



THE RELATIONSHIP BETWEEN EXTERNAL DEBT AND DOMESTIC INVESTMENT AND ITS IMPACT ON ECONOMIC DEVELOPMENT IN IRAQ: THE PERIOD 2004–2024

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Abstract. This research aims at finding the relation between external debt and domestic investment and understanding the impact they have on the development of the Iraqi economy. For this purpose, the Autoregressive Distributed Lag (ARDL) model was used to estimate the short run and the long run relationships of the study variables. The empirical results show that external debt has no statistically significant impact on economic growth in the long term. Gross capital formation, as a proxy for domestic investment, however, has a negative and statistically significant effect on the GDP growth rate in the long run, indicating that domestic investment was not effective in contributing to economic growth during the study period. The impact of external debt and domestic investment on economic growth is positive but not significant statistically in the long term. As far as the control variables are concerned, there is no statistically significant long run effect of the exchange rate on growth, however, the short run effect of the exchange rate on growth is negative and significant. The negative and statistically highly significant impact of inflation on economic growth in both the short and long run is an indicator of the negative impact of chronic inflationary pressures. But, government spending has a positive effect and statistically significant on economic growth in two periods, which highlights the importance of fiscal policy in stimulating economic activity. Oil prices also have a positive and statistically significant long run effect on economic growth. Moreover, the negative and statistically significant error correction coefficient supports the hypothesis of a stable long run relationship between the variables which is confirmed by the error correction model. The estimated coefficient reveals that about 68.98% of the disequilibrium gets corrected within one period, that is, the process of adjustment towards the long-run equilibrium path is relatively fast. Based on the results of the study, the following recommendations can be made: Improving the efficiency and productivity of the domestic investment, redirecting external borrowing to productive activities, controlling the inflationary pressures in the economy, and increasing the efficiency of government spending and utilization of oil revenues to

achieve economic diversification and sustainable economic development for Iraq.

Keywords: External debt, domestic investment, economic development, Iraq.

Introduction

Economic development is one of the major objectives that countries aim to reach, to use available resource and to increase productive capacity to increase the income and improve the economic and social growth of the country. To realize these objectives, developing countries look to financial resources for extensive financing of their development programmes and investment projects, and many of them turn to external borrowing to fill the gap between savings and investment. External debt if it is channeled into development projects and infrastructure that can stimulate economic growth and improve the country's economic efficiency becomes an important source of finance for the economy. An upward trend in external debt can, however, lead to debt service pressures which have negative implications for the country's economic performance since they drain financial resources and hinder domestic investments, a subject which is hotly debated, not only with regard to the nature of the relationship between external debt and domestic investment, but also the reasons why they affect the achievement of economic development.

Research Problem

Debt and investment are some of the most vital economic indicators that help shape the process of economic development. While debt is responsible for providing financial sources necessary for the investment project and economic growth, a high level of debt poses financial obligations that have adverse effects on the economic development of Iraq.

The research problem is presented by addressing the following questions:

1. What is the nature of the relationship between external debt and domestic investment in Iraq during the study period?
2. What is the impact of external debt and domestic investment on economic development in Iraq during the study period?

Significance of the Research

The significance of this research lies in shedding light on the nature of the relationship between external debt and domestic investment and their impact on economic development in Iraq, as well as their effect on investment activity. Accordingly, this study was designed to examine the impact of external debt and domestic investment on economic development in Iraq during the study period. To achieve this goal, a standard economic model was constructed to determine the relationship between economic development and external debt. Domestic investment and their interaction, which will enable us to assess the extent to which domestic investment can channel borrowed resources toward productive uses that support economic development and optimize the use of external debt in the Iraqi economy.

Research Objectives

The object of this study is to review the economic conditions in Iraq during the period 2004–2024, with the following goals in mind:

1. To study the trends and development of external debt, internal investment and Iraq's economic growth in the study period.
2. To study the impact of domestic investment on economic growth in Iraq during the study period.
- 3- To study the interaction of external debt and domestic investments on the economic growth of Iraq, especially if external debt changes the role of domestic investment in the economic growth of Iraq.
- 4-Determine the critical factors contributing to economic growth in Iraq and suggest remedial action in order to enhance the performance of institutions and to optimise management of external debt.
- 5-To determine if there is a long-run relationship between external debt, domestic investment and economic development by using the Auto-Regressive Distributed Lag (ARDL) model.
- 6- Make suggestions for improving the efficiency of external debt management and channeling the funds into financing domestic investment and sustainable economic development in Iraq.

Research Methodology:

The research has applied an inductive and analytical methodology for the examination of economic environment in Iraq over the period 2004-2024. Data needed for the study was gathered from the literature and relevant government sources along with economic indicators. The gathered data was then analyzed by using econometric methods, and special focus was laid on the analysis of the Autoregressive Distributed Lag (ARDL) model. ARDL model was used for the examination of the relationship between external debt, domestic investment, and economic growth in Iraq in the short run and long run, respectively.

Research Hypothesis:

The hypothesis of the research is based on the assumption that foreign debt is one of the major sources of funds that enable economic development as they are used to finance investments, which implies having funds that are required for conducting such operations; however, their effectiveness in terms of economic development is determined by the ability to allocate such finances for efficient investments. Domestic investment is regarded as one of the key avenues for using borrowed funds to create productive capacities and promote economic development.

