

Budget Deficit and Its impact on Iraq's Domestic Public Debt

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Abstract : The general budget deficit is one of the problems that most countries in the world suffer from, especially Iraq, and this is what prompted the Iraqi government to cover this deficit through two types of borrowing, which are internal and external borrowing, which leads to an increase in its public debt. The Iraqi governments after 2003 have tended to follow an expansionary financial policy, which resulted in a planned financial deficit in the Iraqi public budgets, which was negatively reflected in the trend towards internal public debt. Here came the importance of the research to clarify the relationship between the general budget deficit and internal public debt. The aim of the study was to shed light on the causes of the general budget deficit and the methods of financing it and to determine the causes and sources of financing that debt in order to analyze the relationship between the general budget deficit and internal public debt in Iraq for the period (2005-2022). To reach this, the relevant data were analyzed, and standard quantitative analysis was used to clarify this relationship based on the statistical program (12) EVIEWS), and a set of conclusions were reached, the most important of which was the continued existence of a financial deficit in the budget, which was reflected in the increase in the size of the internal public debt in Iraq, during the above search period.

Introduction: The general budget deficit is one of the problems that various countries of the world suffer from, including Iraq, which prompts the Iraqi government to cover this deficit by resorting to internal and external borrowing, which leads to an increase in the general public debt. Successive Iraqi governments after 2003 have tended to follow an expansionary policy. As a result of the Iraqi economy's dependence on oil revenues to a large extent, it was known that oil prices were unstable and exposed to shocks. During the research period, Iraq was exposed to crises and problems, including the instability of the political and security situation, including confronting the threat of terrorism. All of these reasons were reflected in the general budget deficit, and the Iraqi government had to resort to other sources to cover this deficit. One of these sources was the internal public debt. It is known that the increase in debt has a negative impact and very great risks on the national economy and also represents a burden on the process of economic development. However, the internal public debt is known to be less dangerous than external public debt, represented by the exit of funds outside the country, which affects the balance of payments. This matter requires covering the budget deficit by borrowing from the public, commercial banks, or the Central Bank. With the change in events after 2003, Iraq has sought to develop various economic sectors by activating the stock market movement, but these efforts did not achieve financial and monetary stability and alleviate the internal and external debt and maintain deficits in the general budget throughout those years with some exceptions due to excessive government spending with the decline in government revenues as a result of the decline in global oil prices and thus the decline in Iraq's exports of crude oil, which constitute the main source of government revenues with a small contribution from other economic sectors to the formation of the national product and income. From this point, the study shed light on the relationship between the general budget deficit and the internal public debt in Iraq for the period (2005 - 2022).

Research Methodology

Importance of the research: The importance of the research stems from clarifying the role played by the budget deficit in the internal public debt in Iraq and then measuring the impact of the budget deficit on the public debt

Research Problem: The research problem is that Iraq suffers from a deficit in the general budget due to a shortage in public revenues to cover public expenditures, and in order to cover the deficit, the government resorts to internal borrowing, which leads to the emergence of the problem of increasing internal debt in the country

Research Objective: The research aims to clarify the reasons that lead to the general budget deficit and how to finance it, analyze the general budget deficit in Iraq for the period (2005. 2022), and identify the sources of financing

the internal public debt, its causes, as well as analyze the relationship between the general budget deficit and the internal public debt in Iraq for the period 2005-2022

Research Hypothesis: The research is based on the hypothesis that there is a direct relationship between the general budget deficit and the internal public debt in Iraq during the period (2005. 2022)

Research Limits

1. Time limits: 2005-2022
2. Spatial boundaries: The Iraqi economy

Research structure

Part One: Theoretical framework (budget deficit, public debt)

Part Two: Analysis of the reality of the general budget deficit and public debt in Iraq for the period (2005-2022)

Part Three: Measuring and analyzing the role of the budget deficit in the internal public debt in Iraq for the period (2005-2022)

Section One: Budget Deficit and Domestic Public Debt - Theoretical and Conceptual Framework -

First Requirement: Budget Deficit - Theoretical and Conceptual Framework -

First: The Concept of Budget Deficit

The general budget deficit is defined as "an increase in public expenditures over public revenues, and the government must search for sources to finance the deficit, such as government borrowing and deficit financing from the central bank, which together constitute the public debt in the absence of government savings or other financial resources" (Hassan, 2015, p. 11) (Alongside the deficit in the general budget, another term appears, which is the cash deficit, "which is the delay in obtaining public revenues from the date of disbursement of expenditures in the general budget during the implementation period, which leads to a shortage of cash liquidity" (Al-Bakri, 2011, p. 22). The government must achieve a balance between public expenditures and public revenues through financing options available to the government, such as financing by issuing government bonds or financing by issuing new currency. Based on the above, the deficit can be defined as "the inability of public revenues to keep pace with the increase in public spending on goods and services, and it can be settled by managing local resources Such as (cash issuance and issuance of government bonds to the public) or through obtaining foreign resources such as (foreign loans, foreign investments, or aid from abroad) (Al-Wazni, 2007, p. 19).

