Economic analysis of the effects or study of the effec of Different Instruments of Fiscal Policy on the Rate of Agricultural Growth in Iraq (2004-2023(

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Abstract

The purpose of this study is to quantify and examine how fiscal policy affects Iraq's agricultural growth rate from 2004 to 2023 using semi-annual time series data. The dependent variable was the pace of agricultural growth, while public revenues, public expenditures, and public debt were used as independent variables. After conducting The Augmented Dickey-Fuller (ADF) stationarity test, Johansen's cointegration test, and the Vector Error Correction Model (VECM) was adopted. The results indicate that public revenues a notable improvement in Iraq's agriculture GDP growth rate.. Meanwhile, public expenditures had a significant negative impact, which can be ascribed to the decreased government expenditure allocated to the agricultural sector compared to other sectors. Additionally, a portion of the budget allocated to agriculture does not reach the sector due to mismanagement and lack of government oversight. Similarly, domestic debt had a substantial adverse effect on the growth of agricultural GDP, indicating that the state does not efficiently utilize loans to finance investments or build a productive and efficient agricultural sector.The research recommends activating tax revenues by improving tax administration efficiency, enhancing tax collection methods, broadening the tax base, and combating tax evasion rather than simply increasing Adding important keywords

Introduction

Economic stability is one of the primary objectives of fiscal policy, as it promotes job creation and increases investment rates, which in turn helps address unemployment. Public projects and private sector incentives, such as tax exemptions and low-interest loans, further contribute to economic stability [6]. The goal of economic stability is to prevent fluctuations in price levels and production while ensuring sustainable growth rates through the proper use of fiscal policy tools. Fiscal policy must balance government revenues and expenditures to maintain economic revision times of inflation, the government reduces public spending and increases tax revenues, leading to a budget surplus and economic stability [4]. During recessions, the government increases public spending, even if it results in a budget deficit, and lowers taxes to stimulate aggregate demand, consumption, and investment, ultimately leading to economic growth [2]. Economic growth can be measured using various indicators, such as per capita GDP. Growth is a key measure of economic progress, reflecting individuals' economic well-being [3]. To achieve economic growth, real income increases must

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be sustained and cumulative while exceeding population growth. Investment plays a crucial role in driving economic growth by enhancing capital accumulation and infrastructure development [4]. On the other hand, during a recession, government authorities resort to increasing public spending, even if it leads to a budget deficit, provided that it is well-organized. Additionally, they reduce taxes to boost aggregate demand, which encourages higher consumption. This, in turn, leads to increased investment, higher employment levels, and ultimately greater production [2]. Furthermore, fiscal policy aims to achieve full employment of available productive resources within the country. It plays a crucial role in addressing unemployment by adopting an expansionary fiscal policy, which involves increasing public spending and reducing both direct and indirect taxes. This raises effective aggregate demand, leading to higher demand for labor and increased real income. As individual income rises, demand for goods also increases, boosting production and further driving labor demand [5]. There are several definitions and perspectives on economic growth, but they all agree on the ultimate goal: finding the best ways to implement various policies that improve living standards across societies worldwide. Economic growth can be defined as a sustained, long-term increase in real per capita income. If per capita income increases as the economy recovers from poor conditions (such as an economic recession), this increase is cyclical rather than continuous, meaning it does not qualify as comprehensive economic growth [1]. According to this concept, economic growth is linked to achieving a real and sustainable increase in the mean income per person rather than a nominal one. In other words, the growth rate must exceed the population growth rate. In many cases, a country's GDP may increase, but if population growth is faster, it prevents a real increase in per capita income. Therefore, economic growth is a reflection of a country's economic performance and level of development, as seen through the government's efforts to increase per capita income, GDP, and national income.

Research Problem

Achieving economic policy objectives, represented by variables such as the role of the agricultural sector, represented by agricultural growth, agricultural inflation rate, agricultural unemployment rate, and agricultural trade balance, is not an easy matter. This requires the use of an effective financial policy to have an effective impact on achieving these objectives.

following important queries:

.1Does fiscal policy have a significant impact on agricultural growth in Iraq?

.2What are the best strategies and recommendations to stabilize and improve the agricultural sector within Iraq?