Hence, the main research hypothesis is as follows:

External debt and domestic investment have a statistically significant effect on economic development in Iraq at a significance level of less than 0.05.

The following sub-hypotheses stem from this main hypothesis:

H1: External debt has a statistically significant effect on economic growth in Iraq at the 5% significance level.

H2: Domestic investment, measured by gross capital formation, has a statistically significant effect on economic growth in Iraq at the 5% significance level.

H3: The interaction between external debt and domestic investment has a statistically significant effect on economic growth in Iraq at the 5% significance level.

H4: The exchange rate has a statistically significant effect on economic growth in Iraq at the 5% significance level.

H5: The inflation rate has a statistically significant effect on economic growth in Iraq at the 5% significance level.

H6: Government expenditure has a statistically significant effect on economic growth in Iraq at the 5% significance level.

H7: Oil prices have a statistically significant effect on economic growth in Iraq at the 5% significance level.

Section one: Theoretical Aspects

1.1 The Concept of External Debt: The first step in the understanding of the relation between external debt and economic growth is the definition of the concept of external debt, and the determination of the principal forms of external debt. Basically external debt is the debt owed by a country to foreign debtors. It includes loans that are taken out directly by the government, loans which are guaranteed by the government and loans that are taken out by public bodies or companies acting for the state. It can also involve external borrowing by private economic sectors from overseas. External debt, therefore, may be broadly divided into public and private external debt. Based on the nature of the creditor, external debt can be categorized into three main types. Multilateral debt, (also known as foreign debt) occurs where borrowing is secured from international or regional multilateral institutions like the World Bank, the International Monetary Fund, regional development banks and funds. (Bilateral debt) is debt owed to another sovereign state; matters of debt restructuring and rescheduling, or cancellation, are usually handled through arrangements linked to the Paris Club. Commercial/banking debt, by contrast, is debt owed by a private foreign financial institution or commercial bank, and is typically negotiated through the London Club, among other processes. This categorization demonstrates the roles of various institutional providers in external financing and the different externalities that may arise from the different types of financing (Elkhalfi et al., 2024)

1.2 The Concept of Domestic Investment:

The term “domestic investment” does not have a fixed meaning, as it is used to denote the connection between the investment and the administration responsible for it; thus, its meaning varies depending on the location to which the investment is attributed and where it is situated, that is, depending on its spatial nature—whether that administration is national when we speak of the continental level or local when we speak of the national level. The term “national investment,” for example, takes on various names when we discuss investment in the context of international agreements, it becomes “domestic investment,” “national investment,” or “local investment,” but what is meant is national investment (Said, Ben Zaama, 2019) .

1.3 The Interaction Between External Debt and Domestic Investment:

There is a mutual reinforcement between external debt and domestic investments, since borrowing from foreign creditors can either spur domestic investment or significantly hinder it, based mainly on how the borrowed money will be put into use and the state of domestic institutions and the general macroeconomic environment (Safdar & Malik, 2020). The more there is a prevalence of external debt or its misuse, the greater the chances are that domestic investments will be

heavily discouraged. Large amounts of debts constitute an income tax, which implies that both domestic and foreign investors will expect future higher taxation to cover the debt. (OJEKA, Egbetunde, 2026).

1.4 The Concept of Economic Development:

Economic development is often linked with other concepts, including economic growth and economic progress, which in their broad sense relate to an economic transition from a lower to a higher degree of economic welfare and economic improvement. It is a process which involves the entire economy moving towards eliminating its stagnation and underdevelopment and laying the groundwork for a continued economic improvement. Economic development is not just an increase in volume of production, but it is a strengthening of the economy's productive capital, an increase in the stock of productive capital, and the increased utilization of available productive capital. It can also play a role in minimizing dependence on external economies by strengthening domestic productive capacities and providing more employment opportunities. In this context, successful economic development can be measured as an increase in production, enhancement of economic capacity, reduction of structural unemployment and increased economic self-reliance. (Al-Asadi, 2019).

1.5 Indicators of Economic Development

Economic development can be assessed through a range of economic and social indicators that reflect changes in the productive capacity and overall performance of an economy. These indicators provide a basis for evaluating the level of economic development and examining its relationship with economic growth in Iraq. Among the most important indicators that can be used for this purpose are the following:

1. Gross Capital Formation

Fixed capital formation is an accurate method for measuring the impact of investment, and it is defined as follows: - Fixed capital formation is: any addition to fixed assets that leads to the expansion of a society's productive capacity, maintaining and renewing them, as the distinctive characteristic of these productive capacities is that they are durable assets intended for long-term use; they are not consumed through use in a single production process or a few processes, but rather remain in use for a period of time (Bofnish, 2021).

2. Exchange Rate: The exchange rate emerged as an essential component of international economic relations, particularly as countries engage in cross-border trade in goods and services. It provides the mechanism through which the values of different currencies are compared and international transactions are settled. The exchange rate is commonly defined as the price of one unit of foreign currency expressed in terms of the domestic currency. Conversely, it may be expressed as the value of one unit of the domestic currency in terms of a foreign currency (Al-Zawi, 2016, p. 14). More broadly, the exchange rate represents the price of one country's currency relative to the currency of another country and reflects the rate at which one currency can be exchanged for another. Accordingly, changes in the exchange rate can influence international trade, capital flows, and the broader economic performance of a country. (Awadallah, 2008).