The second requirement: The concept of domestic public debt This debt arises when the state borrows from individuals within the borders of the state, both natural and legal, regardless of their nationalities. This debt represents the total proceeds of the outstanding debts owed by the government, institutions and public bodies towards the national economy, and the state resorts to it when there is a deficit in the general budget as a result of the inability of revenues to cover expenditures. The main objective of the state's use of the domestic public debt policy is to limit or reduce public spending on goods as well as absorb the surplus in individuals' income, in order to avoid inflation that may occur in society. Domestic public debt refers to the public debt owed to citizens, companies, and institutions in the state, which are the same resident units that issued the debt. The domestic public debt is also defined as an agreement between two parties whereby the creditor party, individuals and institutions, provides an amount of money in the national currency to the government by purchasing treasury bills or government bonds in exchange for a pledge to repay the value of the loan and its interest within a specific period of time (Al-Khafaji, 2020, 21)

Section Two: Analysis of the Reality of the General Budget Deficit and Public Debt in Iraq for the Period (2005-2022)

First: The Path and Analysis of the Net General Budget (General Budget Deficit) in Iraq for the Period (2005-2022)

Table (1) Analysis of the Net Budget in Iraq for the Period (2005-2022)
Billion Dinars

Net general budget	Growth rate	Total expenses	Growth rate	Total revenue	Year
14127	-	26376	-	40503	2005
10249	47.1	38807	21.12	49056	2006
15368	0.6	39031	11.3	54599	2007
20849	52.2	59403	46.98	80252	2008
-381	-6.4	55590	-31.21	55209	2009
-613	26.2	70134	25.92	69521	2010
21241	12.3	78758	43.84	99999	2011
14729	33.5	105140	19.87	119869	2012
-5038	13.3	119128	-4.82	114090	2013
-6805	-5.8	112192	-7.63	105387	2014

-3928	-37.3	70398	-36.93	66470	2015
-12658	-4.7	67067	-18.14	54409	2016
1846	12.6	75490	42.14	77336	2017
25697	7.1	80873	37.8	106570	2018
-4157	38.1	111724	0.94	107567	2019
-12883	-31.9	76083	-41.25	63200	2020
6231	30.5	102850	72.6	109081	2021
44738	13.8	116959	48.2	161697	2022

Central Bank of Iraq "General Directorate of Research Annual Bulletins 2005-2022

The Iraqi general budget was characterized by deficits and surpluses at other times. After achieving a surplus during the years (2005-2008), it achieved a deficit in 2009 and then began to fluctuate between surplus and deficit during the subsequent years of the research period. This can be attributed to the political and economic developments that the country was exposed to. The surplus before 2008 is attributed to the rise in global oil prices, as well as the increase in local production of Iraqi oil and then the increase in growth in oil revenues, the main funder of public revenues, and as a result of the decline in global oil prices due to the global financial crisis at the end of 2008, and as a result of what happened in the wake of the global mortgage crisis in 2008, which contributed to a decrease in oil exports due to the decline in oil prices to approximately \$40 per barrel in 2009 after it was approximately \$149 in 2008, which contributed to the budget deficit, in addition to what happened in the last crisis in 2014 and the loss of 68%. From crude oil prices, i.e. from the nominal value of oil, not to mention the adoption of a policy of expansion in financial policy and then the growth in public expenditures as a result of military spending due to military operations against the terrorist ISIS organizations and its financial and administrative corruption facilities at that time. It is noted from Table (1) that public revenues witnessed a gradual increase during the period (2005-2008) with varying annual growth rates. The last percentage in 2008 was about (46.98%) compared to the growth rate of public revenues in 2007. This is due to the large increase in the volume of revenues resulting from the increase in global crude oil prices, which led to a surplus in the state's general budget during the years (2005-2008), while the general budget in 2009 recorded a deficit of (-381), and this was due to the decrease in the volume of public revenues compared to 2008 with a negative annual growth rate of (-31.21%), in addition to an increase in the volume of public spending amounting to (59403) billion dinars, as a result of the repercussions of the global financial crisis that occurred in 2008. Revenues rose again in the years (2010 and 2011), as their volume reached (69521, 99999) billion dinars respectively due to the improvement in global economic activity after the end of the repercussions of the global financial crisis of 2008, which had a positive and direct impact on the increase in global demand for crude oil, in addition to the increase in its prices in global markets. Public revenues continued to gradually increase until 2012, reaching (119869) billion dinars, with a growth rate of (19.87%), to decline again due to the double crisis that the Iraqi economy was exposed to, represented by a new global financial crisis in 2008 and a security crisis represented by the control of terrorist organizations over a number of Iraqi governorates and the tightening of their control over a number of oil wells and the disruption of most economic activities, which led to a decrease in public revenues for the years (2013) and until (2016) with a growth rate of (4.82-, 7.63-, 36.93-, 18.14-%) respectively. Public revenues in 2018 recorded a significant increase of (106570) billion dinars over the year 2017. The general budget recorded a surplus of (1846) billion dinars, which is attributed to the improvement of the security situation in Iraq, in addition to the increase in global oil prices. In 2019, public revenues recorded a growth rate of (0.94%), while the general budget recorded a deficit of (4157-) billion dinars due to the increase in the size of public spending to reach (111724) billion dinars, with a growth rate of (38.1%) as a result of the increase in the size of employment. In 2020, the general budget recorded a deficit of (12883-) billion dinars as a result of the decrease in public revenues with a negative growth rate of (41. 25-) due to the spread of the Covid-19 epidemic or Corona, which negatively affected the cessation of economic activities and the decrease in global demand for oil, while the general budget achieved a surplus of (44739) billion dinars in 2022, which is attributed to the rise in oil prices, which constitute the largest proportion of public revenues.(Soham·2013·P10)

