Analysis of the Relationship Between External Debt and Economic Growth in Iraq : An Empirical Study

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Abstract:
Purpose: Measuring and analyzing the relationship between external debt and economic growth in Iraq. **Theoretical framework:** The research dealt with the external debt and its impact on economic growth in Iraq. Iraq is one of the countries that suffers from the problem of external debt and its use to finance consumer spending. The research problem can be formulated as the absence of specific standards to guide financial policy in Iraq, especially the optimal size of debt and how to spend the debt in a way that achieves economic growth.
Design/methodology/approach: The research relied on the deductive inference method based on theoretical foundations, descriptive and quantitative analysis, and standard methods based on theoretical foundations to measure the relationship between external debt and oil revenues as an independent variable in enhancing economic growth as a dependent variable. Indicators, statistical methods, hypothesis testing, and measurement will be used.
Findings: The analysis results confirmed the validity of the hypothesis, and there is a statistically significant relationship between the independent variables of external debt and oil revenues and the dependent variable of economic growth.
Research, Practical & Social implications: We propose a future research agenda and highlight the management of external debt in a way that contributes to enhancing economic growth.
Originality/value: The relationship between external debt and GDP loads for Iraq (2003-2023) still needs to be addressed by analyzing the causal relationship between external debt and GDP according to the modern methodology.
Keywords: External Debt, Oil Revenues, Economic Growth.
JEL Classification: F34,Q30,O40
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1. Introduction:

External debt is particularly important in developing countries, as it represents the external reflection of the domestic resource gap.(Rashid & Amin, 2022(. Like other countries, Iraq suffers from the problem of external debt and its annual increase. Although external debt helps the state to cover the deficit in its budget and support development, external debt without a tangible improvement in the economy increases the state's burdens.(Marzouq & Hamza, 2021). The accumulation of external debt affects the government's financial performance and the efficiency of the state's financial policy, especially if rules of financial discipline do not accompany it. (Hosni et al., 2020). These are the amounts borrowed by an economy for more than one year and are due to be paid to the lender by payment in foreign currencies or by exporting goods and services. (Abul-Nasr & Mahmoud, 2024). The importance of external debt is highlighted by its negative effects on the economic growth rate. (Younes et al.,2024). The development of the size of the external debt has had negative effects on economic growth. These issues may pose challenges to the rate of economic growth. (Khemis & Boucheneb, 2021). For the external debt to be sustainable, the economic growth rate must be greater than the interest growth rate on the external debt. (Al-Ghaish & Muhammad, 2023) *External debt* is the government's debts to foreign parties, whether governments, international organizations, or foreign institutions.) Samuelson, William, 2001). The phenomenon of external debt is of great importance in various advanced and developing economies due to its direct impact on the political and economic stability of the country on the one hand and the standard of living of individuals in society and the future of current and future generations on the other hand. (Asfour & Mohsen, 2022). The World Bank defines *external debt* as debts paid to official lenders abroad in foreign currency or goods and services, with an original or extended repayment period of more than one year. These are a direct obligation of or guaranteed by a public legal entity in the debtor country.(Essa & Zahran, 2021). There are multiple economic theories and positions on the impact of external debt on economic growth between the three trends. The first trend is the belief that external debt hurts economic growth, which the classical theory confirms. (Spilioti & Vamvoukas,2015). The second trend believes in the positive effect of external debt on economic growth, which was confirmed by the Keynesian theory led by John Maynard Keynes. (Ntshakala,2015). The third trend sees that external debt has a neutral effect on economic growth, as in the Ricardian equivalence approach led by (David Ricardo).(Vosyliute,2014). Debt is unsustainable in the short term if the ratio of short-term debt to total debt exceeds 60% of GDP. (Calderon & Fuentes,2013). There are several types of external debt, the most important of which are debts according to the repayment period, debts according to the party providing the loan, debts according to the terms of their provision, and debts according to the nature of use. (Jaber Morsi Mohammed, 2020). External debt can have a positive impact on economic growth if it is spent in a planned and rational manner. (Kaur,2015). Growth is a continuous increase in a country's production volume or an increase in the gross domestic product as a key quantitative indicator of production. Economic growth includes changes in the production of goods and services over a relatively short period, usually one year.(Mladen & Ivic,2015). Economic growth is also defined as an increase in the value of goods and services produced in each country. Economic growth is traditionally measured as the percentage increase in gross domestic product. (Al-Qurashi, 2010) The importance of economic growth is highlighted by the increase in economic productivity in a particular country through the increase in the production of goods and services in a specific period. (Max & Roser,2021). The most important requirements for economic growth are human resources, natural resources, capital accumulation, and technological progress. (Andrea Bassanini,2001). There are several types of economic growth, including spontaneous, temporary, and planned growth. (Ajamiya, 2008). Given the importance of economic growth and the positives it provides to society, the production of goods and services available to individuals is increasing, and the welfare of society is increasing by contributing to supporting production and increasing income rates for individuals. (Aimen Kamran, 2019).

