

The Economic Effects of Agricultural Support Policy for Rice Crop in Iraq (1995–2023)

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I. Abstract:

The research aims to estimate and evaluate the impact of agricultural subsidies on the production of rice crop and to analyze agricultural subsidy policies in Iraq through the challenges facing the agricultural sector despite government support, during the period 1995-2023, and the study variables were (the value of rice production as a dependent variable) while the independent variables are (government subsidies, agricultural loans, deficit and surplus in the general budget of the state, inflation rate, local prices, prices). The research relied on the hypothesis that the agricultural support policy in Iraq during the period 1995-2023 had varying effects on the production of strategic cereal crops, as some measures contributed to stimulating production, while other challenges prevented the achievement of the required results, and two approaches were used in scientific research: the first includes the descriptive aspect, which in turn includes the theoretical framework and the reference presentation of government agricultural support. The second approach relies on standard quantitative analysis, which includes building the model of the study based on the theoretical relationships presented in the theoretical aspect and reinforcing them in previous studies, and then conducting the tests of the model based on the Multiple Linear Regression Model (ML OLS) using a software package (EViews), and the study reached a number of results, the most important of which are: The results indicated that the global prices of wheat had a negative impact on local production, contrary to what economic theory assumes, and the reason for this is the increase in global prices due to the increase in the prices of imported inputs used in agriculture, which raised the costs of local production and negatively affected production values, as the standard model showed its statistical significance through the value of (F) calculated the largest of the tabular at a significance level of 5%, which confirms the correctness of the estimate. The study also recommends the development of government support mechanisms to provide farmers at the appropriate times (before and during the agricultural season) and in formulas that are appropriate to the nature of the requirements of the production process, which enhances its effectiveness in increasing rice production.

Keywords: Government Agricultural Subsidies, Rice, Value of Production, Agricultural Loans, Inflation.

II. Introduction

Agriculture is one of the main pillars of the Iraqi economy, as it contributes to a vital role in achieving food security and enhancing economic and social stability, strategic crops such as rice are one of the most important cereal crops that form the nutritional basis of the population, and contribute significantly to supporting the national economy by providing job opportunities, enhancing food security, and reducing the trade deficit resulting from the import of these crops. The Iraqi government has adopted multiple agricultural support policies over the past decades with the aim of boosting local production and reducing dependence on imports, but the effectiveness of these policies and their impact on agricultural production is still controversial, especially in light of the challenges facing the agricultural sector, the most important of which are the scarcity of water resources, climate change, and weak agricultural infrastructures. In addition to the political and security assumptions that Iraq has suffered from and reflected in agricultural support policies, which leads to the fluctuation of agricultural policies and support, the agricultural sector in Iraq has suffered from several disturbances as a result of the fluctuation of agricultural support during the period 1995-2023 and the extent of the impact of these policies on achieving sustainable agricultural development, and their ability to achieve the desired goals.

The Iraqi economy's dependence on oil revenues to a large extent makes our productive resources in other economic sectors disruptive, and causes a great loss not at the level of production, but at the level of fixed capital, represented by agricultural land and human resources, which suffer from disguised unemployment, and excludes a large proportion of these resources from the circle of production.

Agricultural support is the method used by the state to help farmers increase production, reduce price fluctuations and ensure stable income for farmers, and it is a system followed in various countries of the world, as the followers of agricultural policy in supporting agricultural products is the main purpose with the aim of increasing agricultural production in order to meet the increasing demand for these commodities, especially foodstuffs and the process of industrialization, that the goal of economic policy can be achieved through price support for agricultural production. Price support is a global economic policy followed by most countries, whether developing or developed, but there is a difference in goals in developing countries compared to developed countries, where the application of technology in developed countries leads to an increase in production, and in turn leads to a surplus in production, which leads to a decrease in demand for the product, because the population growth rates in developed countries are low compared to developing countries and are not proportional to the increase in production, and this leads to a decrease in agricultural production prices, which causes damage to farms. The role of the state comes to support the price of agricultural products in order to maintain the balance.



Study Problem:

The problem of the study lies in the question of the effectiveness of the agricultural support policy in Iraq during the period 1995-2023 and its impact on the production of the rice crop, despite the efforts made to support farmers, the agricultural sector still faces multiple challenges that limit its ability to achieve self-sufficiency in strategic crops, so the study seeks to answer the following questions: What is the impact of the agricultural subsidy policy in Iraq on the production of the rice crop during the research period?

Importance of the study:

- 1- The importance of the study comes from the importance of government policies, including the policy of supporting the agricultural sector and its effectiveness in achieving food security, as well as the fact that the study of the reality of the agricultural support policy provides an important knowledge and information base for decision-makers to draw more effective and economically efficient economic policies, as this study is important by clarifying the challenges facing the production of strategic crops and explaining the role of government support in achieving agricultural sustainability. It is one of the main pillars of self-sufficiency, as it provides local food and reduces the need for imports, which preserves foreign exchange, and contributes to providing large job opportunities in the agricultural sector, which supports the income of families and enhances economic and social stability.
- 2- It contributes to providing a knowledge base for decision-makers to develop more effective policies to achieve food security.
- 3- It helps researchers and those interested in agricultural affairs to understand the challenges facing the production of strategic crops.
- 4- The importance of agricultural sustainability and the impact of government support on its achievement are highlighted.

