MEASURING THE EFFECT OF FOREIGN CURRENCY WINDOW SALES ON THE INFLATION RATE IN IRAQ FOR THE PERIOD (2004-2020)

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Article history:		Abstract:
		The research aims to measure the impact of the foreign currency sales window on the inflation rate in Iraq, and the foreign currency sales window is considered one of the important tools that are used in rentier economies, including Iraq, in order to curb inflation by maintaining the general level of prices. In order to measure the effect of currency window sales on the inflation rate, the study used the study methodology and the study used the nonlinear autoregressive distributed lag (nonlinear autoregressive distributed lag) methodology. The study concluded that an increase in foreign currency sales by one million dollars in the short term leads to a decrease in the inflation rate by 0.94%. The study also concluded that an increase in foreign currency sales by one million dollars in the long term leads to a decrease in the inflation rate by 0.74%. The currency window of the dollar and the use of foreign reserves as a tool to face crises and preserve it for the purpose of saving subsequent generations from the internal and external problems that the Iraqi economy is exposed to, and not to deplete, waste and leak financial resources abroad in the form of consumer imports, but must work to invest them in establishing infrastructure and preparing economic sectors Especially the private sector.

THE FIRST TOPIC: THE GENERAL FRAMEWORK OF THE STUDY

First - Introduction:

The transformations that occurred in the Iraqi economy due to its openness to global markets after 2003 led to a large flow of imported goods and services, after a long period of isolation from the outside world, which witnessed an increase in the demand for foreign currency to cover foreign imports, and the entry of many goods and services This necessitated an increase in government spending and an increase in demand for the local currency, which led to higher levels of inflation.

Second - the problem of the study:

The problem of the study lies in the fact that the economy always suffers from high rates of inflation, due to the increase in current spending on the one hand, and the decrease in domestic production and the ability to cover demand on the other hand, and therefore the foreign exchange window is the first step to solve the problem of inflation in Iraq, so we can formulate the problem As

follows: What is the impact of foreign currency sales by the Central Bank of Iraq on the rate of inflation in Iraq after 2003?

Third - The hypothesis of the study:

The study starts from the hypothesis that there is an adverse effect of window sales on the rate of inflation in Iraq

Fourth - the importance of the study:

The study derives its importance in terms of highlighting the dynamic mechanism used in the sale of foreign currencies, and highlighting the means to achieve the requirements of absorbing the continuous general rise in prices in light of the positive and negative effects on the one hand and the scarcity. On the other hand, domestic production. The research also derives importance in highlighting the amount of inflation response to window sales.

Fifth - the research objective:

to determine the functional relationship and then measure the impact of the independent variable represented in foreign currency window sales on the

dependent variable represented by the rate of inflation in the Iraqi economy.

Sixth - Research Methodology:

In line with the nature of the subject, and to find out its details, and to achieve the objectives of the research, the study will depend on two approaches:

1. (Deductive approach): Through it, previous theories related to the study are identified in describing the problem, studying it, and rooting it theoretically from the general to the specific, which is based on collecting and analyzing information based on the (analytical descriptive approach).

2. The applied side will depend on (the inductive approach), depending on the (quantitative) method by finding standard models based on an economic function that reflects the influence of the independent variable on the dependent variable, to express the extent of the effect. of foreign currency sales on the inflation rate in Iraq and thus extract the results and interpret them economically and in light of the acceptance or rejection of the hypotheses of the study.

Seventh. The limits of the eighth research:

1. Spatial boundaries: Iraq as a study model.

2. Deadlines: Choosing the period (2004-2020), as this period witnessed a change in the economic and political system, during which the economic sanctions that were restricting the Iraqi economy were lifted, and a new phase and a new era entered. Orientation towards a market economy, This period also witnessed structural imbalances in the structure of production. The production structure is not able to cover the domestic demand**.**

Eighth. previous study:

1. A study (Mazhar Muhammad, 2011) entitled (Monetary and financial policy and control of inflation variables and exchange rates). Draining it and coordinating with the financial policy to reach these goals, and to reach good rates of development, and that one of the most important findings of the study is to work on converting the foreign currency sale auction into a central market and operating its mechanisms through the market, and this will lead to a positive change in the monetary system.