The accumulation of debt is one of the main reasons for the slowdown in economic growth in creditor countries, as it prevents countries from investing in their productive capacity, which is necessary to stimulate their economic growth rates. (Lakhdhraoui, & Fathy, 2016). Using external debt in productive areas will increase the size of capital, which forms the basis of economic growth in the country because it provides additional resources. (Al-Najjar & Al-Mahdi, 2024). Some economic literature evaluates the impact of external debt on economic growth from the perspective of intergenerational interaction because external debt will increase the disposable income of the current generation at the expense of the disposable income of future generations. On this basis, supporters of external debt believe that it will have a positive effect only if used to finance productive spending. (Teles & Mussolini,2014). If foreign debt is used to finance current (non-productive) expenditures, it has some short-term and temporary positive effects. However, these debts do not enhance economic growth in the long term. (Gomez & Sosvilla,2015). Some believe that the negative effects of external debt do not appear at low levels but rather at high levels. (Fuentes & Calderon,2013) External debt can positively impact economic growth if external debt is spent in a planned and rational manner and according to productive investment channels, as the positive relationship between external debt and economic growth is evident. (Kaur,2015). The research studied and analyzed the relationship between external debt and economic growth in Iraq, especially considering the fluctuation of global oil prices and their impact on the Iraqi economy. The problem can be formulated as follows: The problem of the research is represented by the lack of specific criteria to guide financial policy in Iraq, especially regarding the optimal size of external debt, determining the scope of use of external debt, and how to spend it in a way that achieves financial sustainability. Therefore, the increase in external debt will lead to the accumulation of these debts and thus increase the amount of funds allocated to pay the debt service burden, negatively affecting the economic growth rate. The increase in the size of external debt in a rentier economy depends on one source of income, and this source is often a natural source such as oil, as the Iraqi economy, which depends primarily on oil, puts the economy at the mercy of external variables.

2. Literature Review and Hypothesis Development:

The study (Jassim & Salman, 2017) shows that the external debts in the Iraqi economy are affected in one way or another by trade exchange. The study (Alwan & Taleb, 2019) aims to analyze the general budget deficit and external debt indicators and the economic analysis of the relationship between the general budget deficit. Result (Asfour & Mohsen, 2022)The external debt in Iraq was very high in its early years, specifically in 2004, and then decreased relatively during the last years of the research period. Study of (Januhat & Fadhila, 2006) The growth of the volume of external debt at high rates has increased the burden of servicing these debts very significantly, exceeding the growth rates of those countries' exports. The study (Ibrahim, 2015) examined the impact of the general budget deficit in Egypt on external debt using cointegration and causality. Study (Thabet & Issani, 2019) External debt is one of the most prominent problems suffered by many developing countries, such as Algeria. The study's results (Huseyin Uslu, 2021) show that Turkey's external debt slightly impacts economic growth. Human capital must be improved rather than increasing consumption expenditures to increase this impact. Since improving human capital positively affects economic growth, focusing on investments in health and education will increase the productivity of the country's workforce and thus increase economic growth. (Alieu Kassama, 2016) The relationship between external debt and economic growth in The Gambia is negative in the short and long run, and external borrowing has yet to achieve sustainable economic growth and optimal external position. The study (William, 2022) aims to analyze the dynamic relationship between external debt and economic growth rate.