Study hypothesis:

The study starts from the basic hypothesis that the agricultural support policy in Iraq during the period 1995-2023 had a varying impact on the production of strategic cereal crops, as some measures contributed to stimulating production, while other challenges prevented the achievement of the required results, and the study assumes that the agricultural support policy depends on the extent of its integration with other economic policies such as agricultural, service, environmental, industrial and commercial policy, and the economic theory indicates that there is a direct relationship between agricultural support and the production of the crop study. The symposium relationship is:

- There is a direct relationship between agricultural subsidies and rice production.

Objectives of the study:

- 1- Analysis of agricultural support policies in Iraq during the period 1995-2023.
2. Estimating and evaluating the impact of these policies on rice crop production .
- 3- Identifying the most prominent challenges facing the agricultural sector despite government support.
- 4- Providing recommendations to improve the effectiveness of agricultural support policies and promote local production.

Limitations of the study and study variables:

The study covers a long period of time extending from 1995 to 2023, and the study (Iraq) was taken as a model for the implementation of the reality of the agricultural subsidy policy and its impact on the rice crop. In order to achieve the objectives of the study, especially with regard to the study of the impact of the agricultural subsidy policy on the rice crop, many variables were identified that reflect the reality of the relationship between the dependent variable, which is (production value) and the independent variables, which are (local prices, international prices, government agricultural loans, agricultural government subsidies, inflation rate, deficit and surplus in the general budget). During the period from 1995 to 2023.

Study Methodology :

The study relied on linking two approaches, the first method: the descriptive approach to describe the theoretical framework of the agricultural subsidy policy and its impact on strategic cereal crops, and the second method: the quantitative approach to show the impact of the agricultural support policy on strategic cereal crops.

Data Sources

The study relied on secondary data issued by some official institutions, the most important of which are:

1. World Bank Data
- 2- Data from the Ministry of Agriculture – Iraq
- 3- Data from the Ministry of Planning – Iraq
4. The Food and Agriculture Organization of the World (FAO).

The Theoretical Aspect of Agricultural Support

Previous Studies

(Al-Dujaili, 2016) presented a study entitled The Impact of the Price Support Policy on Stimulating Wheat Production, the study aims to analyze the effectiveness of the wheat price subsidy policy in Iraq, and show its impact on agricultural production, by evaluating the extent of government subsidies in stimulating production and increasing productivity, and studying the repercussions of subsidies on production costs and the extent of its impact on farmers in Iraq. The relationship between local and global wheat prices in light of government subsidies was analyzed in light of government subsidies, as the research is based on the analysis of economic data related to price support and agricultural production, an economic analytical study based on the analysis of temporal data related to wheat production, its prices, and the role of government subsidies, during the time period (2008). – 2014), the study reached a set of results, the most important of which are: The policy of subsidizing wheat prices contributed to stimulating agricultural production, but it led to higher costs due to the reliance on subsidized inputs such as fertilizers and seeds. Government subsidies have not been sufficiently effective in achieving agricultural sustainability, as it has led to a rise in prices without achieving a significant increase in productivity, and the study recommended the need to focus on subsidizing agricultural production requirements as it is more effective than the policy of subsidizing the prices of



the final product. The need to raise the competitiveness of the private sector by providing it with all forms of support, as well as increasing spending on infrastructure and research and development.

Al-Aqabi, 2020 studied "The Reality of Government Support to the Agricultural Sector in Iraq for the Period 2000-2020", the study aims to assess the reality of government support provided to the agricultural sector in Iraq during the period 2000-2020, focusing on the impact of this support on the production of strategic crops such as rice and barley, and to analyze the effectiveness of government policies in supporting farmers and achieving food security. The study followed the descriptive-analytical approach, as official statistical data related to agricultural government subsidies were collected and analyzed, such as loans, subsidies, and technical awareness programs, in addition to agricultural production data for rice and barley crops, the study covered the period 2000 - 2020, and the study used the value of government support (subsidies, loans, technical programs) as independent variables, and the production of strategic crops (rice, barley) As dependent variables, the study reached a set of results, the most important of which are: there was a relative improvement in the value of government support provided to the agricultural sector during the study period, but it was not enough to face the challenges of weak infrastructure and high production costs, government support was not effectively reflected in increasing the production of strategic crops sustainably, which led to the continued dependence on imports to cover the food gap. The need to restructure government support programs for the agricultural sector to enhance their efficiency, with a focus on developing agricultural infrastructure, providing production inputs at reasonable prices, and improving distribution mechanisms to effectively reach farmers, with the aim of increasing local production and achieving food security.

CIMPOIEȘ, 2021 published a study entitled Agricultural Support Policy in Moldova: A Key Factor in the Development of Agriculture, the study aimed to analyze the development of agricultural support policy through the allocation and distribution of agricultural subsidies in Moldova as one of the main economic stimuli to support and develop the agricultural sector in Moldova, during the time period from 2010 to 2019. The value of the allocated subsidy, the number of beneficiaries of the subsidy, the geographical distribution of the subsidy, and macroeconomic data on the performance of the agricultural sector, as for the variable dependent on the development of the agricultural sector in Moldova, the study used the Secondary Data Analysis model, and reached many results, the most important of which are: Agriculture is an important sector for sustainable economic development. The government supports the agricultural sector, but the financial resources allocated for support are limited. A large number of farmers are seeking support, but support is more concentrated on large farms, and the study recommended that support be directed towards innovation: and that agricultural subsidy policy should be shifted towards encouraging agricultural innovation to boost productivity. Promoting the integration of farmers into the market and developing policies aimed at increasing the integration of farmers in local and international markets to improve their incomes and increase the sustainability of the sector, increase financial resources allocated for subsidies and allocate larger budgets for agricultural support to ensure sustainable development in the sector.