2. A study (Salal and Radi, 2019) entitled (Analysis of the impact of the foreign currency selling window on inflation rates in Iraq), the study aims to know the impact of the foreign currency selling window on inflation rates in Iraq during the period (2003-2015), depending on the method Descriptive and analytical, as the study used the currency sale window as an indirect monetary tool that has an impact on inflation rates, and the most important findings of the study were that there was a clear and satisfactory effect of the currency sale window in reducing inflation rates in Iraq. The most important recommendations recommended by the study were: Adopting appropriate policies that eliminate imbalances in the gross domestic product and increase local productivity.

3. Study (Al-Shammari and Al-Quraishi, 2019) titled (Evaluating the foreign currency auction as a tool for monetary policy in Iraq for the period (2003-2017), the study aims to evaluate the direct tool for monetary policy represented by the foreign currency sales window in Iraq during the period (2003-2017) and find An appropriate policy that is not effective in dealing with inflation and does not deplete foreign reserves, using the descriptive and analytical approach. The most important findings of the study is the need of the Central Bank of Iraq for a new, more effective tool in achieving stability in the general level of prices. The most important recommendations were to increase customs protection and follow a policy Replacing imports in order to mitigate the leakage of hard currencies (oil dollars).

4. Study (Al-Mayahi and Shendi, 2021) titled (The Effect of the Foreign Currency Sales Window on the Exchange Rate - Iraq, a Case Study for the Period 2004-2019), the study aims to show the effect of the foreign currency window sales on the exchange rate of the Iraqi dinar during the period (2004-2019) , Depending on the inductive approach for analysis and measurement, where the study used the (ARDL) methodology in the standard aspect to measure the relationship between the variables, and the study concluded that there is an inverse effect between window sales and the exchange rate, as the increase in sales by the window selling foreign currency leads to a decrease in the exchange rate, and that The most important recommendations were working to reduce imports by encouraging domestic and foreign investment by the Iraqi government.

5. A study (Khudair and Hassan, 2022) entitled (The role of the currency selling window in the stability of the dinar exchange rate and its reflection on inflation). The study aims to demonstrate the work of the currency selling window as one of the tools of monetary policy in Iraq after 2003, by relying on the descriptive approach To find out the effect of the window in controlling the exchange rate and its reflection on the levels of inflation in Iraq during the period (2010-2021), and the study

found that the window works to meet the demand for currency, whether the sale in cash has exceeded the purchases, in order to control the exchange rate and its reflection at the level General prices, and the most important proposals proposed by the study is not to rely on oil revenues to supply the dollar to Iraq in order to be able to cover the increasing imports in light of the weakness of the domestic production system in Iraq.

THE SECOND TOPIC
The Theoretical Framework Of The Study
First. Concept of Inflation:

Inflation is defined in its general concept as the large and continuous rise in the general level of prices, and these increases in prices remain for a certain period of time. This definition includes two main pillars: the first is the rise in the general level of prices. The second big one is that not every rise in prices is considered inflation (Abdul Hamid, 2007: 319).

As for inflation in its broadest sense, it is meant by the gap between commodity flows and cash flows, meaning the difference between aggregate supply and aggregate demand in favor of the latter. Therefore, inflation is an economic phenomenon related to the continuous rise in a comprehensive manner in the general level of prices during a certain period of time, and this period may be prolonged or shortened according to the size of And the level of inflation (Al-Hiti, 2005: 197).

Second. Concept of Currency Sell Window:

The foreign currency window is defined as one of the direct methods used by emerging economies with medium financial depth to intervene in the exchange market, with the aim of maintaining the stability of the exchange rate and the general level of prices in light of inflation targeting (Al-Ahbabi, 2019: 11).

Third. Currency selling window as an effective tool in monetary policy:

Some countries with emerging economies, which may suffer from a transitional phase as a result of their exposure to an economic problem or their desire to integrate into the global economy, have worked on adopting new methods of managing monetary policy by consolidating market mechanisms and using quantitative tools in a way that suits the development of their financial systems and the ability to deal with financial intermediation. (Gray et al, 2013:10), on the other hand, the window for selling foreign currency is one of the tools of non-traditional monetary authority, especially in countries with a rentier economy, as

these countries suffer from the lack of readiness of their traditional channels, which in turn transmit the impact of monetary policy to the real sector. It also suffers from an imbalance in the economic structure and dependence on imports to meet domestic demand (www.researchgate.net), so the effects of monetary policy are transmitted to the real sector through the exchange rate channel, as it disappears in the path of the fixed exchange rate and the increase occurs in the path of the flexible exchange rate, in addition to Therefore, the rentier economic systems that witness backwardness in their financial systems and the inefficiency of their traditional channels for transmitting the impact of monetary policy to the real sector, the exchange rate is one of the lowest. The effective watts in the possession of the monetary authority to target inflation and maintain price stability, so the currency sale window was used as one of the effective methods to influence the exchange rate directly to ensure monetary stability during a certain period (Gray et al, 2013: 8–12).

