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MEASURING THE IMPACT OF OIL PRICE FLUCTUATIONS ON THE BUDGET DEFICIT

Malik bin Bashir bin Atiya Al-Wuraimi
Faculty of Economic Sciences and Management / University of Sfax
Malek.el-weriemmi@laposte.net

Wissam Hussein Alwan
Faculty of Economic Sciences and Management / University of Sfax
Wessamhussain21@gmail.com

A B S T R A C

The relationship between oil prices and the public budget deficit is one of the most important topics and issues that have received the attention of economic researchers and have been widely discussed in both developing and developing countries alike.

This research aims to analyze the relationship between the general budget deficit and oil prices and to show the impact of these variables on the general budget deficit in Iraq, and to measure that relationship by relying on the EVIEWS12 standard program. The stability test was used by applying the expanded Dickey-Fuller test and the cointegration test to discover a trend. The long-term relationship between these variables. The results of the research showed the inverse relationship between the price of crude oil and the general budget deficit in the long and short terms. The researcher recommended the need for the state and the competent authorities to focus in preparing the budget on all economic variables related to its budget, by comparing the budget for several years. In order to know the factors and variables affecting them and pay attention to them in order to raise the level of their revenues, and effective investment of Iraqi human capital, which is characterized by society's vulnerabilities for those of working age, through providing job opportunities and developing workers' productive skills in a way that achieves large returns for the general budget and represents a strong support link to pay It accelerates economic growth for all economic sectors, and its achieved returns are comparable to the returns of other physical and financial investments.

K E Y W O R D S

Oil prices, budget deficit.

Introduction

The Iraqi economy is considered one of the economies of developing countries that rely heavily on oil revenues. The Iraqi economy entered a new transformation phase after 2003 and suffered from a cessation of all economic activities in the country, as well as the collapse of the most important

economic institutions and sectors (agricultural, industrial, and services). This imbalance affects all macroeconomic variables.

Since economic variables represent the main indicators of financial and social events, they affect the country's economy, and given their importance, the state takes them into consideration in order to know its economic reality. From knowing these variables emerges a statement of the economic activities that are important in the process of economic growth and development in order to focus on them in Taking a package of basic decisions to support the general budget, as there are many economic variables that affect the general budget deficit, including the gross domestic product, which witnessed a slowdown in economic growth rates for non-oil economic sectors, and this rentier dependence is reflected in the rest of the economic variables, such as the unstable exchange rate and the rise Inflation rates are a result of the decline in these economic sectors in providing goods and services in exchange for an increase in the volume of demand for them, which led to an acceleration in the pace of general prices in Iraq, in addition to the weakness of capital accumulation resulting from a decrease in the level of income with an increase in the level of consumption, causing a savings gap that results in an imbalance in the level of Investment because the funds required for investment are greater than the ability of the national economy to provide them and are represented by their lack of contribution to supporting the gross domestic product to reduce the general budget deficit.

After 2003, the fiscal deficit in the general budget tended to increase as a result of the expansionary spending policy pursued by the government, and the financing of this spending depended to a large extent on oil revenues, which posed a threat to the overall Iraqi economy, due to the fluctuation of oil prices on the one hand, and the neglect of the role of tax revenues and other revenues. Contributing to financing public expenditures correctly without resorting to borrowing from other parties.

First: The importance of the research: The importance of the research is highlighted in trying to clarify the impact of oil price fluctuations on the general budget deficit in Iraq, especially since the Iraqi economy still suffers from being a one-sided economy (the raw resource) whose prices depend on the global market in addition to the high government spending. Especially military and service expenses.

Second: The research problem: The rentier nature of the Iraqi economy has made its general budget greatly affected by the price of crude oil, the impact of which is reflected directly or indirectly in the general budget deficit in Iraq during the study period .

Third: Research objectives: The overall research objectives can be highlighted in the following points:

•Learn about the concept of the general budget deficit and oil prices.

•Analysis of the relationship between the general budget deficit and some oil prices.

•Measuring the relationship between the general budget deficit and oil prices based on modern standard programs (EVIEWS12.)

Fourth: Research hypothesis: The research assumes the existence of a long-term and short-term influence relationship between oil prices and the general budget deficit in Iraq for the period in question

Fifth: Study variables:

1- Independent variable:- Crude oil price.

2- Dependent variable:- General budget deficit

Seventh: Research methodology

In the theoretical aspect, we relied on the descriptive approach to study economic phenomena or problems and arrive at scientific explanations by addressing the theoretical literature. As for the applied

aspect, the standard (EVIEWS12) program was used, which is based on economic measurement methods to analyze the relationship between the research variables, and then interpret them . Quantitative results of evaluating the applied aspect in Iraq.

first topic

The theoretical framework of the concept of oil prices and the general budget deficit and the relationship between them.

