

Economic and econometric analysis of macroeconomic variables affecting agricultural imports for the period (2004-2024)

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Abstract:

This study aimed to analyze and measure the impact of macroeconomic variables on agricultural imports in Iraq during the period 2004–2024. This was achieved by examining the current state and trends of agricultural imports and identifying the most significant influencing factors. The study relied on annual Iraqi data and employed descriptive and econometric methods, utilizing the Autoregressive Distributed Lag (ARDL) model to analyze the short-term and long-term relationships between the variables. Agricultural imports were the dependent variable, while the independent variables included agricultural GDP, national income, population, exchange rate, and inflation rate. The results showed that agricultural imports fluctuated throughout the study period, with a general upward trend. This reflects Iraq's continued reliance on foreign markets to meet a significant portion of its food needs. Furthermore, the study revealed that the increase in imports in certain years, particularly in 2024, was linked to a widening food gap and weak domestic production, coupled with the availability of import capacity supported by oil revenues. The results of the ARDL model confirmed the existence of a long-term equilibrium relationship between agricultural imports and the studied macroeconomic variables. The results also showed that increased agricultural GDP contributes to reducing imports in the long term, while national income had a significant positive long-term impact. Furthermore, the effects of both the exchange rate and the inflation rate differed between the short and long term. The study recommended strengthening domestic agricultural production, developing agricultural and marketing infrastructure, and achieving economic stability by controlling the exchange rate and inflation rates. This would contribute to reducing dependence on agricultural imports and enhancing food security in Iraq.

Keywords: Agricultural Imports, ARDL Model, Food Security, Iraq

Introduction:

Agricultural imports are a crucial component of foreign trade, playing a vital role in achieving food security and meeting the needs of the local market for agricultural and food products. Following 2003, Iraq experienced economic liberalization and the liberalization of foreign trade, leading to increased reliance on agricultural imports due to the diminished capacity of domestic production to meet growing demand. The Iraqi agricultural sector faces numerous challenges, including limited investment, water scarcity, and inadequate infrastructure and agricultural technologies. These factors have contributed to a widening food gap and increased dependence on imports. Agricultural imports are also linked to several macroeconomic variables, particularly given the rentier nature of the Iraqi economy and its reliance on oil revenues to finance imports. This study aims to analyze and measure the impact of macroeconomic variables on agricultural imports in Iraq during the period 2004–2024, employing modern econometric methods. The goal is to identify the influencing factors and provide findings that can inform the formulation of economic and agricultural policies that support economic stability and food security.

Problem study:

The problem lies in the significant increase in the volume of agricultural imports in Iraq during the period (2004–2024), despite Iraq possessing natural and human resources that qualify it to achieve higher levels of domestic agricultural production. This increase

has led to a greater reliance on foreign sources for agricultural and food products, which has negatively impacted the agricultural trade balance and depleted a significant portion of foreign revenues, particularly given the Iraqi economy's heavy dependence on oil revenues. During the study period, the Iraqi economy experienced numerous economic changes, including fluctuations in oil prices, exchange rate variations, rising inflation rates, and volatility in GDP levels, in addition to changes in economic and trade policies. This raises questions about the nature of the relationship between these macroeconomic variables and agricultural imports, and the extent to which each variable influences the volume and direction of agricultural imports in Iraq. The research problem also lies in the lack of clarity regarding the magnitude and nature of the impact of macroeconomic variables on agricultural imports, as well as the limited number of studies that have addressed this topic analytically and empirically in a comprehensive manner covering the period (2004–2024). This period was characterized by exceptional economic and political changes that directly affected the performance of the Iraqi economy and the agricultural sector.

The importance of the study:

The importance of this study stems from the vital role of agricultural imports in the Iraqi economy and their contribution to meeting domestic demand for food and agricultural products, particularly given the increasing reliance on foreign markets after 2003. The study's importance is further highlighted by its

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examination of the impact of macroeconomic variables on the volume and trends of agricultural imports during the period 2004-2024. Its significance is underscored by its reliance on economic and econometric analysis to measure the nature of the relationship between macroeconomic variables and agricultural imports, thus facilitating the development of accurate results that can inform economic, agricultural, and trade policies. The study also contributes to providing policymakers with a scientific basis for rationalizing agricultural imports, supporting local production, and reducing dependence on foreign sources. Furthermore, it represents a valuable addition to the body of research on agricultural economics and foreign trade in Iraq.