Fourthly. The reasons that lead to an increase in the foreign currency window:

1. **Imbalance in the Balance of Payments:**

It is considered one of the most important factors influencing the exchange rate as a result of equilibrium and economic imbalance in the balance of payments, as it is a communication center between the country and the outside world, so in the event of a deficit in the balance of payments for a country, this is due to the increase in demand for foreign currencies to settle that deficit, and this happens A decrease in the demand by foreigners for the local currency, causing a deterioration in the exchange rate, and the opposite is in the case of a surplus in the balance of payments (Bakhit and Meznan, 2006, 419).

2. **Weaknesses in bank auditing:**

Banks are committed to auditing and give it serious attention and care, as the bank is committed to it, whether when granting credit or in the case of opening a current account, as the audit must be based on solid foundations, at which point the bank has fulfilled its obligations (Al-Yassin and Mahdi, 2016, 366.(

3. **Capital flight abroad:**

The smuggled capital outside the country is in the form of foreign currencies, which the economy is in urgent need of, and the reason outside the country is attributed to monetary and financial reasons, in addition to the increase in inflation rates as well as other shocks.

4. **Speculation in the exchange market:**

In this case, the speculator is in a clearly visible place, so his first concern is personal interest, i.e. benefit, regardless of the risk that accompanies him when changes in exchange rates occur (Al-Ahbabi, 19, 2019).

THE THIRD TOPIC
Measuring the impact of foreign currency sales on the inflation rate

This research shows us the standard results of the relationship between inflation rates and the window for selling foreign currency in Iraq, as the increase in dollar sales by the window for selling foreign currency in the Central Bank of Iraq contributes to alleviating inflationary pressures by increasing dollar sales to merchants in particular, as this contributes In an increase in imports of goods and services, and that the process of decreasing these sales will lead to a decrease in foreign imports and thus an increase in prices as a result of a decrease in commodity supply on the one hand and the lack of response of the production apparatus to the increase in demand on the other hand, especially since the production apparatus in Iraq is very weak and almost non-existent Therefore, increasing dollar sales is a temporary

solution, especially in the current period, until the Iraqi economy recovers, especially its productive apparatus.

The variables used in the standard model are as follows:
1. Dependent Variables :Inflation Rate.
2. Independent Variables :Foreign Currency Sales

The equation takes the following form:
$Y = f(x1\_pos\ x1\_neg)$
Y = inflation rate
The positive effect of foreign currency sales = X1_POS
The negative effect of foreign currency sales = X1_NEG

First. Results of the Dickey Fuller Extended Stasis Test:

It is clear from Table (1) that the dependent variable (Y), represented by inflation rates, was static at the original level (Level) at the fixed limit (With Constant) and without a fixed limit or trend, as the probability at the fixed limit reached (0.0001), which is less than the level of significance 5 %, and the probability result without the fixed limit or trend was (0.0001), which is less than the level of significance 5%, and therefore the inflation rate was static at the level and there is no need to conduct the first difference test.

Table(1)
Results of the Dickie Fuller test for foreign currency window sales and inflation rate

variable	Level			1st difference			variable
			Prob			Prob	
	With Constant	With Constant & Trend	Without Constant & Trend	With Constant	With Constant & Trend	Without Constant & Trend	
Y	0.0001	0.1186	0.0001	-	-	-	Inflation rate
X	0.2789	0.7161	0.6022	0.0834	0.0457	0.0281	Foreign currency sales

Source: Prepared by the researcher based on the outputs of the Eviews10 program

As for the independent variable (X), which is represented by the currency window sales, it was not static at the original level and for all cases, whether counting the fixed limit or at the fixed limit and trend or without the fixed limit or trend, and when conducting the Dickie Fuller test for the first difference of the variable (X), it turns out that It lived at the first difference in the fixed limit and trend, as its probability reached (0.0457), which is at a significant level of 5% without the fixed limit or trend, as its probability reached (0.0281), which is less than the significant level of 5%, and therefore the currency window sales were static in the first difference test And to ensure the results of stillness more accurately, the Phillips Byron test will be used.