The first requirement: the concept and types of budget deficit

First: The concept of budget deficit

The general budget deficit is a common economic phenomenon that generally occurs at the level of different countries when public spending exceeds existing revenues and is the result of poor planning or government estimates" (Saadi, 2019: 12). It is also known as "the surplus of final expenditures over final revenues." (Muhammad, 2021: 8). He also knew that "the budget deficit is the failure of the state's estimated public revenues to pay the estimated expenses." Viadislav , 2005-8)) . The deficit is defined as "a negative budget balance in which the state's public expenditures are higher than its revenues" (Muhammad, 2018: 29). Cpesti defined it as "the difference between total expenditures and government revenues, excluding debt" (Cpesti , 1992, 40). Through our review of these definitions, the concept of the deficit of the state's general budget becomes clearly clear to us, and we can say that the budget deficit is the inability of the revenue side to cover the increasing expenditures of the state as a result of the expansion of the economic activities, whether consumption or investment of the state.

Second: Types of state budget deficit

There are multiple types of state budget deficit, the most important of which we will mention as follows:

1- Current deficit .

This deficit expresses the government sector's demand for resources that must be financed through borrowing. This deficit is measured by taking the total difference between the total types of expenditures and public revenues for all government agencies, minus the government expenditures allocated to pay off accumulated debts from previous years. In other words, it is the difference between... Current public spending and current public revenues. This measure aims to know the government sector's requirements for resources that must be financed by borrowing (Dardouri, 2013: 115).

2- Total disability.

It is the traditional or common definition of the fiscal deficit, which measures the negative difference between the amounts of government spending, including interest payments and this measure does not include government debt amortization payments, and government revenues that include the total of tax and non-tax revenues and does not include borrowing revenues. The comprehensive deficit seeks to expand This concept includes all other government entities, such as local bodies, decentralized bodies, and national public programs, where the deficit percentage becomes equal to the difference between the total government revenues and the public sector and the total government and public sector expenditures. Therefore, this deficit must be covered with new borrowing. Moreover, this deficit presents a picture of It is sufficient for all state activities and is not limited to part of the central government sectors, but rather a comprehensive overview of all government sectors. Therefore, be prepared not to exclude government financial institutions when measuring the budget deficit, such as

the losses that the central bank is exposed to when performing its functions, as the financial deficit of these institutions has effects on the economy. In order to match the effects of the financial deficit in the state's administrative agencies, the importance of the financial requirements of these major institutions must be taken into account when measuring the overall deficit in the general budget (Abdul Hamid, 2003: 77).

3- Basic disability.

This type of deficit depends on the current budget policies and is not based on the interest due on the debt, because it is the result of a deficit for previous years and not the result of current financial activity provided by the state. This measure aims to determine the degree of improvement or deterioration that occurred in the government debt as a result of its adoption of current budget policies. The government debt resulting from the current budget policy also provides an assessment of the extent to which the deficit can be tolerated, and this type of deficit is known as the interest-free deficit because it is excluded from all interest appropriations, but this concept excludes an important element of the deficit in most developing countries, which is the interest due on the debts. Foreign Affairs, this has become a heavy burden on these countries (Mohamed, 2021: 10.

4- Operating deficit.

The operating deficit is the deficit that operates in inflationary conditions, which represents the borrowing needs of the government and the public sector, minus the portion of interest paid to correct inflation by the currency correction factor, and including the interest rate paid that carries a portion of the money to creditors to compensate them for their losses resulting from the rise in prices, as Most countries suffer from high rates of inflation, so creditors insist on linking the value and principal of their debts to price changes, because inflation reduces the real value of current debts, and the interest paid to cover losses from the decline in the real value of debts is often sufficient, and in this case the amount of the deficit increases if it is Using the government sector's measure of net demand for resources, some financiers called for excluding these payments due to their importance in correcting the effects of rising prices in addition to the real interest of the loan requested by the real sector (Abdul-Jabbar, 2018: 20).

5- Structural deficit.

It is a measure that explains the impact of emergency or temporary obstacles to which the general budget is exposed, such as price changes, local income deviations, and long-term interest rates. Sales of government assets are excluded from this measure because they represent an extraordinary resource, and the structural school has shown us in its interpretation of the financial deficit, it is the deficit. Resulting from an increase in public spending at a rate that exceeds the increase in the financial wealth of the national economy, this matter is due to the imbalance of the national economy itself. There are those who call this deficit an emergency deficit in order to indicate the structural deficit, given that this is not a structural measure, but it attempts to address the impact of temporary factors that affect the state's general budget. (Victor Argy,1970;72.)

Third: The reasons for the state's general budget deficit

There are many reasons that contributed to the state's general budget deficit, which may be political, social, or economic, but the main reason is the economic factor, that is, the growth of public spending at a rate exceeding public revenues is the largest and most important reason for the budget deficit.

