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THE EFFECT OF THE RECIPROCAL RELATIONSHIP BETWEEN THE EXCHANGE RATE AND MONETARY INFLATION IN IRAQ

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Abstract
The research aims to study the reciprocal relationship between the exchange rate and inflation for the period (2004-2022), and deals with the concept, role and factors affecting the exchange rate, as well as the concept of inflation and what are the factors affecting inflation. The data required for the study were obtained through the Central Bank of Iraq.
In this study, the study of autocorrelation, and through the results, it was shown that there is a relationship between the two variables in the short term, and the existence of a long-term relationship between them, and through a program and a cointegration test, through the Engel-Graniger test model, and testing the two variables in the two cases and each variable separately, once. One is independent and another is dependent on both variables.

Keywords: exchange rate; Inflation rate; ARDL model.

Introduction

The phenomenon of inflation has gained an important position among economic theories and studies, as controlling the phenomenon of inflation is considered one of the most important goals of the governments of various countries of the world, whether developed or developing, and it has constituted a source of great concern for decision-makers. This interest among economists stems from the importance of shedding light on the reasons behind the phenomenon. Inflation, whether economic, social, or political. Given the importance of inflation in the course of the economic system, as a result of the relationship between it and a number of economic variables, including the exchange rate and the stability of the exchange rate in various countries of the contemporary world, especially developing countries, it has become increasingly important in international economies. Even in the life of societies in their various economic, social, cultural and political aspects, exchange rate stability is one of the priorities of monetary policy in various countries, because this stability is the basis for providing the appropriate environment for investment and attracting savings to maintain price stability.

2. Study structure

2.1. Research problem:

- The impact of monetary inflation changes on the exchange rate in Iraq.
- What is the reality of the development of the exchange rate and inflation in Iraq?
- The impact of exchange rate changes on inflation in Iraq.

2.2. Study hypotheses:

Exchange rate changes affect inflation in Iraq (unidirectional causal relationship).

- There is a short-term relationship between the exchange rate and monetary inflation in Iraq.
- There is a long-term relationship between the exchange rate and monetary inflation in Iraq

2.3. The importance of the study:

This study is of great importance because the phenomenon of inflation and the exchange rate takes a local character in Iraq and they have the greatest impact on economic activity, which prompts the necessity of this and studying it, especially in light of the current situation that the country is witnessing.

2.4. Objectives of the study :

- Take a look at the path of the exchange rate and inflation in Iraq
- Measuring the impact of exchange rate changes on inflation in Iraq for the period (2004-2022).

3. Previous studies :

There are many previous studies that addressed the relationship between exchange rates and inflation in various Arab and foreign countries using various tools, including:

- Sabah Nouri Abbas (2008) The impact of inflation on the equilibrium exchange rate of the Iraqi dinar for the period 1990-2005. The results of this study were positive (direct relationship) between the exchange rate and inflation.
- Sanaa Mohamed Abdel Ghani (2016), The impact of liberalizing the dollar exchange rate on the inflation rate in Egypt, and this was the result of the study

There is a short-term relationship between the two variables.

- Ahmed Bin Al-Bar and Ali Al-Senussi (2019) Analysis and measurement of changes in the nominal exchange rate on the inflation rate in Algeria during the period (1985-2017), and the results concluded that there is no cointegration relationship between the two variables under study.

4.Research methodology:

The study dealt with the theoretical and quantitative aspects to demonstrate the effect of the exchange rate, which represents an independent variable, on the dependent variable, which is the inflation rate in the short term, using the unit root test, and the effect of the exchange rate in the long term using cointegration, through the (ARDL) test for the period (2004-2022) The data is also displayed using graphs via the (Eviews9) program.

5. For a theoretical framework of the exchange rate and monetary inflation

5. 1. The concept of the exchange rate and the factors affecting it

5.1.1. The concept of the exchange rate:

There are many definitions of the exchange rate, my agencies: The exchange rate is defined as the ratio on the basis of which foreign exchange is exchanged and obtained for the national

currency, or what is paid in units of the national currency to obtain a unit or a certain number of foreign currencies (Dr. Chamoun, 1994)...

The exchange rate is the main tool that has a direct impact on the relationship between domestic prices and foreign prices, and is often the most effective tool when it is necessary to encourage exports and provide imports. And the rest of the economies are an important means of influencing the allocation of resources between economic sectors, the profitability of export industries, and the cost of importing. In addition, the exchange rate represents a tool linking the prices of commodities in the local economy to their prices in the global market, and the local price of the commodity is linked through the exchange rate (Mahmoud Hamidat, 1966). (The exchange rate can be defined as the number of units of a particular currency that must be paid to obtain one unit of another currency, (Al-Taher Al-Atrash: 23, 2005).

