THE IMPACT OF NON-OIL PUBLIC REVENUES ON NON-OIL GDP IN IRAQ FOR PERIOD (2004-2021)

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Abstract

The countries of the world, as a result of their long experiences in managing their macroeconomic , have realized that in order to advance the joints of the national economy and develop their domestic product, and then increase the rates of economic growth, this is achieved by expanding the variety of public revenues, whether through developing their traditional revenue sources or by finding new ones. To clarify the foregoing, the research went to the analysis of non-oil revenues and the statement of their impact on the gross domestic product in Iraq for the period (2004-2021). The research has reached conclusions of great importance in this regard, represented in proving the hypothesis from which the research was launched, which indicates the weakness of the impact of non-oil public revenues (taxes and loans) in Iraq on the non-oil gross domestic product during the aforementioned period. This indicates a low contribution of the non-oil productive sectors (agriculture, industry) in the formation of the gross domestic product, and this is due to many reasons, including: the weakness of the productive base of the productive sectors of the Iraqi economy, the dependence of these sectors on traditional production methods, as well as the dependence of the Iraqi economy on its development significantly on oil revenues.

Keywords: non-oil public revenues, non-oil GDP

THE INTRODUCTION

Fiscal policy is concerned with managing public revenues and using them to achieve goals stemming from the state's economic, political and social philosophy. Fiscal policy usually performs three functions, namely: improving economic efficiency through reallocating resources, redistributing wealth and income, and achieving gross domestic product (GDP) growth. A major dilemma for most economies, as it is no longer sufficient to achieve a high growth rate, but rather how to maintain and sustain the growth rate in the future, and the sources of public revenues vary at the present time, whether in developing or developed countries, as we find that these sources include taxes, fees, and revenues Domain, public borrowing and financing, and in Iraq, in addition to public revenues, excessive dependence on oil undermined the chances of stabilizing fiscal policy, especially with weak government efforts to maximize and diversify non-oil revenues, and oil's acquisition of more than 90% of the state's total revenues.

First: the importance of research

The importance of the research stems from the importance of the variables of the study and the nature and direction of the relationship between them. Achieving growth in the non-oil GDP is one of the important topics, because of its role in achieving the goals of economic policy, the effectiveness and efficiency of the national economy, the redistribution of income, and its ability to achieve economic stability in Iraq .

Second: the research problem

 The Iraqi economy has long suffered from an imbalance in the structure of output resulting from focusing on one sector in a large way, which is the oil sector, which reflects the rentier nature of the economy, and the resulting concentration of public budget revenues mainly on oil, so the deficit in the state's general budget is One of the structural imbalances suffered by the economies of developing countries in general and Iraq in particular, and based on the above, the research problem can be formulated with the following question:

What is the impact of non-oil public revenues on non-oil GDP in Iraq during the research period?

Third: Research objectives

The objectives of the study focus on:

1- Analyzing and measuring the relationship between non-oil public revenues and non-oil GDP in the Iraqi economy for the period (2004-2021).

2- Analyzing and explaining the relative importance of the economic sectors in the non-oil GDP, with reference to the structural imbalances in the structure of the Iraqi economy.

Fourth: Research hypothesis

The study starts from the hypothesis that the disruption of the production structure through dependence on the oil sector makes the economy vulnerable to shocks and their impact on reducing the state's public revenues and thus increasing the public budget deficit.

Fifth: Research limits

Temporal limits: A time series was adopted from the Iraqi economy that extended from 2004 to 2021, based on quarterly data.

Spatial boundaries of the Iraqi economy

Sixth: research methodology

The deductive approach: through the formation of models and hypotheses based on a set of well-known facts using logical analysis. As shown in the theoretical side of the research.

The inductive approach: The inductive approach was used in the applied side of the research through the use of actual data as a basis for generalization, and the research models were reached using statistical and economic measurement methods through the employment of modern quantitative methods represented by the eviews 12 program.

The first topic: public revenues, gross domestic product, a theoretical and conceptual framework

The first requirement: defining public revenues and their divisions

Public revenues are a major tool of economic and social guidance, and there are many channels of public revenues and their methods and nature differ according to the type and purpose of the public service performed by the state. This multiplicity has opened the door wide for financial thinking to divide public revenues on the basis of distinguishing between their different types into different sections, so that each of them includes resources that are similar in nature or characteristics. One of them is dividing it into resources that the state obtains forcibly from individuals, such as taxes and fines, And others obtained by virtue of a contract, as is the case in the revenues of the industrial and commercial (domain) and resources that the state obtains free of charge, such as subsidies and grants that are paid in its interest, or it may resort to loans or new cash issuance in the event of increasing needs and lack of financial resources (Al-Sheikh 195 :2018), and thus public revenues are defined as "all amounts that are collected by the government during a certain period of time, whether they are revenues from taxes, fees, grants, or loans" (Al-Janabi 40 :1990:), It is necessary to pay attention to the issue of diversifying public revenue sources, diversifying exports, and not relying on a single economic resource in order to achieve sustainable development that has the elements of survival and continuous development" (Mahboob 78:2019), in other words, reducing dependence on one sector and creating new exports and different sources of revenue other than the sources The well-known traditionalism and abandoning the leading role of the public sector and strengthening the role of the private sector in all economic sectors in order to ensure permanent and stable revenues (United Nations, UNESCO 2018: 473).

The second requirement: the historical development of public revenues according to economic schools

First: the classical school

The role of public finance in classical thought is limited to the financial purpose only, and in its narrowest limits, i.e. obtaining public revenues to cover public expenditures. On the one hand, public expenditures should not exceed a narrow, limited range, which comes mainly from the traditional functions of the state represented in security, judiciary, and external defense (Gregory, Stewart 104-106: 1999). Traditional financial thinking in terms of public revenues focuses mainly on

taxes and that It is imposed in the narrowest limits so that its aim is financial only, which is to provide the public treasury with the resources necessary to cover public expenditures, and that it does not have any impact on production, prices, consumption and distribution.

Second: the Keynesian school

Classical ideas prevailed until the Great Depression in 1929 (Salama 124:2015). Unemployment was widespread, and then economic ideas tended to the need for state intervention to prevent the collapse of the capitalist system itself, which paved the way for the emergence of ideas advocated by the English economist John Maynard Keynes, Which was mentioned in his book (The General Theory of Employment, Interest and Money) in 1936, which calls for allowing state intervention in economic life to achieve full employment by influencing the components of effective aggregate demand, and achieving economic balance at a high level of employment. This means that the state has resorted to a lot of resources to cover the increasing public expenditures such as taxes, fees, internal and external loans, and the new monetary issue.