(Hosni et al., 2020) shows that external debts positively finance local investment and bridge the financing gap in these countries. Result of (Helmy & Khalifa, 2023) The results of the relationship between external debt and per capita GDP showed an inverse relationship. Studies (Al-Zay, 2022) show that Iraq is still within the thresholds of external and internal loans while it has reached the risk level of public debt. The study (Ajab & Muhammad, 2023) The problem of the study was represented in the question: What is the impact of external debt on economic growth in Sudan? The study (Sharaf et al., 2021) shows that the external debt in Egypt, Sudan, Morocco, Tunisia, Lebanon, and Jordan is unsustainable, while it was sustainable in Algeria and Mauritania. A study (Dereje Abera, 2013) shows that African countries must consider that achieving true economic development must consider future generations' rights. They should not be burdened with exaggerated external debts, which require continuing the development plans included in the continent's plan to achieve sustainable development. From this, we propose the following hypothesis:

H.1 External debt negatively affects Iraq's GDP.

H.2 Oil revenues have a positive impact on Iraq's GDP.

3. Methodology:

1.**The Sample:** The time dimension of the research is determined for the period (2003 - 2023), the Iraqi economy. Data were collected from the Ministry of Finance, External Debt Department, Ministry of Planning, Central Statistical Organization, Directorate of National Accounts, and the Central Bank of Iraq.

B. Measurement of variables: To achieve the research objectives and prove the validity of its hypothesis, the research relied on deductive reasoning based on theoretical foundations and using all data and variables to measure the impact of (external debt and oil revenues as an independent variable) in enhancing (gross domestic product growth as a dependent variable) in Iraq. Financial indicators and statistical methods will be used to analyze the data and test the hypotheses. External debt and GDP in Iraq were chosen for 2003-2023 due to the importance of the impact of external debt on GDP in Iraq.

Figure (1) shows the nature of the relationship between the two research variables:
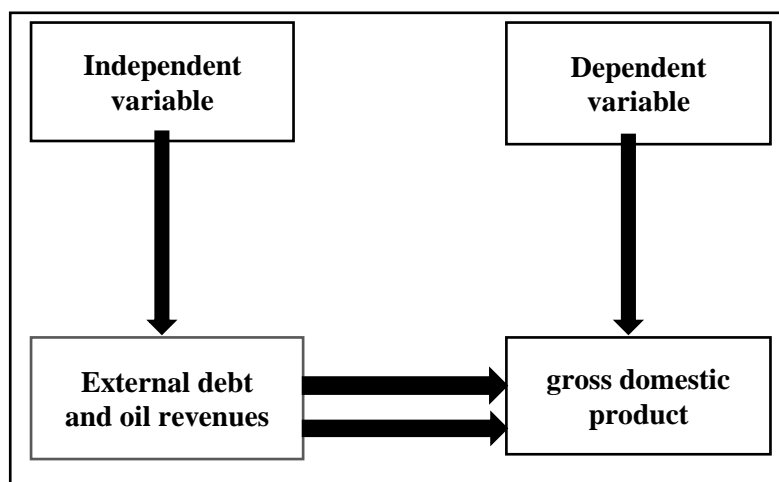

Figure 1: Hypothetical diagram of research.

Source : researcher.

The stage of describing the econometric model is one of the important stages that can support the results of the analytical aspect. This is achieved by using the most accurate econometric methods and a set of tests that support the scientific research results. Additionally, econometric results can determine the nature of the economic relationships between the studied variables in a measured and mathematical manner according to the economic theory.

