Determinants of Agricultural Production Growth in Iraq Under the Influence of Foreign Direct Investment Companies for the Period 2000-2023

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Abstract

The research problem is represented by the lack of funding necessary for the agricultural sector in Iraq to the extent that it has become dependent on foreign imports to feed the population, and the impact of this on the Iraqi economy is extremely important, as the value of imported food bills has reached very high digital levels, accompanied by the policies followed by food-exporting countries. In this regard, the importance of studying the determinants of agricultural production growth in Iraq appears in light of the influence of foreign direct investment companies in agriculture. The study aimed to diagnose the determinants of agricultural production growth in Iraq under the influence of foreign direct investment companies during the period 2000-2023, based on the hypothesis that foreign direct investment companies contribute in different roles in raising the growth rate of agricultural output in the host country, which depends on the nature of the prevailing investment climate. In order to implement the research hypothesis, our study relied on the method of linking the descriptive trend, which relies on previous theoretical studies, and the quantitative trend, which relies on econometric methods and techniques. In it, time series data were used to estimate the determinants of agricultural production growth in Iraq under the influence of the aforementioned companies, relying on the ordinary least squares method and the ARDL model to estimate the relationship between variables in the short and long term, which were represented by the values of foreign direct investment X1, cultivated areas X2, agricultural labor force X3, agricultural loans X4, agricultural exports X5 as independent variables, and the values of agricultural output Y as a dependent variable. Our study reached a number of conclusions, the most important of which was that foreign direct investment in agriculture is one of the most important factors that contribute In achieving economic and agricultural transformation, these companies play a crucial role in developing production and agricultural capabilities. The agricultural sector in Iraq faces a number of constraints that have combined to reduce returns on the sector. We recommend the need to bring in the aforementioned investment companies into agriculture and provide agricultural loans on favorable terms, taking into consideration strict oversight and monitoring to ensure the funds are used in agricultural sectors.

Keywords: Determinants of agricultural production, Iraq, foreign direct investment companies.

Introduction

Foreign direct investment (FDI) is an important source of capital flows and increased foreign exchange reserves. It also plays a role in increasing capital formation and is a better means of financing than borrowing from abroad, given the conditions set by lending countries. Companies that engage in this type of investment in the agricultural sector have received significant attention recently, to the point that they have become a prominent focus of economic and agricultural policymakers (Dogan, 2022, 48). This is due

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to their significant role in stimulating economic growth and achieving sustainable agricultural development in Iraq. Therefore, providing an appropriate investment environment that contributes to attracting these investments is an important goal pursued by most developing and developed countries. In this regard, Iraq has sought to provide a favorable climate to attract more of the aforementioned companies in its agricultural sector by reforming its infrastructure, preparing and liberalizing the business environment, and developing solutions to its chronic economic and structural problems. Iraq's goal in its interest in agricultural investment is to develop this sector, as it is responsible for meeting the needs of domestic food consumption. Production requirements for other sectors and achieving a surplus for export with the aim of providing the foreign currency needed to implement economic development programs. This is in addition to the importance of investing in raising the efficiency of the agricultural sector's performance, in accordance with the state's policy of establishing many promising projects in the agricultural sector, such as land reclamation projects, dam construction, and other projects that achieve horizontal and vertical expansion in the sector under study. Therefore, Iraq has sought to attract more investment companies to its agricultural sector.

Research Problem

The research problem is represented by the inadequacy of the necessary funding for the agricultural sector in Iraq and the negative impact this has on raising the rate of GDP growth and achieving agricultural development to the extent that Iraq has become dependent on foreign imports to feed its population. This has extremely significant impacts on the Iraqi food-importing economy, given that its invoice values reach very high numerical levels. This is in addition to the policies of food-exporting countries, which are represented by raising food prices and interfering in the affairs of food-importing countries. Therefore, the demand for the aforementioned investment companies in Iraqi agriculture has become inevitable, given that these companies have a high capacity to develop the agricultural sector and possess production factors. Administrative expertise and efficient marketing methods contribute to transforming the country from an importer to a food exporter.

Research Importance

The importance of the research stems from the importance of the determinants affecting agricultural growth in Iraq, given the influence of foreign direct investment companies in agriculture. This growth is

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considered one of the primary means of achieving agricultural development, generating income, and providing job opportunities. Furthermore, foreign direct investment is one of the most important sources of agricultural financing in Iraq, as it is considered an alternative to loans, which are relied upon to bridge the gap between investment and local savings. In this regard, various countries around the world seek to attract these companies due to their positive impact on agricultural growth.

Research Objective

Foreign direct investment in Iraqi agriculture is considered one of the most important sources of external financing, serving as an alternative to loans and being relied upon to finance agricultural investments. Therefore, the research aims to measure the determinants of agricultural production growth in Iraq, given the influence of foreign investment companies, during the period 2000-2023.