Third: The Monetary School (Chicago School)

With the beginning of the seventies of the last century, the world faced a crisis of stagflation, which Keynesian ideas based on fiscal policy and its main tools could not address, which necessitated the search for new solutions capable of dealing with this crisis (Jess Benhabib 2015: 179.) in In this framework came the ideas of the monetaryists (the Chicago School), who believe in the importance of monetary policy, and that it is the most effective in facing the problem that Keynesian analysis could not explain, so the owners of the Chicago School, led by Friedman, opposed any interventionist measures through fiscal policy (Siegel 478: 1986) And that the use of this policy will lead to crowding out the private sector, which is called the effect of crowding out.

## Fourth: The School of Rational Expectations

The owners of the theory of rational expectations, or what is called rational expectations, see that the behavior of economic units is determined by the natural pursuit of maximizing benefits to the maximum extent possible and minimizing losses to the lowest possible limits (Guartini 154:1999). If individuals expect that the government will change its fiscal policy and reduce taxes As a measure to stimulate consumer demand, it is natural that rational expectations for this measure will lead to a deficit in the public budget, and this deficit must be covered by borrowing now and raising taxes in the future to cover the debt. Thus, the expansionary fiscal policy will be useless in order for the expectations to be correct and realistic regarding economic changes. The owners of the school of rational expectations set conditions, including (Guesnerie 257: 2002) The need for the government's role to be reduced in the financial aspect, and the existence of a stable and clear fiscal policy to treat economic problems (Abdel Raouf 87: 2010)

Fifth: The school of supply-side economists

The supply-side economics school appeared in the seventies, and supply-side economics theorists called for stimulating economic growth by reducing the tax burden. This school focused on the supply side, as the main of the economy, especially through reducing taxes and limiting state interference in the field of setting wages and prices in order to continue the functioning of the free market mechanism. They view taxes as one of the most important causes of low income and high unemployment rates, and they are in that They are based on Arthur Laver's study of the relationship between income and tax rates, as Laver believes that the state's tax revenue increases whenever the tax rate decreases to a certain extent. While there is no tax revenue at rates (0%, 100) of income, and between these two rates, the tax revenue curve takes the shape of an inverted letter U (which is known as the laffer curve), as shown in Figure (1).

Figure (1)
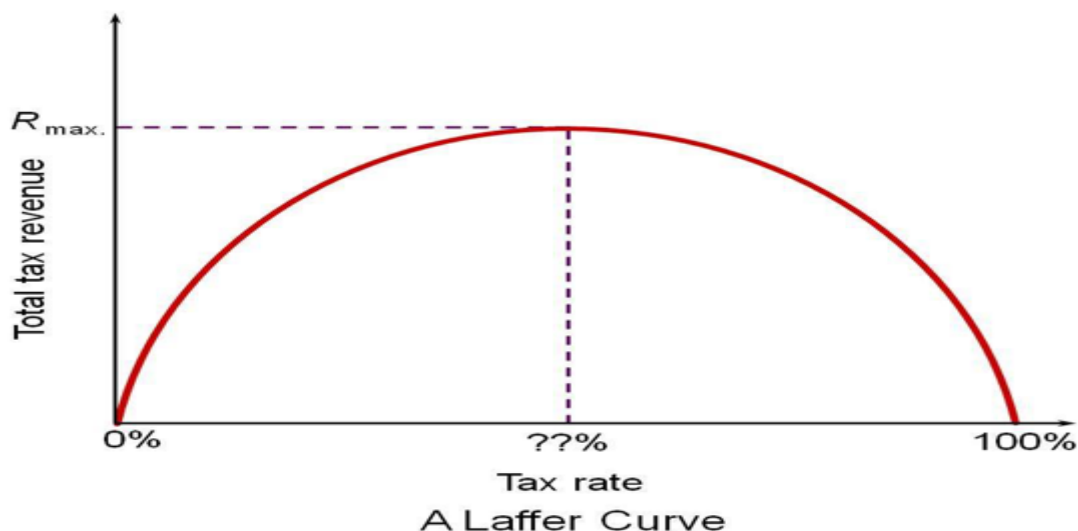
Source: Tim Walshaw, The Laffer Curve, Cambridge university, 2021, p29.

The third requirement: Gross Domestic Product, its definition, importance and indicators
Gross Domestic Product is an economic indicator that measures the monetary value of the total goods and services produced within the borders of the country during a specific period of time (a year or half a year, for example). Gross Domestic Product measures the total values of market goods and services, in addition to some non-market service products that governments provide for free. Such as education, health, security and defense, which were produced within the boundaries of a specific geographical area during a specific period of time.
GDP data, in particular the GDP growth rate, is used to determine the policies to be applied, and investors follow up the GDP growth rates to determine the appropriate countries for investment (United Nations94:2022) The GDP enables financial policy makers and central banks to Judging whether the economy is in recession or expansion.
There are a number of economic indicators that are calculated from the GDP data, the most important of which are, for example, the economic growth rate and the average per capita GDP. The economic growth rate is calculated using the following formula:
GDP growth rate for the current year = ((GDP in prices for the current year – GDP for the previous year) / GDP for the previous year)) x 100.
As for the per capita GDP, it measures the average standard of living in a country by distributing the national economic value to the size of the population. By dividing the gross domestic product by the population, that is, it is the average annual per capita income (Arab Monetary Fund 19:2021). GDP data is used as the main economic indicator of economic growth.
The fourth requirement: the theoretical relationship between public revenues and gross domestic product
Public revenues are one of the most important financial tools, and they mean the total income that the state receives from various sources in order to cover its public expenditures and achieve economic and social stability. The expenditure of public revenues has expansionary effects that can compensate for the contraction that occurs, because of the ability of these revenues to create strength new purchasing. As the aggregate demand increases as a result of adding the government's demand for goods and services to the demand of individuals, if the economic activity is at the level of full employment, the effect of spending the proceeds of public revenues is usually inflationary due to the increase in aggregate demand that exceeds the increase in output. However, if the economy is below the levels of full employment, then the increase in aggregate demand enhances the growth of the gross domestic product in the country (Al-Ani 433:2018), and if the amounts of public revenues are spent to increase investment, this results in an increase in the level of

economic activity, which in turn depends on the level of employment. And on the degree of flexibility of the productive apparatus, if the national economy is at a level less than full employment and the productive apparatus is flexible, then spending is required. But if the state spends the proceeds of public revenues to import consumer goods without resulting in any increase in the productive capacity of the state, or if the national economy is at a level Full employment and if the productive apparatus is low-flexibility, spending generates inflationary waves in the economy.

