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The role of Iraqi monetary policies in addressing inflation after the COVID-19 pandemic and the Russian-Ukrainian War

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Abstract
Monetary policy, a crucial instrument of economic policy, employs monetary variables to guide economic activity and ensure stability. The objective of this study is to elucidate how Iraqi monetary authorities responded to inflation subsequent to the Russian-Ukrainian War and the COVID-19 pandemic. The descriptive-analytical method was used for the study as it is among the most effective approaches to analyze complex and dynamic economic issues. The analysis identified a negative association between Iraq's inflation rate from 2015 to 2019 and the annual growth rate of the broad money supply. At a significance threshold of 0.05, it was found that the yearly growth rate of the broad money supply had a statistically significant impact on the inflation rate in Iraq from 2015 to 2019, prior to the COVID-19 epidemic and the Russian-Ukrainian war. The results demonstrated that the inflation rate dropped by 0.075% for every 1% increase in the yearly growth rate of the broad money supply, confirming the first hypothesis of the study. As a result, the study suggests that monetary policies that can successfully affect Iraq's inflation rates be put into place.

Keywords: Monetary policies, inflation, COVID-19 pandemic, Russian-Ukrainian War

Introduction
Monetary policy is considered one of the fundamental pillars of macroeconomic policies due to its direct impact on a range of economic variables, foremost among them inflation. This policy aims to achieve economic stability by controlling the volume of money supply, interest rates, and the exchange rate, which in turn affects inflation and economic growth rates. This role becomes particularly evident in countries that have adopted the transition toward a market economy, where monetary policy has become an effective tool in managing economic balances. In the Iraqi context, monetary policy has undergone substantial transformations after 2003, both in terms of the independence of the Central Bank and the instruments employed in implementing monetary policies. Previously, under Law No. 64 of 1976, the Central Bank was utilized as a financial lever to finance the public budget deficit through monetary issuance, in what was known as the “cheap money policy,” amid difficult economic conditions marked by the war with Iran and the international sanctions imposed on Iraq, which significantly exacerbated inflation rates.
With the emergence of recent global crises, particularly the COVID-19 pandemic and its subsequent economic disruptions, followed by the Russian-Ukrainian war that directly affected global energy and food prices, the Iraqi economy faced increasing inflationary pressures. Within this framework, the importance of studying the role of Iraqi monetary policies in addressing these challenges emerges, alongside analyzing the extent of their effectiveness in mitigating inflation and achieving economic stability under such complex and changing conditions.

First: Research Problem
The research subject involves evaluating the efficacy of the monetary policies used by the Central Bank of Iraq in mitigating inflation following the COVID-19 epidemic and the Russian-Ukrainian conflict, as well as their capacity to attain economic stability during ongoing global crises.

Second: Research Questions

Main Question: What is the function of Iraqi monetary measures in mitigating inflation following the COVID-19 outbreak and the Russian-Ukrainian conflict? From this primary inquiry, the subsequent sub-questions arise:

1. What instruments did the Central Bank of Iraq employ within its monetary policy to curb inflation during this period?
2. To what extent did Iraqi monetary policy align with fiscal policies in confronting economic crises?
3. How effective were traditional monetary policies (interest rate, money supply, reserve requirement) in containing inflation during this period?
4. How did the Russian-Ukrainian war affect inflation rates in Iraq?

Third: Research Objective

The study seeks to emphasize the significance of Iraqi monetary measures in mitigating inflation subsequent to the COVID-19 outbreak and the Russian-Ukrainian conflict. This project aims to investigate the following:

1. The progression of the annual growth rate of the broad money supply in Iraq from 2015 to 2019, prior to the COVID-19 outbreak and the Russian-Ukrainian conflict.
2. The progression of the annual growth rate of the broad money supply in Iraq from 2020 to 2024, subsequent to the COVID-19 epidemic and the Russo-Ukrainian conflict.
3. The progression of inflation rates in Iraq from 2015 to 2019, prior to the COVID-19 outbreak and the Russo-Ukrainian conflict.
4. The progression of inflation rates in Iraq from 2020 to 2024, subsequent to the COVID-19 epidemic and the Russian-Ukrainian conflict.
5. The influence of the annual growth rate of the broad money supply in Iraq on inflation rates from 2015 to 2019, prior to the COVID-19 pandemic and the Russian-Ukrainian conflict.
6. The impact of the annual growth rate of broad money supply in Iraq on inflation rates during the period (2020-2024), after the COVID-19 pandemic and the Russian-Ukrainian war.

Research Hypotheses

- **First Hypothesis:** The yearly growth rate of the broad money supply has a statistically significant impact on Iraq's inflation rate from 2015 to 2019.
- **Second Hypothesis:** The yearly growth rate of the broad money supply has a statistically significant impact on Iraq's inflation rate from 2020 to 2024.

Fifth: Research Importance

This study is important because it examines how Iraqi monetary policies have addressed inflation in the wake of successive global crises and evaluates how well they have worked to achieve economic stability. It also contributes by providing a scientific perspective that may assist policymakers in developing monetary policy instruments in line with the nature of the Iraqi economy and its changing circumstances. Moreover, it serves as an important reference for researchers and those interested in economic affairs to better understand the relationship between global crises and domestic monetary policies.

Sixth: Research Methodology

The study utilizes a descriptive-analytical methodology and a quantitative approach to analyze the application of monetary policy tools, including interest rates, money supply, exchange rates, and reserve requirements, in mitigating inflationary pressures.