Research Hypothesis

Foreign direct investment plays a complementary role to local investments in agriculture. In addition to its role in the capital financing process, it is an important means of providing job opportunities and transferring production technology, as well as its role in developing competitiveness and export capabilities. Therefore, the research assumes the presence of a number of factors that contribute varying impacts to the growth of agricultural output in Iraq as a result of the influence of foreign direct investment companies.

Research Methodology

Research Method: Our research relied on a descriptive approach, which relies on previous theoretical studies that examined this topic, and a quantitative approach, which relies on econometric methods and techniques, thus measuring the determinants of agricultural production growth under the influence of foreign direct investment companies in Iraq during the research period.

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Reference and Contemporary Studies on the Determinants of Agricultural Production Growth

Foreign direct investment in agriculture is of paramount importance in the economic, agricultural, and social transformation of any country in the world. Interest in studying it has grown due to its significant role in supporting the economies of host countries and developing the agricultural sector, particularly in developing countries, where the agricultural sector is a significant contributor to their gross domestic product (GDP), reaching approximately 9.01% in 2020. Given the importance of this type of investment, we have decided to highlight the most important studies that address the role of foreign direct investment companies in the agricultural sector, so that they can be relied upon to analyze and discuss the research problem.

• In 2016, Alawi published a study on the impact of foreign direct investment (FDI) flows on economic growth in Iraq. He explained that most developing countries suffer from a major problem: the scarcity of capital needed to achieve their economic, agricultural, and social development. Iraq's reliance on the production and export of crude oil and some extractive products to secure its financial resources poses a serious threat to the local economy, given that these products are depletable and cannot be relied upon to meet the needs of the general budget in the medium and long term. Furthermore, their prices fluctuate globally and are subject to political, economic, and strategic considerations. The research problem lies in the significant shortage of domestic funding sources, which necessitates the search for other sources to compensate for this shortfall. Foremost among these sources are foreign direct investment companies, not to mention their role in transferring advanced agricultural technology, management, and marketing methods. They also have significant potential for training national agricultural cadres and developing production skills, which leads to increased employment opportunities and productivity, diversification of agricultural production, and increased growth rates. The research was based on the hypothesis that foreign direct investment flows contribute positively to raising the rate of economic and agricultural growth in Iraq during the period 2000-2014. The importance of the research was represented in the fact that these investments are a complementary means to local investment and can be used to diversify agricultural production and its exports. On the practical side, the results showed the significance of the foreign direct investment variable in its positive impact on the rate of economic and agricultural growth during the period 2000-2014. As for the most important

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conclusions, they were represented in the decline in the values of foreign direct investment coming to Iraq due to the abnormal conditions it went through from 1980 until 2003. However, they began to increase since 2004 due to the lifting of economic sanctions and Iraq's opening up to the outside world and the issuance of the Investment Law of 2006. However, the flows of this investment are still modest, which led to the Iraqi economy's dependence on the production and export of crude oil, which constitutes 97% of Iraq's total exports, which has very important risks for the country. The researcher recommended the necessity of activating the investment law. It also allows foreign companies to invest their capital and expertise in the agricultural sector, achieves political and security stability, rationalizes government spending, and establishes modern rural infrastructure attractive to these investment companies.

In 2017, Marzouq and Ali explained in their study on foreign direct investment and its impact on economic performance that this investment is a topic that has generated a wide range of views. Some consider it the most important source of long-term capital flows, through which development programs are financed in developing countries that lack foreign capital and expertise. The research is based on the hypothesis that foreign direct investment companies contribute positively to raising the growth rate of agricultural production in Iraq. The research aims to study the effects of this type of investment on Iraqi agriculture after 2003. As for the research problem, it focused on studying the reality of the Iraqi economy, which depends on the production and export of crude oil and its revenues, which constitute 85% of the components of the national income. However, this country has not been able to achieve the desired level of economic growth. In this regard, economic policy makers in Iraq called for the use of this type of companies that have huge financial capabilities, high technological expertise, and great competitiveness in global markets with the aim of raising the efficiency of the performance of the agricultural sector in Iraq, as it depends on the production and export of extractive products that constitute a large percentage of the components of the state's general budget, in addition to striving to improve the rates of international trade exchange for the benefit of Iraq. Therefore, economic policy makers in Iraq had to attract this type of companies that have proven their efficiency in developing the agricultural sector in most European countries, whose investments amounted to $453 billion in 2004 and reached $494 billion in 2005. 2005, meaning that foreign direct investment constitutes 20% of global foreign investments. The results of the study showed the

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contribution of foreign direct investment companies in raising the efficiency of the agricultural sector's performance in Iraq, as the agricultural trade balance witnessed a growth of 17% in 2021. The researchers recommended the necessity of attracting more companies of this type of investment, as it is the most effective means of raising the efficiency of the agricultural sector's performance