5.1.2. Factors affecting the exchange rate:

There are factors that affect the exchange rate and determine the exchange rate, the most important of which are:

5.1.2.1. Quantity of money:

The increase in the issuance of money and the increase in it. The quantity of money leads to an increase in the general level of prices, and this makes local goods less able to compete with the goods of other countries, which leads to an increase in the quantity of imports and a decrease in the quantity of exports, which increases demand. on foreign currencies and reduces the demand for the local currency, and this leads to a decrease in the exchange rate of the local currency in exchange for a rise in the exchange rate of foreign currencies (Cavoli Tony, Ragon, Ramkishin: 28,2005).

5.1.2.2. Interest rate: An increase in the money supply leads to a decrease in the local interest rate, which leads to the migration of local capital abroad, on a regular basis, to benefit from the difference between local and global interest rates, given that global interest rates are not affected by changes in local interest rates due to the small size of the money supply. Local economy, this will lead to an increase in the local economy

Demand for foreign currencies. Hence the decline in the exchange rate of the local currency against the foreign currency. An increase in real interest rates will stimulate the inflow of foreign capital, leading to an increase in the exchange rate of the local currency in the foreign exchange market (Mahmoud Hamidat: 1996, 45).

5.1.2.3. Domestic and global inflation: The effect of an increase in the level of local prices compared to the level of international prices leads to an increase in imports, an increase in demand for foreign currencies, a decrease in exports and the supply of foreign exchange, which pushes the foreign exchange rate to rise, and from it it can be considered that the general level of prices is one of the most important of them.

Factors affecting the determination of the exchange rate and its fluctuations (Rogers, Jeffrey, 65, 2007).

5.1.2.4 Balance of Payments: It is the link that reflects the country's relationship with the outside world. There is a close relationship between the balance of payments and the exchange rate approved by the state, as the exchange rate plays an important role in achieving balance in the balance of payments. Exchange rate of a country's exports and imports. The rise in the exchange rate of the local currency against foreign currencies has a positive effect on the country's imports, and this is the reason for the decrease in the prices of those imports for citizens in the country due to the rise in the exchange rate of their currency. As for the rise in the exchange rate of the local currency, it negatively affects the state's exports due to the rise in the prices of local goods in foreign markets, where the foreign citizen pays more in order to obtain local goods, which negatively affects the country's exports. The effect of the exchange rate on the balance of payments depends on the elasticity of domestic demand. For imported goods and services, as well as the flexibility of external demand for the country's domestic exports of goods and services. The greater the elasticity of demand, the greater the impact of the exchange rate on the currency (Fisher, 55, 2015).

5.2. The concept of inflation and the factors affecting it

5.2.1. Inflation concept:

Inflation is considered one of the economic problems that most economies suffer from, whether developed or developing, and it is increasing. As a result of the effects that inflation has on the course of life in general and the economy in particular, this is what prompted economists to place inflation as one of the main economic goals that the macroeconomics seeks to address or address. To reduce it at the very least, inflation is generally defined as a general and continuous rise in prices. Based on this definition, the rise in the price of a commodity over a specific period cannot be considered inflation, because it is not continuous and includes one commodity and not all goods and services. Therefore, the term inflation refers to a rise in the general level of prices. Inflation occurs only when the prices of many goods and services such as housing rise. And clothing, transportation, fuel, and food increase. But if the prices of some types of goods rise, inflation does not necessarily occur. Once inflation occurs, it becomes difficult to stop. For example, if prices rise, workers demand higher wages, leading to a downward spiral. Wages and Prices Therefore, inflation expectations are important, and the relevant attitude of the authorities towards those expectations is also important. If there is an increase in accumulated consumption, and the authorities respond to it by increasing the money supply, this will lead to higher commodity prices.

5.2.2 Factors affecting inflation

5.2.2.1. Money supply: Inflation is mainly due to the increase in money supply on economic growth. The more money supply increases and the government decides to print more money, the lower the value of the currency, because that means more money for the same amount of goods. This leads to increased demand for goods, and thus Price increase.

5.2.2.2.National Debt: National debt leads to inflation, because governments have no choice but to pay off the national debt by increasing taxes or printing more money.

When taxes increase, companies will be forced to raise their prices to compensate for the tax rate imposed on them, and thus inflation will occur.
- In the second case related to printing money, the money supply will increase, and thus inflation will occur.