1- Increasing state public spending.

After the state became involved in all social, economic, and political issues, the rate of public spending increased, and it became one of the most prominent means the state resorts to to achieve its goals. The increase in public expenditures can be attributed to two reasons:

A- Reasons for increasing public expenditures

The actual increase provided by public expenditures is to obtain public benefits. We will present the most important reasons for the actual increase in public expenditures as follows (Khalaf, 2008: 97).

1- Economic reasons.

It is one of the most important reasons that show the real and continuous increase in government spending, that is, the increase in the rate of spending leads to an increase in income, which in turn leads to an increase in demand for consumer goods and services in the event that the income elasticity of demand for goods and services is large, so any increase in the level of Income will directly lead to an increase in the amount of demand for public goods and services, and this leads to an increase in public spending to satisfy this demand.

The increase in public expenditures in developed countries is due to the need to influence economic activities through state intervention and directives to ensure regular growth in the economy and the manner in which government spending is increased to avoid the recession that occurs in these countries. The more progress there is in these countries, the greater the possibility of expansion becomes available. In their public expenditures, their ability to provide public revenues has increased in a way that ensures an increase in the level of production and incomes. As for the increase in spending in developing countries, it is due to economic reasons that can be explained by the intense need to develop their economies resulting from weak economic activity and the lack of projects supporting this activity in terms of diversity, level of production, and all. These activities require government intervention in order to regulate the level of spending and the mechanism for collecting revenue (Ayeb, 2010: 19)

2- **Administrative reasons**.

These reasons are represented by the expansion of the state bureaucratic apparatus, as well as the expansion in the volume of expenditures provided by the state to non-productive sectors, and the increase in the number of employees in state agencies in most developing countries in a way that exceeds the size of the basic work structures. Most of these countries have committed to hiring new graduates in order to eliminate Unemployment, but without returning to the actual need for them, which caused stagnation in the number of employees and exhausted the general budget due to the increasing volume of public spending of the state (Zaki, 1992: 44).

3- Financial reasons

The development that occurred in public spending from the traditional concept to the contemporary concept is one of the most important reasons that worked to increase spending. The importance of this development appeared in order to direct economic activities to achieve high levels of income and employment, especially in times of economic crises, and to provide facilities for issuing public loans, which made it one of the most important sources. Financing public expenditures, that is, these loans gave the state an opportunity to fill the deficit in its budget due to insufficient taxes to carry it out. The

expansion of this demand has become an obstacle to economic development, because it increases the financial burdens of the state and also exhausts a large part of it .

The second requirement : The theoretical framework For crude oil prices-:

First: The concept of the price of crude oil

It is expressed in terms of monetary value at a specific time and place, and is usually expressed in US units of measurement (dollars). The relationship between the price of oil and the monetary value of a barrel of oil is not fixed or equal, but rather is affected by different factors and the specificity that the commodity (oil) possesses, and in addition to that, they are affected by the interaction between global forces of supply and demand (Nima, 2015: 21).

Second: Factors affecting oil prices

The international oil market depends mainly on the demand and supply sides and the balance between them in addition to the global stock of crude oil, because the major countries do not possess new oil reserves that can be exploited in the future (Al-Janabi, 2015: 8) and there are other factors that control the mechanism of oil prices in global markets in the long term. And the immediate ones, including climatic, security, and financial factors that affect the global supply and demand for oil and thus prices (Helou, 2018: 11). There are many factors affecting the determination of global oil prices, varying in the strength of their influence, which can be explained as follows:

1- Economic factors:

•Change in the value of the currency: The US dollar is considered the base currency for oil prices. This relationship is due to historical, political and economic factors. Any change that occurs in the exchange rate of the US dollar will directly affect the value and prices of global oil as well as oil revenues in the international market, and this change leads to major economic damage. It falls largely on oil-producing and consuming countries, and the only beneficiary of the exchange rate change is the United States of America.

•Speculation: These speculations arise in the oil markets between the two parties, producers and consumers, and speculators work to change prices downward or upward in order to reap profits, which may make supply greater than demand, leading to chaos in international oil markets.

•The cost of oil production: It is the main factor in influencing oil prices in the global market. If we compare the production cost ratios between Canada and America with the production cost ratios in the Middle East, if we find that the production and extraction cost ratios in America are more than the cost ratios in the Middle East . This leads to higher costs of administration, transportation, and taxes. (Al-Khafaji, 2017: 27).

•The nature of oil markets: There are many opinions about the nature of oil markets in terms of the direction of prices and settlement at the marginal cost of oil production in the long term in a perfectly competitive market. The limited number of producers and the lack of sufficient information about the stages of the oil industry, and the restrictions imposed on entry or exit from The industry confirms that the conditions of perfect competition are not applied, in addition to the fact that oil pricing is subject to purely monopolistic elements. OPEC enjoys a high monopoly position that helps it determine prices and the quantity of production with complete freedom in order to achieve for itself and its members the highest possible return from oil revenues.