Research Objectives.

This study aims to analyze and measure the impact of macroeconomic variables on agricultural imports in Iraq during the period 2004-2024 by achieving the following objectives:

1. To identify the current state and trends of agricultural imports in Iraq during this period 2004-2024
- 2- To evaluate the main indicators of agricultural imports in Iraq during the period (2004-2024).
- 3- To Identifying the key macroeconomic variables influencing agricultural imports in Iraq.
- 4- The Measuring and analyzing the effect of the identified macroeconomic variables on agricultural imports using appropriate econometric methods ,including an analysis of the long-term

and short-term relationship between the study variables during the period (2004-2024).

5-To Developing a set of findings and recommendations that can contribute to supporting economic and agricultural policies and reducing dependence on agricultural imports.

Study Hypothesis:

The study is based on a main hypothesis stating that there is a statistically significant relationship between macroeconomic variables and agricultural imports in Iraq during the period (2004-2024), and that these variables affect the volume of agricultural imports to varying degrees.

1-The following sub-hypotheses stem from the main hypothesis:

There is an inverse relationship between agricultural GDP and agricultural imports, as an increase in agricultural GDP leads to a decrease in the need for agricultural imports.

2-There is a direct relationship between national income and agricultural imports, as higher national income increases import capacity and consequently agricultural imports.

3-There is a direct relationship between population size and agricultural imports due to increased domestic demand for agricultural and food products.

4-There is a relationship between the exchange rate and agricultural imports, as exchange rate fluctuations affect the cost and volume of agricultural imports.

5-There is a relationship between the inflation rate and agricultural imports, as changes in the inflation rate affect domestic prices, purchasing power, and demand for agricultural imports.

Analysis Methodology

The study employs two methodologies: the first is descriptive, based on theoretical studies relevant to the research topic; the second is econometric, based on quantitative analysis tools and relying on a set of econometric and statistical tests. Time series stationarity analysis was applied, and estimates were made using the Autoregressive Distributed Lag (ARDL) model. The study follows a set of methodological steps, which constitute a general framework for the study:

1- Literature Review: The research begins with a comprehensive review. The study reviewed previous sources and studies related to the topic, analyzing research that discusses the

Previous studies

The first study aimed to analyze the impact of foreign trade policies on agricultural and food exports and imports in Iraq during the period 1990–2004. It employed a descriptive-analytical approach using official data from the Central Bank of Iraq and the Ministry of Planning. The study variables included agricultural and food exports and imports, the agricultural trade balance, GDP, and agricultural inputs. The results showed that Iraq relied primarily on the oil sector to finance imports, while agricultural exports were mainly limited to dates. The study recommended supporting

impact of certain macroeconomic variables on agricultural imports using academic sources, government reports, and relevant international organizations.

2- Identifying Variables: Key variables affecting agricultural imports were identified, including agricultural output, national income, population, inflation rate, and exchange rate.

3- Statistical and Econometric Analysis: Data were analyzed using statistical and econometric tools to estimate the relationship between variables and agricultural imports using the Autoregressive Distributed Lag (ARDL) model.

Data Sources: The research relied on time series data for the period 2004-2023 from the Ministry of Planning – Central Statistical Organization – Agricultural Statistics Department, and the Central Bank of Iraq, Research and Development Directorate.

agricultural production and productive projects, and providing production inputs to increase output and achieve an exportable surplus(1).

The second study aimed to analyze the causal relationship between agricultural imports and certain economic variables in Iraq during the period 1990–2010, using the Granger causality test and time series data. It concluded that there is a direct relationship between GDP and agricultural imports, as well as a causal relationship from GDP to agricultural imports, and from agricultural imports to foreign reserves. The results also showed that agricultural imports exceeded agricultural exports during the study

period. The study recommended protecting local products, activating trade and agricultural policies that support agricultural production, and reducing dependence on imports(2).