Second: Analysis of the development of the internal public debt in Iraq (2005-2022) The accumulation of debts in the Iraqi economy may negatively affect the country's economic performance due to wars, in addition to the economic sanctions imposed on it during the nineties of the last century. Accordingly, Iraq bore the burden of debts and compensation resulting from those wars even after the year (2003). In addition to the increase in the internal public debt due to the global crisis in (2009). The double shock that the Iraqi economy was exposed to, represented by the decline in oil prices on the one hand, and the war on terrorism in (2014) and its subsequent consequences that burdened the general budget on the other hand, and foreign reserves have an important and effective role in influencing macroeconomic variables, whether directly or indirectly, in order to ensure economic stability, as the decline in revenues affects the accumulation of foreign reserves, and the increase in the deficit in the general budget will result in the accumulation of internal public debt, so the process of financing the temporary deficit of the state's

general budget lies in resorting to internal borrowing. We will explain this through the data in Table No. (2) and Figure No. (1)

Table (2)The development of public debt in Iraq for the period (2005-2022)

Annual contribution rate%	Annual % growth	domestic public	Annual contribution % rate	Annual %growth	external Public debt	Annual %growth	total Public debt	Year
5.38	-	6594	94.62	-	116026	-	122620	2005
5.89	-14.38	5646	94.11	-22.28	90179	-21.85	95825	2006
7.55	-8.01	5194	92.45	-29.47	63600	-28.21	68794	2007
6.76	-14.21	4456	93.24	-3.35	61471	-4.17	65927	2008
14.89	89.3	8435	85.11	-21.56	48216	-14.07	56651	2009
12.10	8.84	9181	87.90	38.39	66725	33.99	75906	2010
10.84	-18.89	7447	89.16	-8.19	61261	-9.48	68708	2011
8.87	-12.07	6548	91.13	9.84	67290	7.47	73838	2012
5.85	-35	4256	94.15	1.75	68468	-1.51	72724	2013
12.26	123.7	9521	87.74	-0.5	68129	6.77	77650	2014
31.91	237.6	32144	68.09	0.68	68591	29.73	100735	2015
39.88	47.35	47363	60.12	4.1	71405	17.90	118768	2016
37.90	0.67	47679	62.10	9.42	78132	5.93	125811	2017
34.52	-12.28	41823	65.48	1.56	79350	-3.69	121173	2018
32.81	-8.35	38332	67.19	-1.08	78490	-3.59	116822	2019
64.85	67.61	64248	35.15	-55.63	35823	-15.19	99071	2020
69.30	8.82	89913	30.70	-11.06	30972	1.83	100885	2021
75.20	-29.37	69496	24.80	-35.18	22910	-9.17	92406	2022
26.48	72.98		73.51	9.39		14.7		المتوسط

Central Bank of Iraq "Department of Statistics and Research, Annual Bulletin 2005-2022