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• In 2024, Khalaf explained in her study on foreign direct investment in the Iraqi agricultural sector that this investment has a significant impact on economic and agricultural development and contributes to increasing national and agricultural income and employs large numbers of workers. The need for this type of investment emerged following the increase in food product imports due to the scarcity of local production and the low value of investment allocations in the aforementioned sector due to the nature of the political and economic conditions that the country is going through, which made this investment a subject of discussion for many agricultural policy makers in developing and developed countries, as it contributed to achieving a qualitative shift in the agricultural sector in many developing countries. After being unable to meet the need for local demand for agricultural products, they turned to exporting them, in addition to its role in supporting the agricultural integration movement between the countries of the world, which made this type of investment of great interest in most countries of the world, especially after the spread of economic globalization policies. The research problem was represented by the small number of foreign direct investment companies coming to Iraq with the aim of investing their money in Iraqi agriculture. The research aimed to identify the problems and obstacles that prevent the aforementioned companies from coming to Iraq. The importance of the research comes from the importance of the aforementioned companies and their role in developing and advancing developing agriculture, as they possess the necessary capital and agricultural, administrative and marketing expertise necessary for the development and advancement of developing agriculture. The research assumed the existence of a number of constraints facing Iraqi agriculture under the influence of foreign direct investment companies, which prevented their arrival in Iraq due to the weak political and security stability and the unsuitability of the necessary infrastructure for this type of investment. The researcher addressed the most important constraints facing agriculture in Iraq under the influence of the aforementioned companies, which she represented by the scarcity of water revenues, land salinization, desertification, rural poverty, insufficient infrastructure, and financial and administrative corruption. The researcher reached a number of conclusions, the most important of which was the unsuitability of the Iraqi environment to attract foreign investment companies in the agricultural sector due to the lack of basic components for this, such as infrastructure, political and economic stability, in addition to the increase in desertified land areas, high

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production costs, inflation rates, and weak financial and monetary policies. She recommended the need to pay attention to increasing the value of investment allocations to repair the infrastructure and legislate the necessary laws to attract the aforementioned investment companies without difficult restrictions.

Materials and Methods

- Characterization of the Standard Models Used in Estimation

The standard model characterization phase is one of the most important and difficult stages. To achieve the research objective, several statistical methods were used to obtain the best results (Al-Bajari, 2011, 87). These included multiple regression analyses to estimate the impact of determinants of agricultural output growth in Iraq during the period 2000-2023. The following standard model was formulated:

$$Y=\beta o+\beta 1X1+\beta 2X2+\beta 3X3+\beta 4X4+\beta 5X5+Ui$$

Where:

Y: Value of agricultural output in million dollars

X1: Value of agricultural foreign direct investment in million dollars

X2: Cultivated area in million dunums

X3: Agricultural labor force in thousand workers

X4: Agricultural loans in million dollars

X5: Agricultural exports in million dollars

Ui: Random variable

Coefficients of explanatory variables: β1, β2, β3, β4 β5

- Results of the stationarity test for the research variables using the unit root test:

The unit root test aims to determine the properties of all time series for all variables of the function under study, to ensure the stationarity of the economic time series and determine the integration order of each variable (Hassan, 2024, 18). After conducting the unit root tests for stationarity from Table 1, it was found that the variables of the function of determinants of agricultural production growth did not stabilize at the original level of the data, except for the dependent variable (y), which stabilized at the level. Meanwhile, all variables stabilized at the first difference of the data. This is evident through the augmented Dickey-Fuller (ADF) test, as shown in the following table:

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Table 1: Results of unit root tests for determinants of agricultural production growth in Iraq

UNIT ROOT TEST TABLE (ADF)							
At Level							
		Y	X1	X2	X3	X4	X5
With Constant	t-Statistic	-1.7557	-1.7267	-1.2302	-5.9105	-0.9587	-1.8892
	Prob.	***0.3974*** n0	***0.4116*** n0	***0.6537*** n0	***0.0000*** ***	***0.7603*** n0	***0.3344*** n0
With Constant & Trend	t-Statistic	-1.9889	-2.2806	-1.6753	-3.0913	-1.5822	-3.5738
	Prob.	***0.5921*** n0	***0.4358*** n0	***0.7465*** n0	***0.1228*** n0	***0.7851*** n0	***0.0457*** **
Without Constant & Trend	t-Statistic	-0.2497	-0.7007	-1.0668	0.4475	0.1810	-0.5543
	Prob.	***0.5909*** n0	***0.4080*** n0	***0.2546*** n0	***0.8065*** n0	***0.7343*** n0	***0.4717*** n0
At First Difference							
		d(Y)	d(X1)	d(X2)	d(X3)	d(X4)	d(X5)
With Constant	t-Statistic	-6.6815	-5.7557	-6.8017	-1.2941	-6.7815	-2.9436
	Prob.	***0.0000*** ***	***0.0000*** ***	***0.0000*** ***	***0.6220*** n0	***0.0000*** ***	***0.0500*** **
With Constant & Trend	t-Statistic	-6.6192	-5.6882	-6.7591	-2.1329	-6.7058	-2.8055
	Prob.	***0.0000*** ***	***0.0001*** ***	***0.0000*** ***	***0.5113*** n0	***0.0000*** ***	***0.2044*** n0
Without Constant & Trend	t-Statistic	-6.7082	-5.7589	-6.7082	-1.9779	-6.7082	-4.5791
	Prob.	***0.0000*** ***	***0.0000*** ***	***0.0000*** ***	***0.0471*** **	***0.0000*** ***	***0.0000*** ***