The study also aimed to analyze the impact of macroeconomic variables on Iraqi agricultural foreign trade during the period 1992–2020. This was achieved by examining the development of agricultural and food exports and imports and the factors influencing them, as well as identifying the reasons for the weakness of agricultural foreign trade and the structural imbalances it suffers from. The study adopted an econometric approach using unit root tests (ADF and PP), followed by the ARDL model after confirming the stationarity of the time series at the first differences. The dependent variables were agricultural exports and imports, while the independent variables included agricultural GDP, national income, agricultural investment, population, and the exchange rate. The results showed a weak diversification structure in Iraqi exports and a persistent deficit in the agricultural trade balance. Furthermore, the study revealed a reliance on primary exports with limited competitiveness. It also indicated that trade liberalization led to a decline in local agricultural production due to the influx of agricultural imports and dumping practices. The study recommended supporting agricultural scientific research and employing its results in developing production, encouraging

This study aimed to measure the impact of agricultural imports and certain economic variables on economic growth

foreign investments and transferring modern technology, as well as improving the quality of local agricultural products and activating policies that support them to reduce imports and promote agricultural exports(3).

Al-Janabi's 2023 study aimed to analyze the reality of agricultural imports in Iraq and the impact of post-2003 economic changes on agricultural import and agricultural output indicators during the period 2004–2019, highlighting the structure of agricultural imports and the factors influencing them. The study employed a descriptive-analytical approach to data analysis, considering agricultural imports as the dependent variable. Independent variables included agricultural GDP, self-sufficiency ratio, average propensity to import agricultural products, coverage rate, degree of agricultural vulnerability, gross domestic product (GDP), and the value of the food gap. The results showed a decline in the relative importance of agricultural output in GDP formation, the continued reliance of the agricultural sector on agricultural imports to meet domestic demand, a weak coverage rate, and a high degree of agricultural vulnerability. The study recommended increasing government support for the agricultural sector, encouraging private sector investment, rationalizing indiscriminate agricultural imports, combating dumping, and raising customs duties to protect local products and enhance food security(4).

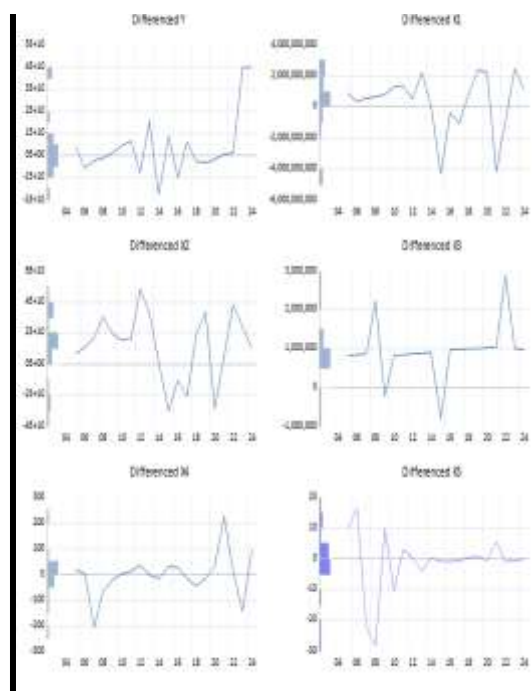
in Iraq during the period 1990-2022 using the ARDL model. It concluded

that there is a long-term equilibrium relationship between agricultural imports and economic growth. The results also showed that agricultural imports have a significant positive impact on economic growth. The study recommended

rationalizing imports and directing them towards supporting agricultural production, developing the agricultural sector, and diversifying national income sources to enhance economic growth(5).

A graphical method for detecting the stationarity of time series variables used in Iraq for the period (2004-2024).

Before subjecting a time series to any test, it is necessary to represent it graphically in terms of time to determine the type and nature of this series. The graph of the time series is an initial indication of the possible nature of the time series. For example, if this graph shows a general upward or downward trend, this indicates that its average has changed over time, meaning the time series is not stationary. Figure () () shows the graph of the studied economic variables at the level and at the first difference. It shows that the variable (X5) is stationary at the level because the shape of the graph of this variable appears as a horizontal line and was not in the shape of an upward or downward trend. This means that the time series for this variable were complete at the zero order $I(0)$. However, after taking the first difference of the variable, we find that the variables (X4, X2, X3, X1, Y) have become stationary and do not contain a unit root because the shape of the graph of this variable appears as a horizontal line, meaning that they are complete at the order $I(1)$.



(1) A graphical method for detecting the stationarity of time series variables used in Iraq for the period (2004-2024).

Unit root test for the stationarity of time series variables using the Phillips-Perron (PP) method.