The second topic: analysis of non-oil public revenues and non-oil GDP in Iraq for the period 2004-2021

The oil sector contributes to the largest percentage in financing the state's public budget and is considered the main resource for it. However, non-oil financial revenues will be analyzed, which Iraq seeks to develop and diversify continuously.

Table (1) shows the volume of non-oil financial revenues, which we find increasing annually, albeit at a different rate. In 2005, the annual growth rate reached 149.4%, which is a very large growth rate that shows the extent of the government's determination to develop and diversify the economic reality in Iraq. The government also seeks to reduce Dependence on crude oil because of its future harms and being a depleted resource that cannot be relied upon permanently (Al-Anbaki 179-180:2008), This annual rise and growth has been preserved in most of the study years, since its impact is related to the public economic policy of the state and global changes, as the growth rate was 38.2% in 2007, and revenues continued to grow in 2008 to 44%, while the growth rate decreased to 16.3% in 2009 as a result Due to the impact of the global financial crisis on all the economies of the countries of the world, including Iraq, and after the improvement of the economic situation and the adaptation of the Iraqi economy to encourage and develop the realization of non-oil revenues, it rose to 211.3% in 2011, but we notice a decline in 2012 by -29% as a result of the increase in the export of crude oil and the rise in world prices, This led to a decline in the value of non-oil revenues achieved, and that increase was vanished with the rise in the price of the source crude oil (Haddad 111:2007), while we note that the situation continued in 2013 and 2014 with a negative annual growth rate of -42.3% and -43.6% respectively. Respectively, part of it is apparent and part of it is real as a result of the impact of the dual financial crisis represented by the decrease in oil prices, the elimination of terrorist gangs, and the government's delay in diversifying the sources of revenue public for Iraq (Abdel-Rida 10: 2007). The volume of non-oil public revenues has been in continuous fluctuation throughout the years The subsequent is affected by the prices of crude oil in the global markets. The higher the prices, the lower the volume of non-oil revenues, and the lower the oil revenues, this led to a recovery in the value of non-oil financial resources. This is supported by the government's tendency to improve and develop these financial revenues and to take a larger space in the future, which is what Iraq seeks to achieve, and we note this through the low annual growth rates for the years 2014, 2018 and 2021, while corresponding with large growth rates as in 2020, as we do not overlook The growth of non-oil revenues requires approvals and internal procedures, as it is slower in response than the change in the volume of revenues from exporting crude oil abroad.

Table(1)

Non-oil public financial revenues and non-oil output in Iraq for the period 2004-2021

(Billion Iraqi Dinars)

the details year	Importance relative to non-oil GDP	Annual GDP growth rate	Non-oil GDP	Non-oil revenue % growth rate	size Non-oil public revenues taxes, fees,) (others
2004	48	-	101788449	-	395.70
2005	50.7	1.7	103568449	149.4	987.00

2006	48.6	5.6	109368369	121.1	2182.30
2007	50.2	1.9	111455813	38.2	3015.60
2008	46.8	8.2	120626517	44.0	4343.90
2009	33	3.3	124659542	16.3	5053.30
2010	37	6.5	132731012	30.3	6584.00
2011	42.8	7.5	142696722	211.3	20499.00
2012	43	13.9	162587533	-29.0	14546.2
2013	38.1	7.6	174990175	-42.3	8389.10
2014	35.6	0.2	175335399	-43.6	4731.80
2015	36	4.7	183616252	220.3	15157.65
2016	39.6	13.8	208932110	-33.1	10142.17
2017	41.1	-1.8	205130066	20.9	12266.67
2018	48.2	2.6	210532887	-14.4	10506.20
2019	43	0.6	211789774	31.6	13826.11
2020	42.4	-11.2	188112265	143.8	33701.17
2021	43.5	-38.0	116593449	-42.6	19344.50

Source: prepared by the researcher based on the reports of the Ministry of Finance, Iraq,
Department of Statistics, annual reports for different years.

   - Ministry of Finance - Economic Department - Final Accounts Tables

  -The World Bank, data for each country, https://www.albankaldawli.org/ar/home

We also notice from table (1) that the size of the gross domestic product has improved well throughout the period of the study, and it was also subjected to a decline in some years of global crises as an exceptional case, as the output in 2005 achieved a growth rate of 1.7% despite the general conditions experienced by Iraq politically and economically. It also achieved a growth rate of 5.6%, which is an excellent growth rate in light of the economic and social conditions that Iraq went through with the deterioration of the security situation in this particular year and what followed in 2007 (Muhammad 100:2010), as we find that this negatively affected the volume of output The non-oil gross domestic product, after achieving a growth of 1.9%, As for the year 2008 and with the improvement of the security situation in Iraq at the end of the previous year, the non-oil output achieved a large growth rate of 8.2%, which is an excellent percentage that maintained the relative importance of the non-oil GDP at a rate of 46.8%. As for the year 2009 and with the intensification of the signs of the crisis Finance around the world and the reflection of its misguidance on the Iraqi economy, including the non-oil gross domestic product. The growth rate of output declined by a modest rate compared to 2008, as the growth rate reached 3.3%, in 2009, which is a reasonable percentage in light of the surrounding economic conditions during which the economies of the countries of the world declined Significantly, as well as the investment companies retreated from their work around the world and return to their places of origin (Unified Arab Economic Report 59: 2015) As for the year 2010, and with finding solutions since the end of the previous year, the non-oil output increased and recorded a growth rate of 6.5%, which is a percentage that Iraq aspires to achieve in light of the good conditions that surrounded the Iraqi economy, including what is included in the external conditions represented in the improvement of oil prices and investment relations International economic, strengthening international economic cooperation and opening the way for mutual investment between Iraq and the regional and non-

regional countries of the world, In addition to the improvement of the economic situation internally, which encouraged an increase in growth in non-oil output to 7.5% and to 13.9% in 2012, but it declined to 7.6% in 2013 with the surrounding economic conditions in Iraq, and the contribution of non-oil output decreased to 35.6%. He attributed this to the deterioration of the security situation in Iraq, and with the improvement of conditions in the subsequent years, its growth rate increased to 4.7%, and it also achieved a large spurt in annual growth of 13.8% in 2016, and the percentage of the contribution of non-oil output in Iraq rose to 39.6%, which is an excellent percentage except The volume of non-oil GDP declined and achieved a negative growth rate of -1.8%. It achieved a slight growth rate in 2018, while it decreased to 0.6 in 2019, as a result of the emergence of signs of the global health crisis, namely (Covid-19), which led to a tightening of trade operations between countries of the world, which increased in 2020. The volume of non-oil output declined, with a negative growth rate of 11.2. -%, while it declined sharply in 2021 with the continuation of commercial closure procedures and the imposition of strict restrictions in trade exchange, and the increase in the cost of transportation and other requirements, as its annual growth rate reached -38%, while the relative importance of non-oil output in Iraq only reached 43.5% for the year 2021.