Goals of the Research

The first goal of this study is to ascertain how fiscal policy affects Iraq's agricultural growth from 2004 to 2023.

The second goal of this study is to Propose key strategies to enhance the agricultural sector's stability and welfare in Iraq.

Research Hypothesis

The study is based on the hypothesis that fiscal policy has a significant impact on the Kaldor square variables of the agricultural sector in Iraq for the period (2004-2023.(

Scope of the Research

Timeframe: 2004-2023, using semi-annual data. This period marks Iraq's economic recovery post-economic sanctions.

Geographical Scope: The Republic of Iraq.

Research Methodology

In order to accomplish the study's goals and evaluate the hypothesis, this research uses:

Inductive methods using historical data from 2004 to 2023 .

Quantitative (econometric) methods to analyze the effect of fiscal policies on Iraq's agricultural expansion.

Model Specification

y=f(x1,x2,x3(

The study examines the relationship between:

This is to use the cointegration test and the unit root test.

X1=Public revenues (million dollars (

X2=Public expenditures (million dollars (

X3=Domestic debt (million (

Results and Discussion

.1Test of Stationarity for (ADF(

The stationarity of the time series for the variables under investigation was confirmed by testing the null hypothesis, which asserts the existence of a unit root (i.e., a general trend in the time series of the studied variable). The purpose of the test was to ascertain whether or not these variables were stationary at their initial level.

If all model variables were found to be stationary at their level (i.e., the original data), the Ordinary Least Squares (OLS) method could be used without concerns about spurious regression, as stationarity is confirmed. However after taking the initial difference, the null hypothesis would be retested if it turned out that the series was non-stationary at the level. Table (1) provides a summary of the test outcomes.

Table (1): Results of the Unit Root Test Using ADF for the Study Variables (2003-2023(

UNIT ROOT TEST RESULTS TABLE (ADF)
Null Hypothesis: the variable has a unit root

		At Level			
		Y	X1	X2	X3
With Constant	t-Statistic	-3.2758	-1.6769	-0.8865	1.4530
	Prob.	0.0310	0.4243	0.7697	0.9982
		**	n0	n0	n0
With Constant & Trend	t-Statistic	-3.6561	-3.1876	-1.9065	-1.0140
	Prob.	0.0569	0.1178	0.6119	0.9144
		*	n0	n0	n0
Without Constant & Trend	t-Statistic	-3.3076	0.5524	0.7857	2.6211
	Prob.	0.0023	0.8252	0.8744	0.9958
		***	n0	n0	n0
		At First Difference			
		d(Y)	d(X1)	d(X2)	d(X3)
With Constant	t-Statistic	-4.5538	-5.0526	-4.3345	-4.2913
	Prob.	0.0034	0.0010	0.0038	0.0045
		***	***	***	***
With Constant & Trend	t-Statistic	-4.4925	-4.9764	-4.1968	-5.3149
	Prob.	0.0148	0.0053	0.0200	0.0029
		**	***	**	***
Without Constant & Trend	t-Statistic	-4.7648	-4.8726	-4.0308	-3.3113
	Prob.	0.0001	0.0001	0.0004	0.0025
		***	***	***	***

Notes:
a: (*)Significant at the 10%; (**)Significant at the 5%; (***) Significant at the 1% and (no) Not Significant
b: Lag Length based on SIC
c: Probability based on MacKinnon (1996) one-sided p-values.

This Result is The Out-Put of Program Has Developed By:
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Source: The researcher's preparation based on the results of the statistical tool Eviews 10.

The outcomes were calculated under three scenarios: (1) with a constant only, (2) with a constant and a time trend, and (3) without a constant or time trend. The findings the time series of all variables at their initial level showing a unit root, indicating that stationarity was not attained. As a result, the null hypothesis (which asserts that the time series data has a unit root) was approved.

However, after taking the first difference of the variables and reapplying the unit root test,

the results confirmed stationarity for all variables at the first difference level. This led to the rejection of the null hypothesis and acceptance of the alternative hypothesis, confirming that the time series variables became stationary after differencing.

Once stationarity was confirmed for the majority of variables at their first difference, the Cointegration test could be applied to examine the existence of a long-term equilibrium relationship among the model variables.

