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The role of some monetary and financial policy indicators in developing gross domestic product growth: An analytical and measurement study in Iraq

Mohammed Medloal Ali Al-Sultan[1], Heyder G. Wannes Alkarawy[2*], Mohammed Mohaisen Abdulridha[3]
[1]Department of Economics, Faculty of Administration & Economics, University of Babylon, Republic of Iraq; bus.mohammed.madl.ool@uobabylon.edu.iq (M.M.A.A.S.).
[2,3]Department Accounting, College of Administration and Economics University of Babylon, Iraq; bus.heyder.wannes@uobabylon.edu.iq (H.G.W.A.); mohammed.abdulredae@uobabylon.edu.iq (M.M.A.).

Abstract: We aim to show the basic features of monetary variables and the nature of the work of monetary policy instruments, and to try to keep pace with the changes that accompanied the action of this policy for the period between 2000–2022. We find that economic stagnation negatively affects economic growth, with increasing bottlenecks affecting the economy in the short term in Iraq. However, elucidating the fundamental characteristics of monetary variables and functioning of monetary policy indicators, such as the money supply, exchange rate, and interest rate, remains a complex task. We used the standard and analytical approach for the results established for monetary policy, the general framework, and analysis of tools, gross domestic product, economic growth, and the impact of monetary policy on economic activity in Iraq for the highest, medium, and low. Through the research, results, the independent variables have a positive effect on the dependent variable that is, increasing the gross domestic product (GDP) for a previous period by one-unit leads to an increase in the gross domestic product (GDP). According to these data, the study presented the necessity of working with monetary policy in Iraq in a way that increases the growth of the gross domestic product. Therefore, it is necessary for monetary policy to work to control the monetary mass by achieving a balanced proportion between the monetary mass and the gross domestic product in order to reach balance between real and cash.

Keywords: *Economic growth, Monetary policy indicators, Monetary policy tools, Monetary policy.*

1. Introduction

The long-term priority of any country's economic policy is to stimulate economic growth and maintain the pace of development at a stable level. The implementation of an effective monetary policy, based on a thorough operational analysis of its mechanisms affecting economic growth, it is a basic condition for achieving this goal. Monetary policy exercises its role through a range of direct monetary measures and indirect monetary instruments, in addition to the modernization of some indirect monetary instruments, as it occupies a key place in most economies of the world, and this importance increases with the expansion of domestic and global exchanges under the international economic system, as a result of the high capacity of this policy to cope with economic shocks and control imbalances and vibrations in the economy, especially monetary, as it leaves a clear impact on the stability of prices, interest rates, and the exchange rate [1-4].

Several studies were included, including those by Alloush and Hussein [5]; Al-Muhammadi and Al-Fahdawi [6], and Mohammed and Kazem [7] on the impact of monetary policy variables on the gross domestic product in Iraq for the period 1990-2020. Given the current economic and financial market instability, the Central Bank of Iraq is increasingly playing a crucial role in resolving complex problems.

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* Correspondence: bus.heyder.wannes@uobabylon.edu.iq

Related to ensuring that the level of well-being of Iraqi citizens is maintained and increased, which is one of the basic requirements for economic growth. One of the state's main economic tools in solving the problems of organizing the economy is the monetary policy pursued by the Central Bank of Iraq. Implementing an effective monetary policy in conditions of increasing economic uncertainty caused by unfavorable external economic and political factors is impossible without improving the system of monetary policy instruments, as well as evaluating the effectiveness of the application of existing mechanisms for regulating the economy [8, 9]. Therefore, the research highlights the potential of monetary policy in stimulating economic growth in Iraq by addressing the basic tools for achieving monetary stability and internal and external balance of Iraq, as well as the direct measures inherent in the general instruments of monetary policy, and the analysis of the relationship between GDP and economic growth, and the impact of monetary policy on economic activity in Iraq. The study also addressed the standard analysis of monetary policy's effects on economic growth by testing the stability of the time chains of variables. The significant slowdown in real economic growth in Iraq and the instability of a number of macroeconomic indicators resulting from geopolitical shocks determine the importance of this study. We organize our paper according to: Section 2 presents the literature review; Section 3 outlines the research methodology; Section 4 presents the empirical results and discussion; and Section 5 concludes the paper with a discussion of possible implications and recommendations for further research.