It is noted from Table (2) that the total public debt has fluctuated between increase and decrease during the research period (2005-2022) with an annual average growth rate of (14.7%), then witnessed a decrease during the period (2005-2009) as it recorded negative growth rates of (21.85-, 28.21-, 4.17-, 14.07-) respectively, which is a natural result of the improvement in revenues from oil as it is the largest percentage of public revenues that finance the general budget of Iraq, but the year 2010 witnessed an increase in the total public debt amounting to (75906) billion dinars with a growth rate of (33.99%), as a result of the increase in the external public debt with a growth rate of (38.39%), which is attributed to the general budget deficit resulting from the increase in government spending, which led to an increase in the size of new loans, and in 2011 the external public debt witnessed a decrease to reach (61261) billion dinars with a negative growth rate of (8.19-%) and with the contribution of The relative contribution reached (89.16%) of the total public debt, as the average relative contribution reached (73.51%) during the study period. During the period (2012-2018), the external public debt began to rise at low growth rates, as it reached (67290) billion dinars in 2012, with an annual growth rate of (9.84%), and with a relative contribution of (91.13%) of the total public debt. The rise continued to reach (79350) billion dinars in 2018, with a growth rate of (1.56%). With the exception of 2014, there was a very slight decrease in the external public debt, with a negative growth rate of (0.5-) and a relative contribution of (87.74%) of the total public debt. This increase is a result of the Iraqi economy being exposed to many shocks, including the control of terrorist organizations over some Iraqi governorates and their control over oil wells, which was reflected in the size of public revenues, in addition to the increase in the size of public spending due to the increase in military expenditures to confront terrorist organizations and the increase in spending to rebuild And the reconstruction of the liberated areas, which forced the government to resort to borrowing again, while the years (2019-2022) recorded a decrease in the total external public debt to reach (78490, 35823, 30972, 22910) billion dinars, respectively, with negative growth rates of (1.08%, 55.63% -11.06, 5.18) respectively, as a result of the improvement in the general budget situation and the increase in public revenues, and Figure (1) shows the development of public debt in Iraq for the period (2005-2022).

Section Three: Measuring and Analyzing the Role of the Budget Deficit in the Internal Public Debt in Iraq for the Period (2005-2022)

This section deals with the standard aspect of knowing the impact of each of the (budget deficit) on the internal public debt in Iraq for the period (2005-2022), as the stability of the time series is tested using one of its tests (the Kapps test or the simple or extended Dickey-Fuller test, Phillips-Perron). These tests are among the important methods that help in making correct decisions and lead to the sound analysis of economic variables and relationships. Thus, the budget deficit data is used as an independent variable, and the internal public debt as a dependent economic variable, with the aim of accurately analyzing this relationship and reaching sound results.

First requirement: The theoretical aspect of stability tests

Before starting to study any economic phenomenon, its stability must first be verified, and we can distinguish between a stable time series and an unstable time series according to the nature of the series' growth.

Stable time series: It can be defined as a series whose levels change over time with the stability of its arithmetic average for a long period of time.

Unstable time series: It is the series in which the arithmetic average changes continuously, whether by increasing or decreasing.

Description of the model

The description stage is one of the most important and difficult stages of building the standard model, as it draws a road map for the relationship under study and clarifies the number and nature of the variables included in the model and expresses this relationship mathematically (Hamid, 2007, p. 39). The description stage includes the following axes:-

First: Model variables

The economic variable is the heart of the standard model, and a model cannot be formulated or an economic relationship studied without these variables. Thus, the model variables are divided into:

1- Independent Variables

These are the variables that affect the model and are not affected by it, and their value is determined by factors outside the model

The general budget deficit, which we will symbolize with the symbol BD

2- Dependent Variables

Internal public debt, symbolized by (ID).

3- Random variable U_i

Second requirement: Building the model

The model consists of a functional economic relationship represented in the form of an equation linking the studied variables.

$$ID = (RE + EX) + U_i$$

Co-integration test using the Autoregressive Distributed Lag (ARDL) model:

The (ARDL) model is one of the dynamic modeling methods for co-integration that has become widely used in the recent period. This model provides a way to introduce time-lagged variables as independent variables in the model. This model was applied by Muhammad Hashemi Pesaran and Shin (1999) to be developed by Pesaran and others in (2001). One of the advantages of this model is that it is not required that the variables included in the model be integrated of the same order, as it can be used if the variables are integrated of degree zero (0)₁ or integrated of degree one (1)₁ or a combination of both, unlike the Johansen co-integration model.

And Applying the joint integration test using the (ARDL) model according to the following procedures and steps:

The first procedure: is to choose the optimal lag period for the first differences of the values of the variables in the unrestricted error correction model using an unrestricted autoregressive vector model, as the appropriate period is chosen that has the lowest value of the statistical criteria.