Notes: (*)Significant at the 10%; (**)Significant at the 5%; (***) Significant at the 1%. and (no) Not Significant
*MacKinnon (1996) one-sided p-values.

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Source: Prepared by the researcher based on the results of the statistical analysis of the Eviews-10 program

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It is noted from the table above that all variables did not stabilize at their original level, except for the variable (x5). Only when the first difference of the variables was taken, all variables stabilized without exception. Based on this, the ARDL models were tested using the autoregressive time-lag methodology, and the best model was (ARDL 4, 3, 0, 0, 4, 4). Using this model leads to adopting the error correction methodology (ECM) as the best model, after passing through three basic stages. The basic stage can be observed by taking the lag periods, as shown in the table below.

Table 2: Periods of slowdown in agricultural output growth determinants in Iraq

VAR Lag Order Selection Criteria						
Endogenous variables: Y X1 X2 X3 X4 X5						
Exogenous variables: C						
Sample: 2000S1 2023S2						
Included observations: 44						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-3467.589	NA	1.50e+61	157.8904	158.1337	157.9806
1	-3278.632	317.7905	1.46e+58	150.9378	152.6409*	151.5694
2	-3256.460	31.24247	3.00e+58	151.5664	154.7292	152.7393
3	-3219.038	42.52524	3.63e+58	151.5017	156.1244	153.2160
4	-3134.197	73.27135*	6.87e+57*	149.2817*	155.3642	151.5374*
* 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						

Source: Prepared by the researcher based on the results of the statistical analysis of the Eviews-10 program.

It is noted that the best slowdown period is period (4) according to the AIC criterion, as shown in the figure below:

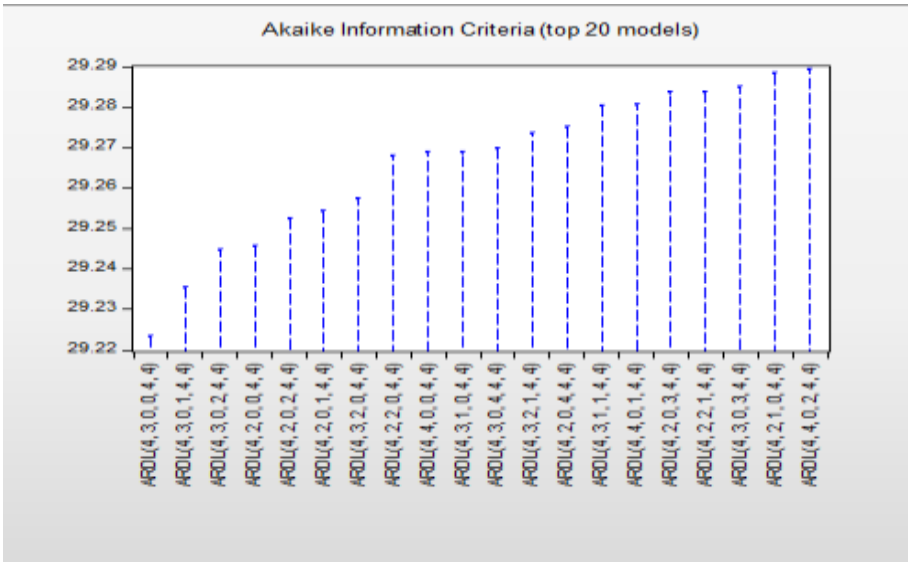

Figure 1: The lag period of the determinants of agricultural production growth in Iraq.

Source: Prepared by the researcher based on the results of the statistical analysis of the Eviews-10 program.

After taking into account the lag period, we proceed to the second stage, which is the TEST BOUND cointegration test, as shown in the table below.

Table 3: Results of the cointegration test of the determinants of agricultural production growth in Iraq.

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	8.006550	10%	2.08	3
K	5	5%	2.39	3.38
		2.5%	2.7	3.73
		1%	3.06	4.15

Source: Prepared by the researcher based on the results of the statistical analysis of the Eviews-10 program.