Seventh: Previous Studies

The study by Hameed Hassan Khalaf Al-Jubouri (2022) [6], entitled *"The Role of Monetary Policy in Achieving Monetary and Economic Stability in Iraq for the Period 2016-2020"*, This study sought to examine the capacity of Iraqi monetary policy to address economic fluctuations and attain monetary and economic stability from 2016 to 2020, particularly following the enactment of the Central Bank Law and its independence in 2004, alongside the implementation of contemporary monetary instruments, including the use of indirect tools and the enhancement of direct tools, as well as the regulation of the foreign currency market via currency auctions. The findings revealed that Iraqi monetary policy remained ineffective in attaining the necessary price stability within the Iraqi economy, a situation attributable to genuine structural imbalances in sectors such as industry, investment, and local markets, including the labor market and the commodities and services market. The research indicated that the exchange rate and the benchmark interest rate served as moderately effective instruments in combating inflationary pressures. Furthermore, it highlighted that the role of the Central Bank of Iraq shifted from a narrowly defined role concerning the policies of commercial banks regarding lending, deposits, and interest rates to a broader role in monetary management.

The study by Manal Gaber Morsi Mohamed (2017) [14], entitled *"Evaluating the Effectiveness of Monetary Policy in Achieving Exchange Rate Stability in Egypt during the Period (1990-2017)"*, intended to evaluate the efficacy of monetary policy tools in stabilizing the exchange rate of the Egyptian pound relative to the U.S. dollar. The research employed an inductive methodology to construct the theoretical framework and an econometric-analytical approach to quantify the link among variables. The findings indicated that monetary policy positively influenced the exchange rate, albeit with constrained efficacy in the short term, as merely 13.5% of the disparity between the actual and equilibrium exchange rate was addressed within one year. The discount rate exerted the most significant long-term impact at 28.88%, succeeded by the real money supply at 7.2%. The models indicated a causal relationship between money supply and the exchange rate, while exports and imports significantly influenced exchange rate variations. The ECM model indicated that the adjustment coefficient reached -0.899, suggesting that nearly 90% of the exchange rate deviation is corrected annually to return toward the equilibrium value.

The study by Ammar Majeed (2016) [9], entitled *"Evaluating the Role of Monetary Policy in Iraq during the Period (2004-2014)"*, intended to examine the monetary policy implemented by the Central Bank of Iraq in the post-2003 era, characterized by political and economic volatility that significantly influenced the framework of the Iraqi economy, especially inflation rates and exchange rate variations. The research utilized a descriptive-analytical methodology, examining the instruments utilized by the Central Bank, including interest rates, exchange rates, and

open market operations, and assessing their efficacy in regulating the money supply and mitigating inflation. The results indicated that monetary policy contributed to the attainment of macroeconomic indicators and economic stability via the actual and targeted growth rates of the money supply, which led to relative success evidenced by monetary stability, a reduction in inflationary pressures, and an appreciation of the real value of the Iraqi dinar against the U.S. dollar, subsequently followed by its stabilization. The study advocated for the implementation of a monetary strategy that effectively regulates the substantial money supply by maintaining a balanced correlation between money supply and gross domestic product.

An examination of prior studies reveals that Hameed Hassan Khalaf Al-Jubouri's research (2022) [6] concentrated on assessing the efficacy of Iraqi monetary policy in attaining monetary stability from 2016 to 2020. It elucidated that, although the use of significant instruments such as exchange rates and interest rates, monetary policy remained unable of achieving effective price stability owing to profound structural imbalances inside the Iraqi economy. This study's strength is its examination of monetary policy instruments regarding their real effects in a vulnerable economic framework. Nonetheless, it did not address current global crises, including COVID-19 and the Russian-Ukrainian conflict, which exacerbated issues in both the global and local economic environments.

The research conducted by Manal Gaber Morsi Mohamed (2017) [14] investigated the Egyptian setting, assessing the efficacy of monetary policy tools in stabilizing the exchange rate through an advanced econometric approach (ECM model). The data suggested that monetary policy had a partially successful impact, especially in the long term. The study's additional value is its precise econometric dimension; nonetheless, its applicability to the Iraqi context is constrained by disparities in economic, political, and monetary frameworks.

Ammar Majeed's (2016) [9] study examined the pivotal transitional era (2004-2014) after the collapse of the previous Iraqi regime, assessing the performance of the Central Bank of Iraq during political and economic transformations. It illustrated that monetary policy played a significant role in attaining monetary stability and regulating inflation. The distinctive feature of this study is its focus on the transitional stage and its monitoring of the Central Bank's role after restructuring, yet it did not address contemporary external influences such as the global health crisis or the geopolitical conflict that recently disrupted global markets.

The current research is distinguished by addressing a sensitive and contemporary phase that has not been covered by previous studies, namely the post-COVID-19 period and the Russian-Ukrainian crisis, along with the accompanying global inflationary pressures and their transmission to the Iraqi economy. In addition, the research examines the efficiency of monetary policy instruments (including the interest rate, money supply, and exchange rate) in a highly volatile environment, thereby providing policymakers with a practical vision of the real effectiveness of these instruments under unstable conditions. The research also attempts to link monetary policy with fiscal policies in addressing crises, an aspect that most previous studies did not emphasize, as they were limited to analyzing only one dimension.

Eighth: Research Plan

- **Chapter One:** Methodological Framework of the Research.
- **Chapter Two:** Conceptual Structure of the Study.
- **Chapter Three:** Applied Study.