2. Literature Review

For commercial banks in Iraq, there is a lot of literature that clarifies the relationship between monetary policy and banking liquidity. Almashhadani and Al-Touma [10] studied the relationship between monetary policy tools and bank liquidity and analyzed it to find out its impact on economic growth through the nature of the monetary tools used by the monetary authority to achieve its objectives and the statement of the duration of internal monetary stability, shift towards a market economy through the forces of supply and demand, activating the market economy mechanisms through a set of technical and legislative measures, relying on indirect tools, and modernizing direct tools. In their study, Mohammed and Kazem [7] also dealt with the role of monetary policy in managing macroeconomic stability in Iraq. Through an inductive approach based on the use of quantitative methods to find out the contribution of monetary policy to the general stability of the economy, the conclusions that proved his hypothesis showed, emphasizing the relative economic stability achieved in Iraq behind its monetary policy through the exchange rate index used to target inflation and the reference interest rate, which was used to address inflation and reduce the speed of inflation when trading money. In addition, many studies focused on the impact of monetary policies, including Mikhailovna [11] and Beda, et al. [2] other researchers, whose studies dealt with the impact of monetary policy on economic variables in Iraq by showing the impact of monetary policy on economic variables. Also, studies measuring the effectiveness of monetary policy, including Alloush and Hussein [5] and Bandar [12] measure the effectiveness of monetary policy in achieving banking sustainability in the Iraqi economy to determine the impact of the effectiveness of monetary policy. It is clear from the previous review of studies that the current research differs from most of these studies in terms of the study community and the temporal and spatial boundaries and variables used, and highlights the scientific contribution of this study compared to previous studies applied in the Iraqi economy, using modern standard models based on the test of stability of the time series of variables and methodology (ARDL). For this reason the research is an update in addition to previous research in the field of monetary policy and the Iraqi economy.

2.1. The Concept of Monetary Policy

According to the researchers Al-Mustafa and Aws [13] and Mahmoud and Israa [14] historically, the question of the impact of monetary policy on economic development goes back to the work of A.

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Smith, who believes that the concept of monetary regulation of the economy has received a great development in terms of the stability of the time series of variables and thus achieving stability in prices.

Monetary policy is one of the main tools for economic stability in its impact on macroeconomic variables through its direct or indirect tools that have the ability to direct the work of the central bank in order to achieve the goals of economic policy and thus the gross domestic product [15-17]. The changes made by monetary policy have a significant impact on financial markets in particular and economic growth in general by raising or lowering the standard rates of the economy, and this work is done through the supply of money, interest rates, and the exchange rate [18-21].

Monetary policy is defined as the policy that affects the money supply and the availability of credit through changing bank reserves in the economy [22]. It is also defined as a policy that covers all monetary decisions and procedures, regardless of whether their objectives are monetary or non-monetary, as well as all non-monetary measures aimed at influencing the monetary system [23]. In the national economy (work directed at influencing cash and credit as well as government borrowing, i.e., the size and composition of government debt [22]).

Monetary policy also includes starting to inject the economy with a certain amount of cash from the bank or central bank in a way that ensures a reduction in interest rates. According to Keynes, this monetary stimulus should work to increase production and reduce unemployment in the event of a recession [7, 23-26]. It is known that monetary policy can exert very important effects, and even complement financial policy in general, through its influence on interest rates in order to achieve the goal of curbing the effects of economic instability and reducing inflationary pressures in the economy, in cases of the merging of the two effects (recession and unemployment) [22, 27-30].

The requirements of reserves in the economy, and most of their interest in such situations, is to increase cash flow, as the increase in the supply of cash reduces the cost of borrowing, which entails known effects, the most important of which is the reduction of returns that individuals can receive if they invest their money in assets that generate income rather than retaining it in the form of liquid cash balances [3, 11, 31-33].

2.2. Gross Domestic Product

One of the most important macroeconomic variables is the gross domestic product (GDP), because it includes all economic sectors in any country. This is based on measuring the overall economic performance of that country on GDP data, in order to predict the trends that the country's overall economy may go through in the future, which is done by observing the imbalances that occur in the economy on the one hand, as well as the growth occurring in the overall economy, which distinguishes it from other economies on the other hand [13, 34]. The gross domestic product is one of the most prominent economic indicators, as it expresses the growth rate. The state formulates its long-term financial and monetary policy and forecasts its future trajectory economic policy.

The gross domestic product in Iraq is formed as a result of the contributions of the various economic sectors, but the oil sector is the dominant sector in the formation of the gross domestic product in Iraq, as can be observed through Table 1 for the period (2000-2022).

Table 1.
Composition of the gross domestic product in Iraq through the percentage of contribution of each sector.

Sectors years	Agriculture	Mining	Oil	Water and electricity	Trade, restaurants and hotels	Financial and insurance sector	Government services	Construction	Government services sector
2000-2015	8.4	2.0	52.7	1.6	7.3	7.1	14.1	6.8	100
2016-2018	4.1	2.9	57.5	2.1	7.4	6.7	12.1	`7.2	100
2018-2022	2.2	2.6	57.2	2.1	8.9	5.8	17.7	7.5	100

Source: Ministry of planning - Republic of Iraq.