Second. Model Estimation Test Results:
The model estimation test is one of the most important tests that show us the important statistical results, including the coefficient of determination, the corrected coefficient of determination, and the Durbin and Watson test. These results show the degree of safety or safety of the standard model through those tests, so the model is evaluated first before entering the rest of the model details, i.e. before Measuring the short and long-term relationships between window sales and the inflation rate in Iraq. Table (2) shows the results of the integrity of the model as follows:

Table (2)
The results of estimating the model between foreign currency window sales and the inflation rate

R-squared	0.961128	**Prob(F-statistic)**	0.000000
Adjusted R-squared	0.946993	**Durbin-Watson stat**	1.994073
F-statistic	67.99507	**Akaike info criterion**	4.270103

Source: Prepared by the researcher based on the outputs of the Eviews10 program

It is clear from table (2) the results of estimating the model, and it is clear from these results that the coefficient of determination that explains the changes that occur in inflation as a result of changes in currency window sales, which amounted to 96%, meaning that changes in window sales lead to a change of 96% of Changes in the rate of inflation in Iraq.

It is also clear from the results that the probability of the model was significant at the level of probability (0.000000) and in less than 5%, and therefore the model used is acceptable in standard terms.

The results also show the Durbin and Watson test with the language (1.99), that is, it was close to the number 2, and thus it shows that the model is free from the problem of false regression, and that the results that will be relied upon are true and distributed results, and therefore will be resorted to measuring cointegration and then measuring The short and long term relationship between window sales as an independent variable and inflation rate as a dependent variable.

Third. Cointegration test results:
The joint test mechanism depends on the critical limits set by Basran by comparing it with the (F) statistic at the level of significance of 5%. If the statistic (F) is located between the lower and upper limits, then the result is inconclusive as it falls in the indecisive zone. Table (3) shows the results of the cointegration test between foreign currency sales and the inflation rate:

Table (3)
Cointegration test between foreign currency window sales and inflation rate

Test Statistic	Value	K
F-statistic	3.920306	2
	Critical Value Bounds	
Significance	I0 Bound	I1 Bound
10%	2.63	3.35
5%	3.1	3.87
2.5%	3.55	4.38
1%	4.13	5

Source: Prepared by the researcher based on the outputs of the Eviews10 program

As it is clear from Table (3) that the (F) statistic was (3.920306), which is higher than the upper limit at the level of significance of 5%, amounting to (3.87), and certainly higher than the minimum limit at the level of significance of 5%, amounting to (3.1), and therefore This result shows the existence of a co-integration relationship between foreign currency window sales as an independent variable and the inflation rate as a dependent variable, and therefore we accept the alternative hypothesis, which assumes the existence of a co-integration relationship between the dependent variable and the independent variable at a significant level of 5%, and

we reject the null hypothesis, which It assumes that there is no cointegration relationship between the dependent variable and the independent variable at a significant level of 5%, and therefore the existence of a cointegration relationship is the first and necessary condition for the long-term relationship between the two variables, but it is not a sufficient condition, as the error correction coefficient is the second and sufficient condition for a long relationship term.

Fourthly. Short term relationship results:
The short-run parameters in the non-linear regression methodology express the short-run outcomes between window sales and inflation:

Table (4)
Short term results between foreign currency window sales and the rate of inflation

	short term model			
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(Y(-1))	0.720736	0.117553	6.131138	0.0000
D(X_POS)	-0.948507	0.332159	-2.855577	0.0092
D(X_POS(-1))	0.292609	0.335954	0.870980	0.3932
D(X_NEG)	-0.193105	0.361413	-0.534304	0.5985
D(X_NEG(-1))	0.535947	0.419748	1.276832	0.2150

Source: Prepared by the researcher based on the outputs of the Eviews10 program

Where the results show us the negative and positive impact of window sales, i.e. the effect of increasing window sales in dollars and its impact on the inflation rate, and decreasing window sales in dollars and its impact on the inflation rate. Table (4) shows the negative and positive effects of window sales in the short term, and the results were as follows:

1. The positive effect shows that an increase in foreign currency window sales by one million dollars leads to a decrease in inflation by 0.94%, and that this effect was significant, as the probability of it reached (0.0092), which is less than 5%.
2. The negative effect shows that there is no effect of the decrease in foreign currency window sales

on inflation rates, because the relationship was not significant, as the probability reached (0.5985), which is greater than 5%, and this does not correspond to the reality of the Iraqi economy.