Chapter Two: Conceptual Structure of the Study

Section One: Theoretical Framework of Monetary Policies and Inflation: One of the most crucial measures that nations rely on to attain monetary stability is monetary policy. Adopting an efficient monetary policy that steers the economy toward stability is thought to be one of the monetary authority's primary goals in order to achieve such stability (Bouzit & Sousha, 2022-2023, p. 6). Accordingly, it is viewed as "a set of laws established by monetary authorities, representing procedures and rules undertaken by the state through the central bank with the aim of achieving economic stability and avoiding crises faced by the national economy" (Gaballah, 2018, pp. 146-147).

First: Definition of Monetary Policy

In order to achieve certain macroeconomic goals, such as price stability, promoting economic growth, balancing the balance of payments, and lowering unemployment rates, the monetary authority in the state typically represented by the central bank adopts a set of policies and procedures known as monetary policy. These policies are intended to influence the money supply and demand trends in the economy through either expansionary or contractionary approaches. (Mandour, 2003-2004, p. 224).

Monetary policy also refers to the legal and regulatory framework upon which the monetary authority relies in managing its traditional and non-traditional instruments, such as the interest rate, reserve requirements, open market operations, and the exchange rate, in order to influence economic activity either directly or indirectly. Monetary policy acquires special importance during periods of crises and economic fluctuations, where it is employed as a flexible tool for rapid intervention in addressing inflation or recession through controlling the liquidity circulating within the financial system (Qadi, 2003, p. 53) [11].

Second: The Importance of Monetary Policy within Economic Policy: Since monetary policy directly affects both internal and foreign economic stability, it is one of the most crucial elements of economic policy. Along with other elements like inadequate productive structures and reliance on rent-based resources, uneven monetary policies are frequently one of the primary drivers of economic imbalances in many emerging nations. Since monetary policy primarily aims to achieve a degree of economic stability under conditions of balanced growth, this reflects the close relationship between economic and monetary activities, where numerous economic problems such as unemployment, inflation, and low employment rates are linked to the solutions provided by monetary policy (Mostafa & Hassanain, 2000, p. 156).

The importance of coordination between monetary policy and other economic policies, particularly fiscal policy, cannot be overlooked in achieving internal stability. Monetary policy resorts to using its various instruments to absorb excess purchasing power in the market by attracting it into savings channels, thereby helping to reduce inflationary pressures. Additionally, it has the power to

affect the national currency's exchange rate, which helps prevent currency depreciation and limit balance of payments deficits. Moreover, monetary policy serves as a means of achieving economic expansion by redirecting productive activities in a way that balances monetary and commodity flows, thereby enhancing the economy's capacity for sustainable growth.

In general, monetary policy seeks to achieve a set of core objectives, most notably (Qamar, 2019, p. 117; Mohamed, 2017, pp. 492-493) [14]:

1. Maintaining the stability of the general price level and reducing inflation rates, thereby ensuring the strength of the national currency and minimizing fluctuations in purchasing power.
2. Stimulating employment growth and expanding the base of productive labor by creating a monetary environment supportive of economic activity.
3. Improving foreign commerce and the balance of payments by stabilizing the foreign exchange market and minimizing changes in the value of the national currency.
4. Supporting and stabilizing financial markets and enhancing confidence in them through liquidity regulation and the provision of effective financial instruments.
5. Attracting financial investments and maintaining the competitiveness of the business environment by providing a stable and encouraging monetary climate for both domestic and foreign investors.
6. Increasing the rate of economic growth, as monetary policy contributes to preparing a suitable environment for growth through the control of interest rates and money supply.

Second: Qualitative Instruments

Qualitative instruments are used to control specific types of loans and regulate spending in particular directions, such as encouraging productive loans over consumer loans, or promoting short-term loans while limiting long-term ones. Monetary policy may also intervene in certain sectors and activities experiencing instability or difficulties that require special treatment through qualitative instruments, the most important of which are (Qadi, 2003, pp. 80-81) [11]:

Credit Guidance: This is a regulatory measure adopted by the monetary authorities to set a maximum limit on the growth of loans granted by commercial banks during a specified period. This is done by imposing specific ratios that must not be exceeded. In case of violation, banks are subject to penalties. The purpose of this measure is to direct loans toward vital sectors that contribute to economic development or require substantial financing.

Minimum Liquidity Ratio

Commercial banks are required by the central bank to maintain a specific proportion of liquidity by freezing a portion of their reserves. This measure aims to reduce excessive lending, especially when banks possess highly liquid assets, thereby helping control the volume of loans directed into the economy.

Conditional Import Deposits

Importers are required to deposit the value of imports as a deposit with the central bank for a specified period before executing the import transaction. This method helps regulate the movement of foreign currency and reduces pressure on monetary reserves.

Direct Banking Operations by the Central Bank: In certain cases, the central bank directly intervenes in the market by providing loans to essential economic sectors, particularly when commercial banks are unable to finance them. Such intervention may be either permanent or temporary, and it aims to support economic activity in vital sectors.

Fourth: Inflation

Inflation is considered one of the most influential phenomena on the macroeconomy in general and the microeconomy in particular, as it causes the activities of institutions to both affect and be affected by their normal operations. Thus, this issue has economic, political, and social dimensions. Inflation often arises as a result of excessive monetary demand or cost-push pressures. Therefore, it is regarded as a monetary phenomenon that leads to currency depreciation and rising prices. In this regard, the monetary authorities are required to intervene when cost components change, especially when wages rise at a rate exceeding productivity, or when energy prices increase, or when import prices rise excessively, whether due to hyperinflation or currency devaluation (Abu Ziyadah, 2021, pp. 383-384) [1].