Molossi, et.al, 2023) addressed agricultural support and public policies to improve sustainability in the beef industry, with the aim of providing a comprehensive overview of beef production in Brazil, the study variables were (public policies to support agriculture, government funding and support programs, integration between agriculture and livestock farming, and environmental laws (such as the Brazilian forest law), while the dependent variables are the sustainability of the beef industry, reducing greenhouse gas emissions, improving productivity Agricultural land, and reducing deforestation, focusing on (1) the historical factors that encouraged the adoption of a large-scale, low-density production system, (2) how national public policies supporting agriculture can improve the

sustainability of the beef industry in Brazil, to achieve a balance between agricultural economic growth and reduce the environmental impacts of this industry. Improve resource use efficiency and reduce the need for expansion into forest areas. and investment in the reclamation of degraded pastoral lands, and the study recommended reducing the need for expansion in forest areas. Investing in the reclamation of degraded rangelands: directing investments towards the reclamation of degraded rangelands and the use of permaculture techniques to increase productivity without harming the environment. Develop sustainable financing programs: to support sustainable agricultural practices and reduce carbon emissions, and encourage the adoption of good agricultural practices: Encourage farmers to adopt sustainable agricultural practices by providing incentives and facilities, with a focus on raising awareness and training.

The concept of government agricultural subsidies

Government subsidies are all the material supplies provided by the government, such as reducing the prices of goods, whether for the benefit of the citizen or for the benefit of industry, and it is very important in a large number of societies, and the lack or decrease of government support fuel the streets. Flour, rice, sugar, milk, electricity, and fuel, as well as housing are among the most important subsidized commodities (Mahwdar, 2012, 254), and agricultural support programs It is a set of measures and programs implemented and provided by the government through public expenditure, and it is approved under the general budget of the state, in which it targets specific groups of society, such as government support programs for poor individuals and groups of society, as the government is interested in providing services to basic social sectors with the aim of achieving social development (health and education) at subsidized prices that make them affordable for individuals below the poverty line, and government support programs are important programs which affect the consumption of food and social services to reach social welfare, such as supporting consumer prices, subsidizing the financing card, subsidizing hydrocarbons, supporting production, agriculture, and industry, and the most important government programs are the ration card program, the social protection program, and the literacy program (Abed and Muheisen, 2024, 145). These programs aim to achieve the social dimension of public expenditure when raising the level of real income for some members of society through subsidies directed to certain groups (Al-Taie, 2014, 65), while government support is a financial contribution made by the government or any public body that benefits those who receive it, and this contribution may take the form of a tangible transformation of funds, or a possible transformational form of funds, as in the case of providing loan guarantees. or a waiver of revenue by the government. As in tax or customs exemptions, or the form of providing services or goods (moral support), as well as the usual form of price and income support (Al-Mahdawi & Mazyed, 2010, 182).

The Impact of Government Subsidies on Agricultural Supply

Government subsidies are one of the most important economic tools used by the state to influence agricultural activity and achieve food security. When the government provides support to farmers, whether in the form of direct price support or indirect support by reducing the costs of production inputs such as seeds, fertilizers, pesticides, and energy, it reduces the total cost of production, and motivates farmers to increase the cultivated areas and increase their productivity, which ultimately leads to an increase in the amount of agricultural crops offered in the markets (Sultan et al., 2021, 217).

Economically, this effect is reflected in Figure 1 as the agricultural supply curve moves to the right, i.e. producers are willing to offer more agricultural commodities at each price level. This shift is due to the improved expected yield of farmers and their increased ability to afford production. For example, when the state subsidizes the purchase price of wheat or barley, it encourages farmers to



expand their cultivation because they guarantee a fair and profitable price, which The overall supply of these crops in the domestic market increases.

On the other hand, if government subsidies are reduced or completely lifted, production costs will rise, leading to farmers' reluctance to expand agriculture, and thus the agricultural supply will decrease and its curve shifts to the left, so government subsidy policies are a sensitive tool in balancing agricultural supply, and governments must implement them in a deliberate way that takes into account economic justice and efficiency (Al-Taie, 2005, 33-34).