The unit root test aims to examine the time series properties of each variable in the function under study, confirming the stationarity of the economic time series and determining the order of integration for each variable. Table (6) shows the Phillips-Perron (pp) test for the variables of the function under study. The results in Table (6) using the (pp) test indicate that the time series of the variable (X5) are stationarized at the t/t, at a probability level of (5%). The variables (X5, X2, X1, Y) of the function under study are stationarized at the first

difference I(1), at probability levels of (1%) and (5%). We observe from the above that the variables differ in their degree of stationarity. This necessitates not using the Ordinary Least Squares (OLS) method, as the studied variables have different order of integration. Furthermore, the OLS method assumes that the variables have the same order of integration (i.e., they are stationarized at the t/t), and to avoid the shaded results that can be obtained using the OLS method, it was necessary to search for another method that accommodates the different degrees of stationarity among the variables used in the model. Therefore, we will... Estimating models using the Autoregressive Distributed Lag (ARDL) model.

Table (6) Unit root test for time series stationarity of variables using the Phillips-Perron (PP) method.

UNIT ROOT TEST RESULTS TABLE (PP)						
Null Hypothesis: the variable has a unit root						
At Level						
With Constant	t-Statistic	0.6062	-2.0179	-1.1858	0.9449	-1.5387
	Prob.	0.6974	0.0774	0.0593	0.0928	0.2101
		n0	n0	n0	n0	n0
With Constant & Trend	t-Statistic	0.4222	-2.1280	-1.5004	-1.1636	-1.4461
	Prob.	0.6679	0.0305	0.2741	0.0907	0.0139
		n0	n0	n0	n0	n0
Without Constant & Trend	t-Statistic	1.4998	0.3859	1.7439	0.9834	-0.2287
	Prob.	0.0617	0.7059	0.0758	0.0000	0.5912
		n0	n0	n0	n0	n0
At First Differences						
With Constant	t-Statistic	-2.5114	-3.7059	-2.9438	-4.5848	-3.5788
	Prob.	0.1284	0.0130	0.0509	0.0021	0.0171
		n0	***	**	***	***
With Constant & Trend	t-Statistic	-3.0970	-3.6636	-2.8580	-4.7227	-5.5437
	Prob.	0.1348	0.0009	0.1960	0.0070	0.0002
		n0	***	n0	***	***
Without Constant & Trend	t-Statistic	-2.3878	-3.6643	-2.4840	-1.9124	-3.5993
	Prob.	0.0200	0.0010	0.0161	0.0551	0.0009
		***	***	**	*	***

Notes:
a. (*): Significant at the 10%, (**): Significant at the 5%, (***) Significant at the 1% and (n0) Not Significant
b. Lag Length based on AIC
c. Probability based on MacKinnon (1995) one-sided p-values

Preliminary Estimation of the Distributed Lag Autoregressive (ARDL) Model for the Impact of Variables Affecting Agricultural

the time series variables using stationarity tests and determining the optimal lag intervals, we performed a preliminary estimate of the Distributed Lag Autoregressive (ARDL) model using the Eviews 12 statistical software. We observe from Table (1) that the adjusted coefficient of determination (R^2) is 0.90, meaning that the independent variables included in the estimated model explain approximately 90% of the variation in the dependent variable. This indicates that the

Imports in Iraq for the Period 2004-2024

After confirming the stationarity of

explanatory factors have the greatest impact on the function. The remaining 10% is unexplained, meaning it is attributed to variables not included in the model, and its effect is considered by the random variable in the model. The calculated F-test value is 15.06, and its probability level is 0.0016, which is less than 0.05 and even less than 0.01. This means that the model The estimate is generally reliable and can be used in the process of planning and forecasting the future

Table Initial estimate of the Autoregressive Distributed Lag (ARDL) model for the effect of variables affecting agricultural imports in Iraq for the period (2004-2024).