The constant rise in the general price level during a given time period is also considered inflation, which is described as "the permanent tendency of the price level to rise."(Abu Ziyadah, 2021, p. 386) [1]. The transformation of inflation into a major problem is due to its impact on the economy, as it reduces individuals' purchasing power, thereby affecting the business sector (Rustam & Ahmed, 2023, p. 180) [7].

Evaluation of Iraq's Monetary Policy's Contribution to Inflation Control: In general, the monetary policy adopted in Iraq has not succeeded in curbing inflation or maintaining it at moderate levels to improve citizens' living standards. One of the most significant causes of inflation is imported inflation, resulting from the dumping policy prevailing in Iraqi markets. Monetary policy in Iraq largely focused on managing money supply and open market operations, which led to a policy of commodity dumping that negatively impacted local economic balance and increased dependence on imports amid weak domestic production (Rustam & Ahmed, 2023, p. 181) [7].

From 1990 until 2022, the Central Bank of Iraq was successful in controlling the exchange rate in accordance with the opinions of specialists and analysts in this area. However, monetary policy also contributed to economic contraction, as high interest rates discouraged the private sector from borrowing. Subsequently, in an effort to reduce inflation rates, the Central Bank of Iraq adopted an inflation-targeting policy using four main instruments: (reserve ratio, interest rate, discount rate, and open market operations) (Rustam & Ahmed, 2023, p. 181) [7].

At that time, conventional monetary policy instruments including managing the money supply, conducting open market operations, and maintaining a stable dinar exchange rate vs the dollar weren't enough to stem the tide of extreme inflation. The Iraqi economy's reliance on oil earnings and lack of income source diversification made it susceptible to

external shocks like changes in the price of oil or world crises, which reduced the influence of these instruments.

Second Requirement: Examining the Level of Coordination between Iraq's Monetary and Fiscal Policies in Times of Crisis

The Effects of Monetary Policies: Iraq has had significant economic difficulties in recent years, especially during crises like the Russian-Ukrainian War and the COVID-19 epidemic. These difficulties include a general budget deficit, rising inflation rates, and volatility in the dinar currency rate. Under such circumstances, coordination between monetary and fiscal policy becomes crucial to ensure macroeconomic stability. The central bank's role cannot be limited to controlling money supply or interest rates alone; rather, coordination with the government in public spending, taxation, and other fiscal policies is essential.

Given this, the study by Jabbar Saadoon Darag *et al*. (2023) [17] demonstrated how well monetary and fiscal policies work to affect inflation rates in the Iraqi economy. It showed that fiscal policy contributes to increasing inflation and the general price level, while monetary policy works to reduce inflation during the period (2004-2023) in Iraq. The study concluded that fiscal and monetary policies were statistically insignificant and did not substantially affect inflation in Iraq. Aside from welcoming investments, balancing fiscal and monetary policies, and encouraging investment inflows, it recommended an economic strategy that boosts productive sectors, places more emphasis on the private sector, and makes the most efficient use of oil resources possible, all while responding to fluctuations in global oil prices.

Another study, *"Analysis of Coordination Between Monetary and Fiscal Policy in the Context of Public Debt: Iraq as a Model (2006-2016)" by Kamal Kazem Jawad and Ibtihal Ahmed Abdul Aoun Al-Shammari*, pointed out that the large public budget deficit during that period forced the government to rely on monetary policy or even instruments such as borrowing from the central bank which created a conflict between the objectives of monetary policy (such as reducing inflation and stabilizing the currency) and those of fiscal policy (such as financing government expenditures). The most significant finding of the analysis was that Iraq's fiscal and monetary policy tools overlapped, leading to an inverse link between the country's domestic public debt and foreign reserves. Among the key recommendations was the necessity of coordinating monetary and fiscal policies in a way that does not limit the effectiveness of either, as well as the importance of diversifying non-oil revenue sources to avoid dependence on global economies (Al-Shammari *et al*., 2018, p. 1) [9].

From these studies, it can be concluded that coordination between fiscal and monetary policies in Iraq has not always been sufficient or effective. Government spending priorities often dominate over monetary stability, thereby reducing the effectiveness of monetary policy instruments in combating inflation.

Third Requirement: The Impact of the Russian-Ukrainian War on Inflation in Iraq

The global economy is characterized by its movement according to mechanisms that are interconnected and interdependent among countries. Thus, the Russian-Ukrainian war had significant effects on the world economy. The sanctions imposed on Russia resulted in negative repercussions, leaving the Russian economy in near paralysis. The impact of this war on inflation in Iraq can be explained as follows (Abdul Hassan, 2024, p. 127) [10]:

Rising Food Prices as an Import-Dependent Market: The Russian-Ukrainian war disrupted global supply chains, particularly from the Black Sea region, which is one of the most important production areas for grains and vegetable oils (such as wheat, corn, and sunflower oil). This disruption reduced the global supply of these crops and food commodities, raising their prices in international markets. Since Iraq heavily depends on imports for essential foodstuffs, this price increase directly affected Iraqi markets. Prices of vegetables and oils rose by up to 30% for some products.

Impact of Exchange Rate Fluctuations: Maritime transport closures and disruptions, along with rising shipping and transportation costs, reduced the efficiency of imports from distant sources or those passing through countries also affected by the crisis. As the cost of imports rose globally, there was a greater need for dollars to fund these items, which put pressure on the Iraqi dinar's exchange rate versus other currencies. Because imported items became more expensive due to the exchange rate depreciation, domestic inflation increased more quickly.

Applied Study

Study Methodology

The descriptive-analytical approach, which seeks to discover and characterize the factors associated with the study, is employed in conjunction with statistical tools and techniques to analyze the study data collected from financial reports. This method makes it possible to get outcomes that support the study's goals.