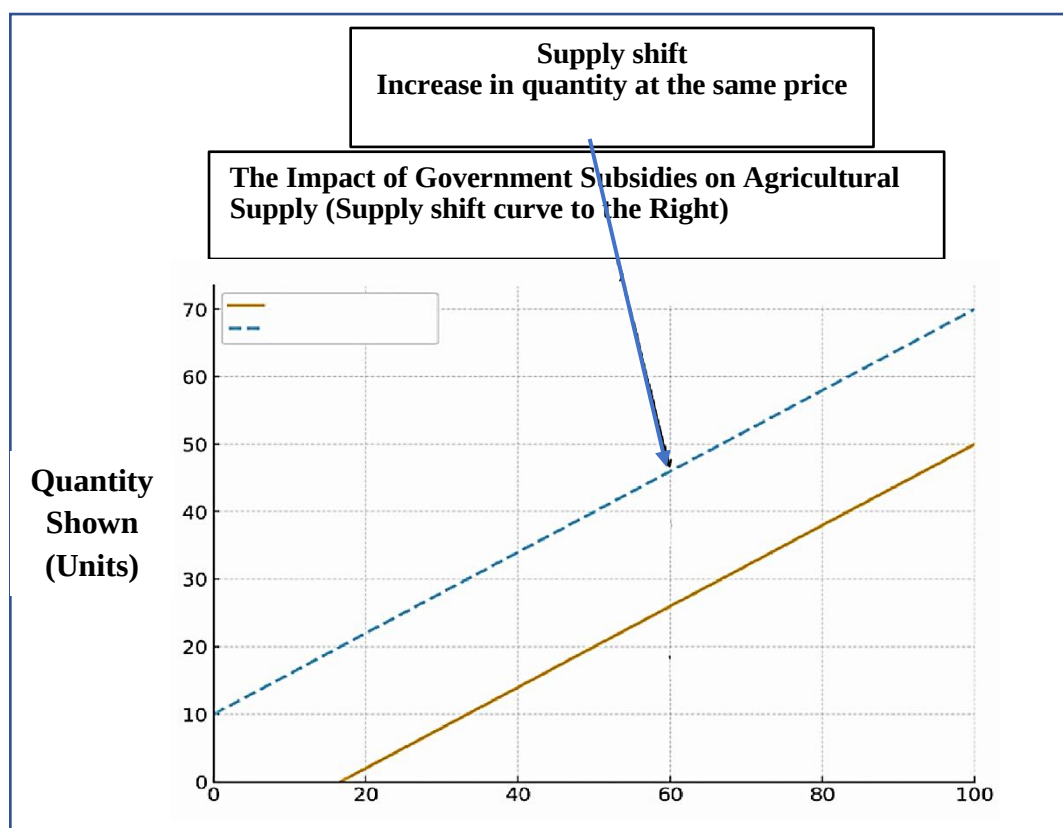


Figure (1): The effect of government subsidies on agricultural supply is shown.

The attached chart shows that the supply curve after support moves to the right compared to the supply curve before support, which means that support contributes to an increase in the quantity offered at each price level.

The Impact of Government Subsidies on Prices

Government subsidies contribute to stabilizing agricultural crop prices by reducing production costs and encouraging farmers to increase production. It also protects consumers from price fluctuations and ensures the availability of basic commodities at reasonable prices. However, oversubsidies can sometimes lead to market distortions and poor production efficiency (Saleh & Al-Douri, 2021, 97)).

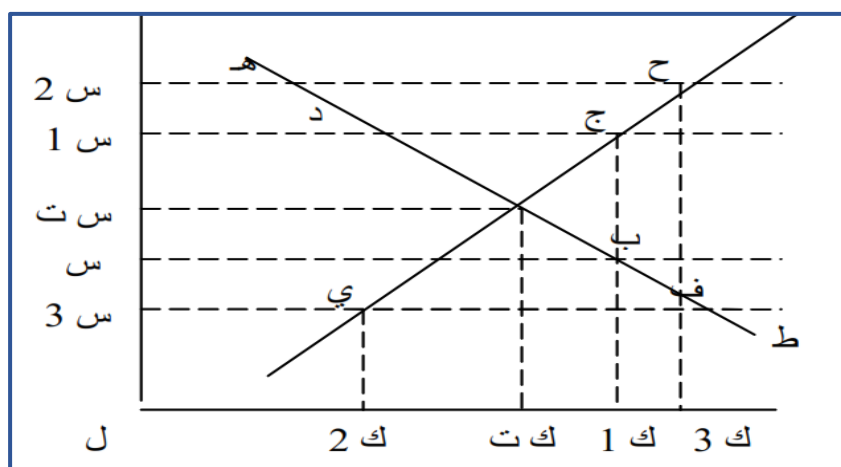


Figure (2): The Impact of Government Subsidies on the Prices of Agricultural Crops.

Where the supply curve refers to the short-term supply, and the demand curve represents the nature of the demand for agricultural products, and the trend of the supply curve upwards, represents the increasing costs that farmers face when increasing production in the short term, if there is no intervention by the state and there is no external import, then the price of the market balance of the commodity will be by (LST) and the amount of balance (LKT), so if the amount of output is to be increased to the level of (KT-K1), then in this case it should be supported. Figure (2) shows the situation for one season in which all grain purchases are disbursed by the state in the same period, where the state must buy all the marketed crop but the output can be increased to the level of (L1) The product must be purchased at a price of (Lx1) and sold at a price of (Lx1) i.e. with a subsidy of one unit of (X1) and the costs borne by the state are in the case equal to the area. When the subsidy price is increased to the level (x2), the cost of the subsidy program increases to the value of the area (Q3 x2 hf), and it is clear that any increase will result in the cost borne by the state and vice versa, provided that other factors remain constant (Al-Attabi, 2012, 131).

The Reality of Rice Production in Iraq

While rice is concentrated in the irrigated area, rice needs to grow large amounts of water, so its cultivation is limited to areas where irrigation water is available, as the available water share affects the production of rice crop (Al-Dubisi, 2009: 153).

Rice is one of the strategic agricultural crops that ranks second among the world's cereal crops in terms of cultivated area, as it is cultivated in a large number of countries of the world due to the availability of natural conditions suitable for its growth in terms of water, temperature and soil. The cultivation of rice dates back to 3,000 BC in China (Al-Younis, 1993, 17). Rice is a staple food crop globally, with an estimated 40% of its consumption as human food globally and a staple food in all developing countries. China and India are among the major rice producing countries in Asia, especially in India, as its cultivation dates back to 1000-1500 BC (Jacob and Nimr, 2011, 87). This crop is superior to other cereal crops because of the energy it contains, as 100 grams gives energy of 360 calories and provides 27% of dietary energy and 20% of dietary proteins, and it is considered an essential source in some countries to supply income and provides a large amount of job opportunities for them, and this crop is low cost at the nutritional level, because it does not need mills such as wheat

and intermediaries in the process of selling and distribution, despite these advantages and benefits The large nutritional value of this crop is that it is more expensive than wheat and other grains, so many countries have relied on the consumption of wheat instead of rice for the mentioned reason (Najafi, 2009, 34).