3. Inflation Rate: Inflation is widely regarded as one of the key indicators used to assess the extent to which a country is able to maintain macroeconomic stability. However, inflation should not be viewed as inherently harmful in all

circumstances, as its economic implications depend largely on its magnitude, persistence, and the conditions in which it occurs. Similarly, low or stable inflation does not necessarily indicate a fully healthy economic environment, since the interpretation of inflation requires consideration of the broader economic context and the factors underlying its movement. In this sense, inflation can be regarded as an economic symptom that reflects underlying developments within the economy rather than a problem in isolation. These underlying factors may have either favorable or adverse effects on economic performance. Therefore, effective inflation management requires identifying and addressing its underlying causes before inflationary pressures intensify and begin to undermine macroeconomic stability and economic growth. (Belkacem, 2013).

4. Government spending: Government expenditure refers to the financial resources allocated and spent by public authorities to support economic and social activities within the economy. It encompasses government payments and expenditures undertaken at different administrative levels, ranging from local government authorities and municipalities to central and federal institutions. Government spending represents an important mechanism through which the public sector participates in economic activity and influences the allocation of available resources. Such intervention becomes particularly relevant when market mechanisms are unable to allocate resources efficiently or when market failures prevent the effective provision of goods and services. Through government expenditure, public authorities can therefore influence resource allocation and contribute to achieving broader economic and social objectives. (Hijazi, 1999).

5. Oil prices: Oil prices stand for the price of a barrel of crude oil and are considered to be one of the most important driving forces in the world energy sector. Oil prices are known to be volatile and are formed based on such factors as supply and demand balance, market dynamics, production volume, and politics. Traditionally, oil prices are subject to dramatic changes, from low periods caused by surplus supply and weak demand to significant spikes triggered by supply disruption, political events, and other important shocks to the economy. Such changes can have serious consequences for countries that export oil and whose budgets are dependent on it. (Shavinina, 2003).

6. Gross Domestic Product (GDP) Growth: Economic growth refers to the sustained increase in a country's productive capacity and its ability to produce a wider range of goods and services for its population. This process is supported by technological advancement, improvements in productivity, and the institutional changes necessary to enhance the efficiency of economic activity (Robert, 2010). In empirical terms, economic growth is commonly measured by the percentage change in the real value of final goods and services produced within a country's borders over a specified period, typically on an annual or quarterly basis. Real Gross Domestic Product (GDP) growth is therefore widely used as a principal indicator of changes in the size and performance of an economy, reflecting periods of economic expansion or contraction. (Investopedia, 2026).

7- Economic Growth in Iraq

Economic growth in Iraq is the sustained expansion of the economy of Iraq -8 over a period of time. It is usually expressed as the percentage change in the volume of goods and services produced in the economy (real Gross Domestic Product or real GDP).

Economic growth is widely regarded as an important indicator of the performance and strength of a national economy. A sustained economic growth can help in creating jobs, enhancing the standard of living, and fight poverty, and enhance the capacity of the Government in its provision of public services and social and economic development (Hassan & Zaki, 2012).

In Iraq, political and economic stability, performance of the oil sector, oil export revenues, foreign investment, and development of non-oil sectors (agriculture, manufacturing, and services) have been in play in shaping economic growth. Given the dominant role of oil in the Iraqi economy, fluctuations in oil production and international oil prices can have a substantial impact on government revenues, investment activity, and overall economic performance.

Hence, Iraq must have an institutional and economic environment that facilitates sustainable economic growth. This encompasses investment encouragement in non-oil industries, physical and economic infrastructure development, education and vocational training development, public institutions efficiency and policies on private sector development and entrepreneurship. A more diversified productive structure may also help to lessen the economic reliance on oil and improve the economy's ability to absorb external economic shocks.

Despite Iraq's large natural and financial resources, it still has to overcome serious impediments to attaining stable and sustainable economic growth. Political and economic uncertainty, reliance on oil wealth, structural fragilities and lack of diversification of productive activities can limit long-term growth. However, policies to improve the economy, better resource allocation and continued investment in productive industries can play a role in reinforcing the productive capacity of the nation and contribute to the overall economic welfare. These two terms are mostly used interchangeably. These two words are used almost synonymously.

Economic transformation and economic growth are not synonymous and are distinct in the study of economic performance. Economic transformation – the fundamental changing of the structure and operation of an economy. These changes can include changes in production structures, technological advances, changes in the market and economic institutions. Economic changes may follow political, technological, institutional or social changes and can help enhance the economic efficiency, adaptability and long-term productive capacity (Daoudi, 2015).

In contrast, (economic growth) generally means an increase in economic production over a given time period. It is typically characterized by an increase in real GDP, national income and production of goods and services. The economic growth is thus a quantitative change in economic activity and it is usually linked with the increase in production, employment and betterment in the standard of living (Hussein & Musa, 2019).

Therefore, economic transformation is concerned with (changes in the structure and characteristics of the economy) while economic growth is concerned with (changes in the volume of economic output). The two processes can work together, however, if structural transformation enhances productivity and productive capacity, which leads to sustained economic growth..