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From Table 1, the composition of the gross domestic product can be observed through the percentage of contribution of each economic sector, where the highest percentage was the oil sector, which amounted to (48.1%), while the lowest percentage was (1.6%), which is the water and electricity sector, and these percentages were during the average, the period (2000-2015), and the percentage of economic sectors' contribution to the formation of the GDP during the average period (2018-2022). Also the oil sector represented the largest percentage among the sectors, which amounted to (57.2%), and as for the mining sector, its percentage was the lowest, which amounted to (0.1%).

2.2.1. Gross Domestic Product and Economic Growth in Iraq

The economy generally operates with a large number of variables and seeks to achieve economic goals of economic growth, full operation, economic stability, reduction of stagnation, inflation, and other objectives. This is done through macroeconomic monetary and financial policies, and the focus on GDP is the most important indicator in economic analysis because it measures the efficiency of economic performance and the development of the level of income that can reflect the level of economic well-being of the members of society in Iraq. In order to monitor the trends in economic growth and GDP in the Iraqi economy for 2006-2022.

Table 2 estimates the GDP for 2000 at 50,486.076 million dinars, indicating an annual growth rate of approximately 47%. As for the years 2001 and 2002, the gross domestic product reached 41,611,411 and 41,022.927 billion dinars, respectively, with a negative annual growth rate of -17%. - 1% because of the decline in oil production and exports, since oil constitutes the highest percentage among the other economic sectors contributing to the formation of the GDP.

Table 2.
GDP development index for 2000-2022 at current prices (Billion dinar).

Year	Economic growth rate	Gross domestic product
2000	-	50486.076
2001	- 17	41611.411
2002	- 1	41022.927
2003	- 27	29585.789
2004	48	53235.359
2005	3	73533.599
2006	6	95587.955
2007	2	111455.813
2008	10	155982.258
2009	8	130805.610
2010	6	162064.566
2011	9	217327.107
2012	3	251666.999
2013	1	273587.529
2014	- 2	258900.633
2015	- 24	191715.792
2016	-5.3	203869.832
2017	12	221665710
2018	21	268918874
2019	2.6	276157868
2020	-20	219768798
2021	22	301152818
2022	27	383064152

Source: Iraqi ministry of planning.

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We notice that 2003, is an actual extension of the previous era in terms of growth or decline in overall economic indicators, as production stopped in all economic sectors in addition to the cessation of oil exports for several months, which created a structural distortion in the structure of the national economy as a whole, which led to a decline in the gross domestic product to reach about 29,585.789 billion dinars in 2003 than it was in previous years, with a decrease rate of -27%, which clearly indicates the dependence of the Iraqi economy on the oil sector. We also notice a decrease in its contribution to the GDP.

As for the periods 2005, 2007, and 2006, the gross domestic product achieved an increase estimated at 73,533,599, 95,587,955, and 111,455,813, respectively, but the economic growth rate declined by 3%, 6%, and 2% for the years mentioned as a result of terrorist operations and lack of security stability, in addition to the underdevelopment of the oil industry infrastructure and the spread of chaos and financial and administrative corruption in production processes. However, the rate of economic growth increased for the year 2008, reaching about 10%, and due to the improvement of the security situation to some extent, economic stability.

The Iraqi economy was also affected by the repercussions of the global financial crisis due to the decline in oil prices globally, as GDP (gross domestic product) fell to about 130,805.610 billion dinars in 2009 compared to 155,982.258 billion dinars in 2008, as a result of the structure of the Iraqi economy based on the crude oil export sector to generate its GDP.

The period 2013-2010 saw a marked increase in GDP (gross domestic product) as growth rates and absolute values of 162,064,566, 273,587.529 billion dinars, respectively, and varying economic growth rates, and the increases were the result of relative stability in the security situation witnessed by Iraq during this period and the allowing of some investment companies to enter Iraq, as well as the record rise in crude oil prices in the world markets and the quantities produced and exported from it.

Recent developments in the Iraqi arena, represented by unstable political and security conditions, the fall of Mosul and the departure of many oil fields from the control of the central government, as well as the rapid decline in world oil prices to unprecedented levels and the war led to a contraction of GDP to about 258,900,633, 191,715,792. 1 billion dinars for 2014 and 2015 respectively, achieving a negative annual economic growth rate of - 2%, - 24%, - 5.3% as a result of the decline in crude oil sector activity in the composition of GDP due to the decline in the price of a barrel of oil to $40.4 compared to $82 per barrel in 2014, reflecting the relative importance of this vital sector, from 45% in 2014 to 32.14% in 2015, the relative importance of this vital sector increased slightly to $203,869.832 billion in 2016 and a negative economic growth rate of -5.3%, This slight increase is the result of a 33.91% increase in the main component of output, which is oil, but during the period 2019-2017, there is a rise in the rate of GDP growth to reach 2.6% in 2019. In 2020, output growth fell to an estimated -20 percent as a result of the Corona pandemic and falling oil prices.