The rice crop ranks first among the summer agricultural crops in Iraq, and despite this importance of this crop, its cultivation in Iraq is still below the required level due to the fluctuation of the areas cultivated in it, its production and consumption, as well as the difficulty of achieving self-sufficiency in it, it is cultivated with limited areas in the Al-Mashkhab area in the province of Najaf in southern Iraq and limited areas in the district of Aqra in northern Iraq (Rasham, 2010, 17).

III. Materials and working methods

Model Description: -

The model characterization stage is one of the most difficult and complex stages that model characterization goes through, and the model has been described based on economic theory and as shown in Table (1)

Table (1) Description of the model used

Sequence	ID	Variable (English)	Description
1	y	Production Value	Dependent variable
2	X1	Budget Deficit/Surplus	Independent variable
3	X2	Inflation	Independent variable
4	X3	Domestic Prices	Independent variable
5	X4	World Prices (\$)	Independent variable
6	X5	Government Loans Value	Independent variable
7	X6	Agricultural Subsidies (Million \$)	Independent variable
8	X7	Trade Exchange Rate	Independent variable

Source: Prepared by the researcher

Stability of Unit Root Variables by ADF Test

The stage of testing the stability of variables is the first stage of economic analysis to find out whether the variables included in the model are stable or unstable, whether it is at the original level of the data $I(0)$ or at the first difference $I(1)$ in order to test the type of model, and it was found through Table (2) that the dependent variable Y has stabilized at the original level of the data while S of the other variables has not settled at this level, and all variables have stabilized without exception at the difference The first is for variables, and this is the main reason for choosing the ARDL model, and the best model was (ARDL4,4,4,4,4,4).

Results of Quantitative Economic Analysis of Rice Crop for the Period (1995-2023)**Stability test results for study variables using unit root test:****Table (2): Stability of the variables included in the model for rice crop.****UNIT ROOT TEST RESULTS TABLE (ADF)**

Null Hypothesis: the variable has a unit root

	At Level							
		LOGY	LOGX1	LOGX2	LOGX3	LOGX4	LOGX5	LOGX6
With Constant	t-Statistic	-2.7676	-0.6138	-1.6470	-1.1435	-0.5042	-1.7301	-0.1018
	Prob.	0.0662	0.8621	0.4551	0.6965	0.8853	0.4135	0.9456
		*	n0	n0	n0	n0	n0	n0
With Constant & Trend	t-Statistic	-2.8698	-2.6024	-2.2743	-1.6156	-2.4664	-2.0131	-2.4828
	Prob.	0.1763	0.2802	0.4437	0.7807	0.3441	0.5878	0.3360
		n0	n0	n0	n0	n0	n0	n0
Without Constant & Trend	t-Statistic	-1.5905	1.6293	1.1267	0.5587	1.2490	-0.0557	1.8456
	Prob.	0.1049	0.9745	0.9320	0.8354	0.9456	0.6622	0.9841
		n0	n0	n0	n0	n0	n0	n0
	At First Difference							
		d(LOGY)	d(LOGX1)	d(LOGX2)	d(LOGX3)	d(LOGX4)	d(LOGX5)	d(LOGX6)
With Constant	t-Statistic	-10.5831	-4.2381	-2.5396	-10.3989	-4.0548	-10.6125	-4.6491
	Prob.	0.0000	0.0009	0.1092	0.0000	0.0017	0.0000	0.0002
		***	***	n0	***	***	***	***
With Constant & Trend	t-Statistic	-10.5498	-4.2136	-2.5188	-10.3513	-4.0656	-10.5791	-4.6443
	Prob.	0.0000	0.0059	0.3187	0.0000	0.0093	0.0000	0.0015
		***	***	n0	***	***	***	***
Without Constant & Trend	t-Statistic	-10.6301	-3.6319	-1.9480	-10.3441	-3.8558	-10.6301	-3.9036
	Prob.	0.0000	0.0004	0.0496	0.0000	0.0002	0.0000	0.0001
		***	***	**	***	***	***	***
Notes:								
b: Lag Length based on AIC								
c: Probability based on MacKinnon (1996) one-sided p-values.								
This Result is The Out-Put of Program Has Developed By:								
Dr. Imadeddin AlMosabbah								
College of Business and Economics								
Qassim University-KSA								

It was found through the above table that the variables did not stabilize at the original level of the data, only the variable (y) stabilized at the constant and the product, and that all the variables stabilized at the first difference of the data, which is one of the conditions for testing the time-distributed slowdown model, and the best model was ARDL (4,0,0,1,4,1,4).



Quantitative Analysis of the Impact of Government Subsidy Variables for Rice Crop in Iraq for the Period 1995-2023.

Table (3): Test the Slowdown Periods for the Variables in the Model.