1.6 The Relationship Between External Debt and Economic Development

The relationship between external debt and economic development is complex and may vary according to the level of indebtedness, the use of borrowed resources, and the country's capacity to service its debt obligations. In the early stages, external borrowing can provide additional financial resources to economies facing domestic savings and investment constraints, enabling governments to finance infrastructure, productive projects, and other development-oriented expenditures. However, as external debt accumulates beyond sustainable levels, debt-servicing obligations may place increasing pressure on public finances and constrain the resources available for productive investment.

The relationship has therefore been described as potentially nonlinear, with the benefits of external borrowing diminishing and eventually becoming adverse as debt levels increase. This pattern has been associated with an inverted U-shaped relationship in which moderate levels of external borrowing may support economic activity, whereas excessive debt can generate substantial economic burdens, particularly when borrowed funds are not allocated efficiently or do not generate sufficient returns to cover debt-service costs (Nouaili, 2025).

External debt may consequently influence economic development through several channels. While foreign borrowing can help bridge the gap between domestic resources and investment requirements, excessive accumulation of debt may increase interest and repayment obligations, place pressure on government budgets, reduce fiscal space, and constrain investment in productive and social sectors. These effects may ultimately weaken economic performance and limit the capacity of the economy to achieve sustained development (Abu Hasira & Muqaddam, 2015).

Thus, the economic consequences of external debt depend not only on its absolute level but also on how effectively borrowed resources are utilized, the terms of borrowing, the economy's capacity to generate foreign exchange, and the productivity of the investments financed through external borrowing.

Section Two: Presentation and Analysis of Results: Analysis of the Relationship Between the Study Variables

A Complete Description of the Model

First) Testing the Stability of the Variables

The unit root test of Augmented Dickey-Fuller (ADF) was used in EViews 12 software to test the variables used in the study for stationarity. This test is used to decide whether the time-series variables are stationary or not stationary and thus whether there is a unit root present or not. Ordering the integration of variables is a crucial step in the estimation of ARDL model in order to meet the conditions needed for further cointegration analysis.

For each study variable, the ADF test was performed on both the level and first difference forms, thus determining if the variable is integrated and what its order is. The results of the test are tabulated in Table (2)

Table (1) Study Variables

Characterization and measurement method	Symbol	Variable
It represents the rate of economic growth, measured by the annual rate of change in real GDP, and is used as an indicator of macroeconomic performance.	GDP Growth	GDP growth
It represents the total debt owed by the country to external parties, and is usually measured as a percentage of GDP or as the total value of external debt according to available data.	EXD	External Debt
It reflects the volume of investments in fixed assets such as equipment, facilities, and infrastructure, is measured as a percentage of GDP, and is a determinant of economic growth.	GSF (GFCF)	Total Fixed Capital Composition
An interactive variable created to measure the impact of the interaction of external debt with capital accumulation on economic growth, and is calculated by multiplying the external debt variable by the total fixed capital formation.	EXD×GSF	Interaction between external debt and total fixed capital formation
It expresses the value of the local currency against foreign currencies, and is used to measure the impact of exchange rate fluctuations on economic activity and foreign trade.	EXCH	Exchange rate
Represents the annual rate of increase in the overall level of prices, and is measured by the annual inflation rate based on the Consumer Price Index (CPI).	INF	Inflation rate
It represents the size of government public spending, measured as a percentage of GDP, and reflects the role of fiscal policy in supporting economic activity.	GEX	Government Spending
It represents the average price of global oil, measured in US dollars per barrel, and is used due to the importance of the oil sector and the impact of its price fluctuations on the economy.	OP	Oil price

Variable Labeling in the Standard Model

The model used in this study can be represented as shown in the following figure:

$$GDPGrowth_t = f(EXD_t, GSF_t, EXD_t \times GSF_t, EXCH_t, INF_t, GEX_t, OP_t)$$

$GDPGrowth_t$: The real GDP growth rate at time t.

EXD_t : External debt, representing the state's external financial obligations at time t.

GSF_t : Total fixed capital formation, which represents the volume of investment in fixed assets and its role in supporting economic growth during the time period t.

$EXD_t \times GSF_t$: The interactive variable between external debt and total fixed capital formation; it is used to measure the combined effect of external debt and capital accumulation on economic growth, and the extent to which the impact of external debt depends on the level of investment.

$EXCH_t$: The exchange rate, which represents the value of the local currency relative to foreign currencies, reflects the impact of exchange rate fluctuations on economic performance.

INF_t : Inflation rate, which represents the annual rate of change in the general price level and is used to measure the impact of price stability on economic growth.

GEX_t : Government spending, which refers to the total amount of public spending by the government and its role in stimulating economic activity.

OP_t : The price of oil, which represents the average global oil price, is used to measure the impact of oil price fluctuations on economic growth.