The second procedure: is to estimate the error correction model using the (OLS) method of least squares

The third procedure: is to test the joint significance of the coefficients of the levels of the lagged variables for one period using (Wald) or the (F) test statistic, which has a non-standard distribution that does not depend on testing a few factors, including the sample size and including the trend variable in the estimation.

The fourth procedure: The calculated (F) value is compared with the (critical) table (F) value, and there are two table values of the (F) statistic because it has a non-standard distribution, the minimum value and it is assumed that the variables are stable in the first differences of their value

The practical aspect of time series stability tests

We will conduct a stability test for the study variables using the Eviews12 program and conduct the expanded Dickey-Fuller test in order to know whether the variables are stable or unstable, i.e. whether they contain a unit root or not, with determining the degree of integration. Table (3) shows the results of the unit root test for the budget data series, the budget deficit, which represents an independent variable, and the internal public debt (ID), which represents the dependent variable

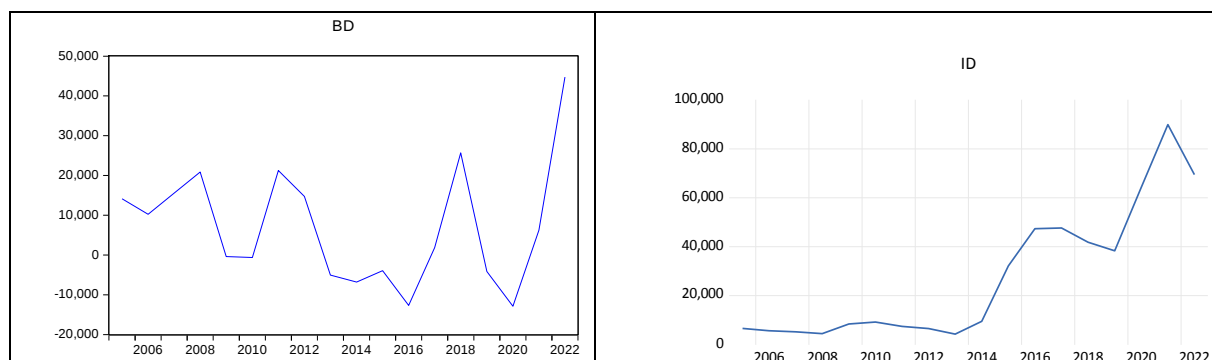
- The following table shows the results of the unit root for the data series (BD). When analyzing it at the level, we noticed that it was unstable in all cases and levels of significance (1%, 5%, 10%), but after taking the first difference, the series stabilized for all levels. This indicates that there is no unit root and means that it is (1)₁

- The (ADF) test was conducted for the internal public debt data series (ID) and it was shown through its analysis at the level that it was in a state without a fixed limit or a general trend. It was unstable at the level of significance (1%, 5%), but it stabilized at the level of significance 10%, which means that it is (0)₁

Table (3)
Unit root test using ADF

Variable	Level			The first difference	
	Fixed limit only	Fixed limit and general direction	without a fixed limit and general direction	Fixed limit only	without a fixed limit and general direction
t-statistic BD					
Augmented Dickey-Fuller test statistic	-1.367597	-3.317146	-1.367597	-4.826321	
Test critical values:					
1% level	-2.728252	-4.667883	-2.728252	-3.959148	
5% level	-1.966270	-3.733200	-1.966270	-3.081002	
10% level	-1.605026	-3.310349	-1.605026	-2.681330	
t-statistic ID					
Augmented Dickey-Fuller test statistic	0.5040	-1.674299	1.688976		
Test critical values:					
1% level	-3.959	-4.728363	-2.728252		
5% level	-3.081	-3.759743	-1.966270		
10% level	-2.681	-3.324976	-1.605026		

Figure (1) Stability of dependent and independent variables in Iraq (2005-2022)



The second requirement: Estimating the standard model of the budget deficit and its role in the domestic public debt using the autoregressive distributed lag model ARDL

1. Estimating the autoregressive distributed lag model ARDL

The standard model related to measuring the deficit and its impact on the domestic public debt was estimated as shown in the following table:

Table (4)

Estimating the autoregressive distributed lag ARDL for the deficit and its impact on the domestic public debt

Dependent Variable: ID

Method: ARDL

Date: 06/24/24 Time: 14:53

Sample (adjusted): 2006Q1 2022Q1

Included observations: 65 after adjustments

Maximum dependent lags: 4 (Automatic selection)

Model selection method: Akaike info criterion (AIC)