VAR Lag Order Selection Criteria						
Endogenous variables: LOGY LOGX1						
LOGX2 LOGX3 LOGX4 LOGX5 LOGX6						
Exogenous variables: C						
Date: 09/20/25 Time: 15:25						
Sample: 1995Q1 2023Q4						
Included observations: 96						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-4882.003	NA	4.05e+35	101.8542	102.0412	101.9298
1	-4237.243	1182.060	1.65e+30	89.44257	90.93844*	90.04722*
2	-4226.624	17.91962	3.73e+30	90.24217	93.04693	91.37590
3	-4207.510	29.46703	7.24e+30	90.86480	94.97844	92.52760
4	-4142.675	90.49911	5.63e+30	90.53490	95.95743	92.72678
5	-4012.437	162.7983	1.18e+30	88.84243	95.57384	91.56338
6	-3999.582	14.19343	3.10e+30	89.59546	97.63576	92.84548
7	-3973.163	25.31812	6.80e+30	90.06590	99.41509	93.84499
8	-3773.533	162.1995*	4.68e+29*	86.92777*	97.58584	91.23594

* indicates lag order selected by the criterion
 LR: sequential modified LR test statistic (each test at 5% level)
 FPE: Final prediction error
 AIC: Akaike information criterion
 SC: Schwarz information criterion
 HQ: Hannan-Quinn information criterion

It was shown through Table (3) that the variables had the best slowdown period in the second period, according to the AIC standard, as shown in Figure (1).

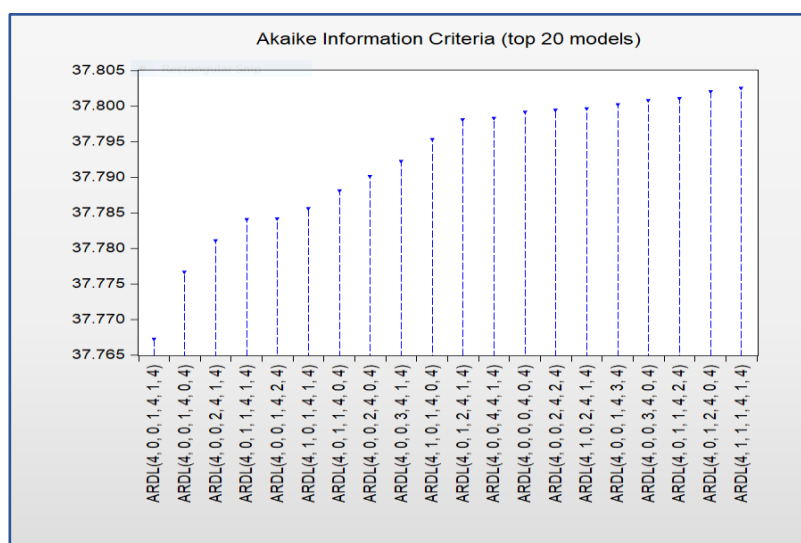


Figure 1: Shows the slowdown periods according to the AIC economic criteria.

First: The results of statistical analysis and economic interpretation in the short and long term of the impact of government subsidies on rice production in Iraq during the period 1995-2023.

Table (4): Joint Integration Test of Economic Variables of Rice Crop.

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	4.150227	10%	1.99	2.94
k	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	3.99

Test –Bounds(Shown by two tests of the value of F)) is L1.150227 and is greater than all the minimum and upper values of all values, which means that there is a state of co-integration of variables.

Table (5): Standard Tests.

Breusch-Godfrey Serial Correlation LM Test:				
F-statistic	1.288646	Prob. F(2,84)		0.2810
Obs*R-squared	3.185248	Prob. Chi-Square(2)		0.2034
Ramsey RESET Test				
Equation: UNTITLED				
Specification: LOGY LOGY(-1) LOGY(-2) LOGY(-3) LOGY(-4) LOGX1				
LOGX2 LOGX3 LOGX3(-1) LOGX4 LOGX4(-1) LOGX4(-2)				
LOGX4(-3) LOGX4(-4) LOGX5 LOGX5(-1) LOGX6 LOGX6(-1)				
LOGX6(-2) LOGX6(-3) LOGX6(-4) C				
Omitted Variables: Squares of fitted values				
	Value	df	Probability	
t-statistic	1.088719	85	0.2794	
F-statistic	1.185309	(1, 85)	0.2794	
Heteroskedasticity Test: ARCH				
F-statistic	0.041822	Prob. F(1,103)		0.8384
Obs*R-squared	0.042616	Prob. Chi-Square(1)		0.8364

Table 22 and Figure 27 show that the variables are free of standard problems.

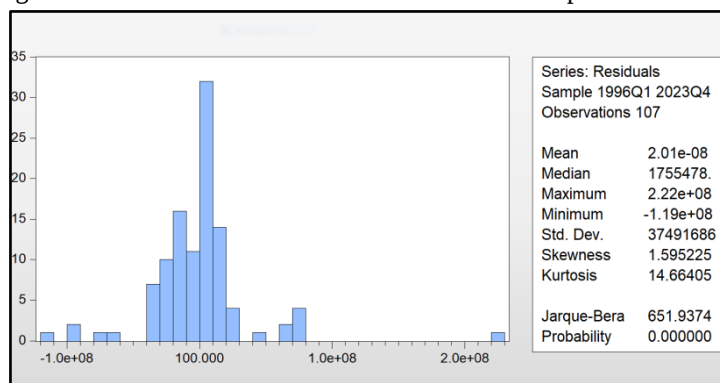


Figure (4) The normal distribution of the residues of the model.