Table (2) The Extended Dickey-Fuller Unit Root Test

First Team			Level			Variable
B	A	Non	B	A	Non	
-	-	-	- 9.852*	-9.518*	- 8.049*	GDP growth (GPD Growth)
-	-	-	- 7.611*	- 10.515*	- 7.817*	External Debt (EXD)
-4.867*	- 4.806*	-4.694*	-2.241	-1.169	0.370	Total Fixed Capital Composition (GSF)
-5.957*	- 4.883*	-5.026*	-1.681	-1.915	-0.531	The Interaction between External Debt and Total Fixed Capital Formation (EXD×GSF)
-4.686*	- 3.419*	-3.498*	1.885-	2.046-	0.590-	Exchange rate (EXCH)

-	-	-	-3.570	-3.616*	- 3.317*	Inflation rate (INF)
-4.867*	- 4.806*	-4.694*	-2.242	-1.169	0.370	Government Spending (GEX)
-5.196*	- 4.711*	-4.532*	-3.047	-2.338	-1.196	Oil price (OP)

a: means the regression contains only a cut-off point

b: means the regression contains a cut-off point and a general trend

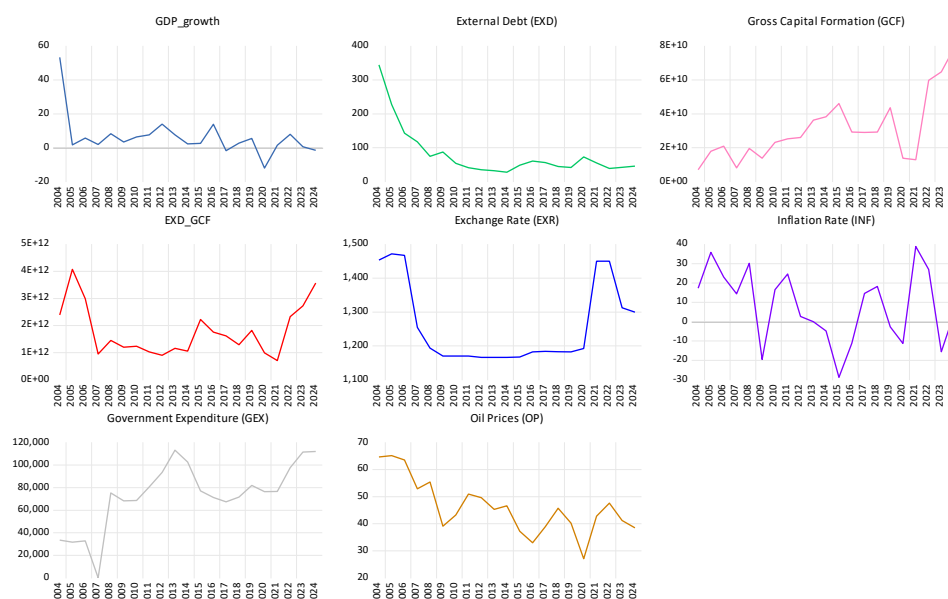
non: means the regression contains neither a cut-off point nor a general trend

*: means statistically significant at the 5% significance level

Source: Prepared by the researcher based on the results of the analysis conducted in the (EViews12)

We observe from Table (2) that the time series for GDP growth, external debt, and the inflation rate were stable at the level, whether with a cut-off or with a cut-off and a general trend—that is, they do not contain a unit root at the 5% significance level, whereas the time series for gross fixed capital formation, the interaction between external debt and gross fixed capital formation, government spending, and the price of oil were stable after taking the first differences of the original series and were found to be stable at the 5% significance level, whether with a cut-off or with a cut-off and a trend.

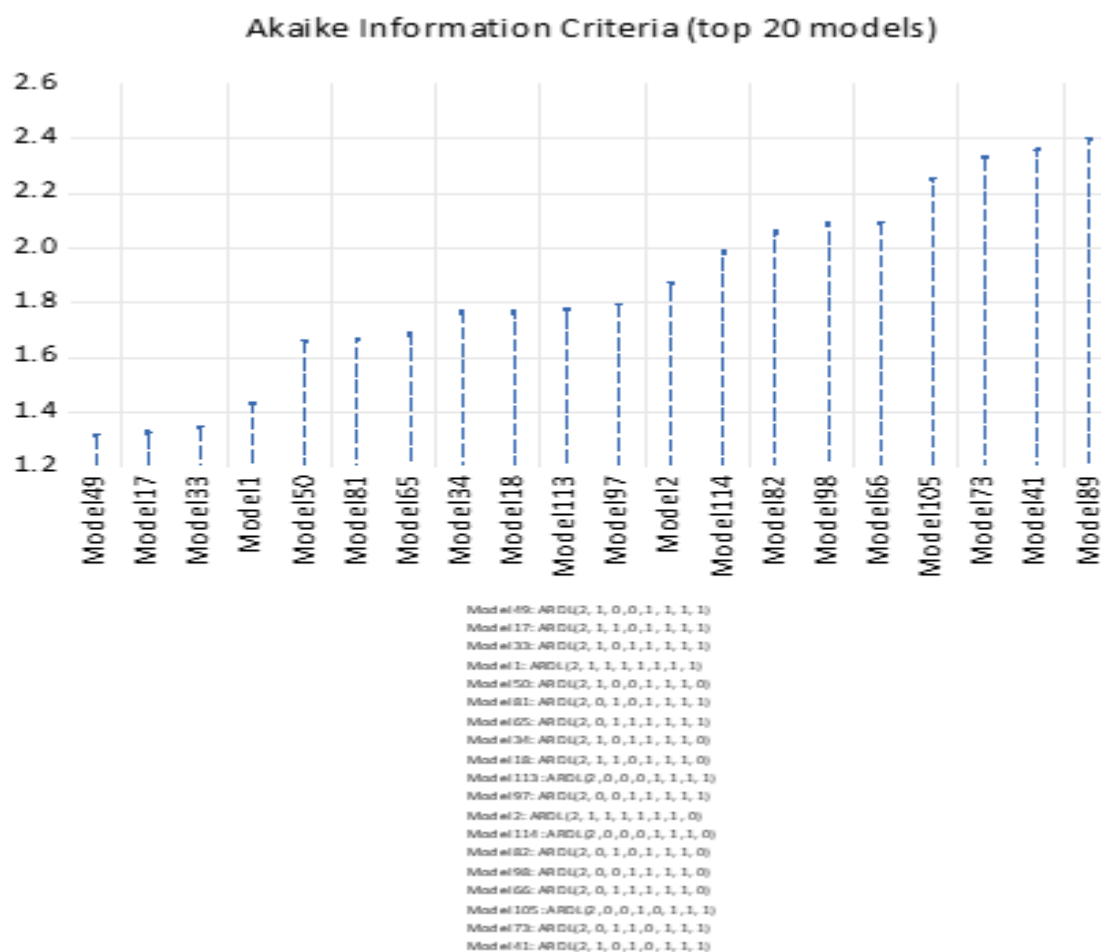
Figure (1): Time series for the period 2004–2024