It is noted that the integration table above shows that the value of (F-TEST) is greater than all the lower and upper values, which indicates the existence of an integration

relationship that clarifies the direct and indirect effect of the variables. It is also noted from Table (4) (short term) that the last condition for the error correction methodology (ECM) is available, which is that the function constant is (negative and significant), which is the last and basic condition for this methodology.

Table 4: Results of short-term diagnostic tests on the determinants of agricultural output growth in Iraq

ARDL Error Correction Regression
Dependent Variable: D(Y)
Selected Model: ARDL(4, 3, 0, 0, 4, 4)
Case 2: Restricted Constant and No Trend
Sample: 2000S1 2023S2
Included observations: 44

ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(Y(-1))	0.533948	0.106124	5.031357	0.0000
D(Y(-2))	0.610677	0.119298	5.118926	0.0000
D(Y(-3))	0.608470	0.119686	5.083900	0.0000
D(X1)	-231.6756	59.76552	-3.876409	0.0008
D(X1(-1))	203.2895	60.86964	3.339752	0.0028
D(X1(-2))	-107.2415	66.64576	-1.609128	0.1212
D(X4)	0.000292	8.72E-05	3.343963	0.0028
D(X4(-1))	-0.000384	0.000103	-3.718929	0.0011
D(X4(-2))	-0.000345	0.000118	-2.928240	0.0076
D(X4(-3))	-0.000399	0.000108	-3.691128	0.0012
D(X5)	-4.261549	6.257555	-0.681025	0.5027
D(X5(-1))	66.80120	10.11193	6.606175	0.0000
D(X5(-2))	24.15673	6.411109	3.767949	0.0010
D(X5(-3))	23.33544	6.375302	3.660288	0.0013
CointEq(-1)*	-1.242676	0.147826	-8.406337	0.0000
R-squared	0.840991	Mean dependent var		72603.25
Adjusted R-squared	0.764228	S.D. dependent var		844354.8
S.E. of regression	409988.3	Akaike info criterion		28.95057
Sum squared resid	4.87E+12	Schwarz criterion		29.55882
Log likelihood	-621.9125	Hannan-Quinn criter.		29.17614
Durbin-Watson stat	1.585832			

Source: Prepared by the researcher based on the results of the statistical analysis of the Eviews-10 program.

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Results of the short-term statistical analysis and economic interpretation of the impact of the determinants of agricultural production growth in Iraq for the period 2000-2023

The results of the quantitative analysis of the determinants of agricultural production growth in the aforementioned period revealed the significance of the foreign direct investment (X1) variable in its negative impact on agricultural output growth, with an elasticity [1(*)]of 1.0696 units. The negative sign of this variable's parameter contradicts the concepts of economic theory. The reason for this lies in the fact that foreign direct investment companies have invested their funds and expertise in the areas of rural infrastructure in Iraq, particularly in the areas of river dredging, dam construction, digging canals, regulating drains, and clearing lands of salinity, specifically in the lands of central and southern Iraq. This has made this variable inconsistent with increasing agricultural output (Ghazal, 2008, 3-8). The estimation results also revealed the lack of significance of cultivated areas. X2 in influencing the values of the dependent variable, if the reason for this is attributed to Iraq's dependence in agriculture on rain-fed lands, which witness fluctuations and a decrease in their agricultural production during the study period, accompanied by the lack of regular rainfall or its falling at the wrong time, and during the mentioned period, Iraq witnessed abnormal political and security conditions, which required most farmers to leave their lands and migrate to the city, which made this variable not contribute a significant impact in increasing agricultural output (Hussein 21, 2011,). The results of the estimation showed the lack of significance of the agricultural labor force X3 in influencing the values of agricultural output, if the reason for this is due to the case of substitution that took place between the factors of agricultural production, if agricultural mechanization replaced agricultural work in most field agricultural operations, which hid the significance of the aforementioned variable, accompanied by skilled agricultural workers leaving agricultural work and working in other economic activities, in addition to the fact that most of the workers The Iraqi agricultural sector is not efficient, aware and aware of the appropriate level, as most of them depend on the traditional agricultural method to the extent that they are unable to increase agricultural production (disguised unemployment) (Youssef and Ali, 30, 2017). The estimation results showed the significance

[1(*)] تحسب المرونات في الدوال الخطية بالطريقة الاتية: $ep=\beta i\ \bar{x}\ \bar{y}$