5.2.2.3. Inflation resulting from higher wages: The higher the wages of workers, the more people are able to spend money on purchasing consumer goods, which leads to increased demand. In this case, companies will raise the prices of goods to a level that the consumer can afford, to achieve a balance between supply and demand.
There are other reasons for increased demand, including lower income taxes, which provides more income to consumers and encourages them to spend more.
Monetary stimulus policies such as lowering interest rates may also increase demand, as this may encourage people to take out more loans, or cause housing prices to rise (Devereux, M. B., C. Engel, and P. E. Storgaard: 87,2004).

5.2.2.4. Cost inflation:
- When companies face an increase in the prices of the raw materials they use for manufacturing, they will increase the price of the good produced, to maintain their profits.

5.2.2.5 Exchange rate:
- The currency exchange rate affects inflation significantly, so as the value of the local currency rises lower than the value of foreign currencies, the prices of imported goods and commodities will be very high and expensive for consumers in the country.

5.2.2.6. Inflation resulting from the pursuit of profits: This type of inflation occurs when companies raise their prices in order to obtain more profits.

5.2.2.7. Decreased Productivity: When firms are less productive, the supply of goods decreases and prices rise.

5.2.2.8 Increase in taxes: When the government imposes more taxes such as value added tax or customs duties, it will lead to higher prices.

5.2.3. The relationship between the exchange rate and inflation:
The exchange rate directly affects inflation rates, as it is the tool that links the local economy with the international economy through the commodity market (which is the exported and imported goods participating in international trade), the asset market (financial and non-financial assets), and factors Production market (assets). Labor market). The exchange rate affects the relative prices of domestic and foreign goods through aggregate demand and supply, so that they are movements and the exchange rate affects, on the one hand, the demand side through lower export prices and increased import prices, thus increasing exports, which leads to increased aggregate demand and increased production, and inflation rates rise. (Imported inflation), while on the supply side, the decline in the exchange rate

leads to a rise in the prices of imported inputs, which prompts projects to increase the prices of local goods, including a rise in the inflation rate (Abdel Moumen and Hisham, 4, 2019), and the concept of "exchange rate" arose. "Effective." In the early 1970s, after the collapse of the Bretton Woods system and the general trend towards the adoption of flexible exchange rates, the effective exchange rate was essentially a single indicator that represented the exchange rate of the domestic currency against all the currencies of trading partners, thus interpreting the effectiveness of the exchange giving a comprehensive picture. A summary of currency exchange rate developments makes it easier for decision makers to follow and evaluate the adopted exchange rate policy (Adnan, 23, 2012).

6. Solutions and treatments

6.1. Inflation situation:

Inflation can be treated through the two most important policies, which are fiscal policy and monetary policy, as follows:

First: Financial policy

The problem of inflation is addressed through the use of fiscal policy tools, which are government spending and taxes. When inflation occurs, the state can address it by increasing the size of taxes, regardless of their details, as increasing taxes will lead to deducting a portion of individuals' incomes, and this is reflected in a decrease in demand for goods. And services, prices fall and inflation decreases, on the one hand.

On the other hand, government spending can be used to address inflation, as the government can pressure government spending, which means reducing the volume of spending, especially consumer spending, because it leads to an increase in demand and then inflation, while investment spending may lead to a reduction in the severity of inflation because it leads to an increase in prices. For capital goods at first, but later on, it leads to a decrease in their prices and a decrease in inflation because it led to an increase in the production of goods and services in exchange for a stability or increase in demand in the same proportion.

Second: Monetary policy:

Just as fiscal policy has been used, through its tools represented by spending and taxes, to address inflation, likewise monetary policy can be used, through its tools, represented by the interest rate, the cash reserve ratio, and open market operations, to address the problem of inflation.

We mentioned previously that inflation can occur as a result of an increase in monetary liquidity with a constant supply of goods and services, or an increase in liquidity occurs at a faster rate than an increase in the production of goods and services. This is what leads to an increase in demand for goods and services, so prices rise and what is known as inflation occurs.

In order to address inflation, the state resorts to using monetary policy tools, for example, it works to raise the interest rate. This leads to withdrawing cash from the markets because everyone is looking for profits, and since a high interest rate brings profits with uncertainty

about future market conditions, then investors will resort to depositing Their money is in the banks to obtain the interest rate, so cash liquidity, demand and inflation decrease.