Source: Prepared by the researcher based on the results of the analysis conducted in EViews 12

1. Determining the Order

Figure (2): Criteria for Selecting the Model Order



Source: Prepared by the researcher based on the results of the analysis conducted in EViews 12

Based on the Akaike criterion, it is clear that Model (49) is the best model, as it achieved the lowest Akaike criterion value of (1.312) compared to the other proposed models. Therefore, the autoregressive model with distributed lags was estimated based on the maximum number of lags (1).

1. Correlation Test (Cointegration) Using the Boundary Test:

Table (2) summarizes the results from the ARDL Bounds test for cointegration that is used to establish whether there is an equilibrium long run relationship among the variables in the model. The null hypothesis of the test assumes that there is no long run relationship (no cointegration) between the variables. The decision on whether to reject the null is made on the basis of comparing the computed F-statistic with the critical lower bound $I(0)$ and upper bound $I(1)$. When the calculated F-statistic is greater than the upper-bound critical value $I(1)$, then the null hypothesis of no long run relationship is rejected and consequently, cointegration exists among the variables. In case the F-statistic is less than the lower bound $I(0)$, then the null hypothesis cannot be rejected. When it is between the two, the result is ambiguous.

As indicated in Table (2), the computed F-statistic is 16.105 while the upper bound critical values are 2.89, 3.21, 3.51, and 3.90 at the 10%, 5%, 2.5%, and 1% significance levels respectively. The computed F-statistic is significantly higher

than the upper bound I(1) critical value at all significance levels indicated above.

It can thus be concluded that the null hypothesis of no long run relationship is rejected and hence the alternative hypothesis is accepted. The results show the existence of a long run equilibrium relationship among the variables included in the model. Consequently, the ARDL model is appropriate for estimating the long run and short run coefficients through the ECM.

Table (2): Results of the Bound Test for Joint Integration (F Bound)

Test Statistic	Value	Significant	I(0)	I(1)
F-statistic	16.105	10%	1.92	2.89
k	7	5%	2.17	3.21
		2.50%	2.43	3.51
		1%	2.73	3.9

Source: Prepared by the researcher based on the results of the analysis in EViews 12

Test for Estimating the Long-Run Coefficient:

The long-run estimate results from the ARDL test indicate that EXD is negatively correlated with GDP growth but statistically insignificant (probability value = 0.1762). Gross capital formation is negative and statistically significant ($p = 0.0477$) at 5%. Interaction between EXD and Domestic Investment is positive but statistically insignificant ($p = 0.1467$). Exchange rate is positively correlated with GDP growth but statistically insignificant ($p = 0.0780$) but statistically significant at the 10% significance level. Inflation negatively affects GDP growth and is highly significant ($p = 0.0006$). Government expenditure and oil prices are positively correlated and highly statistically significant ($p = 0.0021$) and ($p = 0.0007$), respectively. All the above indicates that GCF and inflation significantly impact GDP growth in the long run but in a negative direction. Government expenditure and oil prices have significant positive impacts on GDP growth. External debt and the interaction of External Debt and Domestic Investment does not statistically significantly impact GDP growth in the long run at the 5% level.

Table (3): Long-Run Equilibrium (Model: ARDL (2,1,0,0,1,1,1,1); Dependent Variable: GDP Growth)

Long run coefficients (ARDL)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXD	-0.0266	0.016211	-1.64067	0.1762
GCF	-0.10368	0.036731	-2.82278	0.0477
LOG(EXD_GCF)	1.611943	0.896891	1.797256	0.1467
EXCH	0.001854	0.000787	2.35628	0.078
INF	-0.06221	0.006234	-9.97992	0.0006
GEX	0.527831	0.074911	7.046073	0.0021
OP	0.183695	0.019696	9.326336	0.0007
C	-45.143	20.80771	-2.16953	0.0959
EC = LGDP_GROWTH - (-0.0266*EXD-0.1037*(GCF)^(1/5) + 1.6119*LOG(GCF) + 0.0019*EXCH -0.0622*INF + 0.5278*LOG(GEX) + 0.1837*OP- 45.1430)				

Source: Prepared by the researcher based on the results of the analysis conducted in EViews 12

The long run estimates of the ARDL (2,1,0,0,1,1,1,1) model with the dependent variable GDP growth (LGDP_GROWTH) are presented in the results in Table (3). The results support the existence of stable long-run equilibrium relationship among the study variables.

