raise the value of the Iraqi dinar in addition to getting rid of the phenomenon of dollarization (i.e., the use of the dollar in all transactions) and even in import and export operations as a strong and moral alternative to monetary policy in general and the Iraqi dinar in particular.
5. Stimulate the investment process, especially local investors, in stimulating and increasing their investments, which supports the GDP.
6. Work to stimulate private banks in moving towards the local market and support monetary policy in providing and securing bank credit required by commercial banks, to work to increase GDP and address unemployment and deflation and thus achieve economic stability.
7. Coordinate monetary and fiscal policy more to achieve greater economic stability.
8. Continue the foreign currency auctions used by the Central Bank within the Open Market Operations tool to withdraw liquidity in case of inflation and inject liquidity in deflation.
9. Continue to confront the general rise in prices, which generates inflation through the price signals of the Central Bank of Iraq.
10. Implementing Law 56 of 2004 and giving greater freedom to the monetary policy pursued by the Central Bank and not taking the Central Bank as a mechanism (leverage) and using it to finance the budget deficit but working more to separate the Central Bank from the government.
11. Work on organizing the sale at the currency auction to ensure the protection of the reserve of the Central Bank and conduct control over the financial exchange markets like the financial markets in Baghdad and other Iraqi cities.

Reference

- 1) Abdulhamid, A. (2001). Economic policies at the national economic level (macro-analysis) (Vol. first edition). Egypt: Niles Arab Publishing Group.
- 2) Al Doski, A. S., Al Awali, N. F., & Hussain, A. A. (2011). The impact of fiscal and monetary policies on inflation in the Iraqi economy for the period 2003-mid-2010. Tikrit Journal of Administrative and Economic Sciences, 23, pp. 97-115.

- 3) Al Rufaeei, I. M. (2007). general liquidity and the effectiveness of monetary policy in controlling it, with an operational signal for Iraq. Unpublished doctoral thesis, 29. Baghdad: Faculty of Administration and Economics, University of Baghdad.
- 4) Al Wadi, M. H., Al Assaf, A. A., & Safi, W. A. (2013). Macroeconomics (Vol. third edition). Amman: The Maserah Printing and Publishing House.
- 5) Ali, H., & Shoman, A. H. (2013). Analysis of the long-term equilibrium relationship using unit root tests and the method of integrating self-linked models and delay distribution models (ARDL). *Journal of Economics*, 34(9), p. 186.
- 6) Alzabari, S.A.H., Talab, H.R., Flayyih, H.H. (2019). The effect of internal training and auditing of auditors on supply chain management: An empirical study in listed companies of Iraqi stock exchange for the period 2012-2015. *International Journal of Supply Chain Management*, (5), pp. 1070–1075.
- 7) Angelina, S., & Nugraha, N. (2020). Effects of Monetary Policy on Inflation and National Economy Based on Analysis of Bank Indonesia Annual Report. *Technium Soc. Sci. J.*, p. 423. Retrieved from https://heinonline.org/HOL/Page?collection=journals&handle=hein.journals/techssj10&id=423&men_tab=srchresults
- 8) Batarseh, A. (2021). The nature of the relationship between the money supply and inflation in the Jordanian economy (1980–2019). *Banks and Bank Systems*, 16(2), 38
- 9) Castillo, C. (2014). Inflation targeting and exchange rate volatility smoothing: A two-target, two-instrument approach. *Economic Modelling*, pp. 330-345. doi:<https://doi.org/10.1016/j.econmod.2014.08.011>
- 10) Central Bank of Iraq . (2005-2019). *Economic and Statistic data CBIESD*. Baghdad, Iraq.
- 11) Choi, W., & Oh, S. (2000). Endogenous money supply and money demand. IMF working paper. Retrieved from Choi, Woon Gyu and Oh, Seonghwan, Endogenous Money Supply and Money Demand (November 2000). IMF Working Paper No. 00/188, Available at SSRN: <https://ssrn.com/abstract=880285>
- 12) Eita, J., Manuel, V., Naimhwaka, E., & Nakusera, F. (2021). The Impact of Fiscal Deficit on Inflation in Namibia. *Journal of Central Banking Theory and Practice*, 1, pp. 141-164. doi:DOI: 10.2478/jcbtp-2021-0007
- 13) Gujarati, D. N. (2003). *Basic Econometrics 4th edition* McGraw Hill: New York.
- 14) Hani, A. (2006). *The Currency and money*. Algeria: The Algerian Publications Office.
- 15) Jarallah, R. O., & Thanon, M. A.-A. (2013). Measuring the impact of fiscal development on economic growth in a sample of developing countries using the Distributed Delay Self-regression Model (ARDL). *Rafidain Development Journal*, 114(35), pp. 31-47.
- 16) Joshi, U. (2021). Effect of Money Supply on Inflation in Nepal: Empirical Evidence from ARDL Bounds Test. *International Research Journal of MMC*, 1, pp. 84-98. doi:DOI: <https://doi.org/10.3126/irjmmc.v2i1.35134>
- 17) Khalil, S., & Dombrecht, M. (2011). The Autoregressive Distributed Lag Approach to co-integration testing: application to opt inflation. *PMA WORKING PAPER*, pp. 2-15.
- 18) Narayan, P. K. (2004). Reformulating Critical Values for the Bounds Fstatistics Approach to Cointegration: An Application to the Tourism Demand Model for Fiji. *Department of Economics Discussion*, 4, p. 11.
- 19) Ofori, C., Danquah, B., & Zhang, X. (2017). The impact of money supply on inflation, a case of Ghana. *Imperial Journal of Interdisciplinary Research*, 1, pp. 2312-2318. Retrieved from https://scholar.google.com/scholar?hl=ar&as_sdt=0%2C5&q=The+Impact+of+Money+Supply+on+Inflation%2C+A+Case+of+Ghana&btnG=