During the two years (2021-2022), we observed an increase in the GDP growth rate due to economic improvement and a rise in oil prices, which is the sector that contributes most to GDP formation.

2.3. Analysis of the Impact of Monetary Policy on Economic Activity

2.3.1. Evolution of Monetary Policy Indicators and Variables in Iraq

2.3.1.1. Analysis of Changes in the Presentation of Cash and Factors Affecting it

The new law of the Central Bank of Iraq set the basic objectives of the new Iraqi monetary policy and measures to manage and control the supply of cash in order to stabilize the general level of prices and build a sound financial system in accordance with the program of financial and economic reform of the International Monetary Fund, by strengthening confidence in the local currency, and the banking system, as an attempt to reduce the cash leakage from banks by reducing the currency in circulation. After 2003, this became the main goal of the monetary authority in Iraq Is to stabilize the growth rate of the cash supply and reduce liquidity to reduce inflation so that the reality of the offer of cash can be analyzed.

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2.3.2. Interest Rate Index and Exchange Rate as Intermediate Instruments

2.3.2.1. Interest Rate Changes: Monetary Analysis

When difficulties arise in moving the exchange rate, the government uses the interest rates as a tool to influence the level of economic activity. Monetary policy in Iraq tried after 2003 to express its working mechanism according to short-term interest rates in the money market, and it relied on rules based on signals and information. In order to achieve stability in the financial market, it is possible to create clear effects on the structure of interest rates through the facilities provided by the Central Bank to commercial banks in receiving their deposits, according to which they obtain the required credit. You can follow Table 3 to track the indicator's evolution. Interest rate in Iraq for the period 2000-2022.

The Central Bank raised interest rates on loans and deposits from 2000 to 2005, a move it took to reduce cash liquidity and control inflation rates, as shown in Table 3.

During the period 2006-2007, the interest rate recorded 16.0% and 20%, with a positive annual increasing in the economic growth rate reaching 91.9% in 2007. This increase came because the Central Bank liberalizing the interest rates on deposits, loans, credit, and securities according to market conditions in order to achieve a real balance of the forces of supply and demand. Critically, this liberalization of interest rates came as a result of implementing the financial reform strategy for the purpose of providing borrowers with the opportunity to make their own decisions instead of being restricted by directives and orders issued by the Central Bank.

Table 3.
Iraq interest rate index development for 2000-2022.

Year	Interest rate	Economic growth rate%
2000	7.3	-
2001	7.3	0
2002	6.3	-13.6
2003	6.3	0
2004	6.0	-5.5
2005	7.0	16.6
2006	16.0	48.8
2007	20	91.9
2008	16.7	-16.2
2009	8.8	-47.2
2010	6.2	-29.2
2011	6.0	-4
2012	6.0	0
2013	6.0	0
2014	6.0	0
2015	6.0	0
2016	6.0	0
2017	4.0	-0.3
2018	4.0	0
2019	4.0	0
2020	4.0	0
2021	4.0	0
2022	5.0	0.2

Source: Reports from the Central Bank of Iraq.

As for the period 2008-2009, it is noted that there is a decrease in interest rates of 16.7% and 8.8%, respectively, with a negative annual growth rate estimated at - 47.2% and - 29.2%. The reason for this

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decline and decrease is mainly due to the improvement in the exchange rate of the Iraqi dinar as compared to US dollar. During the public auction for sale, the Central Bank decided to reduce the interest rate to 8.8% in 2009, based on information from the Central Bank that the inflation rate decreased from 30.9% in 2007 to 12.7 in 2008.

During the period 2010-2016, the Central Bank continued to reduce the interest rate to 6%, with the aim of achieving monetary stability and raising the rate of economic growth by stimulating credit activity to finance development projects.

As for the period 2017-2020, there was a clear decline in the interest rate index due to the cessation of a number of banks and financial institutions from practicing their work normally as a result of the Corona pandemic sweeping the world's economies, including the Iraqi economy, to record an annual growth rate of -0.3% during this period.

In the year 2022, there was an increase in the growth rate of interest rates, because of the increased demand for loans and banking facilities on the one hand, and the high level of economic activity on the other.

2.3.2.2. Change in Exchange Rate and Associated Factors

As part of the trend towards a market economy and the issuance of the Central Bank Act 56 in 2004, fixed and multiple exchange rates became inconsistent with the new trends of monetary authority in building a stable economy in Iraq, so monetary policy makers tended to adopt a managed floating exchange rate system determined by the strength of supply and demand in the market, as well as the use of the method of daily auctions to sell and buy the dollar, thus becoming the central market for foreign currency works to reduce fluctuations in the market.