The coefficient of external debt (EXD) is statistically insignificant, negative at (-0.0266) and p-value of (0.1762). On the other hand, the coefficient of gross capital formation (GCF) was found to be (-0.10368) with a negative sign and a p-value of 0.0477, which shows that gross capital formation has a negative and statistically significant long-run relationship with economic growth for the study period.

The interaction term external debt and domestic investment is positive but not statistically significant, LOG(EXD_GCF) with coefficient (1.6119) and p-value (0.1467). The exchange rate (EXCH) also positively affects the model but at the 5% level the coefficient is statistically insignificant, with a coefficient of 0.001854 and a p-value of 0.0780.

The coefficients of the regression between GDP growth and inflation (INF) are negative and statistically significant with a coefficient of (-0.06221) and a p-value of (0.0006), suggesting that higher inflation is linked to lower growth of the economy in the long run. The coefficient of the effect of government expenditure (GEX) is 0.527831, indicating a positive effect, and the p-value is 0.0021, which is statistically significant. Likewise, oil prices (OP) are positively and significantly related with a coefficient of (0.183695) and p-value of (0.0007). which shows the significance of oil revenues on the economic activity of Iraq.

The overall conclusion of the long-run results is that there is a significant negative impact of the variable GCF and inflation on GDP growth while government expenditure and oil price have significant positive impact. At 5% level, the effects of external debt, its interaction with domestic investment and the exchange rate are not statistically significant. The Error Correction Model (ECM) is used to study the short-run dynamics in an estimated long-run equilibrium relationship..

Table (4): Specification of the Extended Correction Model (ECM) (ARDL)

Variable	Coefficient	St. Error	T-Statistics	P.value
D(LGDP_GROWTH(-1))	1.581178	0.098281	16.08827	0.0001
D(EXD)	-0.05727	0.003513	-16.2997	0.0001
D(EXCH)	-0.01415	0.001396	-10.1373	0.0005
D(INF)	-0.0898	0.004641	-19.3496	0.0000
DLOG(GEX)	1.303319	0.070297	18.54007	0.0000
D(OP)	0.585063	0.025731	22.73741	0.0000
CointEq(-1)*	-0.68984	0.176949	-20.8525	0.0000

The Double Integral Formula:

$$D(LGDP_GROWTH) = -0.689835984378*(LGDP_GROWTH(-1) - (-0.02659727*EXD(-1) - 0.10368255*(GCF_)^{(1/5)} + 1.61194253*LOG(EXD_GCF)$$

$$+ 0.00185361*EXR(-1) - 0.06221228*INF(-1) + 0.52783125*LOG(GEX_{-1})) + 0.18369464*OP(-1) - 45.14304063))$$

* Source: Prepared by the researcher based on output from Eviews 12

Short-run estimates of the ARDL model are provided in table (4). Change in GDP growth in the previous year, $D(LGDP_GROWTH(-1))$, is positively and statistically significantly ($p=0.0001$) related to the economic growth in the short-run, which suggests that economic growth is persistent in the short-run.

External debt change ($D(EXD)$) has a statistically significant negative influence on GDP growth ($p = 0.0001$), thus suggesting that external debt increase leads to short-run economic growth fall. Similarly, the influence of exchange rate change, $D(EXCH)$ on GDP growth is negative and statistically significant ($p = 0.0005$).

Inflation change ($D(INF)$) also influences the economic growth negatively and statistically significantly ($p = 0.0000$). Thus, a positive inflation rate implies the negative impact on economic performance. However, the change in government expenditure, $DLOG(GEX)$ influences GDP growth positively and statistically significantly ($p = 0.0000$). This can be attributed to the impact of the public expenditures on the short-run economic activities. Finally, oil prices change, $D(OP)$ also has a statistically significant positive impact on the GDP growth, $d(OP) = 0.87$.

Finally, $CointEq(-1)$ is negatively and statistically significantly ($p = 0.0000$) related to the GDP growth, and therefore, proves that there exists long run relation between the variables and short-run deviations will be corrected in the long run. The speed of adjustment should be taken directly from the error-correction coefficient (-0.6898). Thus, approximately 68.98% of the short-run disequilibrium is corrected in one period.

Table (5): Test of the Normal Distribution of Residuals

Test	Standard Value	Value	Probability	Nature of Residuals
Jarque–Bera	—	2.271	0.321	Normally Distributed

Source: Prepared by the researcher based on the results of the analysis in EViews 12.

The results in Table (5) show that the residuals follow a normal distribution according to the Jarque-Bera test.

Table (6): Autoregressive serial correlation test for the residuals according to the Broesch method

Test Statistic	Value	Probability
F-statistic	0.326	0.754
Obs*R-squared	4.672	0.0967
Prob. F(2,2)		0.754
Prob. Chi-Square(2)		0.0967

Source: Prepared by the researcher based on the results of the analysis in the (EViews 12)

The outcome of the Breusch-Godfrey serial correlation test, which was used to determine whether there is autocorrelation in the residuals of the model, is depicted in Table (6). It can be observed from the outcome that the F statistic is 0.326 and the probability is 0.754. Because the probability is greater than 5%, the null hypothesis of non-existence of serial correlation is accepted. Hence, the residuals are not auto-correlated.