•The global supply of oil: depends on the proven reserves of the producing countries and the extent of their development, in addition to the discovery of many new oil reserves in these countries, and in addition to the available production and export capacity and its development, the increase of these

explorations above the specified limit or their disruption will directly affect the quantity supplied of oil. Oil and thus the level of oil prices. On the other hand, the rise in oil prices generates an economic incentive to exploit oil fields located outside the regions of oil-producing countries at a relatively expensive cost, as happened in the late seventies and early eighties of the last century. This forced OPEC to reduce the volume of production to support Prices The oil peak that oil experts expected to reach also played a prominent role in the rise in prices in the oil market. (Al-Jubouri, 2019: 10).

•Global demand for oil: depends on global economic growth and population growth, so the expansion of the global oil industry that depends on oil energy is considered the main factor in the rise or fall of prices in the global oil market, as happened in the crisis in mid-2008, which led to a rise in prices and had a significant impact. Negative impact on the global economy, which led to a decline in global demand for oil (Faraj, 2015: 43).

2- Natural factors: Natural disasters related to climatic factors have a clear impact on oil prices, such as hurricanes that occur in the United States, Katrina, Mexico, and other countries, as they create negative effects on the oil facility located in these countries, which affects the oil supply and this is reflected in the oil supply . High prices and low production (Sumaya, 2010: 85).

3- Political factors: This factor is considered to have the greatest impact on the movement of prices in international oil markets. Internal disturbances and conflicts in the extraction and refining areas affect the movement of these products and their delivery to consumers, which negatively affects prices, in addition to the external political escalation between countries, such as economic sanctions imposed on some. countries, as well as the economic crisis in mid-2008, which had a clear impact on global oil prices, and from this perspective, instability became one of the most important features affecting global oil markets (Al-Sudairi, 2014: 51).

4- Other factors: are the policies adopted by the governments of oil-producing or consuming countries, as they play an important role in influencing oil prices in international markets, in addition to the policies followed by major companies that still control the bulk of oil trade outside the oil-producing countries (sweet , 2018: 12).

The third requirement: The relationship between crude oil prices and the general budget deficit

Oil is of strategic importance to the economy in general in most countries, especially the oil-producing countries, as it contributes to the formation of the gross domestic product, national income, the state's total public exports, the general budget and all economic development programs. It also contributes in the oil-producing countries to building their cash reserves because the returns Oil is derived from foreign currencies and is considered a primary source of financing the general budget. Fluctuations in crude oil prices directly affect both sides of the general budget, public revenues and public expenditures. Countries that rely heavily on crude oil prices are more exposed to economic fluctuations and general budget deficits (Raima, 2015: 97).

•Public revenues: They are considered one of the most important economic indicators that show the economic situation of the country and the state of the general budget, surplus or deficit. They are closely related to the size of oil revenues and are characterized by large fluctuations due to fluctuations in crude oil prices resulting from global financial crises. The oil-producing countries are considered the primary beneficiaries of a major oil boom. Large foreign exchange income was generated, which contributed to the improvement of economic activities to support the general budget, and vice versa, if global oil prices were exposed to a decline, it would negatively affect economic activities and lead to a general budget deficit (Seham, 2018: 119).

•Public expenditures: They have many economic effects and characteristics, as they affect production and consumption, and in addition to the distribution of income and savings, they depend primarily on oil revenues, and the continuous decline in crude oil prices led to a decline in oil revenues and financial surpluses, which led to a decrease in public spending. In these countries. That is, public expenditures decrease as a result of a decline in the rate of public revenues, which depend largely on global oil prices and the factors affecting them. The decline in the rate of public spending led to a deficit in most of the public budgets of oil-producing countries, because the decline in the rate of oil revenues affected the state's investment and development expenditures, while Current expenditures were not affected by this decrease, which is the main reason for the budget deficit (Nima, 2015: 23) .

•Gross Domestic Product: The oil sector constitutes a large part in the formation of the gross domestic product of the oil-producing countries, as it affects most of the productive economic sectors and contributes to the formation of the gross domestic product of these countries. Any change in the prices of this sector affects the output and leads to a deficit in the state's general budget (Allawi , 2019: 8).

The second topic

Analysis of the reality of the budget deficit and oil prices in Iraq

Macroeconomics is one of the branches of economics that specializes in studying the economic phenomena represented by the continuous rise in the general price level, that is, inflation, the economic growth rate, and the gross domestic product, in addition to other variables. Macroeconomic policies work to create an appropriate economic environment to achieve general economic stability and growth. Which reduces unemployment rates by creating sufficient job opportunities, raises the level of the country's wealth and improves the standard of living for individuals. Overall economic stability is a necessary condition for achieving development and growth, as advanced macroeconomic policies must be followed within a coordination framework, so that both policies Financial, monetary and exchange rate policies for the local currency, and management of the capital account represented by the balance of payments are harmonious with each other, to address imbalances in the structure .