.2Cointegration (Johansen-Juselius Test(

The cointegration test among the model variables was conducted using the Johansen-Juselius (1990) method, which is considered among the most effective methods for determining the cointegration vector's uniqueness and estimating it. The approach depends on two crucial tests:

.1Trace Test (λtrace(

.2Maximum Eigenvalue Test (λmax(

Both tests help determine the presence of a long-term equilibrium relationship between the study sample's economic variables. Table (2) presents the findings.

After performing the Cointegration test, the results indicated the presence of a Cointegration vector among the variables. Specifically:

The trace statistic (λ trace) was 66.07 ,which is higher than 47.85, the critical value. Furthermore, the presence of a cointegration vector and a valid equation was confirmed by the p-value (0.0004) being less than 5%, which resulted in the rejection of the null hypothesis and the acceptance of the alternative hypothesis (R > 1.(

The maximum eigenvalue statistic (λ max) was 38.28, which exceeded the critical value of 27.58, with a p-value of less than 5%, or 0.0015. Additionally, this resulted in the alternative hypothesis being accepted and the null hypothesis (r = 0) being rejected, demonstrating that the system has a single cointegration vector. These results show that, despite some short-term variations, the research variables have a long-term equilibrium connection, moving in the same direction throughout time.

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Table (2): Johansen-Julius Cointegration Test Results for the Study Variables (2003-2023(

Date: 10/20/24 Time: 13:55
Sample (adjusted): 2006 2023
Included observations: 18 after adjustments
Trend assumption: Linear deterministic trend
Series: Y X1 X2 X3
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.880819	66.07128	47.85613	0.0004
At most 1	0.595022	27.78323	29.79707	0.0839
At most 2	0.425483	11.51264	15.49471	0.1818
At most 3	0.081823	1.536566	3.841466	0.2151

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.880819	38.28805	27.58434	0.0015
At most 1	0.595022	16.27059	21.13162	0.2094
At most 2	0.425483	9.976071	14.26460	0.2135
At most 3	0.081823	1.536566	3.841466	0.2151

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

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

Based on the Cointegration test's findings, We'll use the Vector Error Correction Model(VECM .(

Long-term parameter results for the VECM model Table (3): Long- Model.

Vector Error Correction Estimates
Date: 11/15/24 Time: 12:03

Sample (adjusted): 2005S2 2023S1

Included observations: 36 after adjustments

Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
Y(-1)	1.000000
X1(-1)	835.0352
	(143.837)
	[-5.80544]
X2(-1)	620.2366
	(137.804)
	[4.50088]
X3(-1)	111.4076
	(58.5629)
	[1.90236]
C	25059744

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

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)Note: Within the VECM model, long-term results are interpreted by reversing the signs(.

From the variables are significant and negative. that public revenues had a significant positive effect on the growth rate of agricultural GDP in Iraq, where the t-value was (5.80544). This means that for every unit increase in public revenues, the agricultural GDP growth rate in Iraq increased by 835.0352 units. This result is consistent with economic logic. The results also indicate that public expenditures had a significant Represents the value of the constant (c(negative effect on the agricultural GDP growth rate in Iraq, with a t-value of (-4.50088). This can be interpreted because government spending on the agricultural sector is very weak compared to allocations for other sectors. On the other hand, the agriculture sector does not receive the full amount of the state's general budget allocated to it because mismanagement and theft operations resulting from the absence of state oversight. As for the internal debt variable, it had a significant negative effect on the agricultural GDP growth rate in Iraq. This means that the state does not optimally utilize the loan to finance investments or build an efficient productive system in the agricultural sector.

Table (4) Results of the Error Correction Vector Estimation and Short-Term Parameters for the Period (2003-2023.(