This helps to either prove or disprove the hypothesis. The statistical program (Eviews12) The autoregressive distributed lag (ARDL) model was used, and after conducting stability tests, we found that all data were stationary at the first difference, except for the external debt, which was stationary at the level. The autoregressive distributed lag (ARDL) model was used, and the annual data for the period (2003-2023) were adopted. The data were divided into two independent variables (external debt and oil revenues) and a dependent variable (gross domestic product), as shown in the following equations:

GDB = f (EXT, RO)

GDB = $B_0 + B_1 x_1 y_1 - B_2 x_2 y_2 + u_t$

Table 1: Variations of the classical model

Variable type	Variable name	Variable symbol
Independent	External debt	EXT
Independent	Oil revenues	OR
Dependent	Gross domestic product	GDB

Source: Prepared by the researcher based on the model description

4. Results:

Testing the stationarity of time series for the variables of the standard model used

To determine the degree of stationarity of time series data in the estimated standard model, the modified Dickey-Fuller (ADF) and Phillips-Perron (P.P) tests were conducted, and the results were as follows:

- Expanded Dickey-Fuller test (ADF)

From Table (2) it is clear that all variables were not stationary at their original level (Level), but when taking the first difference we find that all data became stationary as the value of (Prob) was less than (0.05%), which means that there is no unit root between the variables. Accordingly, we reject the null hypothesis (H0) and accept the alternative hypothesis, which states that the time series is stationary between the variables, which indicates that the series are integrated of the first degree I(1).

Table 2 : Results of the Augmented Dickey-Fuller test statistic

Variables		At Level			At First Difference		
		With Constant	With Constant & Trend	Without Constant & Trend	With Constant	With Constant & Trend	Without Constant & Trend
Prob 5%	GDP	0.6344	0.1229	0.9567	0.0005	0.0031	0.0002
	EXT	0.2582	0.0000	0.7032	0.0000	0.0000	0.0001
	RO	0.2003	0.0918	0.8728	0.0004	0.0026	0.0000

Source : Prepared by the researcher based on the outputs of the statistical program (Eviews12).

Phillips-Perron (P.P) test: From Table (3) it is clear that the results of the two tests are similar except for external debt, which was stationary at the level, and thus there is no need to take the first difference. However, when taking the first difference, we find that the time series became stable in the Phillips-Perron test for all variables. Therefore, we reject the null hypothesis (H0), which indicates the instability of the time series, and we accept the alternative hypothesis, which indicates the stability of the time series between the variables, which indicates that the series are integrated to the first degree (I(1), as confirmed by the value of (Prob), which was less than (0.05%).

Table 3: Results of the Phillips-Perron test statistic

Variables		At Level			At First Difference		
		With Constant	With Constant & Trend	Without Constant & Trend	With Constant	With Constant & Trend	Without Constant & Trend
Prob 5%	GDP	0.5777	0.2538	0.9241	0.0002	0.0014	0.0007
	EXT	0.0000	0.0000	0.0000	-	-	-
	RO	0.3669	0.3116	0.8396	0.0000	0.0006	0.0002

Source : Prepared by the researcher based on the outputs of the statistical program (Eviews12).

Estimating the relationship between the independent variables (external debt and oil revenues) and the dependent variable (gross domestic product) in Iraq
- Testing the autoregressive distributed lag (ARDL) model
After conducting the stability test for the time series of economic variables, including external debt, oil revenues (independent variable), and gross domestic product in Iraq (dependent variable), it was found that all variables became stable at the first difference I(1). When this condition is met, the ARDL model test can be applied. The following table shows the test results for this model as follows:

Table 4: Results of testing the ARDL model for the external debt model and its relationship to economic growth in Iraq

Variable	Coefficient	Std. Error	t-Statistic	Prob	
RO	2.169577	0.181943	11.92451	0.0019	
EXT	-1.107654	0.700899	-0.651216	0.0417	
EXT (-1)	-1.826179	0.211015	-1.507974	0.0306	
EXT (-2)	-0.180143	0.360988	-0.132362	0.0068	
EXT (-3)	-1.998057	0.188946	-1.680528	0.0349	
EXT (-4)	-0.549214	0.581506	-0.944468	0.0446	
C	-56689126	55988690	-1.012510	0.0179	
Adjusted R-squared	0.997295	Durbin-Watson stat	2.313207	Prob (F-statistic)	0.018781

Source : Prepared by the researcher based on the outputs of the statistical program (Eviews12).