The third topic: The theoretical and conceptual framework of the standard model

The first requirement: time series stability tests.

First: Time series

Time series are defined as a set of values for a specific variable arranged according to a time sequence, so that each time period corresponds to a numerical value for the variable. In other words, it is a set of data represented through time arranged in an ascending order" (Sheikhi 197:2011). realistic(Zanboua 13:2016) The time series data are arranged(Monthly, quarterly, annually or over a specific period so that the difference is equal between the different data) (Obaid 395:2017) and the changes that occur on the various variables (internal and external) in the time series are studied through tests of the quiescence of the time series (stability tests) which is the first step in developing co-integration models, because the absence of static or stability leads to the occurrence of what is known as false regression (Gujarati 734:2009).

Second: Root unit tests

The unit root tests not only work to reveal the component of the general trend, but also help to determine the appropriate method to make the series stable, that is, the presence of the unit root means the instability of the chain data, and vice versa, the absence of the unit root means the stability of the time series (Abdullah Al-Qadir11: 2004) Therefore, many tests were developed to detect the problem of the root of the unit, but the most important of them is (Dicky-Fuller test and Philips Perron PP test).

1- Simple Dickey and Fuller test (DF)

This test was developed by Dickey, Fuller in 1979, and this test is based on the hypothesis of the time series generated by the autoregressive process. A test is also conducted based on the following equations (Mayeh Shabib Al-Shammari 2014:43)

Having a constant limit and a general trend et

$\Delta X\_t = \alpha\_0 + \alpha\_1 X\_{(t-1)} + B\_ \ldots \ldots \ldots (1)$

Without fixed term and without general trend

$X_t = \llbracket \alpha \rrbracket \_1 X\, t - 1 + et \ldots \ldots (2)$

Having only a constant limit

$X_t = \alpha_0 + \alpha_1 X_{t-1} + et \ldots \ldots (3)$

The first difference is a coefficient representing :Δ, i.e

$\llbracket = X \rrbracket \_{(t)} \ \llbracket -x \rrbracket \_{(t-1)} \Delta X\_t \ldots \ldots \ldots (4)$

et : random error

It is possible to process the series and test its static at the first and second difference. If the time series is stable, then it is integrated at the "level" or the first difference, but if it is unstable after taking the first difference, then it is integrated of the second degree (Khalaf 82:2015).

2-: Augmented Dickey-Fuller (ADF) test:

Dickey Fuller 1981 developed the simple unit root test in order to get rid of the problem of autocorrelation (Kamel, Fathi 270:2005). The extended Dickey-Fuller test can be explained through the following equation:

$$\Delta Y_t = B1 + B2\, Y_{t-1} + u_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 5$$

An appropriate number of time lags can be added, and this is what distinguishes the (ADF) test from the (DF), so the unit root equation for the (ADF) test becomes as follows (Gujarati 817:op, cit)

$$\Delta Y = B1 + B2t + {}^{\delta}Y_{t-1} + \sum_{i=1}^{m} \alpha i\, \Delta Y_{t-i} + u_t \ldots\ldots\ldots\ldots\ldots 6$$

3- Phillips-Perron test (pp):

This test is one of the important tests that are used to detect and determine the degree of integration and stability of time series, and the formulas used in this test are the same as those used in the simplified Dickey-Fuller test (DF), except for the first formula, as the Phelps-Peron (PP) test performs a process Non-parametric correction in the case of changing autocorrelation and variance. As for Dickie Fuller (DF), the correction process is by adding the limits of differences to the variable on the right of the equation in case of autocorrelation problem, and according to the following formula:

$$\mathbf{S2\ u = T\text{-}1} + \sum_{j=1}^{T} \cup_T^2 + \mathbf{2T\text{-}1}\sum_{j=1}^{l}\sum_{j+1}^{T} \cup_T \cup_{T-j} \ldots\ldots\ldots\ldots(7)$$

The parameter (λ) is tested by the calculated (T) test and compared to the critical value as in the Dickie Fuller test (Shoman 182-183: 2013)

The second requirement: co-integration tests

The concept of joint integration appeared in 1983, and this analysis is considered by many economists as one of the most prominent modern concepts and has great importance in the field of economic measurement. Joint integration is defined as the participation or association between two or more time series (PX) so that fluctuations in one of them lead to the cancellation of fluctuations In the other, in a way that makes the ratio between their values constant over time, and the co-integration exists between two variables according to the following equations:

Yt = a + bx, +Ut 8

Yt~I(1). Xt1(1) ,Ut ~1. 9

Among the most important cointegration tests are the Engel-Granger test and the Johansen test, and they can be clarified

1- The Angel-Granger test

The "Engel-Cranger test requires that the relationship be between two variables only and that the two series are for a long period of time, that is, it is conducted by estimating a regression equation for co-integration" in two steps (Al-Anazi 38:2015)

2- Johansen - Gesselius test for cointegration test:

This test was developed by Johansen in 1990 to avoid the defects involved in the two-step Angel Granger test, as the Johansen test is distinguished from its counterpart on the Angel Granger test because it is suitable for small-sized samples , and it is distinguished that it is not applied to the integration test The co-existence of two variables only, but includes cases that include several variables to reveal the existence of a co-integration relationship, and it must have the same rank of integration (Hussein , Abdel-Karim: 2017)

The third requirement: Autoregressive Distributed Lag Estimates (ARDL) model.

The (ARDL) model is one of the modern models presented by Shin and Pesaran (1999), which gives the best results for the estimated parameters in the short and long term.). The autoregressive distributed lag model takes the following formula assuming we have three variables (E, T, C)

$$\Delta E_t = \beta_0 + \sum_{i=1}^{n}\beta_1 \Delta E_{t-i} + \sum_{i=1}^{n}\beta_2 \Delta T_{t-i} + \sum_{i=1}^{n}\beta_3 \Delta C_{t-i} + \lambda_1 E_{t-1} + \lambda_2 T_{t-1} + \lambda_3 C_{t-1} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots(10)$$

ß1, ß2, and ß3: represent short-term transactions.