The central bank can also resort to a policy of cash reserve ratio, which means the amount of money that banks must keep with the central bank, and the latter is the one who decides the percentage of funds that the bank must pay to it according to economic conditions. If inflation occurs, the central bank raises this percentage and it decreases. The ability of banks to grant credit and then demand decreases, so prices decrease and then inflation, and vice versa in the event of deflation.

The central bank can also resort to a policy of open market operations to address inflation. When inflation occurs, the central bank enters the stock market as a seller of securities, as selling securities in exchange for the money it obtains means withdrawing cash liquidity from the markets and thus decreasing demand and inflation. Because the entry of the central bank as a seller to individuals, commercial banks, and financial institutions will lead to a reduction in the cash reserves of commercial banks and a decrease in their ability to grant credit, so demand will decrease as a result of the decrease in spending, and inflation will disappear.

The monetary policy tools discussed above are called quantitative tools, and if they do not lead to a desired result, one can resort - in addition to quantitative tools - to using qualitative tools, some of which can be mentioned as follows*:

1- Regulating consumer credit, such as the central bank raising the value of the first installment or shortening the repayment periods. In both cases, the demand for credit will decrease, thus spending will decrease, and then inflation will decrease.

2- Moral persuasion, such as the central bank, in the event of inflation, sending an invitation to bank management

Others need to be cautious in their lending and investment policies.

3- Direct impact, by imposing sanctions on banks that adopt inappropriate practices from a monetary policy point of view, such as the central bank refusing to conduct a rediscount in favor of commercial banks when it announces its disagreement with their investment policies, or refusing to provide commercial banks with additional cash reserves in the event Its loans exceeded the prescribed maximum limits.

These are the most prominent solutions to inflation that a decision-maker can resort to to address the problem of inflation. Certainly, using these solutions in a manner opposite to what was discussed above will lead to addressing the problem of deflation, which is represented by stagnation and a decline in economic activity.

6.2. Exchange rate situation:

Through the foreign currency window, two functions can be performed. The first is concerned with financing the private sector’s foreign trade and its foreign exchange needs in meeting the increasing demand arising from government spending primarily through imports. The second is concerned with exercising a monetary policy of step-in intervention to stabilize the price of wool and control local liquidity. There is another view regarding the foreign currency window in Iraq, which is clear from the fact that the link between the cash substitute and government spending and private sector purchases of foreign currency did not contribute to determining the appropriate tool that the monetary authority can use to influence the

money supply and thus achieve stability in the medium term. Also, the currency window does not provide tools to engage in managing the exchange rate while adhering to guidance in managing this variable as a lesson for correcting the paths of financial and monetary policy at the current stage. Therefore, the assumption that the benefits of the foreign currency window and free floating have been exhausted requires searching for other options that are appropriate. Positively with the requirements of the current stage, and while it is not possible to predict which options will achieve the desired success, the reality of the Iraqi economy, and the fact that oil in Iraq constitutes the largest share of the gross domestic product and exports, may stabilize exchange rates and link them to a basket of currencies Political.

In addition to achieving external balance, one of the components of the economic stability of any country, the option of linking the currency to a basket of currencies, especially the currencies of the most important trading partners, is the most successful method in light of the reality and data of the Iraqi economy at the current stage.

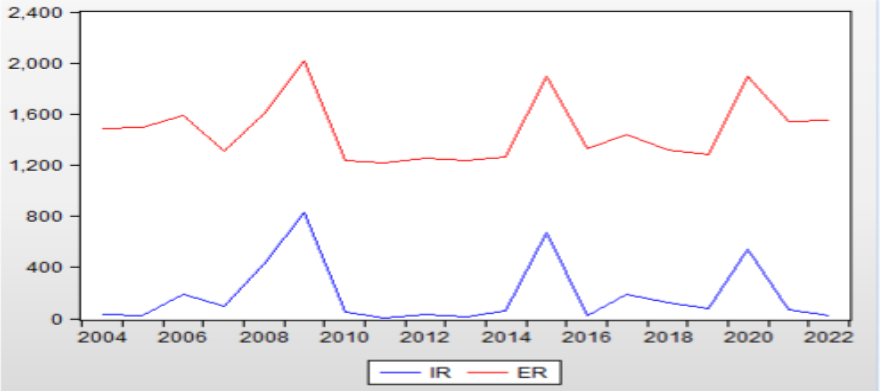


Figure No. (1) shows exchange rate fluctuations and inflation for the period (2004-2022)
Search results according to (Eviews9) program
Source: Central Bank of Iraq data for the period (2004-2022)

7. Statistical Analysis

7.1. examination of data:

Through measures of central tendency, graphs, measures of dispersion, and testing for normal distribution, all of these statistical operations are considered within the examination of data. Examining the independent exchange rate variable, which is the adopted inflation rate

Table

	IR	ER
Mean	182.5181	1289.085
Median	65.62500	1222.000
Maximum	833.3330	1530.150
Minimum	3.448000	1180.000
Std. Dev.	247.7409	119.7397
Skewness	1.564268	0.883293
Kurtosis	4.106434	2.176484
Jarque-Bera	8.717778	3.007544
Probability	0.012793	0.222290
Sum	3467.844	24492.62
Sum Sq. Dev.	1104760.	258076.7

research results

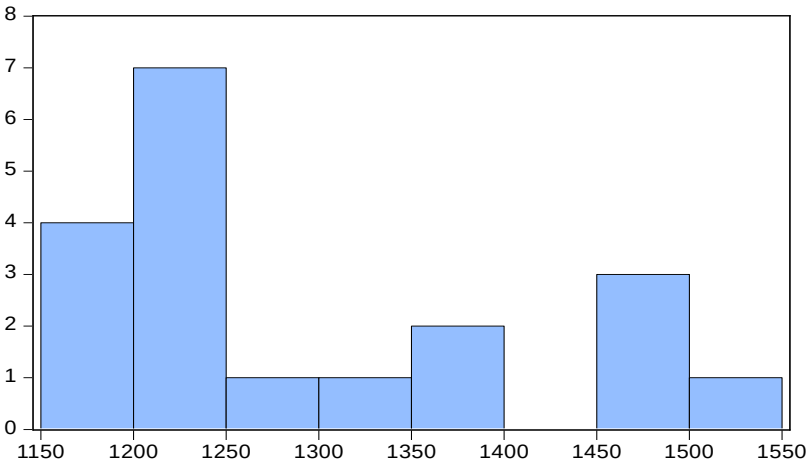
The table above shows the averages of the exchange rate, inflation, median, minimum and maximum value, standard deviation, and skewness, in addition to that of Jack Bearer, which is extracted or explained within descriptive statistics and Jack Bearer's rule as follows:

Jarque – Bera test : P < 0.05 , Not Normal distribution , p > 0.05 , Normal distribution .

In the table above, as shown through the parameters, the p value is less than five percent, and therefore the distribution is abnormal:

Jarque – Bera test : P < 0.05 , Not Normal distribution.

7. 1. 2 . The table below shows the descriptive statistics for the variable represented by the exchange rate in Iraq.



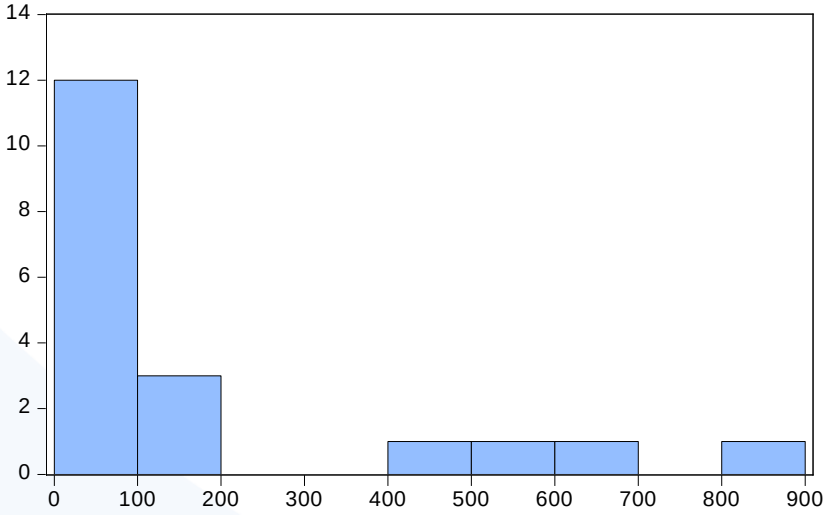
Series: ER
Sample 2004 2022
Observations 19

Mean	1289.085
Median	1222.000
Maximum	1530.150
Minimum	1180.000
Std. Dev.	119.7397
Skewness	0.883293
Kurtosis	2.176484
Jarque-Bera	3.007544
Probability	0.222290

In the table above, as shown through the parameters, the p value is greater than five percent, and therefore the distribution is normal:

Jarque – Bera test : P > 0.05 , Normal distribution.

7. 1. 3. The table below shows the descriptive statistics for the variable monetary inflation in Iraq.