of agricultural loans X4 in the positive impact on the values of agricultural output with an elasticity of 0.032 units, and the positive sign of the parameter of this variable was consistent with the concepts of economic theory. The reason for this is the importance of loans as a basic element in supporting agricultural development, increasing farm assets and revenues, and raising the efficiency of using agricultural resources by providing all inputs and requirements for agricultural production (Hashem and Sultan, 215, 2022). The estimation results showed the lack of significance of agricultural exports X5 in influencing the values of agricultural output. The reason for this is the low values of agricultural output in Iraq to a level that does not achieve Self-sufficiency or food security in most years of the series means that production levels did not reach a level that would be exported to neighboring, regional, and foreign countries. This justifies the lack of significance of this variable in influencing the values of the dependent variable (Al-Hayali, 107, 2013). The explanatory power of the estimated model, represented by the adjusted coefficient of determination R2, reached 0.92. This means that 92% of the changes in agricultural output values are explained by changes in the independent variables included in the estimated model, and 8% of the changes in the dependent variable are explained by other factors, which may be quantitative and not included in the estimated model, or may be qualitative and fall within the concept of a random variable. The estimation results showed that the calculated F value reached 26.910, which is greater than its table value at a significance level of 5%. This means that the estimated model is statistically significant. The calculated Durbin-Watson value reached 1.585. This result indicates that there is no problem of autocorrelation between the values of the random variables, and no problem of multicollinearity between the values of the independent variables appeared according to the Klein test. We can now move on to interpreting Table (5), which shows the long-term interpretation of the model variables.

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Table 5: Long-term diagnostic tests for the determinants of agricultural output growth in Iraq

ARDL Long Run Form and Bounds Test
Dependent Variable: D(Y)
Selected Model: ARDL(4, 3, 0, 0, 4, 4)
Case 2: Restricted Constant and No Trend
Sample: 2000S1 2023S2
Included observations: 44

Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.65E+08	90522441	0.000000	0.0000
Y(-1)*	-1.242676	0.174637	-7.115764	0.0000
X1(-1)	-397.8316	91.16637	-4.363798	0.0002
X2**	-1.057513	0.204525	-5.170585	0.0000
X3**	1416.960	1215.264	1.165969	0.2556
X4(-1)	0.000557	0.000105	5.278934	0.0000
X5(-1)	-68.94679	12.02875	-5.731833	0.0000
D(Y(-1))	0.533948	0.129853	4.111951	0.0004
D(Y(-2))	0.610677	0.142970	4.271354	0.0003
D(Y(-3))	0.608470	0.143381	4.243716	0.0003
D(X1)	-231.6756	78.54369	-2.949640	0.0072
D(X1(-1))	203.2895	79.01616	2.572759	0.0170
D(X1(-2))	-107.2415	84.47281	-1.269539	0.2169
D(X4)	0.000292	0.000113	2.592590	0.0163
D(X4(-1))	-0.000384	0.000136	-2.812780	0.0099
D(X4(-2))	-0.000345	0.000154	-2.242547	0.0349
D(X4(-3))	-0.000399	0.000147	-2.712488	0.0124
D(X5)	-4.261549	8.006824	-0.532240	0.5997
D(X5(-1))	66.80120	12.88959	5.182570	0.0000
D(X5(-2))	24.15673	7.537695	3.204790	0.0039
D(X5(-3))	23.33544	7.447555	3.133302	0.0047
* 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.
X1	-320.1411	63.22918	-5.063187	0.0000
X2	-0.850997	0.127067	-6.697220	0.0000
X3	1140.249	971.5607	1.173626	0.2526
X4	0.000448	5.03E-05	8.899242	0.0000
X5	-55.48253	6.685848	-8.298504	0.0000
C	3.74E+08	56457622	6.626367	0.0000

EC = Y - (-320.1411*X1 -0.8510*X2 + 1140.2492*X3 + 0.0004*X4
-55.4825*X5 + 374108909.7449)

Source: Prepared by the researcher based on the results of the statistical analysis of the Eviews-10 program.

Results of the long-term statistical analysis and economic interpretation of the impact of determinants of agricultural production growth in Iraq for the period 2000-2023.

The quantitative estimation results revealed the significant negative impact of foreign direct investment (X1) on agricultural output values, with an elasticity of 1.478 units. The negative sign of this variable's parameter contradicts the economic literature, and the explanation for this lies in interpreting the sign of the same variable in the short term. The estimation results revealed the significant negative impact of cultivated areas (X2) on agricultural output values, with an elasticity of 1.043 units. The negative sign of this variable's parameter contradicts the concepts of economic theory, as the reason for this is attributed to the presence of large uncultivated areas and the inefficient exploitation of land due to irregular rainfall, the migration of farmers to cities, and the scarcity of water resources. This has made this variable ineffective in increasing output. Agricultural, and the estimation results showed the lack of significance of the agricultural labor force X3 in influencing the values of agricultural output, and this result contradicted the concepts of economic theory, as the reason for this lies in the same reason mentioned for the same variable in the short term. The estimation results showed the significance of agricultural loans X4 in the positive impact on the values of agricultural output with an elasticity of 0.049 units, and the positive sign of the parameter of this variable agreed with our expectations and the concepts of economic theory. The explanation for this lies in considering agricultural loans as one of the means relied upon in purchasing inputs and production requirements of goods and machines that contribute to increasing the production and productivity of crops, especially subsidized ones (Colman & Nixson, 1986, 18). The estimation results showed the significance of agricultural exports X5 in the non-positive impact on the values of agricultural output with an elasticity of 0.006 units. The negative sign of this variable's parameter can be explained by the fact that agricultural export revenues are not used in the areas of developing and advancing local agriculture as much as they are used in non-agricultural areas, including real estate areas from which the farmer seeks to obtain fixed incomes, which has made this variable not contribute positively to agricultural output (Yahya, 2005, 98). The explanatory power of the estimated model, represented by the adjusted coefficient of determination (R2), was 0.76. This value means that 76% of the changes in agricultural output values are explained by changes in the values of the