Table (4) shows that the ARDL model automatically determines the lag order of the variables, and the results of the modified R-squared test showed that the independent variables explained (99%) of the changes in the dependent variable, while the remaining (1%) was due to other factors not included in the model. In addition, its value was less than the Durbin-Watson statistic, which was (2.313207), indicating that the model is free from the problem of autocorrelation and has explanatory power. As for the value of the F statistic, it was (52.67367) at a level less than (0.05%), indicating that the model is statistically significant.
- Results of the Bounds Test for Cointegration
The bounds test is used to determine the existence of a long-term equilibrium relationship between (external debt and oil revenues) as an independent variable and GDP as a dependent variable. This is done by comparing the F statistic with the lower and upper critical values, as follows:

Table 5 : Results of the bounds test between the independent variables and GDP as a dependent variable in Iraq

Test Statistic	Value	K
F-statistic	4.871707	2
(Critical Value Bounds)		
Significance	I0 Bound	I1 Bound
%10	2.63	3.35
%5	3.1	3.87
%2.5	3.55	4.38
%1	4.13	5

Source : Prepared by the researcher based on the outputs of the statistical program (Eviews12).

It is clear from Table (5) that the statistical F value was (4.871707) which is greater than the upper critical value (3.87) at a significance level of (0.05%). Accordingly, we reject the null hypothesis (H0) and accept the alternative hypothesis (H1). This indicates the existence of an integrative relationship between the independent variables (external debt and oil revenues) and the dependent variable (GDP), i.e. there is a long-term equilibrium relationship between them.

- Test estimated (short-run) parameters and unconstrained error correction factor
This test estimates short-term parameters to reveal the degree of impact of the independent variable on the dependent variable, as well as to determine the nature of the short-term relationship. Additionally, the error correction term indicates the speed at which the model returns to equilibrium in the long term, as shown in the following table :

Table 6 : Results of estimating the error correction model and the short-term relationship of the external debt model and its relationship with economic growth in Iraq

Variable	Coefficient	Std. Error	t-Statistic	Prob
D(EXT)	-1.107654	0.538130	-2.058340	0.0258
D (EXT (-1))	-1.268700	0.532732	-2.381497	0.0402
D (EXT (-2))	-1.448843	0.509781	-2.842090	0.0047
D (EXT (-3))	-0.549214	0.193094	-2.844286	0.0046
CointEq (-1) *	-0.455342	0.065237	-6.979762	0.0199

Source : Prepared by the researcher based on the outputs of the statistical program (Eviews12).

From the above table, it is clear that there is a short-term negative relationship between external debt as an independent variable and GDP as a dependent variable, as increasing external debt by one unit leads to a decrease in GDP by (-1.107654) at a significance level (Prob= 0.0258) with other factors constant. The results also showed that the unconstrained error correction coefficient (UECM) reached a value of (-0.455342), which is a negative and significant value with a probability of (Prob= 0.0199). This reflects the existence of a short-term equilibrium relationship between the independent variable and the dependent variable in the direction of a long-term equilibrium relationship. The value of the error correction limit means that (45%) of the imbalance (short-term imbalance) in the previous period (t-1) can be corrected in the current period (t) towards the long-term equilibrium relationship due to any shock or change in the independent variable.

- Testing of long-term estimated parameters
This test shows the estimation of long-term parameters with the aim of revealing the degree of influence of the independent variable on the dependent variable, as well as determining the type of long-term relationship between the two variables, as follows :

Table 7 : Results of estimating the error correction model and the long-run relationship of the external debt model and its relationship to economic growth in Iraq

Variable	Coefficient	Std. Error	t-Statistic	Prob
EXT	-1.208266	0.365849	-0.358978	0.0440
RO	4.956654	0.942946	2.551102	0.0254

Source : Prepared by the researcher based on the outputs of the statistical program (Eviews12).