Series: IR
Sample 2004 2022
Observations 19

Mean	182.5181
Median	65.62500
Maximum	833.3330
Minimum	3.448000
Std. Dev.	247.7409
Skewness	1.564268
Kurtosis	4.106434
Jarque-Bera	8.717778
Probability	0.012793

In the table above, as shown by the parameters, the p-value is less than five percent, and therefore the distribution is abnormal.

Jarque – Bera test : P < 0.05 , Not Normal distribution.

7.2 Darbin-Watson test

Table 7.2.1. Testing the Darbin-Watson model: Considering the dependent variable is the exchange rate and the dependent variable is monetary inflation ,The results of Watson's training were as follows:

Dependent Variable: ER
Method: Least Squares
Date: 11/03/23 Time: 13:06
Sample: 2004 2022
Included observations: 19

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1313.590	34.05568	38.57183	0.0000
IR	-0.134259	0.112610	-1.192246	0.2495

R-squared	0.077163	Mean dependent var	1289.085
Adjusted R-squared	0.022878	S.D. dependent var	119.7397
S.E. of regression	118.3620	Akaike info criterion	12.48467
Sum squared resid	238162.8	Schwarz criterion	12.58409
Log likelihood	-116.6044	Hannan-Quinn criter.	12.50150
F-statistic	1.421451	Durbin-Watson stat	0.510458
Prob(F-statistic)	0.249542		

Research results

Since the value of Durbin-Watson is (0.510958), and is smaller than the value given in the table, which is (1.53), (1.08), for both D and D, we reject the null and accept the alternative, since it is far from the null value, which is (2).

7.2.2.Table 6.2.1. Testing the Darbin-Watson model: Considering the dependent variable is monetary inflation and the dependent variable is the exchange rate, the results of Darbin-Watson were as follows:

Dependent Variable: IR
Method: Least Squares
Date: 11/03/23 Time: 13:09
Sample: 2004 2022
Included observations: 19

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	923.3937	623.9462	1.479925	0.1572
ER	-0.574730	0.482056	-1.192246	0.2495

R-squared	0.077163	Mean dependent var	182.5181
Adjusted R-squared	0.022878	S.D. dependent var	247.7409
S.E. of regression	244.8906	Akaike info criterion	13.93880
Sum squared resid	1019514.	Schwarz criterion	14.03822
Log likelihood	-130.4186	Hannan-Quinn criter.	13.95563
F-statistic	1.421451	Durbin-Watson stat	2.133077
Prob(F-statistic)	0.249542		

research results

Since the value of Durbin-Watson is (2.133077), greater than the value given in the table, which is (2.47), (2.92), for both Du and Dl, we reject the null and accept the alternative because it is far from the null value, which is (2).

Since the value of Durbin-Watson is (2.133077), less than the value given in the table which is (2.47), (2.92) for both D and D, we accept the null hypothesis and reject the alternative hypothesis as it is located between the value of (2) and the value of (4-du) equal to (2.47).

7.3. Unit root sample test:

Table 7.3.1. which shows the unit root test on the monetary inflation variable, as shown below:

Null Hypothesis: D(IR) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=3)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.873166	0.0011
Test critical values:	1% level	-4.616209	
	5% level	-3.710482	
	10% level	-3.297799	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 17

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IR,2)
Method: Least Squares
Date: 11/03/23 Time: 19:47
Sample (adjusted): 2006 2022
Included observations: 17 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IR(-1))	-1.421644	0.242057	-5.873166	0.0000
C	102.6642	198.1015	0.518240	0.6124
@TREND("2004")	-10.19776	17.79925	-0.572932	0.5758

R-squared	0.711330	Mean dependent var	-2.396000
Adjusted R-squared	0.670091	S.D. dependent var	623.5887
S.E. of regression	358.1751	Akaike info criterion	14.75871
Sum squared resid	1796051.	Schwarz criterion	14.90574
Log likelihood	-122.4490	Hannan-Quinn criter.	14.77332
F-statistic	17.24911	Durbin-Watson stat	2.251375
Prob(F-statistic)	0.000167		

research results

The unit root test on the monetary inflation variable above shows stability at the zero degree level. In the normal test equation and without the trend, we notice the probability and value (0.0011), which is less than 1%, and also t (t-Statistic), which is (-5.873166), is lower at the 1% level.

(-4.616209) and at the 5% level (-3.710482), as well as at the 10% level (-3.297799), therefore we accept the substitution hypothesis and reject the null hypothesis.