Table No. (1)

The impact of global oil prices on the general budget deficit in Iraq for the period (2004-2020) billion dinars

General budget deficit (6)	Global oil prices dollar (1)	the years
865	36.05	2004
9671	50.64	2005
10248	61.08	2006
15568	69.08	2007
20848	94.45	2008
2642	61.06	2009
-613	77.46	2010
21241	107.46	2011
14326	109.45	2012
-5360	105.85	2013
-8086	96.29	2014
-3927	49.47	2015
-12658	36.09	2016
1845	49.31	2017
25696	69.78	2018
-4156	64.04	2019
-12882	41.47	2020

Source:

-Central Bank of Iraq - Department of Statistics and Research - Annual Statistical Bulletin for various years.
-Ministry of Planning, Central Bureau of Statistics - National Accounts, various years.

The development of the Iraqi economy has become dependent on the oil revenues that generate imports for the country, which control 95% of the total volume of exports. These revenues are linked to oil prices in the global market, and the improvement of the monetary value of the dollar, which is considered the currency of payment for these revenues, so the heavy reliance on these revenues. It had negative effects that were evident in a deep imbalance between monetary and economic indicators and a distortion in the trade balance, as its effect is not limited to a decline in growth rates only, but also affects the currency of this country, which has made the country's economy more vulnerable to the fluctuations that occur in global oil prices.

We note from the data available to us in Table (1) that in the years between 2004 and 2008, the demand for oil in the world increased significantly after the high growth rates in India and China, but OPEC was unable to supply this huge amount of demand, which led to a sequential rise. And the global oil prices are regular, but speculation intensified in 2008 on oil prices, which led to them reaching (94.45). After this year, speculation diminished and oil demand decreased at the end of 2008, which is considered the beginning of the global financial crisis that occurred as a result of the fall of the major American banks and the collapse of companies. Mortgage, and this decline continued until 2009, i.e. by (61.06). After this year, prices began to gradually recover until they reached (77.46) in 2010 after the decision was taken by OPEC at the historic Oran meeting in Algeria, which included making a collective reduction in the amount of oil . As a result of this decision, 4.2 million barrels were withdrawn from the markets. Oil prices rose again in 2011, resulting from the worsening political turmoil that the Arab countries witnessed in the wake of the Arab Spring, including Iraq, Syria, and Libya, and continued the upward trend until they reached their highest rate in 2011. 2012 by (109.45). We see behind this increase the ban imposed by the United States and the European Union on Iranian oil exports, which caused about one million barrels per day of its oil to be removed from the market. After this year, it began to gradually decline until it reached (49.47) in 2015, he explained. The International Monetary Fund caused this decline since 2014 due to two shocks to the Iraqi economy. The first shock occurred on June 10, 2014, after terrorist groups entered the city of Mosul and many other areas. The second shock is considered external: the collapse of oil prices, which began to show the repercussions of this crisis in the year 2016. -2017. There was joint management of this crisis by the Central Bank, the Ministry of Public Finance of the State, and the International Monetary Fund. Oil prices recovered in 2018 and 2019 and relapsed again in 2020 until they reached (41.47) due to the global health crisis (Corona pandemic). Which caused the disruption of many economic resources around the world. Since Iraq depends entirely on crude oil exports to obtain revenues from the foreign currency (the dollar), the instability in oil prices will affect the Iraqi economy. This reason is attributed to the large correlation between oil revenues and foreign reserves in Iraq. The decline in these revenues It directly affects foreign reserves.

The first topic

The first section: measuring the impact of oil price fluctuations on the budget deficit

The first requirement : Description of the standard model and the nature of the relationship between its variables.

This study used a set of variables in accordance with the reality of the Iraqi economy and the year-after-year policies implemented after 2003, and to demonstrate the impact of oil price fluctuations on the budget deficit , a model that expresses the pattern of this relationship must be described and formulated, which can be considered one of the most difficult stages of quantitative research, through An accurate description of the variables included in the model , in addition to identifying the main variables, using econometric methods (Econometrics) , which is the main tool for giving economic theory its applied aspect, which helps to test statistical and measurement hypotheses in a way that brings them closer to reality so that they are more logical , through testing the stability of the extended Dickey-Fuller and Phillips-Perron time series (Phillips-Peron) and an autoregressive distributed lag model was used . (ARDL(

In estimating the model parameters, we relied on variable data from different issues of the annual statistical bulletin (the Central Bureau of Statistics , the Public Debt Department in the Ministry of Finance, the Budget Department in the Ministry of Finance, with 68 views ranging from 2004Q1 2020Q4 using the statistical program 1 2 Eviews.