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independent variables included in the estimated model. 24% of the changes in the dependent variable are explained by other factors, which may be quantitative and not included in the estimated model, or qualitative and fall within the concept of a random variable. The calculated F value was 11.446, which is greater than its table value at a significance level of 5%. The results of the Durbin-Watson test indicated the absence of autocorrelation between the values of the random variables, and no multicollinearity problems appeared between the values of the independent variables according to the Klein-Test.

It is noted from Table 6 and Figure 2 that the model is free of all standard problems, as shown below.

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Table 6: Standard Tests of the Model

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.144608	Prob. F(2,21)	0.3374
Obs*R-squared	4.324983	Prob. Chi-Square(2)	0.1150
Heteroskedasticity Test: ARCH			
F-statistic	1.554125	Prob. F(1,41)	0.0852
Obs*R-squared	1.664634	Prob. Chi-Square(1)	0.0932
Ramsey RESET Test			
Equation: UNTITLED			
Specification: Y Y(-1) Y(-2) Y(-3) Y(-4) X1 X1(-1) X1(-2) X1(-3) X2 X3 X4 X4(-1) X4(-2) X4(-3) X4(-4) X5 X5(-1) X5(-2) X5(-3) X5(-4) C			
Omitted Variables: Squares of fitted values			
	Value	df	Probability
t-statistic	0.787939	22	0.4391
F-statistic	0.620847	(1, 22)	0.4391

Source: Prepared by the researcher based on the results of the statistical analysis of the Eviews-10 program.

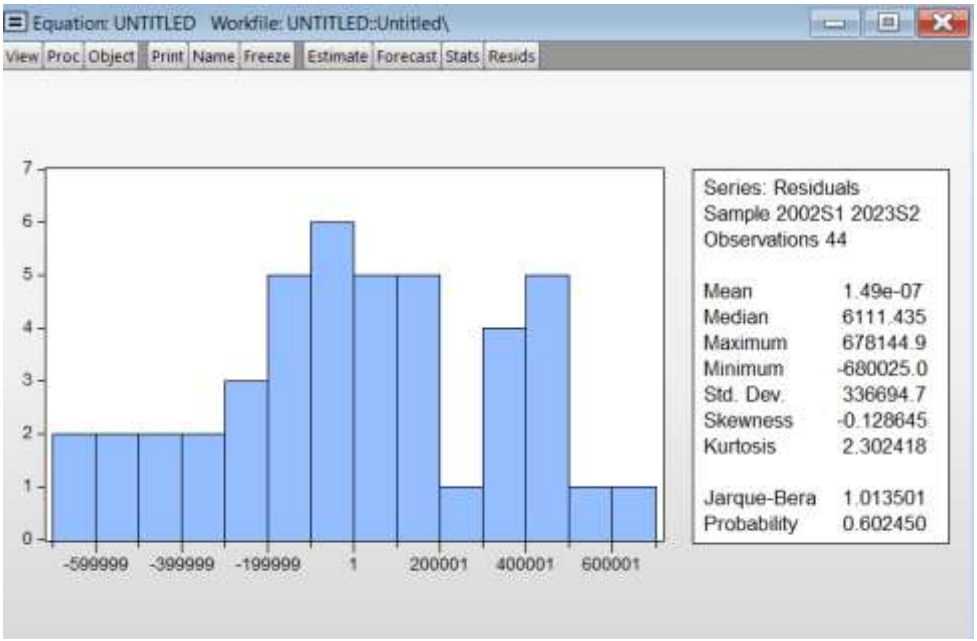

Figure 2: Jarque-Bear test

Source: Prepared by the researcher based on the results of the statistical analysis of the Eviews-10 program.