Table 7.3 .2. which shows the unit root test on the exchange rate variable, as shown below:

Null Hypothesis: D(ER) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=3)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.281577	0.0195
Test critical values:	1% level	-4.667883	
	5% level	-3.733200	
	10% level	-3.310349	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 16

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ER,2)
Method: Least Squares
Date: 11/03/23 Time: 19:35
Sample (adjusted): 2007 2022
Included observations: 16 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ER(-1))	-1.245540	0.290907	-4.281577	0.0011
D(ER(-1),2)	0.570600	0.227234	2.511073	0.0274
C	-104.5304	44.56774	-2.345429	0.0370
@TREND("2004")	10.37972	3.997325	2.596666	0.0234

R-squared	0.605665	Mean dependent var	8.440625
Adjusted R-squared	0.507082	S.D. dependent var	77.67994
S.E. of regression	54.53763	Akaike info criterion	11.04798
Sum squared resid	35692.24	Schwarz criterion	11.24112
Log likelihood	-84.38382	Hannan-Quinn criter.	11.05787
F-statistic	6.143672	Durbin-Watson stat	2.166176
Prob(F-statistic)	0.008966		

Unit root test on the exchange rate variable, as shown above, stability is at the zero degree level. In the normal test equation and without the trend, we notice the probability and value (0.0195), which is less than
1%, and also t (t-Statistic), which is (--4.281577), is less. At the 1% level
(-4.667883) and at the 5% level (-3.733200), as well as at the 10% level (-3.310349), therefore we accept the wildcard hypothesis and reject the null hypothesis.

7.4 . Engel-Graniger test

Table 7.4.1. Engel-Graniger test: Considering the dependent variable is the exchange rate and the dependent variable is monetary inflation. The result of the first stage was to estimate the required equation Engel-Graniger test. My agencies:

Dependent Variable: ER
Method: Least Squares
Date: 11/03/23 Time: 22:39
Sample: 2004 2022
Included observations: 19

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1313.590	34.05568	38.57183	0.0000
IR	-0.134259	0.112610	-1.192246	0.2495

R-squared	0.077163	Mean dependent var	1289.085
Adjusted R-squared	0.022878	S.D. dependent var	119.7397
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Sum squared resid	238162.8	Schwarz criterion	12.58409
Log likelihood	-116.6044	Hannan-Quinn criter.	12.50150
F-statistic	1.421451	Durbin-Watson stat	0.510458
Prob(F-statistic)	0.249542		

Null Hypothesis: D(U) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=3)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.694167	0.0096
Test critical values:	1% level	-4.667883	
	5% level	-3.733200	
	10% level	-3.310349	

*MacKinnon (1996) one-sided p-values.

Warning: Probabilities and critical values calculated for 20 observations, and may not be accurate for a sample size of 16 .

From the table above: The significance of the test is shown through prob (0.0000), and therefore we accept the alternative hypothesis and reject the null, in terms of the existence of a relationship between the two variables over the long term.

schedule. 7.4.2. The second stage is by extracting the remaining residues. We estimate the required equation Engel-Graniger test. My agencies:

7.4.1.1. Dickey-Fuller model test: The second stage involves extracting the residuals and estimating the required equation

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(U,2)
Method: Least Squares
Date: 11/03/23 Time: 22:48
Sample (adjusted): 2007 2022
Included observations: 16 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(U(-1))	-1.693780	0.360826	-4.694167	0.0005
D(U(-1),2)	0.506047	0.236901	2.136116	0.0540
C	-149.9522	56.17444	-2.669402	0.0204
@TREND("2004")	14.82132	5.041583	2.939816	0.0124

R-squared	0.682374	Mean dependent var	6.639856
Adjusted R-squared	0.602967	S.D. dependent var	115.2415
S.E. of regression	72.61433	Akaike info criterion	11.62052
Sum squared resid	63274.09	Schwarz criterion	11.81367
Log likelihood	-88.96416	Hannan-Quinn criter.	11.63041
F-statistic	8.593410	Durbin-Watson stat	1.839536
Prob(F-statistic)	0.002568		

From the table above: The significance of the test is shown through prob (0.0005), and therefore we accept the alternative hypothesis and reject the null, in terms of the existence of a relationship between the two variables over the long term.