Table No. (2)

Standard model variables

Variable symbol	Variable name in Arabic	Variable type
Y	Budget deficit	continued
X1	Crude oil price	independent

.Source: Table prepared by the researcher based on the model description

The study variables can be explained as follows:

Dependent variable: Public budget deficit (Y): It is defined as: “It is an economic phenomenon that has received great attention at the level of countries around the world. It occurs as a result of the discrepancy in the growth rate between public expenditures and public revenues, that is, the volume of the state’s public spending exceeds the public revenues obtained definitively from the amount of exports.” Belhaoui, 2021: 267).

Independent variables :

The price of crude oil (X1) is defined as the monetary value of a barrel of crude oil, which is expressed in US dollars. It is an economic indicator that has a strong impact on most economic sectors, especially in oil-producing countries whose economies depend on crude oil, such as Iraq and other countries (Hussein, 2018: 90).

second requirement : unit root test.

Augmented Dickey - Fuller test

We can infer through the (ADF) test if the included variables do not have the characteristic of stability and suffer from a unit root, and then here we accept the null hypothesis (H 0 = 0) and reject the alternative hypothesis. However, if the variables do not suffer from a unit root and have the characteristic Stability. Here we will accept the alternative hypothesis (H 1 = 1) and reject the null hypothesis.

Table No. (3)

Extended Dickey-Fuller (ADF) test for study variables

Variables	the level			The first difference		
	FAD	Sig.	the condition	ADF	Sig.	the condition
Y	- 2.6790 _	0.022	Intercept	-2.179	0.0493	None
X1	- 2.2585 _	0.003	Intercept	-8.939	0.00 21	Intercept

Source: Table prepared by the researcher using (12 Eviews program.

It is clear from Table (3) the results of the Extended Dickey-Fuller (ADF) test that the study variables stabilized at level (Level) and the first difference is (1) I as in Table (2).

third requirement : descriptive statistics, variables and the correlation between them.

First: Descriptive statistics for the study variables:

We note in Table (4) the descriptive statistics for the study variables (oil prices) as an independent variable and the indicator (budget deficit) as the dependent variable used in this study during the period 2004-2020. The data was divided into quarterly and converted to logarithmic form, so the number of observations is 68. For each of the variables mentioned.

Table No. (4)

features Statistics Descriptive For study variables

	Average	highest value	Lowest value	standard deviation	Views
Y	4389986	25696645	-1.3 887 07	11848201	68
X1	68.70282	111.1546	35.85032	23.21997	68

Source: Table prepared by the researcher using (10 Eviews) program

.

The table shows the most important statistical indicators for the variables in the study sample, where the general budget deficit (Y) recorded the highest value of (Y) . (25696645) and the lowest value was (-1.388707) and its average was (4389986) and a standard deviation , It reached (11848201). As for crude oil prices (X1) , the highest value was recorded at (11848201). (111.1546, the lowest value was (1181.650), the average value was (68.70282) , and the standard deviation was (23.21997)

Second: the correlation matrix between the variables.

Table No. (5) Correlation matrix between model variables

Covariance Analysis: Ordinary		
Correlation		
Probability	Y	X1
Y	1.000000	

X1	-0.383880	1.000000
	0.0016	-----

Source: Table prepared by the researcher using (12 Eviews) program.

We note from Table (5) that the macroeconomic indicators (X1) are negatively and strongly related to the general budget deficit indicator (Y), where the value of the correlation coefficient between the dependent variable and the independent variables reached (-0.383880) (in order, with a probability level of less than 5%.

The third requirement: measuring the impact of some macroeconomic variables.

Model integrity test:

Testing the soundness of the model is considered one of the important tests that demonstrate the soundness of the model used. From Table (6), it is clear that the model is free of the problem of spurious regression because the value of the Durbin -Watson stat is greater than the value of the coefficient of determination (R-squared).

Table No. (6)
Integrity of the ARDL model

Dependent Variable: LOGY			
Method: ARDL			
R-squared	**0.994008**	**Mean dependent var**	**16.44262**
Adjusted R-squared	**0.989515**	**SD dependent var**	**0.530262**
F-statistic	**221.1981**	**Durbin-Watson stat**	**2.187195**
Prob(F-statistic)	**0.000000**		
***Note: p-values and any subsequent tests do not account for the model selection.**			

Source: Prepared by the researcher using the program (1 2 Eviews)

The table above shows that the probability of an error was (0.000000) and indicates that all results will be real and not fake. It is also clear from the results that 98% of the changes occurring in the budget deficit were the result of changes occurring in macroeconomic variables, by relying on the value of the coefficient of determination, which It reached 98%, and the Durbin-Watson value reaching 2.187195 indicates that there is no problem of serial autocorrelation, and this will be confirmed by the autocorrelation test in the same study.