Study Population and Sample

The examination of the population comprises data pertaining to the economic variables of the research, specifically the monetary policy variable, denoted by the yearly growth rate of the broad money supply, and the inflation variable, shown by the annual inflation rate. The research chose a data sample for these factors across two intervals: (2015-2019) and (2020-2024). The data were sourced from economic reports and bulletins published by the Iraqi Ministry of Finance and the World Bank.

Statistical Methods Used

The study relied on the Statistical Package for the Social Sciences (SPSS 25) and E-Views software in processing the data and testing the research hypotheses by applying the following statistical methods and indicators:

- **Descriptive Statistic Measures:** Used to extract arithmetic means, standard deviations, maximum and minimum values, and growth rates of the study variables, in addition to employing graphical representations to describe the study variables.
- **Single Linear Regression Analysis:** Made use of for testing research hypotheses and analyzing the relationship between independent and dependent variables.
- **Econometric Tests:** In order to learn more about the short-term and long-term nature of the relationship, we use the Augmented Dickey-Fuller (ADF) test, the

causality test, and the cointegration test to examine the variables' relationships, evaluate the time-lag intervals, and apply the error correction model (ECM). Utilizing the E-Views application, the econometric relationships between the dependent and independent variables were quantified.

Normality Test: A normality test was performed on the study data using the Kolmogorov-Smirnov test and the Shapiro-Wilk test to verify adherence to the assumption of a normal distribution. The tests were conducted to evaluate the hypothesis that the data originate from a normal distribution, with the results of both tests as follows:

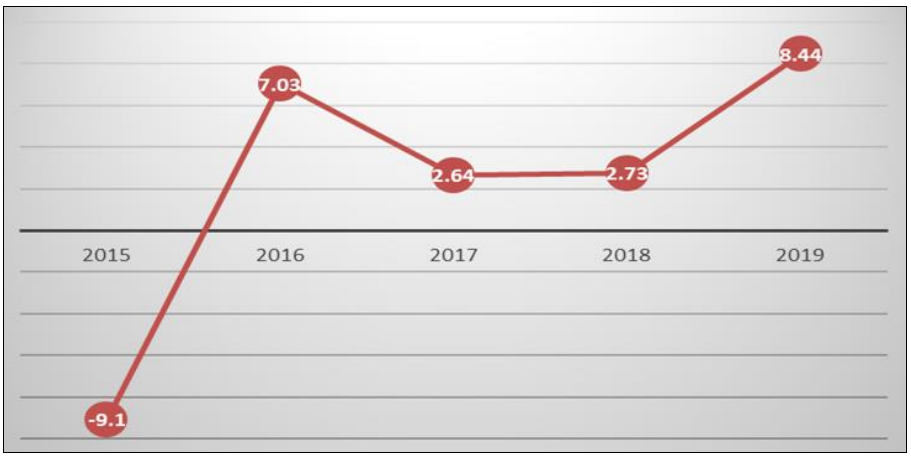
Table 1: Normality Test (Normal Distribution)

Variables	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
The yearly increase in the broad money supply from 2015 to 2019.	.317	5	.112	.850	5	.194
Rate of expansion of the money supply on an annual basis from 2020 to 2024	.283	5	.200*	.890	5	.357
Inflation rate during the period (2015-2019)	.233	5	.200*	.944	5	.696
Inflation rate during the period (2020-2024)	.343	5	.055	.822	5	.120

***Source*:** Compiled by a researcher employing statistical analysis utilizing SPSS software.

From the above table, it is evident that the significance level (Sig) for all study variables in both tests (Kolmogorov-Smirnov and Shapiro-Wilk) was not statistically significant at the 0.05 level; since the values of (Sig) for all variables were greater than (0.05), this confirms that the data are normally distributed, fulfilling the normality assumption.

Descriptive Analysis Results: Forecasting the Future Rate of Growth in the Total Money Supply from 2015 to 2019: From 2015 to 2019, Iraq's broad money supply grew at an average annual rate of 2.35 percent, with a standard deviation of 6.90 percent. The peak value attained was 8.44% in 2019, whereas the nadir was -9.10% in 2015, reflecting a decline of 1.93% over the study period (2015-2019).

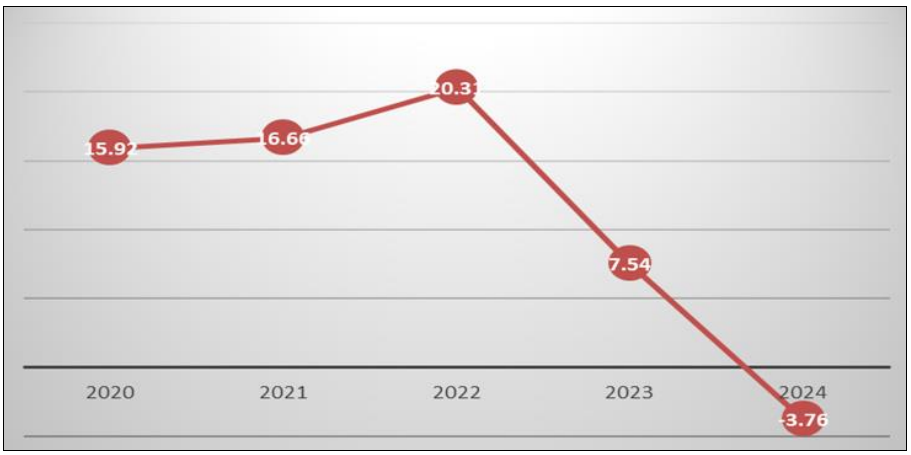


Source: Data from Table 2 were used to compile this report.