Fifth. Long term relationship results:
The error correction coefficient is defined as a suitable model for measuring the imbalance correction in the previous period. If there is a co-integration, it is formulated using the first differences that remove the vector from the variables included in the model and solve the problem of false regression. Table (5) shows the error correction coefficient and the results of the long-term relationship as follows

Table (5)
The results of the error correction coefficient and the long-term relationship between foreign currency window sales and the inflation rate

			Error correction coefficient	
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
(CointEq(-1)	**-0.296366**	**0.070207**	**-4.221324**	**0.0004**
				Long Run Form
Cointeq = Y - (-0.7479*X_POS -0.6457*X_NEG + 19.2282)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
X_POS	**-0.747907**	**0.185269**	**-4.036874**	**0.0006**
X_NEG	**-0.645671**	**0.344492**	**-1.874274**	**0.0742**
C	**19.228218**	**3.769299**	**5.101272**	**0.0000**

Source: Prepared by the researcher based on the outputs of the Eviews10 program

As it is clear from Table (5), the error correction coefficient was according to its necessary conditions, as it was significant and its probability was swallowed (0.0004), which is less than 5%, and negative and its parameter is less than one, as the error correction parameter reached (-0.296366), and this means that the imbalance that occurred The inflation rates in the previous period, i.e. (the short period), can be addressed by the Central Iraqi policy of foreign currency sales through the foreign currency sales window at a rate of up to 29.6% annually, and therefore it is possible to return to the equilibrium state during a period of (0.296/1), i.e. During approximately three years and five months, as shown in Table (5), the results of the long-term relationship between sales of foreign currency from the dollar and the inflation rate in Iraq, and the results were as follows:

1. The positive effect shows that an increase in foreign currency window sales by one million dollars leads in the long term to a decrease in the inflation rate by 0.74%, and that this effect was significant, as the probability of it reached (0.0006), which is less than 5%.

2. The negative effect shows that there is no effect of the decrease in foreign currency window sales on inflation rates, because the relationship was not significant, as the probability reached (0.0742), which is greater than 5%, and this does not apply to the reality of the Iraqi economy.

Sixthly. The results of the existence of the model:

1. Serial Autocorrelation Test:
   Table (6) shows the results of the serial autocorrelation test, where the problem of serial autocorrelation exists if the value of the chi-square probability is less than the level of significance 5%, and the problem of serial autocorrelation is absent if the probability of the chi-square is greater than 5%. Table (6) shows The results of the serial autocorrelation test are as follows:

Table (6)
Serial autocorrelation test

		Breusch-Godfrey LM	
F-statistic	0.770521	**Prob. F(2,20)**	0.4760
Obs*R-squared	2.217734	**Prob. Chi-Square(2)**	0.3299

Source: Prepared by the researcher based on the outputs of the Eviews10 program

It is clear from Table (6) that there is no problem of serial autocorrelation due to the value of the chi-square probability greater than the level of significance 5%, as the probability of chi-square was (0.3299), and therefore we accept the null hypothesis that assumes that there is no problem of serial autocorrelation, and we reject The alternative hypothesis is that there is a serial autocorrelation problem.

2. Homogeneity stability test:

Table (7) shows the results of the consistency of variance homogeneity test, where the problem of stability of variance homogeneity lies if the value of the chi-square probability is less than the level of significance 5%, and the problem of stability of variance homogeneity is absent if the probability of chi-square is greater than 5%, and Table (7) shows The results of the homogeneity of variance stability test are as follows:
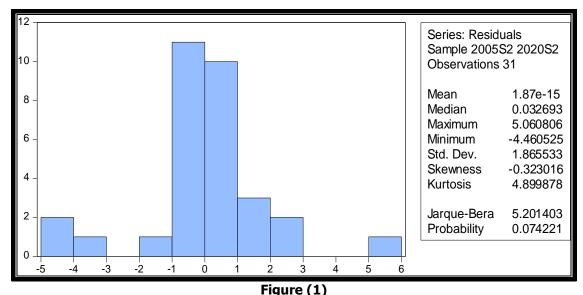
Table (7)
Variation homogeneity stability test