Error Correction:	D(Y)	D(X1)	D(X2)	D(X3)
CointEq1	-0.470995	-0.000460	0.000315	0.000150
	(0.22643)	(0.00020)	(0.00018)	(5.5E-05)
	[-2.08011]	[-2.26290]	[1.72219]	[2.74540]
D(Y(-1))	0.717623	0.001606	0.000657	-0.000368
	(0.22390)	(0.00313)	(0.00281)	(0.00084)
	[3.20504]	[0.51340]	[0.23367]	[-0.43818]
D(Y(-2))	0.018038	0.004702	0.001237	0.000392
	(0.01455)	(0.00316)	(0.00284)	(0.00085)
	[1.23979]	[1.48652]	[0.43518]	[0.46174]
D(X1(-1))	15.70417	0.676032	0.049215	-0.091678
	(17.0704)	(0.23847)	(0.21436)	(0.06404)
	[0.91996]	[2.83491]	[0.22959]	[-1.43150]
D(X1(-2))	-10.22468	0.463031	0.227505	-0.275353
	(22.6793)	(0.31682)	(0.28480)	(0.08509)
	[-0.45084]	[1.46149]	[0.79884]	[-3.23618]
D(X2(-1))	-6.163454	-0.030979	0.399537	0.013208
	(15.2404)	(0.21290)	(0.19138)	(0.05718)
	[-0.40442]	[-0.14551]	[2.08766]	[0.23100]
D(X2(-2))	-1.720411	-0.251684	-0.677722	0.066029
	(17.0735)	(0.23851)	(0.21440)	(0.06405)
	[-0.10076]	[-1.05524]	[-3.16100]	[1.03082]

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D(X3(-1))	39.73931	-0.291721	-0.165612	0.427299
	(50.6610)	(0.70771)	(0.63618)	(0.19007)
	[0.78442]	[-0.41220]	[-0.26033]	[2.24817]
D(X3(-2))	-110.9337	1.673235	0.210817	0.023748
	(49.7425)	(0.69488)	(0.62464)	(0.18662)
	[-2.23016]	[2.40794]	[0.33750]	[0.12725]
C	120939.6	-2531.957	2522.035	1811.813
	(143580.)	(2005.76)	(1803.01)	(538.671)
	[0.84231]	[-1.26234]	[1.39879]	[3.36349]
R-squared	0.754156	0.586188	0.547237	0.569493
Adj. R-squared	0.669056	0.442946	0.390511	0.420472
Sum sq. resids	1.21E+08	1.68E+09	1.36E+09	8.59E+12
S.E. equation	2157.005	8031.671	7219.805	574939.7
F-statistic	8.862000	4.092278	3.491686	3.821549
Log likelihood	-321.5773	-368.9055	-365.0692	-522.6569
Akaike AIC	18.42096	21.05031	20.83718	29.59205
Schwarz SC	18.86083	21.49017	21.27704	30.03192
Mean dependent	1806.495	2233.255	2900.804	-21772.72
S.D. dependent	3749.503	10761.11	9247.889	755240.0

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

As shown in table (4)'s findings, the R^2 coefficient was 75%, and the adjusted R^2 was 66%. This means that the independent variables explain 66% of the variations in the dependent variable. However, more attention and focus The agricultural economy is far from ideal according to the reality of the Kaldor square variables due to its connection to oil prices and the absence of the role of the agricultural sector.

should be placed on the F-value, equilibrium relationship. The error

tests should be conducted, including: Serial Correlation LM Test: This test makes sure there are no autocorrelation issues with the estimated model. When the autocorrelation issue is identified using the Breusch-Godfrey test, the outcomes of the test are shown in Table (5:(

Table (5): Results of the Self-Correlation Test of Errors (LM Test.(

VEC Residual Serial Correlation LM Tests
Date: 11/15/24 Time: 12:21
Sample: 2004S1 2023S2
Included observations: 36

Null hypothesis: No serial correlation at lag h

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	20.47842	16	0.1994	1.341821	(16, 58.7)	0.2039
2	8.611462	16	0.9285	0.513803	(16, 58.7)	0.9297

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

The p-value for the F-statistic (Prob. F = 0.51) is 0.92, which is higher than 5%, according to the results in the above table. This suggests that the model is free from the issue of autocorrelation between the residuals, as the alternative hypothesis is rejected and the null hypothesis—which asserts that there is no autocorrelation between the residuals—is accepted., and the alternative hypothesis is rejected, suggesting that the model is free from the problem of autocorrelation between the residuals.

Heteroscedasticity Problem Test

This test is used to detect the problem of heteroscedasticity, and the results shown in Table (6) are as follows:

Table (6): Results of the Heteroscedasticity Test.