The value of the Iraqi dinar against the dollar in order to balance the supply and demand for the dollar, and the stability of exchange rates, which was reflected in a cycle on price stability, as well as reducing the phenomenon of dollarization through the exchange rate signal, and increasing the attractiveness of the local currency due to its stability and stabilization against the dollar [26] thus following the development of the exchange rate of the Iraqi dinar through the Table 4.

It is clear from Table 4 that the official and parallel exchange rate of the Iraqi dinar against the US dollar fluctuated during the years 2000-2002, between rise and fall. However, in 2003, the parallel exchange rate reached 1,936 Iraqi dinars, while the nominal exchange rate recorded approximately 1,836 Iraqi dinars.

We estimate a negative annual growth rate of -1.0% for the dollar, given the convergence of both the nominal and parallel exchange rates.

This decline is attributed to the start of military operations and its entry into Iraq, the escalation of military operations, and the lack of stability, as well as the lack of confidence in the local currency and the loss of its function as a warehouse.

In terms of value, there was a decline in both the parallel exchange rate and an annual growth rate of -24.9% during the year 2004. This decline was due to poor security conditions, but in the years 2005-2006, the Iraqi exchange rate improved against the dollar in both the nominal market and the parallel market. We recorded 1467 and 1475 Iraqi dinars consecutively.

This is due to the monetary policy followed by the Central Bank in supporting the Iraqi dinar. However, this situation did not last long as the exchange rate declined during the period 2006-2009 to record in both markets 1170 and 1182 in 2009, achieving this rate. Negative annual growth -1.7%. This decline in the exchange rate is mainly due to the Central Bank changing the status of the value of the local currency through foreign currency auctions and providing the appropriate status of the dollar in order to achieve stability.

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Table 4.
Development of the Iraqi Dinar exchange rate index for 2000-2022.

Year	Official rate (Of exchange)	Parallel price (Of exchange)	Growth rate (Economic) %
2000	0.31	1930	-
2001	0.31	1929	-0.05
2002	0.31	1957	1.45
2003	1836	1936	-1.0
2004	1453	1453	-24.9
2005	1469	1472	1.3
2006	1467	1475	0.2
2007	1255	1267	-14.0
2018	1193	1203	-5.0
2019	1170	1182	-1.7
2010	1170	1185	0.2
2011	1170	1196	0.8
2012	1166	1233	3.0
2013	1166	1232	- 0.08
2014	1166	1214	-1.46
2015	1190	1247	2.7
2016	1166	1280	2.6
2017	1184	1258	-0.01
2018	1183	1209	-0.03
2019	1182	1196	-0.01
2020	1192	1234	0.03
2021	1192	1452	0.17
2022	1194	1454	0.001

Source: Central bank of Iraq, directorate general of statistics and research, statistical group, miscellaneous bulletins for a number of years.

During the period following the years 2010-2011, there was a slight improvement in the exchange rate of the Iraqi dinar in both markets, recording an annual growth rate of 0.8% and 3.0%, respectively. This is due to reducing Iraq's debts to support the Central Bank's cash reserves of dollars. On the one hand, the central bank holds auctions in order to control foreign exchange movements.

This slight improvement did not last long either, as the parallel exchange rate recorded a slight decline of about 1,214 dinars in 2013, after it was 1,233 dinars in 2012. This decline can be attributed to the increased demand for the dollar for the purposes of speculation and financial expansion on the one hand, and political instability on the other.

As for the period 2015-2016, there was an increase in the official and parallel exchange rate against the dollar, recording 1,190 and 1,247 dinars, respectively, with an annual growth rate of 2.7%. This was due to military and political conditions' deterioration on the economy, as well as the resulting decline in foreign reserves. Derived from the decline in oil prices during that period, in 2016 there was a slight change in the nominal exchange rate, estimated at approximately 1,166 dinars.

During the period 2017-2020, the exchange rate index was fluctuating due to the fluctuations that occurred at that time, including changes in the work of monetary policy related to the rise in the price of the dollar on the one hand and the emergence of the Corona pandemic on the other hand, to record an annual growth rate estimated at 0.03% in 2020 after it was 2.6%. In 2016, there was a slight increase during the year 2021 as a result of an increase in external cash transfers, as well as an increase in the sale of currency at currency auctions to reach 0.17%.

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3. Methodology

3.1. Quantitative Model

3.1.1. Description of the Standard ARDL Autoregressive Model

The research relied on descriptive and quantitative approaches to demonstrate the measurement and analysis of the impact of some monetary policy indicators on the gross domestic product in Iraq and for a long time series that extended for the period 2000-2022 and its application in the Iraqi economy. It was designed according to the statistics of the Central Bank of Iraq and the Iraqi Ministry of Planning, and using the statistical program (EViews9). The ARDL model is one of the methods of dynamic modeling of co-integration, as this model was applied before Saad and Khalil [35]. The results of the standard ARDL model have proven the existence of a long-term equilibrium relationship between the dependent variable and the independent variables, with the existence of co-integration between them.