From the above table, it is clear that there is a long-term inverse relationship between external debt as an independent variable and the GDP of stocks as a dependent variable, where increasing the external debt by one unit leads to a decrease in the GDP by (-1.208266) at a significance level (Prob=0.0440) with other factors constant. The results also showed a positive relationship between oil revenues as an independent variable and GDP as a dependent variable. Increasing oil revenues by one unit leads to an increase in GDP by (4.956654) at a significance level (Prob=0.0254) with other factors constant.**Conduct diagnostic tests for estimated residuals**

For the purpose of verifying the validity and accuracy of the results obtained, in the previous tests we will conduct some important diagnostic tests to prove this, as follows :

Autocorrelation Problem Test (LM Test)

This test is used to verify the extent to which the estimated model is free from the problem of autocorrelation of the residuals, as follows :

Table 8 : Results of the Autocorrelation Problem (LM) Test for the External Debt Model and its Relationship to Economic Growth in Iraq

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	2.250011	Prob. F	0.1398
Obs-R-squared	4.615402	Prob. Chi-Square	0.0995

Source : Prepared by the researcher based on the outputs of the statistical program (Eviews12).

From the table above it is clear that the value of (F-statistic) is at a probability level of (0.1398), which is greater than (0.05%), and this means that there is no autocorrelation problem, so we accept the null hypothesis (H0) which states that there is no autocorrelation problem , between the random residuals, and we reject the alternative hypothesis (H1) which states that there is an autocorrelation problem between the random residuals, and that this test enhances the accuracy of the results of the model (ARDL).

- Testing the heterogeneity of variance problem (ARCH Test)

This test is used to verify the extent to which the estimated model is free from the problem of variation in variance of the residuals, as in the following table :

Table 9 : Results of the consistency of variance test. Error limits (homogeneity of variance) for the market value model for shares in the Bank of Baghdad (STB)

Heteroskedasticity Test: ARCH			
F-statistic	0.024751	Prob. F	0.8767
Obs*R-squared	0.027463	Prob. Chi-Square	0.8684

Source : Prepared by the researcher based on the outputs of the statistical program (Eviews12).

The table above shows the results of the test for the difference in variance (ARCH) problem. The value of the F-statistic reached a probability level of (0.8767), which is greater than 0.05. This means that the model is free of the problem of difference in variance. Therefore, we accept the null hypothesis which states that there is no There is a problem of variance difference between random residuals. We reject the alternative hypothesis that states that there is

a problem of variance difference between random residuals, and that this test enhances the accuracy of the model results (ARDL).

- Testing the problem of normal distribution of the model

This test is used to ensure that the estimated model is free from the problem of normal distribution of residuals, as follows :
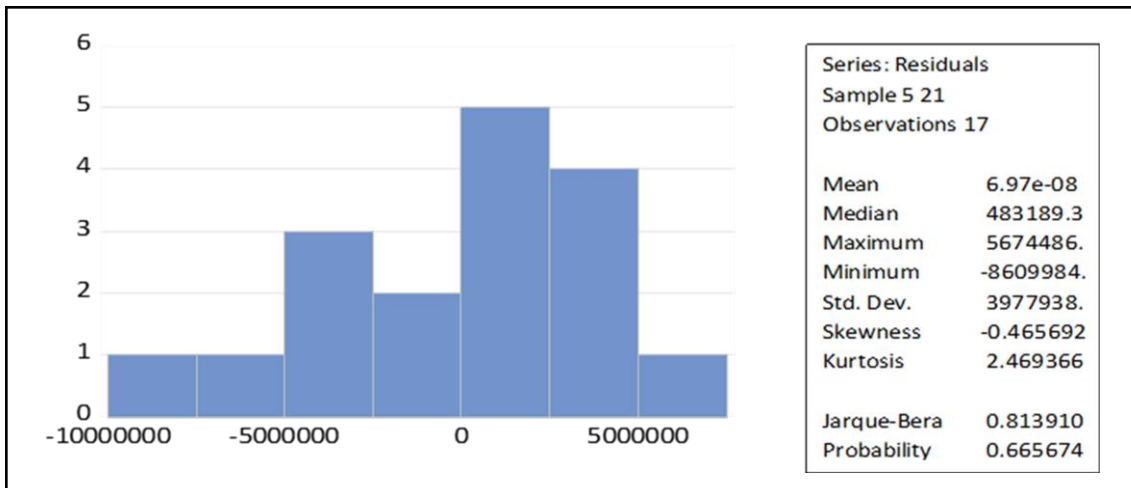