Fig 1: Development of the Annual Growth Rate of Broad Money Supply during the Period (2015-2019)

2. Forecasting the Future Rate of Increase in the Total Money Supply from 2020 to 2024

The arithmetic mean of the annual growth rate of broad money supply in Iraq from 2020 to 2024 was 11.33%, with a standard deviation of 9.65. The peak value attained was 20.31% in 2022, but the nadir was -3.76% in 2024, reflecting a decline of 1.24% over the study period (2020-2024).

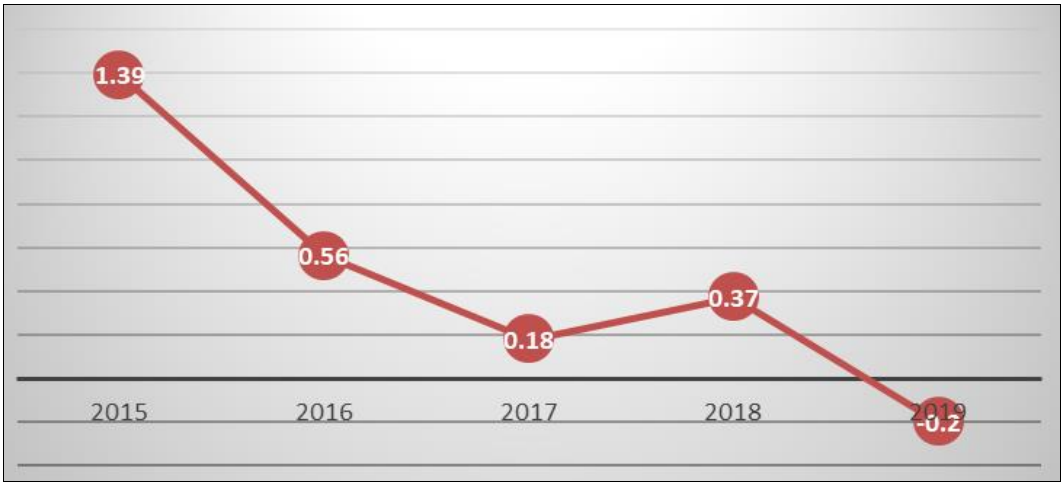


Source: Data from Table 2 were used to compile this report.

Fig 2: Development of the Annual Growth Rate of Broad Money Supply during the Period (2020-2024)

3. The evolution of the inflation rate from 2015 to 2019

According to the data, the arithmetic mean of Iraq's inflation rate from 2015 to 2019 was 0.46%, with a standard deviation of 0.59. During the study period (2015-2019), the value decreased by 1.14%, with the highest value reaching 1.39% in 2015 and the lowest value being -0.20% in 2019.

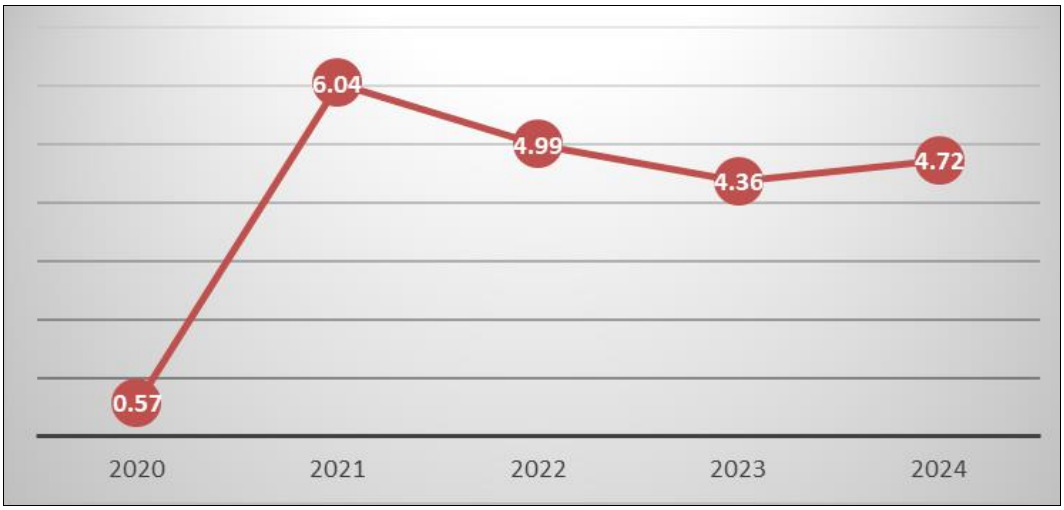


Source: Developed by the investigator using information from Table (2).

Fig 3: The Evolution of the Inflation Rate from 2015 to 2019

4. Analysis of the Inflation Rate's Growth from 2020-1924

According to the data, the arithmetic mean of Iraq's inflation rate from 2020 to 2024 was 4.14%, with a standard deviation of 2.09. The study period (2020-2024) had a growing rate of 7.28%, with the highest value reaching 6.04% in 2021 and the lowest value being 0.57% in 2020.



Source: created by the investigator using the information in Table (2).

Fig 4: Analysis of the Inflation Rate's Growth from 2020-1924

Table 2: Development of the Study Variables During the Periods (2015-2019), (2020-2024)

Year	Increase in the Total Money Supply on an Annual Basis (%)	Inflation Rate (%)
2015	-9.10	1.39
2016	7.03	0.56
2017	2.64	0.18
2018	2.73	0.37
2019	8.44	-0.20
Period Average	2.35	0.46
2020	15.92	0.57
2021	16.66	6.04
2022	20.31	4.99
2023	15.54	4.36
2024	-3.76	4.72
Period Average	11.33	4.14

Source: Created by the researcher using study data.