λ1, λ2, and λ3: represent the long-run coefficients

The integrity and stability of the model are tested through group tests:

A- Correlation LM Test Breusch-Godfrey Serial

b- Heteroskedasticity test

C- Estimated Parameters Test (Wald-test)

d- Testing the normal distribution coefficients for the remainder of the model

Fourth: Error Correction Model (ECM).

When co-integration is achieved between the variables of a particular phenomenon, the most appropriate model to explain its behavior is the error correction model (ECM) (William 259: 2011).

The fourth topic: building the model, describing it, and evaluating the results

First: build the model

For the purpose of building the model, quarterly data was relied on in Iraq for the period 2004-2021 using the following formulas: (Kazem 68:2005)

a :Logarithmic Double

$$\text{Log } Y = \text{Log } A + \alpha \text{ Log } X1 + Ui\ldots\ldots.11$$

b : Semi-logarithmic

$$Y = A + \alpha \text{ Log } X1 + Ui\ldots\ldots.12$$

c: logarithmic Inverse

$\text{Log } Y = \text{Log } A + \alpha X1 + Ui \ldots\ldots.13$

Since we have one independent variable and three dependent variables, we will have three models to describe the relationship of non-oil public revenues to non-oil GDP.

$$N0dgb = \beta_{0+} B_1 X1 + Ut \ldots\ldots.14$$

Second: Standard Model Description

In it, the relationship between the independent variable and the dependent variables included in the standard model is determined, according to the data of economic theory. The standard model consists of the following variables:

1- The independent variables (external) Dependent Variable

The independent variables explain the rise and fall in the dependent variable during the research period (2004-2120).

A- Non-oil public revenues (NOPR)

B- General Loans (GL)

2-The dependent variable (internal) Independent Variables

The dependent variable is non-oil gross domestic product (NOGDP).

Economic logic indicates that the relationship is positive between non-oil public revenues, public loans, and non-oil GDP, that is, the more non-oil public revenues increase, this leads to an increase in non-oil GDP, i.e. the stability of the economic situation, as in the following equation:

$$NOGDB = \beta_{0+} B_1 X1 + Ut \ldots\ldots.15$$

3- Symbols and variables of the Standard Model

Schedule (2) symbols and variables of model

the reason	expected relationship	variable type	the description	symbol
/	/	independent	public loans	GL
/		independent	non-oil public revenues	NOPR
An increase in non-oil public revenues leads to an increase in non-oil GDP	+	Dependent	non-oil GDP	NOGDB
/	/	/	It represents the first difference of the variable	Δ
/	/	/	represents the fixed limit	α0
/	/	/	short term (slope)	β2 , β1
/	/	/	long term (slope)	λ2 , λ1
/	/	/	(2021 Q4 – 2004 Q1)	T
/	/	/	It represents the error limit of	Et

			the model	

Source: from the researcher's work.

The third topic: quantitative measurement of the impact of non-oil public revenues and public loans on non-oil GDP in Iraq for the period (2004-2021)

1- Testing the stability of time series for the variables of non-oil public revenues, public loans and non-oil GDP using the Dickie-Fowler and Fables-Peron test

We notice from Table (3) the Dickie Fuller test that the independent variables represented by non-oil public revenues (Nopr) and public loans (gl) have settled at the first difference without a fixed limit and time trend, where the estimated value of non-oil public revenues (NOPR) was (-5.158901) is less than the tabular value (-2.717511) at a significant level of 1% and with a probability of (0.000), i.e. settled in degree (1) I, As well as the independent variable public loans (gl) settled at the first difference without a fixed limit and time trend, while the dependent variable represented by the non-oil GDP (Nogdp) settled at the level with a significant level of 5%, but when conducting the P.P test to make sure, we note The stability of non-oil public revenues at the first difference, as well as the second independent variable represented by public loans, settled at the difference. As for the dependent variable, non-oil GDP, it settled at the first difference. Thus, the variables are stable at the level and at the difference, and the standard model will be estimated and the effect measured using the (Ardl) model, which is the most appropriate, as shown in Table (3).

Table (3)

Unit root test results for the variables of non-oil public revenue, public loans, and non-oil GDP using the ADF, P.P Test

Variables	Level		1st Difference		Critical value			
	ADF test	Prob	ADF test	Prob	1%	5%	10%	test Equation
Nogdp	-2.886168	0.0072			-2.740613	-1.968430	-1.604392	None
Nopr			-5.158901	0.0000	-2.717511	-1.964418	-1.605603	None
Gl			-3.750889	0.0009	-2.717511	-1.964418	-1.605603	None
Variables	P-P TEST	Prob	p-p test	Prob	1%	5%	10%	
Nodgb			-7.246152	0.0000	2.598907-	1.945596-	1.613719-	None
Nopr			-5.6231123	0.0004	-3.920350	-3.065585	-2.673460	Intercept
Gl			-3.752474	0.0010	-2.717511	-1.964418	-1.605603	None

Source: - Prepared by the researcher based on the statistical program Eviews 12

Second: Estimating the model according to the (ARDL) methodology.

1- Measuring the impact of non-oil public revenues on non-oil GDP in Iraq for the period 2004-2021 using the ARDL model

Table (4) Results of estimating the Autoregressive Distributed Model (ARDL) to measure the impact of non-oil public revenues on non-oil GDP in Iraq for the period 2004-2021

Dependent Variable: NOGDP
Method: ARDL
Date: 04/15/23   Time: 15:09
Sample (adjusted): 2005Q2 2021Q4
Included observations: 67 after adjustments
Maximum dependent lags: 5 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (5 lags, automatic): NOPR GL
Fixed regressors: C
Number of models evaluated: 180
Selected Model: ARDL(3, 5, 0)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
NOGDP(-1)	1.643262	0.113969	14.41854	0.0000
NOGDP(-2)	-0.407328	0.223228	-1.824719	0.0734
NOGDP(-3)	-0.211119	0.124437	-1.696594	0.0953
NOPR	28.53164	81.03298	0.352099	0.7261
NOPR(-1)	-104.9044	106.8152	-0.982110	0.3303
NOPR(-2)	1.923016	102.4665	0.018767	0.9851
NOPR(-3)	2.335045	102.4453	0.022793	0.9819
NOPR(-4)	227.2671	115.1671	1.973369	0.0534
NOPR(-5)	-410.3787	96.26963	-4.262805	0.0001
GL	-50.08667	17.64001	-2.839378	0.0063
C	2893402.	1566413.	1.847151	0.0700