Dependent Variable: Y				
Method: ARDL				
Date: 02/07/26 Time: 19:20				
Sample (adjusted): 2006 2024				
Included observations: 19 after adjustments				
Maximum dependent lags: 2 (Automatic selection)				
Model selection method: Akaike info criterion (AIC)				
Dynamic regressors (1 lag, automatic): X1 X2 X3 X4 X5				
Fixed regressors: C				
Number of models evaluated: 64				
Selected Model: ARDL(2, 1, 1, 1, 1, 1)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Y(-1)	1.585580	0.265828	5.964695	0.0010
Y(-2)	1.598996	0.571882	2.796025	0.0313
X1	13.07635	2.488198	5.255350	0.0019
X1(-1)	-6.335041	1.990986	-3.181861	0.0190
X2	-0.301595	0.139057	-2.168858	0.0732
X2(-1)	-0.523960	0.151139	-3.466751	0.0134
X3	-28987.32	4765.465	-6.082790	0.0009
X3(-1)	29979.72	4412.044	6.794974	0.0005
X4	3.05E+08	61436813	4.962867	0.0025
X4(-1)	2.48E+08	69572543	3.564423	0.0119
X5	-3.87E+09	6.89E+08	-5.614775	0.0014
X5(-1)	-6.77E+08	4.43E+08	-1.528011	0.1774
C	-5.96E+11	1.02E+11	-5.862289	0.0011
R-squared	0.967863	Mean dependent var	1.12E+10	
Adjusted R-squared	0.903589	S.D. dependent var	2.01E+10	
S.E. of regression	6.23E+09	Akaike info criterion	48.16027	
Sum squared resid	2.33E+20	Schwarz criterion	48.80646	
Log likelihood	-444.5226	Hannan-Quinn criter.	48.26963	
F-statistic	15.05836	Durbin-Watson stat	2.927762	
Prob(F-statistic)	0.001646			

Source: Prepared by the researcher based on the outputs of the Eviews 12 program.

Estimating and interpreting the short- and long-term relationship model according to the ARDL model for the impact of variables affecting agricultural imports in Iraq for the period (2004-2024).

After confirming the existence of cointegration (a long-term equilibrium relationship), we find the short- and long-term relationships between the variables and then interpret them. We observe from Table (2) that the coefficient of the independent variable is Agricultural GDP (USD). (1X) reached (13.076), indicating a direct relationship between agricultural GDP (dollars) and agricultural imports. This means that a

1% increase in agricultural GDP would lead to a 13.076% increase in agricultural imports. The significance of this variable was confirmed at the 1% probability level. This contradicts economic logic and arises from several factors, including insufficient domestic production to meet demand despite increased agricultural output, weak diversification in seasonal local agricultural production (necessitating the import of certain agricultural goods), and increased domestic food demand due to rising incomes and improved agricultural activity. However, in the long run, the parameter of the independent variable, agricultural GDP (dollars) (1X), reached (-3.086), indicating an inverse

relationship between agricultural GDP and agricultural imports. This aligns with economic logic, and the significance of this variable was confirmed at the 5% level. The coefficient of the independent variable, national income (X2), in the short run was (-0.302). The negative sign indicates an inverse relationship between national income and agricultural imports, meaning that a 1% increase in national income would lead to a 0.302% decrease in agricultural imports. However, this variable was not statistically significant at the 5% probability level, and this result is considered illogical, as an increase in national income should lead to an increase in agricultural imports. In the long run, the national income coefficient was (0.378), indicating a direct relationship between national income and agricultural imports, meaning that a 1% increase in national income leads to a 0.378% increase in agricultural imports. This variable was statistically significant at the 1% probability level, and this relationship is logical, as an increase in national income should lead to an increase in agricultural imports. The estimation results also indicate that the population parameter (X3) was (-28987.32) in the short run, which indicates The study found an inverse relationship between population size and agricultural imports, meaning that a 1% increase in population would lead to a 28,987.32% decrease in agricultural imports. This variable was significant at the 1% probability level. However, this estimate is not economically logical, as population growth leads to increased demand for food and agricultural products due to expanded agricultural consumption,

while domestic production does not grow at the same rate due to limited water resources and weak agricultural investment. In the long term, the estimated population is projected to decrease by 454,277, indicating an inverse relationship between population size and agricultural imports, meaning that a 1% increase in population leads to a 454.277% increase in agricultural imports. However, this variable was not significant at the 5% probability level.

The short-term exchange rate (USD/DIR) (X4) had a parameter of 3.05. A positive sign indicates a direct relationship between the exchange rate and agricultural imports, meaning that an increase in the exchange rate by a certain amount... A 1% increase in the exchange rate would lead to a 3.08% rise in agricultural imports. This variable was significant at the 1% probability level. This result is considered illogical from an economic perspective, as most imports are conducted in US dollars, and a rise in the exchange rate increases the cost of importing food commodities, thus reducing import volume and decreasing the purchasing power of both importers and consumers. However, in the long run, the exchange rate parameter reached -2.53, indicating an inverse relationship between the exchange rate and agricultural imports. This means that a 1% increase in the exchange rate leads to a 2.53% decrease in agricultural imports. This variable was significant at the 1% probability level, and this relationship is consistent with economic logic. A rise in the exchange rate leads to a decrease in agricultural imports for several economic reasons, the most important of which is that a

higher exchange rate makes imported goods more expensive than locally produced goods. If this increase persists for an extended period, consumers and businesses tend to reduce their reliance on imports and seek local alternatives, which encourages increased domestic agricultural production to meet a larger share of the demand.