Bound Test:

The co-integration test initially shows us the existence of the long-term relationship between the dependent variable and the independent variable. The presence of co-integration between the variables is considered a necessary condition for the long-term relationship, but it is not a sufficient condition, as the coefficient of determination with its conditions is considered a sufficient condition, and in order for there to be a long-term relationship, there must be The necessary condition and the sufficient condition are met, and Table (7) shows the cointegration test as follows:

Table No. (7)
Bounds test results Bound Test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	52.81121	10%	1.99	2.94
K	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	3.99

Source: Table prepared by the researcher using (12 Eviews) program.

It is clear from Table (7) the results of the Bound Test for co-integration between the study variables if the calculated F-statistic value reaches (52.81121), which is greater than the maximum tabular value at a significance level (5%), which means rejecting the null hypothesis and accepting the hypothesis. Alternatively, this means the existence of a cointegration relationship between some variables, meaning that the first condition is for the long-term relationship. Therefore, the second condition, represented by the error correction factor, must be verified according to its main conditions.

Short-run relationship and error correction factor:

The short-term relationship between the dependent variable and the independent variable is clarified, that is, measuring the effect of the independent variables on the dependent variable, and this is what Table No. (8) shows.

Table No. (8)
The relationship is short-term according to ARDL

ARDL Long Run Form and Bounds Test				
Dependent Variable: D(LOGY)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-27.17297	17.92177	-1.516199	0.1490
LOGY(-1)*	-0.500505	0.109014	4.591184	0.0003
LOGX1	-3.366621	1.631106	2.064011	0.0055

Source: Table prepared by the researcher using the program (1 2 Eviews).

The results of the short-term relationship showed the following- :

The results of the table above showed that there is an inverse relationship between the price of crude oil (X1) and the general budget deficit (Y), that is, when the price of crude oil (X1) increases by one unit, this leads to a decrease in the general budget deficit (Y) by (3.3) units, with all other factors remaining. This is consistent with the logic of economic theory, due to the budget being very dependent on oil.

The results showed the value of the error correction factor ECM = (-0.500505) It is negative and probable at a lower probability level (0.50). This result fulfills the necessary and sufficient condition for the long-term relationship between the variables, and that the short-term imbalance in the previous year (t-) is corrected during (2%) of the current year (t-1).

Long term relationship**.**

Table No. (9)(
Long-term relationship according to ARDL

LevelsEquation				
Case 2: Restricted Constant and No Trend				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
LOGX1	**-6.726455**	**3.505704**	**-1.918717**	**0.0070**

Source: Table prepared by the researcher using (12 Eviews) program.

The results of the short-term relationship showed the following : -

The results of the table above showed that there is an inverse relationship between the price of crude oil (X1) and the general budget deficit (Y), that is, when the price of crude oil (X1) increases by one unit, it leads to a decrease in the general budget deficit (Y) by (6.7) units, with all other factors remaining. Constant, and this is consistent with the logic of economic theory, due to the budget being very heavily dependent on oil. We also note that in the long period, the effect is greater .

Model quality tests: There are many tests that determine the quality of the model, a group of which will be used as follows:

Test for normal distribution of residuals:

To demonstrate the fact that the estimated model is normally distributed or not, the Jarque-Bera test was used. Figure (1) shows us the results of the test for the normal distribution problem, as we notice that the probability reached (3711920 Prob=) greater than (5%), which supports accepting The hypothesis that states that the residuals are normally distributed.