R-squared	0.976996	Mean dependent var	1.59E+08
Adjusted R-squared	0.976460	S.D. dependent var	39269994
S.E. of regression	2336446.	Akaike info criterion	32.31518
Sum squared resid	3.06E+14	Schwarz criterion	32.67714
Log likelihood	-1071.558	Hannan-Quinn criter.	32.45841
F-statistic	1858.864	Durbin-Watson stat	1.902760
Prob(F-statistic)	0.000000		

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

Table (4) shows that most of the estimated parameters were significant to indicate the explanatory power of the model, that is, the value of the coefficient of determination (R^2) reached 0.97, which is a very high value indicating that the change in non-oil GDP according to this model is explained by 97% to The independent variables are represented by non-oil public revenues and public loans, as an increase in non-oil public revenues and public loans leads to an increase in non-oil GDP by (1.76), as we note(D.W) test amounted to (1.90) and this indicates that there is no problem of autocorrelation between the independent variables of revenues Non-oil public loans, public loans, and the dependent variable non-oil GDP. Upon studying the overall significance of the model, we find that the calculated F value amounted to (1858.864) with a probability of (0.00000). It is greater than the tabular F value at a significant level of 1%, and this indicates the quality of the model in expressing the relationship between non-oil public revenues and non-oil GDP in Iraq for the period 2004-2021.

2- Estimating the slowdown period for the variables of non-oil GDP, non-oil public revenues, and public loans

We note that there is a co-integration relationship between non-oil public revenues (taxes, fees, and others) and public loans and the dependent variable non-oil GDP, the optimal model that gives the lowest value for the slowing period criterion (Alc) is the Ardl model (0, 5, 3) to estimate the equilibrium relationship in the long run, as shown in the figure below (2).

Akaike Information Criteria (top 20 models)
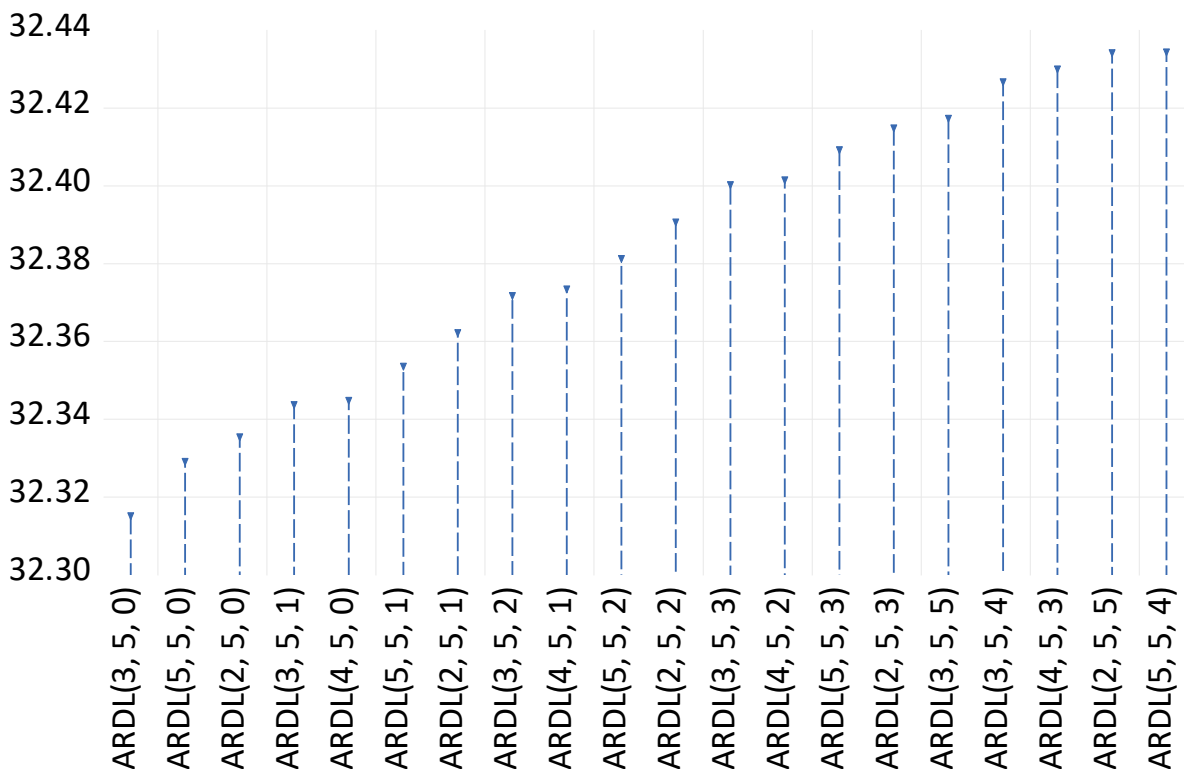
Source: - Prepared by the researcher based on the statistical program Eviews 12

Third: ARDL Long Run Form and Bounds Test

After completing the estimation of the model according to the ARDL methodology, we conduct the bound test to ensure the existence or absence of co-integration between the independent variables represented by non-oil public revenues and public loans and the dependent variable non-oil GDP, i.e. the presence or absence of a long equilibrium In the term, when the calculated F is greater than the tabular F for the upper and lower limits, we accept the alternative hypothesis and reject the null hypothesis, i.e. there is a long-term co-integration. The results of this test are shown in the table.

Table (5) The results of the cointegration limits test for variables

ARDL Long Run Form and Bounds Test
Dependent Variable: D(NOGDP)
Selected Model: ARDL(3, 5, 0)
Case 3: Unrestricted Constant and No Trend
Date: 04/16/23   Time: 00:56
Sample: 2004Q1 2021Q4
Included observations: 67

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.

C	2893402.	1566413.	0.000000	0.0000
NOGDP(-1)*	0.024816	0.011644	2.131251	0.0375
NOPR(-1)	-255.2262	68.55609	-3.722882	0.0005
GL**	-50.08667	17.64001	-2.839378	0.0063
D(NODGP(-1))	0.618447	0.116382	5.313937	0.0000
D(NOGDP(-2))	0.211119	0.124437	1.696594	0.0953
D(NOPR)	28.53164	81.03298	0.352099	0.7261
D(NOPR(-1))	178.8535	81.87580	2.184449	0.0331
D(NOPR(-2))	180.7765	82.32144	2.195983	0.0323
D(NOPR(-3))	183.1115	82.77205	2.212239	0.0310
D(NOPR(-4))	410.3787	96.26963	4.262805	0.0001

* p-value incompatible with t-Bounds distribution.
** Variable interpreted as Z = Z(-1) + D(Z).