Dynamic regressors (4 lags, automatic): BD

Fixed regressors: C

Number of models evaluated: 20

Selected Model: ARDL(4, 3)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
ID(-1)	3.341724	0.091571	36.49331	0.0000
ID(-2)	-4.361230	0.260134	-16.76534	0.0000
ID(-3)	2.614976	0.270006	9.684886	0.0000
ID(-4)	-0.596714	0.101654	-5.870035	0.0000
BD	0.122969	0.061542	1.998133	0.0406
BD(-1)	-0.439714	0.180208	-2.440039	0.0179
BD(-2)	0.507349	0.188775	2.687587	0.0095
BD(-3)	-0.204974	0.072573	-2.824373	0.0066
C	187.5860	66.45694	2.822670	0.0066
R-squared	0.899933	Mean dependent var		27290.66
Adjusted R-squared	0.899924	S.D. dependent var		23855.57
S.E. of regression	208.5845	Akaike info criterion		13.64645
Sum squared resid	2436419.	Schwarz criterion		13.94752
Log likelihood	-434.5097	Hannan-Quinn criter.		13.76524
F-statistic	104634.9	Durbin-Watson stat		1.438375
Prob(F-statistic)	0.000000			

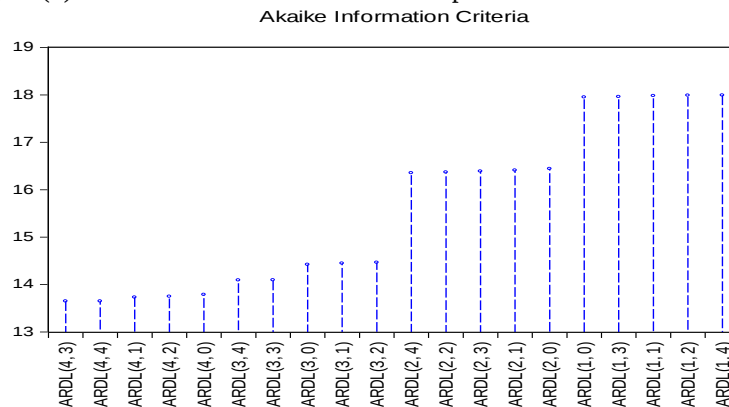
*Note: p-values and any subsequent tests do not account for the model

From the results in the table, we note that the value of the coefficient of determination R² reached 0.89, which indicates that the ARDL model estimate that measures the relationship of the impact of the deficit on the internal public debt ID explained 89%, meaning that this variable in the model explained 89% and the rest is due to other variables not included in this model, and the value of the corrected coefficient of determination reached 0.89. It is also clear that the value of F reached 104634.9, and this value is significant, meaning that the null hypothesis is rejected and the alternative hypothesis is accepted. We conclude that there is a direct relationship between the deficit and the internal public debt ID for the estimated model.

2. Akaike Criterion (AIC, Akaike)

The values of the AIC criterion were drawn for a group of models that were selected by the program, which showed that the best slowdown period is (4,3), which had the lowest AIC value based on the EvIEWS program

Figure (2) AIC values for different slowdown periods for the estimated model



3. Boundary Test

To achieve the economic meaning based on testing the existence of a long-term equilibrium relationship and a joint integration relationship between the independent variable and the dependent variable of the autoregressive distributed lag model, we relied on the boundary test and the results were placed in the following table:

Table (5) Boundary Test for the Impact of the Deficit on the Domestic Public Debt

ARDL Bounds Test

Date: 06/24/24 Time: 14:55

Sample: 2006Q1 2022Q1

Included observations: 65

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K		
F-statistic	6.529018	1		
Critical Value Bounds				
Significance	I0 Bound	I1 Bound		
10%	4.04	4.78		
5%	4.94	5.73		
2.5%	5.77	6.68		
1%	6.84	7.84		
Test Equation:				
Dependent Variable: D(ID)				
Method: Least Squares				
Date: 06/24/24 Time: 14:55				
Sample: 2006Q1 2022Q1				
Included observations: 65				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ID(-1))	2.342968	0.091719	25.54516	0.0000
D(ID(-2))	-2.018261	0.169811	-11.88534	0.0000
D(ID(-3))	0.596714	0.101654	5.870035	0.0000
D(BD)	0.122969	0.061542	1.998133	0.0406
D(BD(-1))	-0.302375	0.117253	-2.578838	0.0126
D(BD(-2))	0.204974	0.072573	2.824373	0.0066
C	187.5860	66.45694	2.822670	0.0066
BD(-1)	-0.014369	0.005515	-2.605698	0.0117
ID(-1)	-0.001244	0.001546	-0.804526	0.4245
R-squared	0.853337	Mean dependent var		979.9584
Adjusted R-squared	0.842385	S.D. dependent var		2390.297
S.E. of regression	208.5845	Akaike info criterion		13.64645
Sum squared resid	2436419.	Schwarz criterion		13.94752
Log likelihood	-434.5097	Hannan-Quinn criter.		13.76524
F-statistic	1043.582	Durbin-Watson stat		1.438375
Prob(F-statistic)	0.000000			