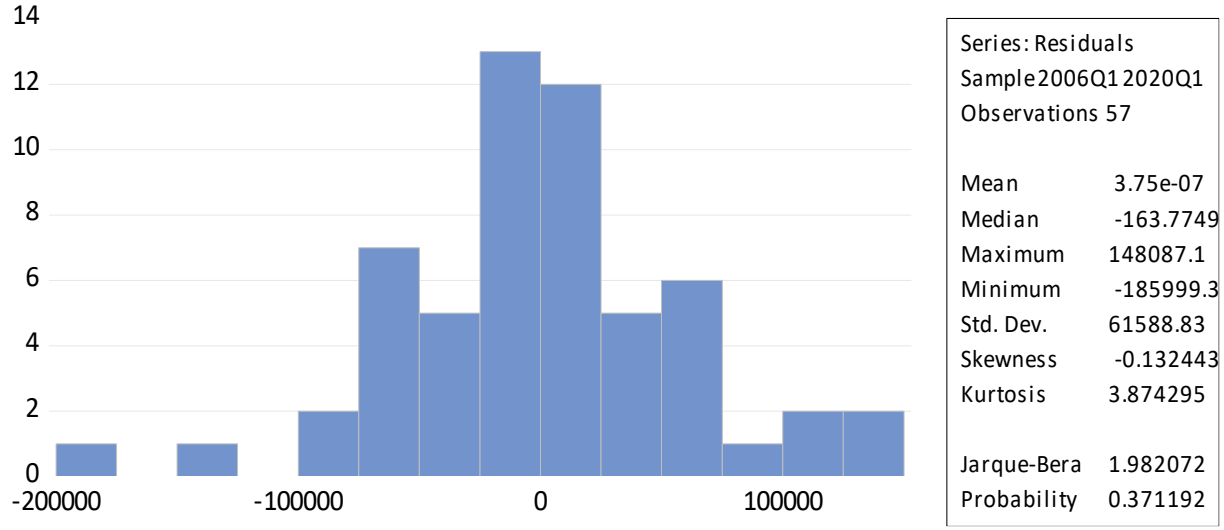

Figure (1)

Results of testing the normal distribution problem

Source: Figure prepared by the researcher based on the outputs of the Eviews.12 program.

Autocorrelation test:

To ensure the extent to which the estimated model is free from the problem of autocorrelation of the residuals, a Serial Correlation LM Test LM , the results of which are listed in Table (10), which confirmed that the model is free of the autocorrelation problem, if the Chi- Square probability exceeds (0.05), reaching (0.98765), as follows:

Table (10)

Serial Correlation LM Test LM for autocorrelation

Breusch-Godfrey Serial Correlation LM Test:			
Null hypothesis: No serial correlation at up to 2 lags			
F-statistic	**31.88215**	**Prob. F(2, 25)**	**0.98765 _**
Obs *R-squared	**40.94625**	**Prob. Chi-Square(2)**	**0.89867 _**

Source: Table: Prepared by the researcher based on the outputs of the Eviews.12 program.

The problem of homogeneity of variance stability: To verify the extent to which the estimated model is free from the problem of variance of the error term, an ARCH test was used , the results of which are listed in Table No. (11), which confirmed that the model is free of the problem of variance of the random error term, as the probability exceeded chi . Square (0.05), reaching (0.5146), as shown below :

Table No. (11)

the ARCH error term

Heteroskedasticity Test: ARCH			
F-statistic	**4.587628**	**Prob. F(2,52)**	**0.5 146 _**
Obs *R-squared	**8.249072**	**Prob. Chi-Square(2)**	**0.5 162 _**

Table: Prepared by the researcher based on the outputs of the Eviews program.12

.**Conclusions-:**

1- The results of the unit root tests (Extended Dickey-Fuller (ADF) showed that some of the study variables stabilized at Level) and others stabilized at the first difference (1.)

2- It showed that macroeconomic indicators (X1 , It is negatively and strongly associated with the general budget deficit index (Y), as the value of the correlation coefficient between the dependent variable and the independent variable reached (-0.383880) with a probability level of less than 5%

3- Bound Test for cointegration between the variables of the study revealed the existence of a cointegration relationship between some variables.

4- The results of the short-term relationship showed that there is an inverse relationship between the price of crude oil (X1) and the general budget deficit (Y), that is, when the price of crude oil (X1) increases by one unit, it leads to a decrease in the general budget deficit (Y) by (3.3) units, with all factors remaining. The other is fixed, and this is consistent with the logic of economic theory, because the budget depends very heavily on oil.

5- As for the long-term relationship, the results showed that there is an inverse relationship between the price of crude oil (X1) and the general budget deficit (Y), that is, when the price of crude oil (X1) increases by one unit, this leads to a decrease in the general budget deficit (Y) by (6.7) units. With other factors remaining constant, this is consistent with the logic of economic theory, due to the budget being very heavily dependent on oil. We also note that in the long period, the effect is greater.

Recommendations

1- The need for the state and the competent authorities to focus in preparing the budget on all economic variables related to its budget, by comparing the budget for several years in order to know the factors and variables affecting it and pay attention to them in order to raise the level of its revenues.

2- Establish multiple financing sources for public revenues other than the oil sector, work to expand the state's sovereign resources, and build a strong foundation capable of raising the efficiency of tax systems, taking into account the scope of tax collection and achieving the principle of social justice when imposing them.

3- Exploiting the economic surplus achieved in certain years by investing in sovereign wealth funds and other productive investments because of their impact in providing an additional source of income to support the general budget

4- -Determining the value of the exchange rate in foreign currencies by following an economic policy with effective goals in achieving economic stability, addressing the deficit in the balance of payments, and supporting the Iraqi dinar to stabilize at its real price, which reflects its actual value.

5- It is necessary to link the amount of government spending in the general budget to the growth rate of the gross domestic product, because the amount of spending in excess of the budget capacity directly affects the size of the money supply by issuing additional currency to finance those expenditures, which affects the money supply on the budget deficit.

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