Levels Equation
Case 3: Unrestricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NOPR	10284.94	3700.010	2.779706	0.0074
GL	2018.360	842.8532	2.394676	0.0200

EC = NODGP - (10284.9397*NOPR + 2018.3602*GL)

Null Hypothesis: No levels
F-Bounds Test relationship

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	7.242934	10%	3.17	4.14
K	2	5%	3.79	4.85
		2.5%	4.41	5.52
		1%	5.15	6.36
			Finite Sample: n=70	
Actual Sample Size	67			
		10%	3.25	4.237
		5%	3.947	5.02
		1%	5.487	6.88
			Finite Sample: n=65	
		10%	3.3	4.25
		5%	4.01	5.08
		1%	5.583	6.853

t-Bounds Test Null Hypothesis: No levels

Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	2.131251	10%	-2.57	-3.21
		5%	-2.86	-3.53
		2.5%	-3.13	-3.8
		1%	-3.43	-4.1

relationship

Source: - Prepared by the researcher based on the statistical program Eviews 12

It appears from Table (5) that there is a co-integration between the independent variables represented by non-oil public revenues and public loans and the dependent variable non-oil GDP, i.e. there is a long-term equilibrium relationship as it appeared in the test the calculated (F) value of (7.242934) is greater than the value of The minimum is (5.487) and the maximum is (6.88) at a significant level of 1%. Accordingly, we accept the "alternative" hypothesis, which states that there is a long-term co-integration between the model variables, and this confirms the existence of a long-term linear relationship between non-oil public revenues and non-oil GDP. in the long term.

Fourth: Estimating the short-term relationship of the second model using the ECM error correction model

The error correction model is used to measure the short-term relationships, as well as it is used to measure the speed of adaptation carried out by the independent variables to correct the imbalances that occur in the short term and restore them to balance in the long term, that is, if the value of the error correction coefficient ((-1) CointEq is negative and statistically significant, then this Confirmation of the existence of a short-term equilibrium relationship between the dependent variable and the independent variable included in the estimated model. Therefore, the value of this coefficient supports the results of the Bound Test. Table (6) shows us that the error correction coefficient was a positive and insignificant value as it amounted to (0.024). At a significant level of 1%, that is, there is no co-integration relationship in the short term between the independent variables represented by non-oil public revenues and public loans, and the dependent variable non-oil GDP, but there is only a long-term relationship between the variables of the model.

Table (6) ECM Error Correction Model

ARDL Error Correction Regression

Dependent Variable: D(NODGP)

Selected Model: ARDL(3, 5, 0)

Case 3: Unrestricted Constant and No Trend

Date: 04/16/23   Time: 01:02

Sample: 2004Q1 2021Q4

Included observations: 67

ECM Regression

Case 3: Unrestricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2893402.	807616.0	3.582645	0.0007
D(NOGDP(-1))	0.618447	0.113956	5.427067	0.0000
D(NOGDP(-2))	0.211119	0.119998	1.759358	0.0840
D(NOPR)	28.53164	77.48737	0.368210	0.7141
D(NOPR(-1))	178.8535	78.72483	2.271881	0.0270
D(NOPR(-2))	180.7765	79.49866	2.273957	0.0268
D(NOPR(-3))	183.1115	80.19620	2.283295	0.0262
D(NOPR(-4))	410.3787	93.39839	4.393852	0.0001
CointEq(-1)*	0.024816	0.005231	4.743926	0.0000

R-squared	0.902043	Mean dependent var	-342749.7
Adjusted R-squared	0.888532	S.D. dependent var	6876378.
S.E. of regression	2295809.	Akaike info criterion	32.25548
Sum squared resid	3.06E+14	Schwarz criterion	32.55163
Log likelihood	-1071.558	Hannan-Quinn criter.	32.37266
F-statistic	66.76195	Durbin-Watson stat	1.902760
Prob(F-statistic)	0.000000		

* p-value incompatible with t-Bounds distribution.

Figure (3)

The remaining estimated and actual models for the non-oil GDP variables, public loans and non-oil public revenues
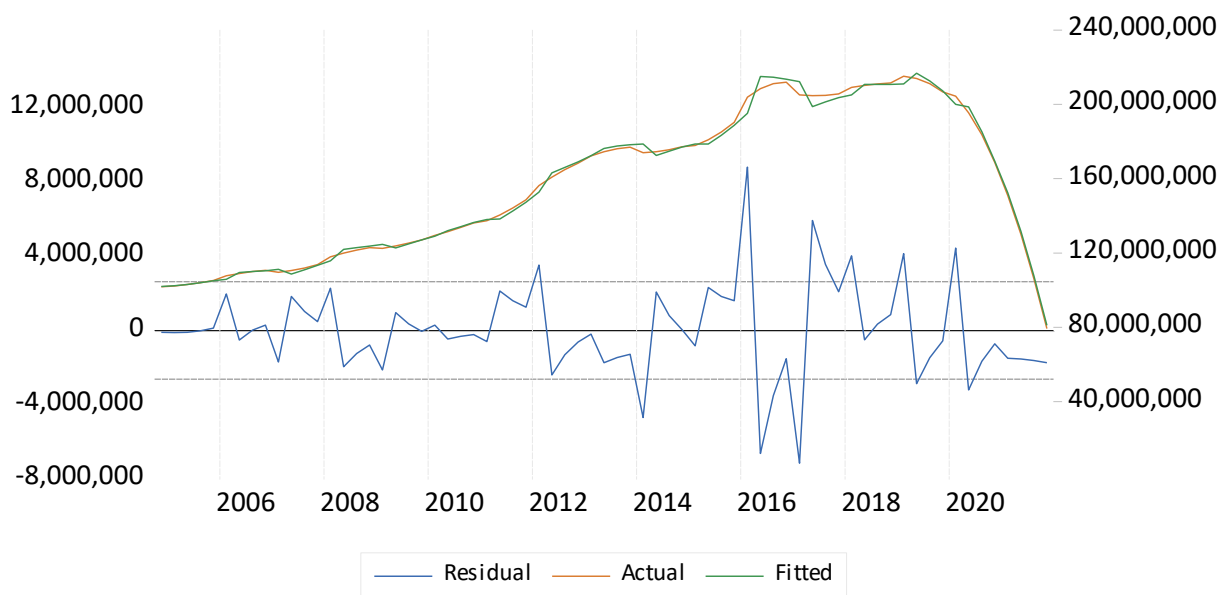

Figure (3) shows the agreement of the rest of the estimated and actual models, and this reflects the accuracy and quality of the estimated model according to the ARDL methodology.