Through the results, we notice the existence of a joint integration relationship between the deficit and the internal public debt during the time period for conducting this research. The value of F calculated in the boundary test according to the ARDL model reached 6.529018, and this value is higher than the critical value at the upper limit of 5.73 and the lower limit of 4.94 at a significance level of 5%. From this, we conclude the rejection of the null hypothesis and the acceptance of the alternative hypothesis, which states the existence of a long-term equilibrium relationship between the independent variable and the dependent variable.

4. Diagnostic tests for the estimated model

A- Testing the problem of autocorrelation

The test of the problem of autocorrelation in the model can be tested using the Breusch-Godfrey test or the LM test, and the table below includes the results of this test:

Table (6)Breusch-Godfrey test or the LM test for the effect of the independent variable on the dependent variable

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.298114	Prob. F(2,54)	0.0709
Obs*R-squared	5.66246	Prob. Chi-Square(2)	0.0600

Test Equation:

Dependent Variable: RESID

Method: ARDL

Date: 06/24/24 Time: 14:58

Sample: 2006Q1 2022Q1

Included observations: 65

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ID(-1)	-0.332358	0.139807	-2.377267	0.0210
ID(-2)	0.933320	0.391603	2.383332	0.0207
ID(-3)	-0.935986	0.395463	-2.366809	0.0216
ID(-4)	0.335621	0.144024	2.330321	0.0236
BD	0.082869	0.062801	2.319551	0.0226
BD(-1)	-0.247058	0.184406	-1.339747	0.1859
BD(-2)	0.250778	0.192066	1.305687	0.1972
BD(-3)	-0.092440	0.073325	-1.260687	0.2128
C	79.02750	66.83903	1.182356	0.2422
RESID(-1)	0.578676	0.179635	3.221407	0.0022
RESID(-2)	0.168969	0.160487	1.052853	0.2971
R-squared	0.604038	Mean dependent var		-7.14E-12
Adjusted R-squared	0.599230	S.D. dependent var		195.1129
S.E. of regression	194.2104	Akaike info criterion		13.52882
Sum squared resid	2036754.	Schwarz criterion		13.89679
Log likelihood	-428.6866			
F-statistic	1.059623			
Prob(F-statistic)	0.408746			

The above results indicate that the Chi-Square value was equal to 0.0600 and this value is greater than the 5% significance level. This means accepting the null hypothesis that states that the problem does not exist. Thus, we conclude that the estimated model does not suffer from the problem of autocorrelation.

B - Test of heterogeneity of variance

Table (7) Heteroskedasticity Test

Heteroskedasticity Test: ARCH

F-statistic	0.505416	Prob. F(1,62)	0.0698
Obs*R-squared	0.517501	Prob. Chi-Square(1)	0.0619

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 06/24/24 Time: 14:58

Sample (adjusted): 2006Q2 2022Q1

Included observations: 64 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	34723.92	11433.88	3.036932	0.0035
RESID^2(-1)	0.089798	0.126311	0.710926	0.4698
R-squared	0.408086	Mean dependent var		38068.98

Adjusted R-squared	-0.407913	S.D. dependent var	83039.09
S.E. of regression	83366.97	Akaike info criterion	25.53064
Sum squared resid	4.31E+11	Schwarz criterion	25.59811
Log likelihood	-814.9806		
F-statistic	0.505416		
Prob(F-statistic)	0.479796		

From the results in the table above, it is clear that the Chi-Square value reached 0.0619, and this value is greater than the 5% significance and therefore the null hypothesis is accepted, which states that the problem does not exist. Thus, we conclude that the estimated model does not suffer from the problem of heterogeneity of variance.