- 20) Patrizio, T. (2016). Public finance and the optimal inflation rate. Report. Department of Communication, University of Teramo.
- 21) R, S. A. (2014). ARDL Bounds Testing Approach to Cointegration A RE-Examination Of Augmented Fisher Hypothesis in an Open Economy. *Asian Journal of Economic Modelling*, 2, pp. 103-114.
- 22) SAEED, H. S., HASAN, S. I., NIKKEH, N. S., & FLAYYIH, H. H. (2022). THE MEDIATING ROLE OF SUSTAINABLE DEVELOPMENT IN THE RELATIONSHIP BETWEEN PRODUCER COST EXPECTATIONS AND CUSTOMER DESIRES. *Journal of Sustainability Science and Management*, 17(10), 13–21. <https://doi.org/10.46754/jssm.2022.10.002>
- 23) Saleh, M. M. (2012). the monetary policy of the Central Bank of Iraq and the paradox of prosperity in a ritual economy. 2. Baghdad: Central Bank of Iraq.

Appendix

Appendix No 1 Study variables (44) View quarterly data

	X1	X2	X3	X4	Y
Year	Money Supply	(GDP)	interest rate	Exchange rate	Records
2005Q1	10357562	100536681.04375	7.068249999999	1423.8125	39.328125
2005Q2	10960263.5	102703690.35625	6.76575	1462.6875	46.496875
2005Q3	11700475.75	104634908.05625	6.848750000000002	1488.4375	53.484375
2005Q4	12578198.75	106330334.14375	7.317250000000005	1501.0625	60.290625
2006Q1	13593432.5	107789968.61875	8.171250000000006	1500.5625	66.915625
2006Q2	14746177	109013811.4812501	9.410750000000008	1486.9375	73.359375
2006Q3	16036432.25	110001862.7312501	11.035750000000001	1460.1875	79.621875
2006Q4	17464198.25	110754122.36875	13.046250000000001	1420.3125	85.703125
2007Q1	19340805.00000001	109570981.425	18.41131249999999	1311.0625	94.415625
2007Q2	20919060.50000001	110531501.425	20.00518749999999	1267.4375	99.009375
2007Q3	22510294.75000001	111936073.4	20.79693749999999	1233.1875	102.296875
2007Q4	24114507.75000001	113784697.35	20.78656249999999	1208.3125	104.278125
2008Q1	25351438.71875	117983498.978125	18.697968750000001	1210.15625	99.0781250
2008Q2	27133713.53125	119957776.596875	17.593781250000001	1197.09375	100.796875
2008Q3	29081071.40625	121613655.909375	16.197906250000001	1186.46875	103.559375
2008Q4	31193512.34374999	122951136.915625	14.510343750000001	1178.28125	107.365625
2009Q1	33050406.03125001	122563622.303125	10.9684375	1175.03125	117.3875
2009Q2	35661265.21875001	123826945.621875	9.322562500000004	1170.71875	121.2125
2009Q3	38605459.59375001	125334509.559375	8.010062500000004	1167.84375	124.0125
2009Q4	41882989.15625001	127086314.115625	7.030937500000004	1166.40625	125.7875
2010Q1	46907351.09375001	129375928.384375	6.854093750000004	1170	123.35
2010Q2	50286152.15625003	131498786.540625	6.354156250000005	1170.00000	124.35
2010Q3	53432889.53125003	133748457.678125	6.000031250000005	1170.0000	125.6
2010Q4	56347563.21875002	136124941.796875	5.791718750000008	1170.0000	127.1
2011Q1	59929466.8125	137402438.896875	6.054687500000001	1170.625	129.31875
2011Q2	62020295.6875	140522868.978125	6.007812500000001	1170.375000	131.13125
2011Q3	63519343.4375	144260432.040625	5.976562500000001	1169.8750000	133.00625
2011Q4	64426610.06249999	148615128.084375	5.960937500000001	1169.1250000	134.94375
2012Q1	61882462.90625001	156299269.9062499	6.000000000000001	1166.875	137.94375
2012Q2	62750020.34375001	160803306.79375	6.000000000000001	1166.1250000	139.60625
2012Q3	64169649.71875001	164839551.5437499	6.000000000000001	1165.6250000	140.93125
2012Q4	66141351.03125002	168408004.1562499	6.000000000000001	1165.3750000	141.91875