Source: created by the researcher using the World Bank's and Iraq's Ministry of Finance's economic reports and bulletins from 2015 to 2024.

Econometric Relationships between the Study Variables

To assess and analyze the relationships between the independent variable (annual growth rate of broad money supply) and the dependent variable (inflation rate) across the two study periods (2015-2019) and (2020-2024), econometric relationships were evaluated using a series of econometric tests, including the Augmented Dickey-Fuller (ADF) test, causality test, cointegration test to investigate variable relationships, and lag period test. Additionally, the Error Correction Model (ECM) was utilized to ascertain the nature of the association between the variables in both the long and short term, employing E-Views software.

1. The Econometric Model of the Relationship between the Annual Growth Rate of Broad Money Supply and the Inflation Rate during the Period (2015-2019):

- **Unit Root Test:** For this purpose, we checked the model variables' stability using the Augmented Dickey-Fuller (ADF) test. The results showed that the broad money supply annual growth rate series (X1) was non-stationary at its level but became stationary after the first difference, suggesting that the series is integrated of order one (I(1)). At the same time, it was found that the inflation rate series (Y1) is integrated of order zero (I(0)) and that it is stationary at its level. The cointegration test between the two series was conducted using the ARDL approach because their integration orders were different.

Table 3: Results of the Augmented Dickey-Fuller (ADF) Test

Variables	Level			1st Difference		
	ADF	Sig.	Result	ADF	Sig.	Result
X1	-2.003	0.056	No stationary	-5.080	0.003	stationary
Y 1	-3.770	0.006	stationary			

***Source*:** Results of E-Views Calculations

Causality Test: At the 0.05 level of significance, there are no unidirectional or bidirectional causal relationships between the inflation rate and the yearly growth rate of the broad money supply from 2015 to 2019.

Table 4: Causality Test

Null Hypothesis	Obs	F-Statistic	Prob.
Y1 does not Granger Cause X1	3	0.89566	0.4305
X1 does not Granger Cause Y1	3	0.39751	0.6793

Source: Outcomes of E-Views Analyses

Cointegration Test (Bounds Test): Analysis indicates the absence of cointegration between the yearly growth rate of broad money supply and the inflation rate for the period 2015-2019 at a significance level of 0.05.

Table 5: Cointegration Test (Bounds Test)

Test Statistic	Value	K
F-statistic	0.969654	1
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	4.04	4.78
5%	4.94	5.73
2.5%	5.77	6.68
1%	6.84	7.84

Source: Results of E-Views Calculations

Lag Length Selection: It is demonstrated that the inflation rate variable has an ideal number of lag periods of one period, but there are no lag periods associated with the annual growth rate of the broad money supply.

Table 6: Lag Length Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Y1(-1)	0.514515	0.343901	1.496111	0.3751
X1	-0.073710	0.061681	-1.195007	0.4436
C	0.289955	0.342701	0.846088	0.5530
R-squared	0.728609	Mean dependent var		0.227500
Adjusted R-squared	0.185826	S.D. dependent var		0.324487
S.E. of regression	0.292790	Akaike info criterion		0.494980
Sum squared resid	0.085726	Schwarz criterion		0.034701
Log likelihood	2.010039	Hannan-Quinn criter.		-0.515068
F-statistic	1.342358	Durbin-Watson stat		3.396905
Prob(F-statistic)	0.520952			

***Source*:** Findings from E-Views Estimations

Error Correction Model (ECM) in the Long Run and Short Run: In order to ascertain the relationship's parameter values in the short and long term, the error correction vectors were computed. It is clear that there has been no transition from the short to the long run of correction because the coefficient of the error correction term is not significant at the 0.05 level. Since X1 is not statistically significant at the 0.05 level, the long-run equation provides more evidence that there is no long-term correction impact.

Table 7: Results of the Error Correction Model Test

Cointegrating Form				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(X1)	-0.073710	0.061681	-1.195007	0.4436
CointEq(-1)	-0.485485	0.343901	-1.411698	0.3924
Cointeq = Y - (-0.1518*X + 0.5972)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
X1	-0.151827	0.195663	-0.775960	0.5799
C	0.597248	0.720695	0.828711	0.5595

***Source*:** Results of E-Views Calculations

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Unit Root Test: To determine if the model variables were stable, the Augmented Dickey-Fuller (ADF) test was used. Results showed that the wide money supply annual growth rate series (X2) is not stationary at its level; stationarity is attained after the second difference, suggesting that the series is integrated of order two (I(2)). After the initial difference, the inflation rate series (Y2) became stationary, suggesting that it is integrated of order one (I(1)), as it was non-stationary at its level. The cointegration test between the two series is conducted using the ARDL method because their integration orders are different.

Table 8: Results of the Augmented Dickey-Fuller (ADF) Test

Variables	**Level**			**1st Difference**			**2st Difference**		
	ADF	Sig.	Result	ADF	Sig.	Result	ADF	Sig.	Result
X2	-0.981	0.242	No stationary	-0.518	0.417	stationary No	-1.319	0.015	stationary
Y2	-0.165	0.565	stationary	-10.831	0.000	stationary			

***Source*:** Results of E-Views Calculations

Causality Test: There are no causal correlations, either bidirectional or unidirectional, between the annual growth rate of the broad money supply and the inflation rate throughout the period of 2020 to 2024 at a significance level of 0.05.