Abdullah and Yahya [1] utilized the model, implementing the ARDL slow-time gap autoregressive model. Their findings demonstrated a direct relationship between the variables in both the short and long terms, aligning with the principles of economic theory.

This model was also applied by Ihab [31] and the test results showed that the autoregressive distributed lag model (ARDL) showed that the explanatory power of the independent variables for the special effects on the dependent variable is 93% = R, while the value of the corrector was 85%.

As for the method Batal [36] according to the ARDL model, statistical tests indicate the significance of the estimated model, explaining that 91% of the changes occurring in the dependent variable are the result of changes in the independent variables, and this is consistent with the content of economic theory.

In order for the model to be a true representative of the explanation and interpretation of a particular economic phenomenon, it is necessary to truly understand this phenomenon, its elements, and its economic relationships, and this can only be achieved with economic theory.

The characterization phase is one of the most important and difficult stages of building the standard model because it requires determining the variables that the model must contain, and at this stage, economic theory is relied upon to transform the relationship between variables into mathematical equations using symbols to determine the type and direction of the relationship between economic variables.

Therefore, the standard model equation includes two types of variables dependent variables and independent variables according to the below equation:

$$GDP = f(M, EX, R)$$

Where GDP is the gross domestic product variable.

M is a money supply variable.

EX is the exchange rate variable.

R is the variable interest rate.

From the foregoing, a table can be drawn up showing these variables as follows, as in Table 5.

Table 5.
Variables used in the estimated standard model and their symbols.

Symbols	Variables
GDP	Gross domestic product
M	Money supply
EX	Exchange rate
R	Interest rate

Table prepared by the researcher based on the description of the model.

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4. Results and Discussion

4.1. Testing The Stability of Variables

We begin by testing the stability of the time series of variables using Eviews.7 and conducting an extended Fuller test (ADF) to determine whether the variables are stable or contain the root of the unit and are unstable with the integration rank.

The test was conducted, and we got the results shown in Table 6.

Table 6 shows that some variables have stabilized at the level, whether with a cutter or a cutter and a general direction, and these variables (M, R) at a moral level of 5% will be graded (0. I).

The test was retested after the first differences were taken, and it was found that all variables stabilized with either a cutter or a cutter and a general direction and would be graded(1. I).

Table 6.
Time series stability test.

At level					
Variables	**level**	**GDP**	**M**	**EX**	**R**
With constant	t-statistic	-1.2416	0.7010	-17.3312	-2.5726
	Prob.	0.6349	0.9889	0.0000	0.1156
	Ver.	n0	n0	***	n0
With constant & trend	t-Statistic	-1.2731	-4.2980	-11.9748	-3.0209
	Prob.	0.8650	0.0190	0.0000	0.1523
	Ver.	n0	**	***	n0
Without constant & trend	t-statistic	0.2618	1.6138	-0.0239	-0.9756
	Prob.	0.7518	0.9688	0.6598	0.2833
	Ver.	n0	n0	n0	n0
Upon first difference					
Variables	**level**	d(GDP)	d(M)	d(EX)	d(R)
With fixed	t-Statistic	-2.7756	-3.0452	-5.2877	-3.9171
	Prob.	0.0805	0.0533	0.0009	0.0089
	Ver.	*	*	***	***
With constant & trend	t-Statistic	-3.5167	-2.8518	-5.2687	-3.8987
	Prob.	0.0696	0.2030	0.0041	0.0345
	Ver.	*	n0	***	**
Without constant & trend	t-statistic	-2.7673	-1.0505	-5.6463	-4.0354
	Prob.	0.0084	0.2540	0.0000	0.0004
	Ver.	***	n0	***	***

Note: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1% and (No) Not significant.

4.1.1. Estimate The Model of Self-Regression Model of ARDL Distributed Slowing of the GDP Function

After conducting a series stability test, we estimate the ARDL self-depreciating model of gross domestic product function and slow periods (7), and after the model estimate process, we present the data shown in Table 7.

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Table 7.
Results according to ARDL for the GDP.

Variable	Coefficient	Std. error	t-statistic	Prob.*
GDP(-1)	1.56	0.13	11.4	0.00
GDP(-2)	-0.77	0.14	-5.55	0.00
M	0.51	0.24	2.05	0.04
R	459	629	0.72	0.47
EX	954	566	0.16	0.86
C	648	877	0.73	0.46
R-squared	0.98	Mean dependent var		1.64E+08
Adjusted R-squared	0.97	S.D. dependent var		83112556
S.E. of regression	124	Akaike info criterion		35.6
Sum squared resid	5.11E+15	Schwarz criterion		35.9
Log likelihood	-689	Hannan-Quinn criter.		35.7
F-statistic	332	Durbin-Watson stat		1.88
Prob(F-statistic)	0.00			

It is clear from Table 7, where the data obtained to estimate the ARDL model were estimated, showing that the analysis of the estimated model (R2 = 0.98) and the adjusted R-squared value (0.97), that is, the independent variables described in the estimated model, explained 98% of the changes in the dependent variable. Subsequently, I explained that the model is significant, as the calculated F value was large (332.75) and is significant at the 5% level, meaning that the estimated rolling model is significant. In this case, the null hypothesis (H0): b=0 is rejected, and therefore the (alternative) hypothesis is accepted other (H1: b≠0).