2013Q1	71895085.21875001	172223155.740625	6.000000000000001	1166	141.63125
2013Q2	73678946.03125001	174570227.634375	6.000000000000001	1166.0000000	142.31875
2013Q3	74722894.40625001	176163710.946875	6.000000000000001	1166.00000000	143.04375
2013Q4	75026930.34375001	177003605.678125	6.000000000000001	1166.00000000	143.80625
2014Q1	72934414.00000002	174025892.484375	6.000000000000001	1165.84375	144.871875
2014Q2	72421281.00000002	174584217.790625	6.000000000000001	1165.9062500	145.603125
2014Q3	71830891.50000002	175614562.253125	6.000000000000001	1166.03125000	146.265625
2014Q4	71163245.50000005	177116925.871875	6.000000000000001	1166.21875000	146.859374
2015Q1	70418343.00000005	179091308.646875	6.000000000000001	1166.46875000	147.384374
2015Q2	69596184.00000005	181537710.578125	6.000000000000001	1166.78125000	147.840624
2015Q3	68696768.50000006	184456131.665625	6.000000000000001	1167.15625000	148.228124
2015Q4	67720096.50000006	187846571.909375	6.000000000000001	1167.59375000	148.546874

Source: Prepared by the researcher based on:

docky-Fuller Extended Test (ADF)						
Vector	audition	At Level				
		X4	X3	X2	X1	Y
Just categorical.	t-Statistic	-2.089836	-1.114196	-3.273290	-2.645467	1.141169
	Prob.t	0.2506	0.6785	0.0405	0.1136	0.9925
	Stationarity	no	no	**	no	no
The conclusive and general direction	t-Statistic	-1.769099	-3.396825	-2.887485	2.800538	-0.706063
	Prob.t	0.6645	0.1035	0.1999	1.0000	0.9256
	Stationarity	no	no	no	no	no
Without a definite and general direction	t-Statistic	-0.172420	-1.638350	-0.684837	-5.716714	0.716399
	Prob.t	0.6062	0.0937	0.4006	0.0001	0.8478
	Stationarity	no	*	no	***	no
(At the first difference) At First Difference						
Vector	audition	X4	X3	X2	X1	Y
Just categorical.	t-Statistic	-3.542159				-7.728569
	Prob.t	0.0243				0.0004
	Stationarity	**				***
The conclusive and general direction	t-Statistic	-3.612262				-1.894555
	Prob.t	0.0693				0.5500
	Stationarity	*				no
Without a definite and general direction	t-Statistic	-3.573914				-8.988708
	Prob.t	0.0018				0.0000
	Stationarity	***				***

* Ministry of Planning, Central Bureau of Statistics, Department of National Accounts, Annual Bulletin (2005-2015).

**Central Bank of Iraq General Directorate of Research and Statistics, Annual Bulletin (2005-2015).

Appendix No 2 Table of Results of the Time Series Stability Test of Study Variables by Dickie Fuller Extended (ADF)

Notes: a: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1%. And (no) Not Significant