Table 7.4.2. Engel-Graniger test: Considering the dependent variable is monetary inflation and the exchange rate is the dependent variable, and the result of the first stage was to estimate the required equation Engel-Graniger test. My agencies:

Dependent Variable: IR
Method: Least Squares
Date: 11/03/23 Time: 22:52
Sample: 2004 2022
Included observations: 19

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	923.3937	623.9462	1.479925	0.1572
ER	-0.574730	0.482056	-1.192246	0.2495

R-squared	0.077163	Mean dependent var	182.5181
Adjusted R-squared	0.022878	S.D. dependent var	247.7409
S.E. of regression	244.8906	Akaike info criterion	13.93880
Sum squared resid	1019514.	Schwarz criterion	14.03822
Log likelihood	-130.4186	Hannan-Quinn criter.	13.95563
F-statistic	1.421451	Durbin-Watson stat	2.133077
Prob(F-statistic)	0.249542		

Null Hypothesis: D(U) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=3)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.406660	0.0158
Test critical values:	1% level	-4.667883	
	5% level	-3.733200	
	10% level	-3.310349	

*MacKinnon (1996) one-sided p-values Warning: Probabilities and critical values calculated for 20 observations, and may not be accurate for a sample size of 16.

7.4.2.1. Dickey-Fuller model test: The second stage involves extracting the residuals and estimating the required equation

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(U,2)
Method: Least Squares
Date: 11/03/23 Time: 22:56
Sample (adjusted): 2007 2022
Included observations: 16 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(U(-1))	-2.046530	0.464417	-4.406660	0.0009
D(U(-1),2)	0.430109	0.278867	1.542346	0.1489
C	-27.22705	217.8753	-0.124966	0.9026
@TREND("2004")	3.331370	19.07759	0.174622	0.8643

R-squared	0.763825	Mean dependent var	-8.561547
Adjusted R-squared	0.704781	S.D. dependent var	643.2443
S.E. of regression	349.5005	Akaike info criterion	14.76320
Sum squared resid	1465807.	Schwarz criterion	14.95635
Log likelihood	-114.1056	Hannan-Quinn criter.	14.77310
F-statistic	12.93661	Durbin-Watson stat	2.039113
Prob(F-statistic)	0.000454		

research results

From the table above: The significance of the test is shown through prob (0.0000), and therefore we accept the alternative hypothesis and reject the null, in terms of the existence of a relationship between the two variables over the long term.

8. Conclusions and recommendations

8.1. Conclusions

Inflation is considered a phenomenon of an international nature that has an impact on global economic activity, which prompted us to study it in Iraq and determine its effectiveness

Its relationship with the factors affecting it, and the most important of these factors is the exchange rate, as any shock in the exchange rate casts a shadow on inflation rates in the short term, as well as in the medium and long term due to the presence of synchronization and the existence of a complementary relationship between them, as the current study showed during the study period and through... Unit root test and ARDL test.

8.2. Recommendations

Among the recommendations that can be mentioned are:

Iraq is a rentier state that depends on the export of oil, especially in light of the crises that Iraq faced as a result of the American occupation of Iraq and the economic blockade of Iraq in 1991.

Fluctuations in the oil market affect the value of the currency and the exchange rate, and therefore inflation rates. Therefore, the economy must be diversified, and measures must be taken as follows:

- The foreign exchange market must be controlled and stabilized.
- Studying all variables and factors affecting inflation, especially those that can occur, include them in causal models, and use these models in studying the inflation phenomenon.
- The importance of standard models in studying the relationship between economic variables and measuring and determining the mutual influence between them.

References

1. Abdel Majeed Qadi, Introduction to Macroeconomic Policies - University Press Office, Algeria, 2003.
2. Angeloni, Ignazio - Michael Ehrman - Inflation differentials in the euro area - European Central Bank, Working Paper Series, No. 338, September 2004.
3. Auer, “Exchange rate pass-through, domestic competition, and inflation: Evidence from the revaluation of the renminbi.” Journal of Money, Credit and Banking, 47, 2015.
4. -Cavoli Tony, Rajon, Ramkishin, Inflation Targeting and Monetary Policy Rules for Small Businesses. and open developing economies - Western Economic Association meetings in Hong Kong - January 2005.
5. Corsetti, J., L. Didola, and S. Leduc, “High Exchange Rate Volatility and Low Pass-through.” Journal of Monetary Economics 55, 2008.
6. Coulibaly, D., and H. Kempf, “Does Inflation Targeting Reduce Exchange Rate Pass-Through in Emerging Countries?” Work 2018
7. Devereux, M. B., C. Engle, and B. E. Storgard. “Pass-through of the internal exchange rate when nominal rates are fixed in advance.” International Journal, 2004.
8. Union of Education and Economic Research working papers series. Issue 1561-2422, Moscow 2004.
9. Edwards, Sebastian, The Relationship between Exchange Rates and Inflation Targeting Revisited - Central Bank of Chile Working Papers No. 409 – December.