			(ARCH)
F-statistic	0.508895	**Prob. F(2,20)**	0.4815
Obs*R-squared	0.535511	**Prob. Chi-Square(2)**	0.4643

Source: Prepared by the researcher based on the outputs of the Eviews10 program

It is clear from Table (7) that there is no problem of consistency of variance homogeneity due to the value of the chi-square probability greater than the level of significance 5%, as the probability of chi-square was (0.4643), and therefore we accept the null hypothesis that assumes that there is no problem of consistency of variance homogeneity, and we reject The alternative hypothesis is that there is a problem of consistency of variance homogeneity.

3. The normal distribution of the residuals

It is clear from this test, which shows the normal distribution of the residuals of the model and depends on the probability value of (Jarque-Bera), and the residual is distributed normally if the probability value is greater than 5%. Figure (1) summarizes the various statistical measures such as the arithmetic mean of the model residuals, which It reached (1.87e-15), in addition to the probability that reached (0.074), which is greater than the level of significance 5%, and therefore the model is devoid of the problem of the normal distribution of the residuals

Series: Residuals	
Sample 2005S2 2020S2	
Observations 31	
Mean	1.87e-15
Median	0.032693
Maximum	5.060806
Minimum	-4.460525
Std. Dev.	1.865533
Skewness	-0.323016
Kurtosis	4.899878
Jarque-Bera	5.201403
Probability	0.074221

Figure (1)
The normal residual distribution (Jarque-Bera)
Source: Prepared by the researcher based on the outputs of the Eviews10 program

4. Structural stability tests:

Pearan conducted two tests to ensure that the study data used are free from structural changes, which are the (CUSUM) test and the (CUSUM OF SQUARES) test, which determines the structural changes in the data, as well as the degree of agreement and harmony between the long-term parameters with the short-term parameters, and checks Structural stability of the model If the graph of the two binding tests lies within the critical points at the 5% significance level, the computed parameters are structurally stable.

It is evident from Figure (2) the first test, which is the cumulative sum of the residuals (CUSUM), and it is clear from the figure that the cumulative sum of the residuals falls within the limits of confidence at the 5% level of significance, and therefore the short-term and long-term parameters are stable in the non-autoregressive model. Linearity of automatically distributed deceleration times.
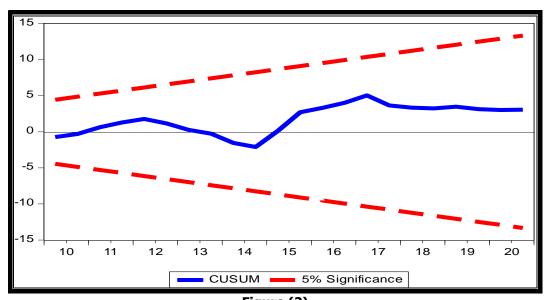

Figure (2)
Cumulative sum of residuals (CUSUM) test
Source: Prepared by the researcher based on the outputs of the Eviews10 program

THE FOURTH TOPIC
Conclusions

1. The positive effect in the short term shows that an increase in foreign currency window sales by one million dollars leads to a decrease in inflation by 0.94%, and this effect was significant, as the probability of it reached (0.0092), which is less than 5%.

2. The negative effect in the short term shows that there is no effect of the decrease in foreign currency window sales on inflation rates, because the relationship was not significant, as the probability reached (0.5985), which is greater than 5%, and this does not correspond to the reality of the Iraqi economy.

3. The positive effect in the long term shows that an increase in foreign currency window sales by one million dollars leads in the long term to a decrease in the inflation rate by 0.74%, and that this effect was significant, as the probability of it reached (0.0006), which is less than 5%.

4. The negative effect in the long run shows that there is no effect of the decrease in foreign currency window sales on inflation rates, because the relationship was not significant, as the probability reached (0.0742), which is greater than 5%, and this does not apply to the reality of the Iraqi economy.

5. That the independent variable (foreign currency window sales) does not cause the dependent variable (inflation rate) because its probability was greater than 5%, and vice versa since (inflation rate) does not cause (foreign currency window sales) because its probability was greater of 5%, which means that there is no causal relationship in both directions between (foreign currency window sales) and (inflation rate).

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