Table (7): Test for Heteroscedasticity Using the Arch method

Test Statistic	Value	Probability
F-statistic	0.0428	0.839
Obs*R-squared	0.0481	0.827
Prob. F(1,16)	—	0.839
Prob. Chi-Square(1)	—	0.827

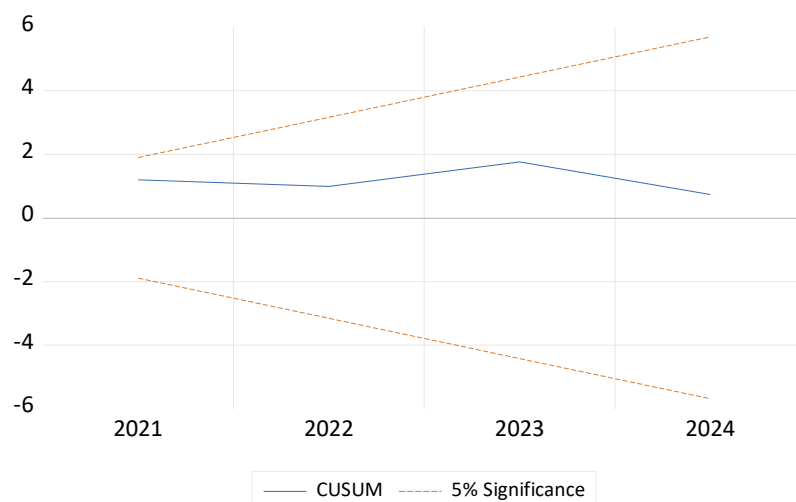
Source: Author's calculations based on the results obtained using EViews 12.

The outcome of the ARCH test performed to test for an equal variance of the residual variance over time is presented in Table (7). The results show an F-statistic of 0.0428 and probability value of 0.839. The value of this probability is above the 5% significant level, so that the null hypothesis of no ARCH effects is not rejected. So, there is no statistically significant evidence of conditional heteroskedasticity in model residuals. Likewise, the Obs*R-squared is 0.0481 and the Chi-Square probability value is 0.827, both of which are greater than the 5% significance level. This confirms that there was no significant ARCH effect in this result. As a result, there is no heteroskedasticity problem for the residuals as the variance of the residuals is reasonably constant over time..

Model Stability Test

To assess the stability of the estimated model and determine whether the variables and model coefficients are free from structural changes over the study period, the CUSUM test (Cumulative Sum of Recursive Residuals) was employed.

Figure (3) CUMSUM Test Results



Source: Prepared by the researcher based on the EViews 12 analysis results.

Figure 3 shows that the CUSUM statistic remains within the 5% critical bounds throughout the study period. This indicates that the model coefficients are stable over time and that there is no evidence of significant structural instability at the 5% significance level.

Conclusions

- 1- 1- In the long-run, the GDP growth rate is negatively affected by external debt although the effect is not statistically significant. But it has a statistically significant negative effect at 5% level of significance in the short run.
- 2- In the long run, the GDP growth rate is negatively associated with Gross capital formation (domestic investment), statistically significantly at the 5% level of significance.
- 3- The interaction between external debt and domestic investment is statistically insignificant but has a positive effect on the GDP growth rate in the long run at the 5% level of significance.
- 4- In the long run the exchange rate has a positive though statistically insignificant effect on the GDP growth rate at 5% significance level while a negative effect is statistically significant in the short run.
- 5- The GDP growth rate is negatively and significantly affected by inflation at 5% significance level for both short run and long run.
- 6- The government spending has a positive effect on GDP growth rate in both short and long run and is statistically significant at 5% level of significance.
- 7- The GDP growth rate in both the short and long run is positively affected by oil prices and the relationship is statistically significant at the 5% level of significance.
- 8- The sign and statistical significance of the error correction coefficient is negative, which is consistent with the presence of a long run equilibrium relationship of the variables. The estimated error correction coefficient is - 0.6898, suggesting that about 68.98% of the short-run deviations from long-run equilibrium are corrected in one period, which is fairly quick to move back towards the LR equilibrium..

Recommendations:

This study calls for consideration of several important aspects and recommendations, including:

- 1-Work to reassess domestic investment policies and improve the efficiency of directing investments toward high-value-added productive sectors, thereby ensuring that they contribute more effectively to economic growth and sustainable development.
- 2-Efforts should be made to improve mechanisms for utilizing resources derived from external debt and linking them to productive investment projects, thereby ensuring a greater positive impact of the interaction between external debt and domestic investment on economic growth.
- 3-However, monetary and financial stability policies need to be implemented to curb exchange rate volatility and reduce the adverse impact in the short term.
- 4-Policies that involve controlling inflation rates and maintaining the stability of the general price level should be strengthened as they are important to support economic activity and stimulate investment and production.

5-It is desirable to maintain the amount of productive government spending and channel it to development sectors and infrastructure that strengthen the efficiency of the national economy and its economic growth.

6-Attention should be paid to the periods of high oil prices to increase public revenues and use them for diversifying the economic basis and developing non-oil sectors to minimize overreliance on the oil sector in the future.

7-Improve policies that promote lasting harmony between the economic variables, which will allow the economy to continue absorbing shocks, correct imbalances and rapidly return to a path of harmony..

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