Figure 2: Results of testing the normal distribution problem of the external debt model and its relationship to economic growth in Iraq
Source : Prepared by the researcher based on the outputs of the statistical program (Eviews12).

From Figure (2), it is clear that the value of (F-statistic) is at a probability level of (0.665674), which is greater than ((0.05). This means that the model is free of the problem of normal distribution. Therefore, we accept the null hypothesis which states that there is no problem of normal distribution of the residuals. We reject the alternative hypothesis, which states that there is a problem with the normal distribution of residuals, and that this test enhances the accuracy of the results of the ARDL model.

- Model Stability Tests

Figure (3) shows the test of the cumulative sum of the remainder of the research model, as it is clear from the figure that the study model is stable throughout the duration of the research, because the continuous and winding chain does not depart from the critical intermittent boundaries.
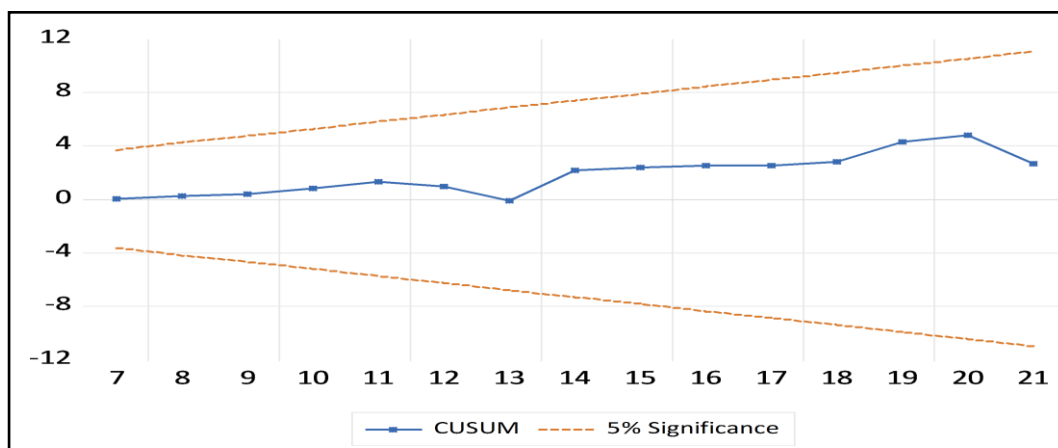