Fifth: standard tests

These tests are used to ensure whether the model has passed the standard problems or not, through the following:

1- Breusch - Godfrey Correlation LM Test

We can see from the table (7) that the model is free from the autocorrelation problem, as the value of Prob. Chi-Square amounted to (0.7242), which is greater than the level of significance (5%), so we accept the null hypothesis, which states that the residuals are not self-correlated.

Schedule (7)

Test the autocorrelation problem

Breusch-Godfrey Serial Correlation LM Test:

Breusch-Godfrey Serial Correlation LM Test:

Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.262628	Prob. F(2,54)	0.7700
Obs*R-squared	0.645428	Prob. Chi-Square(2)	0.7242

2- Heteroscadasticity Test: ARCH

To make sure that the remainder is free from the problem of homogeneity of variance, we find that the calculated (F) value of (2.094871) is not significant with a probability greater than 5%, and the Chi-square parameter is not significant with a probability greater than 5%. Therefore, we accept the null hypothesis that states the homogeneity of the model remainder It does not contain the problem of heterogeneity of variance, as shown in Table (8).

table (8)
Heteroscadasticity problem test (ARDL)

Heteroskedasticity Test: ARCH

F-statistic	2.094871	Prob. F(2,62) 0.1317
Obs*R-squared	4.114433	Prob. Chi-Square(2) 0.1278

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 04/16/23   Time: 02:45
Sample (adjusted): 2005Q4 2021Q4
Included observations: 65 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.00E+12	1.22E+12	3.278839	0.0017
RESID^2(-1)	0.253852	0.126288	2.010114	0.0488
RESID^2(-2)	-0.105763	0.126277	-0.837545	0.4055

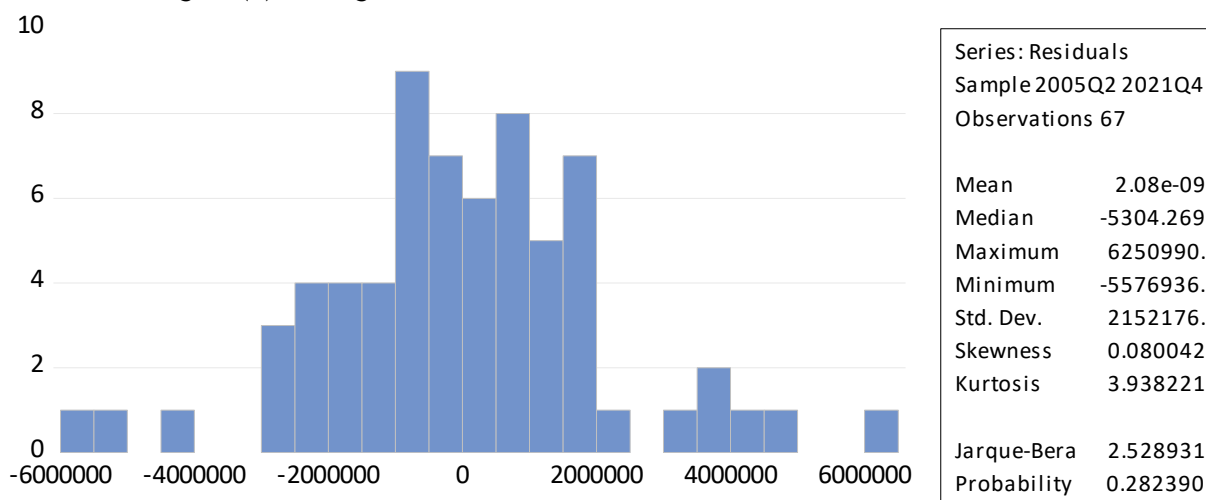|			
R-squared	0.063299	Mean dependent var	4.69E+12
Adjusted R-squared	0.033083	S.D. dependent var	7.97E+12
S.E. of regression	7.84E+12	Akaike info criterion	62.26219
Sum squared resid	3.81E+27	Schwarz criterion	62.36255
Log likelihood	-2020.521	Hannan-Quinn criter.	62.30179
F-statistic	2.094871	Durbin-Watson stat	1.982855
Prob(F-statistic)	0.131714		

3- Histogram-Normality Test

We note from figure (4) that the residuals are distributed normally. We find that the probability value of the (Jarque-Bera) test reached (2.528931) at a significant level greater than 5%. Therefore, we have to accept the null hypothesis, which confirms that the residuals do not contain random errors and are distributed normally.

Figure (4) Testing the normal distribution of the residuals of the first model

Series: Residuals	
Sample 2005Q2 2021Q4	
Observations 67	
Mean	2.08e-09
Median	-5304.269
Maximum	6250990.
Minimum	-5576936.
Std. Dev.	2152176.
Skewness	0.080042
Kurtosis	3.938221
Jarque-Bera	2.528931
Probability	0.282390

CONCLUSIONS

1- Proof of the hypothesis from which the research was launched, which indicates the weakness of the impact of non-oil public revenues (taxes and loans) in Iraq on the non-oil GDP during the study period.

2- The deteriorating political and economic conditions experienced by the Iraqi economy during the study period caused the instability of the relationship between GDP and non-oil revenues.

3- The Iraqi economy during the study period went through difficult periods represented by the financial crises that were reflected as a result of the drop in oil prices in the global market, as well as the instability of the security and military situation, which negatively affected the growth of the domestic product and its fluctuation and instability.

4- The productive sectors in Iraq contributed modestly to the formation of the non-oil gross domestic product, during the period of the study, and this is due to many reasons, including: weak industrial and agricultural production base, scarcity of industrial machinery and equipment, especially modern ones.

Recommendations:

1- The Iraqi economy, within its economic policy, must move towards diversifying sources of income to mitigate the impact of financial shocks that it may be exposed to as a result of the concentration of exports in a specific type only, which requires attention to diversification with public revenues.

2- Increasing the contribution of other non-oil economic sectors in the Iraqi economy, such as the agricultural sector and the industrial sector, is of great importance in the emergence of forward and backward links for the various sectors of the national economy, and then reducing dependence on one source of income, which is the oil sector.

3- Working to establish a sovereign fund that will be financed from the abundance of the future financial surplus in order to finance the interests and installments of the public debt instead of the pressures exerted by interest and installments on public spending and crowding out spending on the gross domestic product (industrial, agricultural and service sectors...... etc.) .

4- The need to focus the efforts of fiscal policy in Iraq in the search for opportunities to maximize non-oil revenues, as well as the need to control and control public expenditures.

5- Reconsidering taxes and their use, as well as increasing the dissemination of tax awareness among members of society, and this in turn leads to an increase in the size of the tax base.

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