Table (6) Estimation of Short-Term Parameters of Rice Crop

ARDL Error Correction Regression				
Dependent Variable: D(LOGY)				
Selected Model: ARDL(4, 0, 0, 1, 4, 1, 4)				
Case 2: Restricted Constant and No Trend				
Date: 09/20/25 Time: 15:27				
Sample: 1995Q1 2023Q4				
Included observations: 107				
ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGY(-1))	0.205180	0.084965	2.414865	0.0179
D(LOGY(-2))	0.205180	0.084965	2.414865	0.0179
D(LOGY(-3))	0.205180	0.084965	2.414865	0.0179
D(LOGX3)	622432.2	105570.4	5.895896	0.0000
D(LOGX4)	-1036975.	283431.1	-3.658649	0.0004
D(LOGX4(-1))	571573.4	275534.9	2.074414	0.0410
D(LOGX4(-2))	571573.4	275534.9	2.074414	0.0410
D(LOGX4(-3))	571573.4	275534.9	2.074414	0.0410
D(LOGX5)	-89432.17	114393.4	-0.781795	0.4365
D(LOGX6)	-204259.5	136465.0	-1.496790	0.1381
D(LOGX6(-1))	-87811.53	124986.9	-0.702566	0.4842
D(LOGX6(-2))	-87811.53	124986.9	-0.702566	0.4842
D(LOGX6(-3))	-87811.53	124986.9	-0.702566	0.4842
CointEq(-1)*	-0.521232	0.086988	-5.992019	0.0000
R-squared	0.432802	Mean dependent var		-200861.1
Adjusted R-squared	0.353516	S.D. dependent var		49781464
S.E. of regression	40026391	Akaike info criterion		37.96943
Sum squared resid	1.49E+17	Schwarz criterion		38.31915
Log likelihood	-2017.364	Hannan-Quinn criter.		38.11120
Durbin-Watson stat	1.841714			
* p-value incompatible with t-Bounds distribution.				

Results of the Quantitative Analysis of the Impact of Government Subsidy Policy on Rice Production in Iraq for the Period 1995-2023

1- Short period: The results of the quantitative analysis in the mentioned period showed that the deficit did not appear in the general budget of the State X1, as the reason for this is that the deficit in the General Budget of the Iraqi State did not reach levels that affected the value of government subsidies allocated to the rice crop, and the effect of the inflation rate X2 did not appear on the values of government subsidies for the said crop, as the reason for this is that the inflation rates did not reach the levels that affect the values of government subsidies for the crop under study. The results of the analysis showed the significance of the X4 trade exchange rate variable in the non-positive effect on the value of rice production, as the reason for this lies in the fact that Iraqi rice is highly priced and cannot compete with its counterparts in the global market such as Indian and Thai rice. Despite the fact that it is the best type of rice in the world, and the significance of the global price of X5 rice did not appear to affect the value of Iraqi rice production, as the reason for this is the lack of competition between both types, and the results of the estimation showed that the significance of government support for Iraqi rice did not appear, as the reason for this is the lack of subsidy amounts granted to rice, accompanied by the multiplicity and variety of administrative procedures necessary to receive the subsidy amount, which makes farmers refrain from receiving the subsidy amounts allocated for this crop.

The explanatory power of the estimated model, represented by the modified coefficient of determination R^2 , was 0.35, and this result means that 35% of the variables that occur in the values of rice production are explained by the changes that occur in the mentioned independent variables, and 65% of the variables that are dependent on their interpretation are attributed to other factors that may be quantitative or may be qualitative that fall within the concept of the random variable, and the results of the estimation showed that the value of F The calculated value is greater than the tabular F value at the significance level of 0.05, which means the significance of the statistically estimated model, and the D.W test showed that there is no self-correlation problem between the values of random variables, and there is no problem of linear interference between the values of the independent variables according to Klein's test.

Table (7) Estimation of long-term parameters for rice crop

ARDL Long Run Form and Bounds Test				
Dependent Variable: D (LOGY)				
Selected Model: ARDL (4, 0, 0, 1, 4, 1, 4)				
Case 2: Restricted Constant and No Trend				
Date: 09/20/25 Time: 15:28				
Sample: 1995Q1 2023 Q4				
Included observations: 107				
Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	50209549	24302049	0.000000	0.0000
LOGY(-1)*	-0.521232	0.091800	-5.677898	0.0000
LOGX1**	340.3298	505.9516	0.672653	0.5030
LOGX2**	37753643	1.20E+08	0.000000	0.0000
LOGX3(-1)	265250.6	82099.87	3.230829	0.0017
LOGX4(-1)	-1119870.	263012.2	-4.257861	0.0001
LOGX5(-1)	162054.5	106121.0	1.527073	0.1304
LOGX6(-1)	135299.4	100893.8	1.341008	0.1834
D(LOGY(-1))	0.205180	0.091771	2.235774	0.0280
D(LOGY(-2))	0.205180	0.091771	2.235774	0.0280
D(LOGY(-3))	0.205180	0.091771	2.235774	0.0280
D(LOGX3)	622432.2	113213.7	5.497854	0.0000
D(LOGX4)	-1036975.	306881.5	-3.379072	0.0011
D(LOGX4(-1))	571573.4	325196.7	1.757624	0.0824
D(LOGX4(-2))	571573.4	325196.7	1.757624	0.0824
D(LOGX4(-3))	571573.4	325196.7	1.757624	0.0824
D(LOGX5)	-89432.17	139349.5	-0.641783	0.5227
D(LOGX6)	-204259.5	155007.3	-1.317741	0.1911
D(LOGX6(-1))	-87811.53	146057.7	-0.601211	0.5493
D(LOGX6(-2))	-87811.53	146057.7	-0.601211	0.5493
D(LOGX6(-3))	-87811.53	146057.7	-0.601211	0.5493
* p-value incompatible with t-Bounds distribution.				
** Variable interpreted as $Z = Z(-1) + D(Z)$.				
Levels Equation				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGX1	652.9334	958.9888	0.680856	0.4978
LOGX2	72431534	2.28E+08	0.317094	0.7519
LOGX3	508891.6	137500.5	3.701015	0.0004
LOGX4	-2148504.	364599.4	-5.892780	0.0000
LOGX5	310906.6	165808.0	1.875101	0.0160
LOGX6	259576.1	192051.2	1.351598	0.1800
C	96328576	45140115	2.133990	0.0357
EC = LOGY - (652.9334*LOGX1 + 72431534.0687*LOGX2 + 508891.5833				
*LOGX3 -2148504.4309*LOGX4 + 310906.6174*LOGX5 +				
259576.0694*LOGX6 + 96328575.5004)				