Conclusions

1. The agricultural sector in Iraq faces a number of crises, which have combined to lead to declining returns, high unemployment rates, economic dependency, and a low level of technical knowledge in the agricultural field. Therefore, it has become necessary to attract foreign direct investment companies to enhance the exploitation of available resources and achieve self-sufficiency in some types of products.
2. Foreign direct investment in Iraqi agriculture is one of the most important factors contributing to economic, agricultural, and social transformation, given its critical role in transferring knowledge and modern technology, developing agricultural production capabilities, and diversifying sources of income and encouraging local investment.
3. Foreign direct investment companies in Iraqi agriculture face several economic constraints, including inflation rates, loans, agricultural exports, and the state's general budget deficit. Other constraints include cultivated areas, the labor force, the size of the monetary mass, the degree of openness to the outside world, and market size.
4. 4- The scarcity of investment and financing allocations and loans available to the agricultural sector and the monitoring of their implementation are among the most important and prominent determinants that hinder the performance of the aforementioned sector and the direction of food security paths within it. This is reflected in its impact on the inability of production capacities to meet the increasing needs in the demand for food.

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Recommendations

1. Work to attract foreign direct investment companies into agriculture, considering this a reality that must be addressed, as they are an important source of supplies for implementing production plans necessary to raise agricultural growth rates.
2. Striving to achieve the greatest possible degree of political, economic, and security stability by eliminating all forms of tension between segments of society. Coordination of fiscal and monetary policies aims to stabilize the exchange rate of the local currency against foreign currencies, as agricultural investors refrain from investing if they cannot guarantee the aforementioned stability.
3. Training and qualifying workers from the agricultural sector, who will be part of the workforce of the aforementioned investment companies, as raising the skill level of the agricultural workforce is one of the most important means of attracting foreign companies.
4. Providing agricultural loans on favorable terms, with interest rate support, and disbursing them at appropriate times, taking into consideration strict monitoring and oversight of the use of the aforementioned funds in areas that contribute to increasing the value of agricultural production.

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Sources

1. Alawi, Atheer Abdullah, 2016, The Impact of Foreign Direct Investment Inflows on Economic Growth in Iraq during the Period (2000-2014), Scientific Journal of Commercial and Environmental Studies, Volume 7, Supplement to Issue 4, pp. 201-224.
2. Al-Bajjari, Walid Ibrahim Sultan, 2011, Estimation and Analysis of Factors Affecting Production and Productivity of Some Cash Grain Crops in Selected Arab Countries with Special Reference to Iraq for the Period (1985-2008), Master's Thesis in Agricultural Economics, College of Agriculture and Forestry, University of Mosul, p. 87.
3. Al-Hayali, Asaad Ibrahim Mustafa, 2013, The Reality of Strategic Grain Trade in Some Developing Countries Under the Influence of Globalization Policies, Master's Thesis, College of Agriculture and Forestry, University of Mosul, p. 107.
4. Colman, D; F. Nixson, 1986, Economics of change in less developed countries, second edition, Philip Allan publishers LTd, P18.
5. Dogan, Berna, 2022, Does FDI in agriculture promote Food Security in developing countries the role of land governance, Transnational corporations, Vol. 29, No2,PP47-57.
6. Ghazal, Qais Nazim and Zuwaid Fathi Abdul, 2008, Determinants of Iraqi Agricultural Growth for the Period (1980-2005), College of Agriculture and Forestry, University of Mosul, Journal of Rafidain Development, Issue 91, Volume 30, pp. 223-238.
7. Hashem, Ahmed and Walid Ibrahim Al-Sultan, 2022, An Economic Study of the Impact of Government Subsidies on the Production of Major Crops (Wheat, Barley, and Rice) in Iraq for the Period 1995-2020, Journal of Regional Studies, Issue 50, p. 215.
8. Hassan, Saadia Hilal, 2024, The Importance of Investment in the Agricultural Sector and Its Contribution to Increasing Production, Diwaniyah Investment Commission, available at: https://www.investdiw.gov.iq
9. Hussein, Fadwa Ali, 2011, The Impact of Technological Changes on Agricultural Product Growth in Iraq for the Period 1985-2005, Tikrit University Journal of Agricultural Sciences, Volume 11, Issue 4, p. 21.
10. Khalaf, Sahar Naji, 2024, Foreign Direct Investment in the Agricultural Sector in Iraq: Problems and Solutions, Iraqi Journal of Administrative Sciences, Volume 16, Issue 64, pp. 190-202.

ISSN 2072-3857

11. Marzouq, Atef Lafi and Akram Nema Ali, 2017, Foreign Direct Investment and Its Impact on Economic Performance in Iraq - Restrictions and Limitations, Journal of the Kufa Studies Center, Issue 44, pp. 231-255.
12. Yahya, Yusra Mahmoud Qasim, 2005, Estimation and Analysis of Some Factors Influencing Agricultural Productivity Growth in Selected Developing Countries for the Period (1970-2000), Master's Thesis, University of Mosul, College of Agriculture and Forestry, Agricultural Economics, p. 98.
13. Youssef, Basem Sajit and Mazen Abdul Hussein Ali, 2017, Measuring the Impact of Growth Factors on Agricultural Production in Iraq for the Period (1981-2014), Iraqi Agricultural Research Journal (Special Issue), Volume 22, Issue 11, p. 30.

ISSN 2072-3857