5. Robustness Tests

5.1. Bounds Test

Table 8 shows the test limits below, which test the existence of a cointegration relationship as a long-run equilibrium relationship.

It is clear according to Table 8 that the analysis of the results of the marginal test is observed, where we note that the calculated F-statistic value was (4.50), which is greater than the tabulated value of (4.35) at a significant level of 5%, so there will be a long-term equilibrium relationship, and in this case, the null hypothesis is rejected and the alternative hypothesis is accepted.

Table 8.
Bounds test.

ARDL bounds test		
Test statistic	**Value**	**K**
F-statistic	4.50	3
Critical value bounds		
Significance	I0 bound	I1 bound
10%	2.72	3.77
5%	3.23	4.35
2.5%	3.69	4.89
1%	4.29	5.61

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5.2. Testing the Model is Free of Standard Problems and Natural Distribution

From the analysis of the shown model, it is confirmed that it is free from the problems of serial correlation using the Breusch-Godfrey Serial Link LM test and heterogeneity of variance using the Breusch-Pagan-Godfrey test, and the results are explained according to Table 9.

According to Table 9, the model shown shows that there is no serial correlation. The null hypothesis is accepted, which states that there is no serial correlation between the remainders because the value of F and Chi-square test is not significant at the 5% level. In this case, the alternative hypothesis of the presence of serial correlation and that it is free of a problem is rejected because the statistical indicators were not significant, i.e., the error variance is homogeneous.

Table 9.
Breusch-Godfrey serial link LM test.

Breusch-Godfrey serial correlation LM test:			
F-statistic	0.37	Prob. F(2,31)	0.68
ObsR-squared	0.92	Prob. Chi-square (2)	0.62
Heteroskedasticity test: Breusch-Pagan-Godfrey			
F-statistic	1.63	Prob. F(5,33)	0.17
ObsR-squared	7.75	Prob. Chi-square (5)	0.17
Scaled explained SS	7.47	Prob. Chi-square (5)	0.18

When conducting the natural distribution test shown in Form (1), we note that the value of the Jarque-Bera test was (2.94) and is not moral at the level of 5% and according to probability value, i.e., errors are distributed naturally.

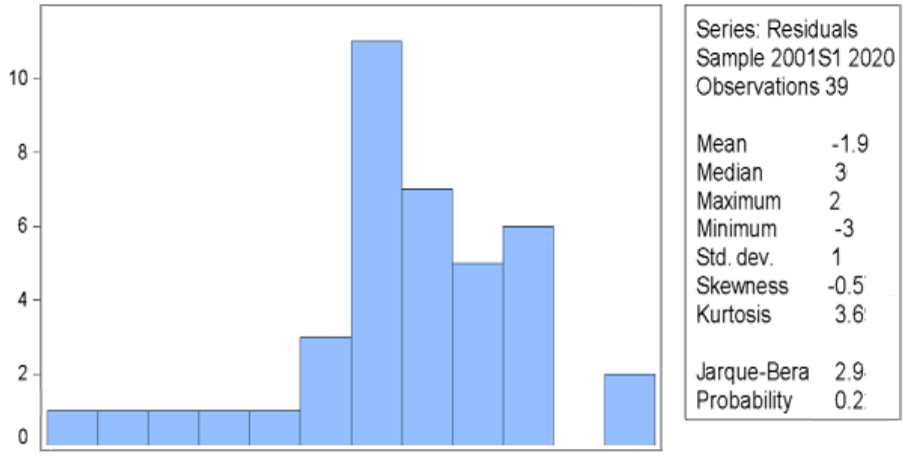

Figure 1.
Structural stability variables series with normal distribution of parameters.

According to Figure 1, it turns out that the series of normal distributions of the estimated parameters is stable in terms of the distribution of errors according to the probability value showing the distribution of the series of errors. The distribution of these errors follows a normal pattern, indicating structural stability within the model.

5.3. Estimating The Model of Correcting Mistakes and the Long-Term Relationship

After testing the safety and stability of the estimated model and having a long-term relationship, we will estimate the short-term parameters (error correction model) and the long-term according to the ARDL approach. After the estimate, we have obtained the results described in Table 10.