Figure 3: Cumulative sum of residuals test
Source : Prepared by the researcher based on the outputs of the statistical program (Eviews12).
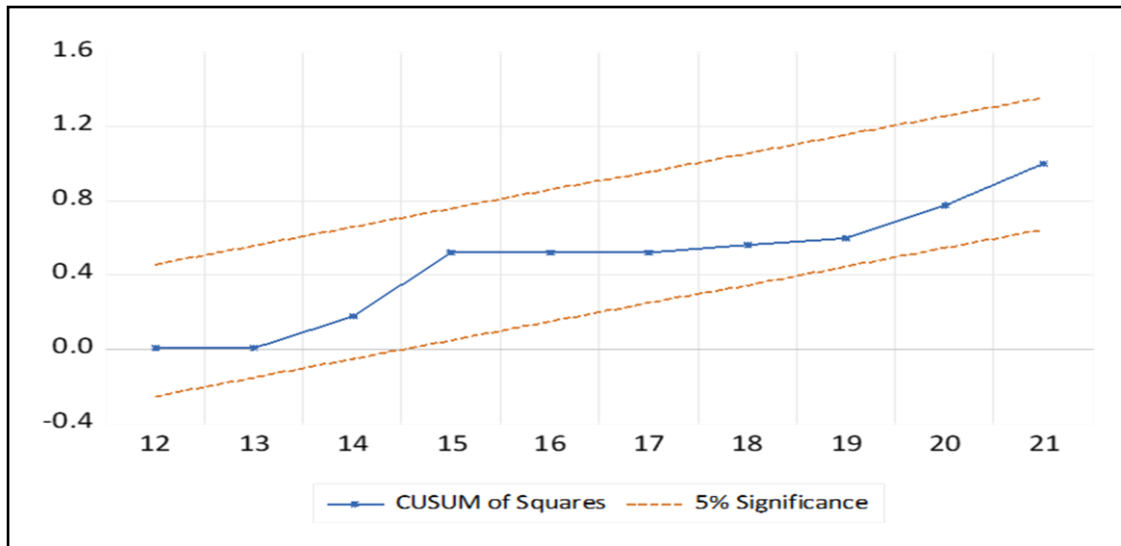
Figure 4 : Cumulative sum of squares test
Source : Prepared by the researcher based on the outputs of the statistical program (Eviews12).

5. Discussion of Results:

The results indicate an inverse relationship between external debt and economic growth due to not benefiting from external debt and, therefore, using it for consumer purposes. This proves the validity of the hypothesis that there is a misuse of external debt, which led to a negative impact and thus negatively reflected on the economic growth rate; there is also a positive relationship between oil revenues as a variable and economic growth, as the increase in oil revenues and oil prices is positively reflected in the growth rate of the gross domestic product.

6.Conclusion:

The standard analysis results confirmed the validity of the research hypothesis, as it was shown through the standard results that there is a statistically significant relationship between the independent variables (external debt and oil revenues) and the dependent variable (gross domestic product) in Iraq. The results of the standard analysis also showed that the independent variables (external debt and oil revenues) explained (99%) of the changes in the dependent variable (gross domestic product) in Iraq. The results of the standard analysis showed that there is a short-term negative relationship between external debt as an independent variable and gross domestic product as a dependent variable, as an increase in external debt by one unit leads to a decrease in gross domestic product (-1.107654) at a significance level (Prob = 0.0258), with other factors constant. Accordingly, the study hypothesis was accepted, which states that there is a misuse of external debt, which led to a negative effect or a long-term negative causal relationship between external debt and economic growth in Iraq.

Authors Declaration:
Conflicts of Interest: None
-We Hereby Confirm That All The Figures and Tables In The Manuscript Are Mine and Ours. Besides, The Figures and Images, which are Not Mine, Have Been Permitted Republication and Attached to The Manuscript.
- Ethical Clearance: The Research Was Approved by The Local Ethical Committee in The University.

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Shaved (1)

Year	GDP	RO	EXT
2003	29585788.6	15728387	171,352,896
2004	53235358.7	32593011	88,849,497
2005	73533598.6	39448514	64,108,629
2006	95587954.8	46873201	45,320,031
2007	111455813.4	51949251	39,235,065
2008	157026061.6	76297027	20,057,909
2009	130643200.4	50190202	19,946,160
2010	162064565.5	63594168	19,906,380
2011	217327107.4	98241562	20,511,270
2012	254225490.7	111326166	18,843,726
2013	273587529.2	105695824	16,751,922
2014	266332655.1	95174441	18,267,722
2015	194680971.8	65086896	19,895,610
2016	196924141.7	46249617	24,325,980
2017	221665709.5	65155570	30,233,140
2018	268918874	95619839	31,167,290
2019	276157867.6	99216318	30,298,590
2020	215661516.5	54448514	28,820,610
2021	304053321.3	95270298	31,676,160
2022	415628494.4	153623277	27,437,780
2023	330046390.6	124428748	20,923,172