VEC Residual Heteroskedasticity Tests (Levels and Squares)
Date: 11/15/24 Time: 12:22
Sample: 2004S1 2023S2
Included observations: 36

Joint test:

Chi-sq	df	Prob.
182.6597	180	0.4307

The Chi-sq value of 0.4307, which is higher than 5%, suggests that the model is not affected by heteroscedasticity, according to the results above. This means that the null hypothesis (which claims that there is no heteroscedasticity problem) is accepted, while the alternative hypothesis is rejected, suggesting that the non-constant variance issue is not present in the model. This increases the model's results' acceptance.

Unit Root Test (Model Quality Test(

Since the points in Figure (1) fall inside the circle's bounds, it is evident that the model achieves stability.

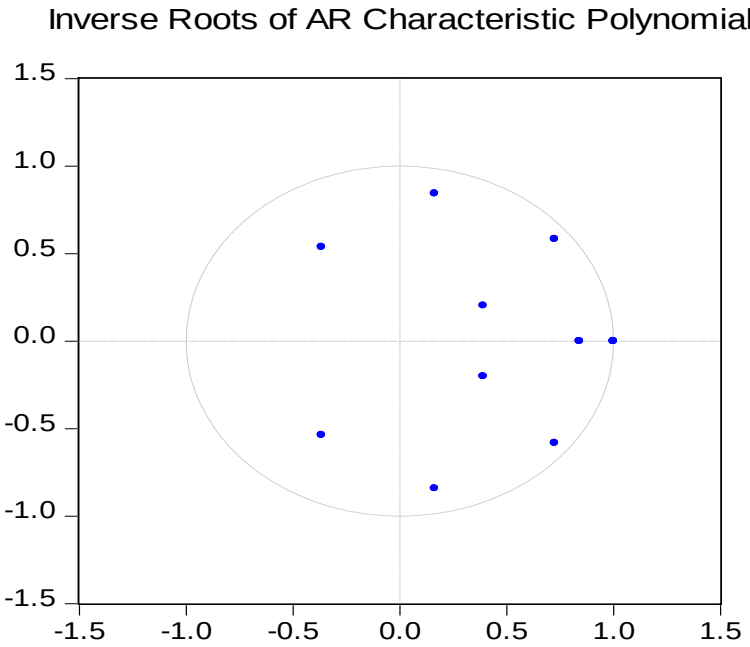

Figure (1): Results of the Model Quality Test (Unit Root Test.(

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Source: Prepared b y the researcher based on the outputs of the statistical program (Eviews10.(

Conclusionsand recommendations

regarding the agricultural sector and fiscal policy in Iraq

from several issues, the most prominent being the lack of stability and difficulty in determining the size of public revenues, as the Iraqi economy relies primarily on the oil sector, and the price of oil is influenced by an external factor, which is global supply and demand. Additionally, the budget in Iraq is often prepared with a planned deficit, leading to both internal and external debts to cover this deficit, but it typically ends with an actual surplus in most years of the studied period. This is due to inaccurate budget estimates on one hand and inefficiency in implementing these estimates on the other hand. As a result, a large portion of the allocations for ministries and public agencies is returned to the state treasury. The inefficiency in utilizing public expenditures, the lack of impact from investment expenditures on achieving productive capacity, in addition to Iraq's weak capital accumulation and infrastructure, have made public spending a negative factor against financial sustainability. Moreover, the lack of attention to tax and other revenues, poor management, and the absence of necessary statistics for economic activities have made tax and other revenues extremely insignificant as a proportion of total public revenues.

The study recommends the need to activate the role of non-oil sectors in Iraq (agriculture, industry, trade, and services) to provide the state's general budget with sustainable financial resources. Furthermore, financial waste and unjustified spending, particularly in consumer spending, should be reduced, and investment expenditures should be used efficiently to stimulate economic sectors and increase capital accumulation, whether in infrastructure or expanding productive capacities in the economy. It is essential to work hard on diversifying the Iraqi economy, activating real sectors, and moving away from reliance solely on the oil sector. This can be achieved by encouraging and diversifying the productive base of the economy through attracting both local and foreign investments. The study also recommends enhancing tax revenues, which requires improving the efficiency of tax administration and its performance, improving tax collection methods, combatting tax evasion and broadening the tax base instead of raising taxes.

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