5. Estimating the long-term relationship according to the ARDL model

The results of estimating the ARDL model for the long-term relationship appeared according to the EvIEWS program, as in the following table:

Table (8) Results of the long-term relationship according to the ARDL model

ARDL Cointegrating And Long Run Form

Dependent Variable: ID

Selected Model: ARDL(4, 3)

Date: 06/24/24 Time: 14:59

Sample: 2005Q1 2022Q1

Included observations: 65

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ID(-1))	2.342968	0.091719	25.545157	0.0000
D(ID(-2))	-2.018261	0.169811	-11.885338	0.0000
D(ID(-3))	0.596714	0.101654	5.870035	0.0000
D(BD)	0.122969	0.061542	1.998133	0.0506
D(BD(-1))	-0.507349	0.188775	-2.687587	0.0095
D(BD(-2))	0.204974	0.072573	2.824373	0.0066
CointEq(-1)	-0.001244	0.001546	-0.804526	0.4245

$$\text{Cointeq} = \text{ID} - (-11.5514 \cdot \text{BD} + 150798.7046)$$

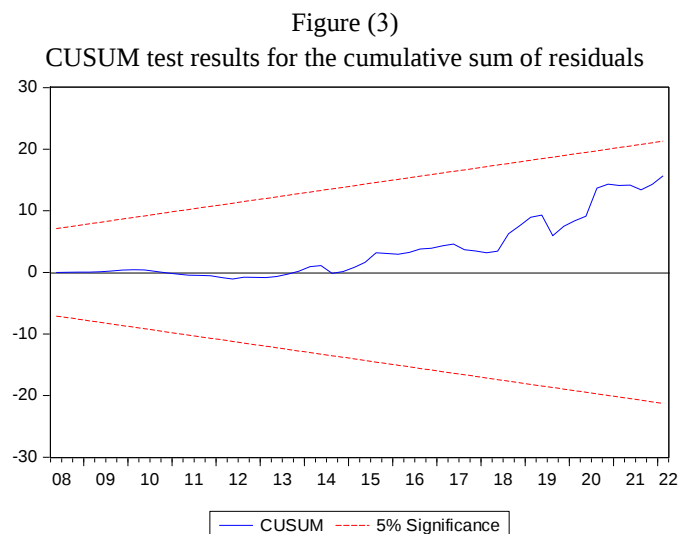
Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BD	11.551366	3.044636	3.794005	0.0430
C	150798.704	165256.818	0.912511	0.3654

The above results, which represent the estimation of the long-term relationship model between the deficit and the domestic public debt, showed the existence of an impact relationship for the deficit on the domestic public debt because the value of Prob. was less than the 5% significance level, which means that the relationship between the deficit and the domestic public debt was a significant direct relationship.

6. Stability test for model parameters

To know the stability of the estimated model for the long- and short-term parameters, the CUSUM test can be used for the cumulative sum of residuals, which is a test used to determine the stability and consistency of the long-term parameters with the short-term parameters of the estimated model. The test contains two critical limits, the upper and lower level of significance of 5%. If the CUSUM test graph is within the limits, this means that the structural stability of the estimated parameters of the model is achieved. However, if it is outside the limits, this means that the structural stability of the estimated parameters of the model is not achieved. The following figure shows that the CUSUM test graph is within the limits, which means that the structural stability of the estimated parameters of the model is achieved.



Conclusions and Recommendations

Conclusions

1. The research reached results indicating the proof of the research hypothesis, which indicates the existence of a direct relationship between the general budget deficit and the internal public debt in Iraq during the period (2005-2022)
2. The existence of a financial deficit in the budget leads to an increase in demand for borrowing from the Central Bank, which is reflected in an increase in the size of the internal public debt, because it is a quick solution to cover the deficit resulting from a significant increase in public spending.
3. The time series stability test was conducted using the Eviews12 program for both the budget deficit and the domestic public debt, where it was found that the budget deficit stabilized at the first difference, while the public debt stabilized at the level.
4. The existence of a long-term equilibrium direct relationship between the financial deficit and the internal public debt
5. From the practical side, the model of the long-term relationship between the deficit and the internal public debt was estimated, which showed the existence of a relationship of the impact of the deficit on the internal public debt because the value of Prob. was less than the 5% significance level, which means that the relationship between the deficit and the internal public debt was a direct moral relationship

Recommendations

1. The need to emphasize the achievement of financial discipline in public spending as a first step to reduce the state's general budget deficit by determining the size of support and proper guidance to combat financial and administrative corruption in state institutions and waste of public money.
2. The necessity of benefiting from cases of financial abundance and achieving a surplus in the general budget balance by establishing sovereign funds or emergency funds that can be used in cases of financial deficit. This is a system in place in most rentier economies, as they are vulnerable to external shocks.
3. It is important to work seriously to develop various productive sectors such as the agricultural sector, the industrial sector and other productive sectors, with the aim of diversifying and increasing revenues and avoiding any economic crises that affect oil revenues as a result of any change in global oil prices.
4. The need to work on exploiting government debts by issuing securities (long-term bonds and short-term treasury transfers) because they represent non-inflationary tools that contribute to financing the government, in addition to encouraging it to invest in financial markets(.Ameer2023).

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