Table 9: Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
Y2 does not Granger Cause X	3	2.82310	0.0933
X does not Granger Cause Y2		0.72443	0.5019

***Source*:** Outcomes of E-Views Computations

Cointegration Test (Bounds Test): Cointegration exists between the yearly growth rate of broad money supply and the inflation rate for the period 2020-2024 at a significance level of 0.01.

Table 10: Cointegration Test (Bounds Test)

Test Statistic	**Value**	**K**
F-statistic	28.51536	1
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	4.04	4.78
5%	4.94	5.73
2.5%	5.77	6.68
1%	6.84	7.84

***Source*:** Results of E-Views Calculations

Lag Length Selection: We show that one lag period is the best number for the inflation rate variable. On the other hand, there should be no wait periods for the annual growth rate of broad money supply.

Table 11: Lag Length Test

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.***
Y2(-1)	-0.237970	0.104501	-2.277206	0.2634
X2	0.029032	0.023191	1.251855	0.4291
C	5.681235	0.546911	10.38787	0.0611
R-squared	0.882956	Mean dependent var		5.027500
Adjusted R-squared	0.648867	S.D. dependent var		0.722651
S.E. of regression	0.428218	Akaike info criterion		1.255335
Sum squared resid	0.183370	Schwarz criterion		0.795056
Log likelihood	0.489330	Hannan-Quinn criter.		0.245286
F-statistic	3.771889	Durbin-Watson stat		3.108711
Prob(F-statistic)	0.342117			

***Source*:** Findings from E-Views Estimations

Error Correction Model (ECM) in the Long Run and Short Run: In order to ascertain the relationship's parameter values in the short and long term, the error correction vectors were computed. No correction from the short run to the long run is evident from the fact that the error correction term coefficient is not significant at the 0.05 level. Given that X2 is not significant at the 0.05 level, the long-run equation further demonstrates that there is no correction effect over the long term.

Table 12: Results of the Error Correction Model Test

Cointegrating Form				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(X2)	0.029032	0.023191	1.251855	0.4291
CointEq(-1)	-1.237970	0.104501	-11.846504	0.0536
Cointeq = Y2 - (0.0235*X2 + 4.5892)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
X2	0.023451	0.019072	1.229629	0.4347
C	4.589154	0.258032	17.785203	0.0358

***Source*:** Results of E-Views Calculations

Evaluating the Study's Postulates

First Hypothesis: There is a statistically significant effect of the annual growth rate of broad money supply on the inflation rate in Iraq during the period (2015-2019).

Table 13: Results of the Simple Linear Regression Model for Testing the First Hypothesis

P-VALUE	r	R^2	F	t	b
0.050	0.878	0.771	10.086*	-3.176*	-0.075

***Source*:** Results of E-Views Calculations

Since the F-value is not statistically insignificant at the 0.05 level, where the value of (Sig F) = 0.050, or 0.05, it was determined that the model is significant. This shows that the computed F-value is higher than the F-value in the table. Additionally, it was discovered that 77.1% of the variances in the dependent variable (inflation rate) can be explained by the independent variable (annual growth rate of the broad money supply). Furthermore, during the 2015-2019 period, there was a negative link between Iraq's inflation rate and the yearly growth rate of the broad money supply. At the 0.05 significance level, it was demonstrated that the yearly growth rate of the broad money supply had a statistically significant impact on Iraq's inflation rate from 2015 to 2019. The findings support the study's first premise, showing that the inflation rate falls by 0.075% for every 1% increase in the broad money supply's annual growth rate.

Second Hypothesis

From 2020 to 2024, the rate of inflation in Iraq is significantly impacted by the yearly growth rate of the broad money supply.

Table 14: Results of the Simple Linear Regression Model for Testing the Second Hypothesis

P-Value	r	R^2	F	t	b
0.871	0.102	0.010	0.031	-0.177	-0.022

***Source*:** Results of E-Views Calculations

Since the F-value is not statistically significant at the 0.05 level, while the value of (Sig F) = 0.871 is more than 0.05, it was determined that the model is not significant. As a result, the tabular F-value is greater than the computed F-value. The findings support the rejection of the study's second hypothesis by demonstrating that, at the 0.05 significance level, there is no statistically significant relationship between the yearly growth rate of the broad money supply and the inflation rate in Iraq throughout the 2020-2024 timeframe.

Study Results

1. The yearly growth rate of the broad money supply and the rate of inflation in Iraq from 2015 to 2019 are inversely correlated. At the 0.05 significance level, a statistically significant relationship between the annual growth rate of the broad money supply and the inflation rate in Iraq was discovered between 2015 and 2019, prior to the COVID-19 epidemic and the Russian-Ukrainian war. The findings support the study's first premise, showing that the inflation rate falls by 0.075% for every 1% increase in the broad money supply's annual growth rate.
2. The annual growth rate of the broad money supply does not exhibit a statistically significant effect on the inflation rate in Iraq from 2020 to 2024, following the COVID-19 pandemic and the Russian-Ukrainian war, at the 0.05 significance level, thereby rejecting the study's second hypothesis.
3. The ineffectiveness of the monetary policies applied in Iraq in influencing the inflation rate after the COVID-19 pandemic and the Russian-Ukrainian war highlights the necessity of working towards the application and implementation of monetary policies that positively affect inflation rates.

Recommendations

1. Pay attention to investigating the factors influencing the inflation rate in Iraq.
2. Work on implementing monetary policies that can effectively impact inflation rates in Iraq.
3. Develop Iraqi monetary policies that contribute to addressing local and global problems and crises.

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