The estimation results also indicate that the coefficient The independent variable, the inflation rate (X5), reached (-3.87) in the short run, indicating an inverse relationship between the inflation rate and agricultural imports. This means that a 1% increase in inflation will lead to a 3.87% decrease in agricultural imports. The significance of this variable was confirmed at the probability level of 1%. This estimate is economically logical, as when inflation rates rise in the economy,

the prices of food commodities and agricultural products rise domestically, prompting the government to increase agricultural imports to provide goods in larger quantities and attempt to stabilize the local market and reduce prices. However, in the long run, we observe that the inflation coefficient reached (2.08). This indicates a direct relationship between inflation and agricultural imports, suggesting a continued rise in prices over time. This, in turn, leads to increased agricultural imports to cover the shortage in the domestic supply of agricultural products and meet rising food demand. This indicates a direct relationship between inflation and agricultural imports, which aligns with economic logic, and the significance of this variable was confirme

Estimating and interpreting the short- and long-term relationship model according to the ARDL model for the impact of variables affecting agricultural imports in Iraq for the period (2004-2024).

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.96E+11	1.02E+11	0.000000	0.0000
Y(-1)*	-0.184576	0.755906	2.890012	0.0277
X1(-1)	6.741310	2.773378	2.430722	0.0511
X2(-1)	-0.825555	0.236501	-3.490701	0.0130
X3(-1)	992.4015	1282.362	0.773886	0.4684
X4(-1)	5.53E+08	1.04E+08	0.000000	0.0000
X5(-1)	-4.55E+09	9.84E+08	0.000000	0.0000
D(Y(-1))	-1.598996	0.571882	-2.796025	0.0313
D(X1)	13.07635	2.488198	5.255350	0.0019
D(X2)	-0.301595	0.139057	-2.168858	0.0732
D(X3)	-28987.32	4765.465	-6.082790	0.0009
D(X4)	3.05E+08	61436813	0.000000	0.0000
D(X5)	-3.87E+09	6.89E+08	0.000000	0.0000
* p-value incompatible with t-Bounds distribution.				
Levels Equation				
Case 3: Unrestricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
X1	-3.085866	1.111773	-2.775626	0.0322
X2	0.377901	0.084054	4.495948	0.0041
X3	-454.2765	548.1667	-0.828720	0.4390
X4	-2.53E+08	76642615	-3.302176	0.0164
X5	2.08E+09	5.50E+08	3.785413	0.0091
EC = Y - (-3.0859*X1 + 0.3779*X2 -454.2765*X3 -253087386.8410*X4 + 2080683656.2899*X5)				

Source: Prepared by the researcher based on the outputs of the Eviews 12 program.

Error correction parameter for the ARDL model of the impact of variables affecting agricultural imports in Iraq for the period (2004-2024).

Table (3) shows that the error correction parameter was -0.185 and significant at

the 1% level. This fulfills the necessary and sufficient condition, meaning that the imbalance (short-term disequilibrium) in agricultural imports can be corrected towards a long-term equilibrium relationship, $ECM = -0.185$ i.e., it requires five years to return to the long-term equilibrium.

Error correction parameter for the ARDL model of the impact of variables affecting agricultural imports in Iraq for the period (2004-2024).