2- Long term: The results of the estimation in the mentioned period showed that the significance of the deficit variable did not appear in the general budget of the state X1, and this result matched the result of the same variable in the short term, as well as the results showed that the significance of the inflation rate X2 did not appear, and the reason for this is that the inflation rate did not rise to levels that affect the value of rice crop production, and the local price significance for the previous year appeared X3. The positive impact on the production values of the crop under study, which is a result that is in agreement with the concepts of economic theory, as the farmers of this crop observe the prices of the previous year, which is a reality for agriculture in the current year, and the results of the estimation clarified the morale of trade exchange for the previous year X4 in the non-positive effect on the value of rice production, and the explanation for this is that Iraqi rice does not have the ability to compete in foreign markets due to its high prices due to the high costs of its production and the limited areas cultivated in it. In the district of Al-Mashkhab in Najaf province and the district of Aqra in northern Iraq, the results of Al-Qadeer showed that the significance of the international prices X5 did not appear in affecting the values of rice production because this crop could not enter the global competition with the rest of the types of rice produced, and the Indian and Thai types were not visible, and the significance of the government support X6 did not appear in affecting the production values of the rice crop for the same reason mentioned about the same variable in the short term.

The explanatory power of the estimated model, represented by the value of the modified coefficient of determination, was 0.72, and this result means that 72% of the changes that occur in the value of rice production in the long term are caused by the changes that occur in the independent variables included in the estimated model and 28% of the variables in the value of rice production are attributed to other quantitative variables that are not included in the estimated model or may be attributed to qualitative variables that fall within the concept of the random variable. The calculated F value exceeded the tabular F value at the significance level of 0.05, which means the significance of the statistically estimated model, and the D.W test showed that there was no problem of self-correlation between the values of random variables, and the Klein test showed that there was no problem of linear interference between the values of the independent variables.

IV. Conclusions

1. It was found that the budget deficit did not have a significant impact on rice production, indicating that deficit levels did not reach significant limits or remained stable at rates that did not put pressure on agricultural activity.
2. The results showed that the inflation rate had a negative and significant impact on rice production, which is consistent with economic theory, as high inflation rates lead to an increase in the costs of production inputs and labor wages, which limits the expansion of production.
3. The study confirmed that the local prices of wheat represent an important factor in increasing production, as the higher the local price of the crop, the more incentive farmers are to expand its cultivation, which is in line with economic principles.
4. The results indicated that global wheat prices had a negative impact on domestic production, contrary to what economic theory assumes. This is due to the fact that higher international prices are reflected in the increase in the prices of imported inputs used in agriculture, which has raised the costs of domestic production and negatively affected production values.
5. The results showed that agricultural loans did not show a significant impact on supporting rice production, due to the complexity of administrative and security procedures related to



obtaining the loan, as well as the spending of a large part of them in non-agricultural fields, which made them ineffective in boosting production.

6. Government subsidies to farmers have not had a significant impact on increasing rice production, due to the inappropriate timing of its delivery and insufficient supply to cover the actual needs of farmers, which has reduced its economic viability.
7. The explanatory power of the Standard Model (represented by the modified coefficient of determination R^2) was 0.28, i.e. 82% of the changes in rice production could be explained by the model variables, while 18% were attributed to other qualitative or quantitative factors that were not included in the model, such as climate, agricultural technology, and infrastructure.
8. The standard model showed its statistical significance through a calculated value of (F) greater than the tabular at a significance level of 5%, confirming the integrity of the estimate. The D-W and Klein-Test also demonstrated that there were no problems of self-correlation or linear overlap between independent variables, which enhances the reliability of the results.

V. Recommendations:

1. Reconsidering agricultural lending policies by activating mechanisms for granting agricultural loans on concessional terms and in proportion to the actual needs of farmers, and linking them to the requirements of rice cultivation, to ensure their positive reflection on production.
2. Developing government support mechanisms so that they are provided to farmers at the appropriate times (before and during the agricultural season) and in formulas that are appropriate to the nature of the requirements of the production process, which enhances its effectiveness in increasing rice production.
3. Adopting a flexible marketing policy for local prices that ensures the stability of farmers' returns and encourages them to expand rice production, especially since local prices have proven to have a significant impact on increasing the value of production.
4. Review the impact of global prices on domestic production by developing strategies to reduce dependence on imported inputs (such as fertilizers, seeds, and machinery), and encourage the manufacture and production of local alternatives, to mitigate the impact of rising global prices on production costs.
5. Adopting economic policies to address inflation by stabilizing agricultural commodity prices and production costs, thus reducing the impact of negative inflation on farmers and ensuring the sustainability of the production process.
6. Reorienting fiscal policies related to the public budget so that clear percentages of public expenditure are allocated to support the agricultural sector directly and effectively, given the insignificance of the deficit in affecting rice production.
7. Promoting future studies to include qualitative variables that are not included in the current model (e.g., agricultural technology, resource management efficiency, climate, agricultural infrastructure) as they represent a significant percentage of changes in rice production (18%).

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