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Table 10.
Short-term parameters (Error correction model) and long-term.

Cointegrating form				
Variable	**Coefficient**	**Std. error**	**t-statistic**	**Prob.**
D(GDP(-1))	0.77	0.14	5.55	0.00
D(M)	0.51	0.24	2.05	0.04
DI	459	629	0.72	0.47
D(EX)	954	566	0.168	0.86
CointEq(-1)	-0.21	0.08	-2.531	0.01
Cointeq = GDP – (2.3434 M + 2104759.6335 R + 4376.9034 EX + 29738378.6651)				
Long run coefficients				
Variable	Coefficient	Std. error	t-statistic	Prob.
M	2.34	0.38	6.13	0.00
R	210	273	0.76	0.44
EX	437	263	0.16	0.86
C	2973	3927	0.75	0.45

From Table 10, we note that the short-term parameters of independent variables gross domestic product (GDP (-1), M) were moral at 5%, and according to the Probability Column (Prob), both independent variables have a positive effect on the dependent variable, i.e., the increase in gross domestic product (GDP) for a period. A one-unit precedent leads to an increase in gross domestic product (GDP) by (0.77) units as well as an increase in the supply of cash (M) leads to an increase in gross domestic product (GDP) by (0.51) units, which is identical to the content of economic theory, and variables I, EX), were not significant at 5%.

We note that the parameter of correcting the error or the speed of adjustment reached (0.21-), which is moral at the level of 5%, i.e., deviations in the short term corrected by (21%) towards the long-term balance value during the same period, i.e., the speed of adjustment is slow in the model, and then the existence of a long-balance relationship, and here we will reject the hypothesis of nothingness and accept the alternative hypothesis of a long-term balance relationship. This is consistent with Alloush and Hussein [5] in accepting the alternative hypothesis, it indicates that there is a long-term equilibrium relationship between the money supply and the gross domestic product, as the results of the bounds test showed, where the calculated F (4.239) was greater than the tabulated one at a 5% significance level. Therefore, we reject the null hypothesis and accept the alternative hypothesis, that is, the existence of an equilibrium relationship. Long term.

As for the long-term relationship, we note that the long-term supply of cash has a moral impact on gross domestic product (GDP), i.e., an increase in the supply of cash by one unit leads to an increase in gross domestic product (GDP) by (2.34) units in the long term, while the parameters of other independent variables (R, EX) were also unethically at the level of 5%.

According to the analysis of the results, it is clear that the current economic situation in Iraq is moving towards increasing the gross domestic product, and this is what Al-Mustafa and Aws [13] and Ali and Muthanna [15]showed, as the error correction model is that the short-term parameters match in terms of the level of importance for the long-term results, and that The correction factor shows the speed of adjustment from the short run to the long run, and therefore it is significant at a level of less than 5%, meaning that all monetary policy variables in the current year and the previous year combined significantly affect the GDP in the short run, and therefore through the model it is shown that (74%) of the GDP results from monetary policy variables, and this is consistent with the content of economic theory.

6. Conclusion

Our study dealt with the most important basic features of monetary policy on the one hand, the nature of the monetary policy indicators used (money supply, exchange rate, interest rate) in the study, how they work, and the impact on the gross domestic product on the other hand. Our study also focused on monitoring the changes that accompanied this process to enhance the policy's effectiveness. Cash in Iraq is used as a basis for creating conditions to ensure economic growth in the country.

Our study worked to address the gap represented by increasing bottlenecks, the presence of some obstacles that affect the Iraqi economy in the short or long term, and economic instability. Here we call for increasingly serious work to bridge this gap, thus contributing to overcoming this situation and achieving economic growth in Iraq.

The hypothesis of a serial correlation guided our analysis of statistical indicators. Thus, we accept the null hypothesis because the estimated model is free of serial correlation. That is, we accept the null hypothesis, which stipulates that there is no serial correlation between the residuals. Because the value of the *F* and *Chi-Square* tests is not significant at the significance level of 5%, we reject the alternative hypothesis.

Since the statistical indicators were also significant, the error variance is homogeneous. The estimation of the error correction model and the long-run relationship indicated that the alternative hypothesis of the long-run equilibrium relationship was accepted, while the null hypothesis, which determines the extent of the possibility of creating the desired economy in terms of its effects on the Iraqi economy, was rejected.

Our study has presented the basic arguments for changing monetary policy in Iraq and stimulating gross domestic product (GDP) growth. Thus, monetary policy in Iraq can represent a broad cash flow compared to economic growth in the country, which achieves more financial and monetary stability in Iraq, and we believe that it is in the interest of Iraq. Iraq aims to fortify its monetary variables, enhance the functionality of its monetary policy instruments, and alleviate economic obstacles in the near future.

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The authors declare that they have no competing interests.

Authors' Contributions:

All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.

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