ARDL Error Correction Regression				
Dependent Variable: D(Y)				
Selected Model: ARDL(2, 1, 1, 1, 1, 1)				
Case 3: Unrestricted Constant and No Trend				
Date: 02/07/26 Time: 19:30				
Sample: 2004 2024				
Included observations: 19				
ECM Regression				
Case 3: Unrestricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.96E+11	4.89E+10	0.000000	0.0000
D(Y(-1))	-1.598996	0.187915	-8.509160	0.0001
D(X1)	13.07635	1.235099	10.58729	0.0000
D(X2)	-0.301595	0.064884	-4.648194	0.0035
D(X3)	-28987.32	2740.167	-10.57867	0.0000
D(X4)	3.05E+08	30338574	0.000000	0.0000
D(X5)	-3.87E+09	3.34E+08	0.000000	0.0000
CointEq(-1)*	-0.184576	0.177359	12.31725	0.0000
R-squared	0.939494	Mean dependent var	3.94E+09	
Adjusted R-squared	0.900990	S.D. dependent var	1.46E+10	
S.E. of regression	4.60E+09	Akaike info criterion	47.63395	
Sum squared resid	2.33E+20	Schwarz criterion	48.03161	
Log likelihood	-444.5226	Hannan-Quinn criter.	47.70125	
F-statistic	24.39998	Durbin-Watson stat	2.927762	
Prob(F-statistic)	0.000007			
* p-value incompatible with t-Bounds distribution.				

Source: Prepared by the researcher based on the outputs of the Eviews 12 program.

The Jarque-Bera JB test was used to assess the normality of the residuals in the regression equation for the period 2004-2024.

To confirm the normality of the residuals in the regression equation, the JB test

was employed. Figure (2) shows that the regression equation is normally distributed, and the JB value was 1.188 at a probability level of 0.552, which is greater than 5%. Therefore, we accept the null hypothesis that the model residuals are normally distributed.

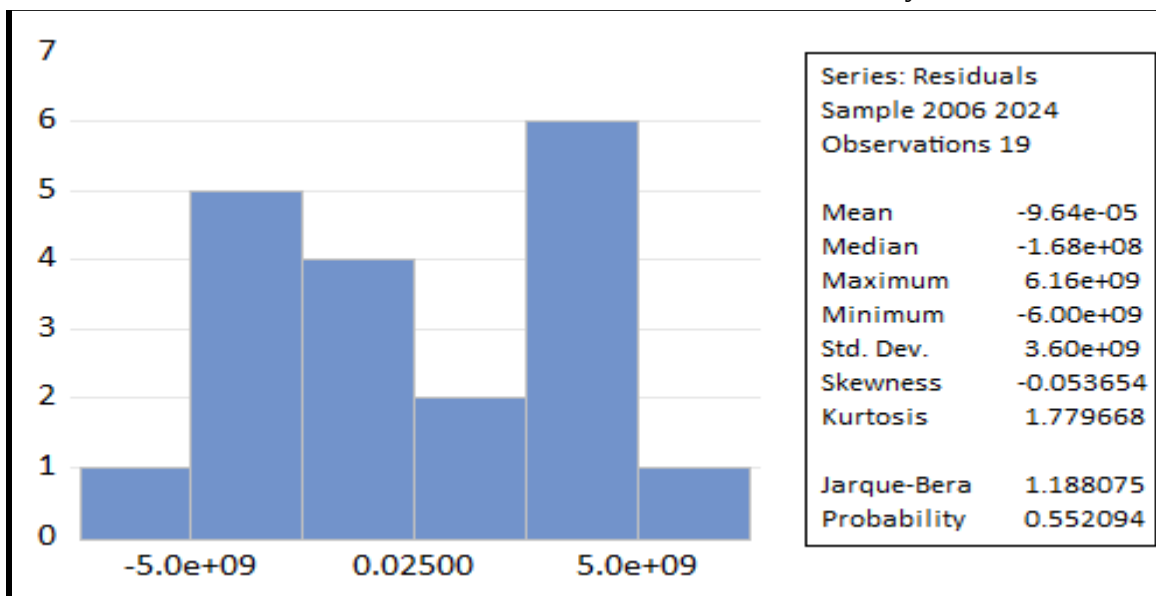


Figure (2) shows the Jarque-Bera normal distribution test for the effect of variables influencing agricultural imports in Iraq for the period (2004-2024).

Source: Prepared by the researcher based on the outputs of the Eviews 12 program.

The heteroskedasticity test was used to assess the impact of variables affecting agricultural imports in Iraq for the period 2004-2024.

This test confirms the absence of heteroskedasticity in the estimated model using the Breusch-Pagan-Godfrey Heteroskedasticity Test. Table (4)

shows that the model does not suffer from heteroskedasticity, as its F-statistic is 0.773 at a probability level of 0.670, which is greater than 5%. Therefore, we can accept the null hypothesis stating that there is no heteroskedasticity problem.

Table (4) shows the results of the heteroskedasticity test for the impact of variables affecting agricultural imports in Iraq for the period 2004-2024

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
Null hypothesis: Homoskedasticity			
F-statistic	0.773233	Prob. F(12,6)	0.6692
Obs*R-squared	11.53868	Prob. Chi-Square(12)	0.4834
Scaled explained SS	0.448571	Prob. Chi-Square(12)	1.0000

Source: Prepared by the researcher based on the outputs of the Eviews 12 program.

Model suitability test (Ramsey reset test) for the effect of variables influencing agricultural imports in Iraq for the period (2004-2024)

The Ramsey reset test determines the model's suitability based on its functional form. Table (5) shows that

Table (5) Ramsey reset test for the effect of variables influencing agricultural imports in Iraq for the period (2004-2024)

the F-statistic value was 0.996 at a probability level of 0.365, which is greater than 5%. Therefore, this model is functionally suitable, and we can accept the null hypothesis stating that the model does not suffer from functional inadequacy.

Ramsey RESET Test			
Equation: UNTITLED			
Omitted Variables: Squares of fitted values			
Specification: Y Y(-1) Y(-2) X1 X1(-1) X2 X2(-1) X3 X3(-1) X4 X4(-1) X5 X5(-1) C			
	Value	df	Probability
t-statistic	0.996450	5	0.3648
F-statistic	0.992912	(1, 5)	0.3648
Likelihood ratio	3.441651	1	0.0636

Source: Prepared by the researcher based on the outputs of the Eviews 12 program.

Conclusions:

The study reached the following conclusions:

1. Agricultural imports in Iraq are characterized by clear fluctuations with a general upward trend, reflecting increased domestic demand and continued dependence on imports.
2. The significant increase in agricultural imports in some years (especially 2024) indicates a widening food gap resulting from weak domestic production and improved import capacity due to oil revenues.
3. Iraq's contribution to global agricultural imports remains limited but has increased relatively in some years due to growing domestic demand
4. Agricultural imports constitute an important part of total commodity imports, despite their declining percentage, indicating their continued importance in meeting food needs.
5. Agricultural imports are directly affected by security and economic conditions; stability supports production and reduces imports, and vice versa.

Recommendations:

1. Supporting and developing the local agricultural sector by adopting comprehensive agricultural policies

aimed at increasing local production through support for agricultural inputs (seeds, fertilizers, modern technologies), thereby reducing the growing dependence on imports and narrowing the food gap.

2. Reducing dependence on imports and enhancing self-sufficiency by developing a national strategy to rationalize agricultural imports, encouraging local production of essential goods, and implementing well-considered protectionist policies when necessary.

3. Diversifying import sources and improving their efficiency. Given the continued need for imports, it is necessary to diversify trading partners and reduce the risks associated with relying on specific markets, while improving the efficiency of import operations and reducing their costs.

4. Achieving economic and security stability by strengthening security and economic stability, which plays a significant role in supporting local agricultural production and reducing the need for imports, by creating a suitable environment for agricultural investment.

5. Restructuring macroeconomic policy by coordinating monetary, fiscal and trade policies to stabilize economic variables (exchange rate, inflation) and reduce fluctuations in agricultural imports.

References:

1. Hussein, S. A. (2009). An economic analysis of foreign trade in agricultural and food products in Iraq for the period (1990–2004). *Journal of Administration and Economics*, 75.
2. Abdali, S., & Katea, I. S. (2015). Analysis of the causal relationship between agricultural imports and some economic variables in Iraq for the period (1990–2010). *Journal of Economic and Administrative Sciences*, 21(85).
3. Hussein, H. G. (2022). Macroeconomic variables affecting Iraqi agricultural foreign trade (1992–2020) (Doctoral dissertation, Tikrit University, College of Agriculture, Iraq).
4. Al-Janabi, N. M., & Abd, Y. M. (2023). The reality and performance of agricultural imports and agricultural output in the Iraqi economy for the period (2004–2019). *Al-Ghay Journal of Economic and Administrative Sciences*, 19(4).
5. Al-Ajrawi, A. A., Zaidan, A. A. Q., & Hamdoun, A. A.-I. (2024). The nature of agricultural imports in Iraq and their impact on economic growth during the period (1990–2022). *Tikrit Journal of Administrative and Economic Sciences*, 19(64).