

قياس وتحليل العلاقة بين تنوع الايرادات العامة وتكوين الناتج المحلي الاجمالي في العراق للمدة 2004-2023

Measurement and analysis of the relationship between the diversity of public revenues and the composition of Iraq's Gross Domestic Products for the period (2004-2023)

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الكلمات الرئيسية : انموذج الانحدار الذاتي للفضوات المتباطئة زمنيا، الناتج المحلي الاجمالي، تنوع قاعدة الايرادات العامة، الايرادات النفطية، الايرادات الضريبية، الايرادات الاخرى .

Keywords: ARDL, GDP, Diversity of the general revenue base, Oil Revenues, Tax Revenues, Other Revenues.

المستخلص:

تهدف الدراسة الحالية الى تحليل العلاقة بين تنوع الايرادات العامة وتكوين الناتج المحلي الاجمالي في العراق من خلال تسليط الضوء على ثلاثة انواع اساسية من الايرادات العامة المعتمدة في الموازنة العامة العراقية وهي (الإيرادات النفطية، الإيرادات الضريبية، الإيرادات الأخرى) ومن ثم قياس مدى التأثير الذي يتركه تنوع قاعدة الإيرادات العامة في تطور الناتج المحلي الاجمالي وذلك من خلال قياس وتحليل العلاقة بين هذه الأنواع من الإيرادات والناتج المحلي الاجمالي، وتتبع اهمية الدراسة الحالية في كونها تركز على ضرورة تنوع قاعدة الإيرادات العامة لضمان توفر المورد المالي اللازم للانفاق على مختلف الأنشطة الاقتصادية، والذي بدوره يضمن تطور تكوين الناتج المحلي الاجمالي للدولة، وتوصلت الدراسة الى جملة من الاستنتاجات المهمة بهذا الصدد كان من ابرزها ان متغير الإيرادات الضريبية (TR) لم يكن له تأثير معنوي في تكوين الناتج المحلي الاجمالي اذ بلغت (Prob) للمتغير (0.077) وهذه النسبة اكبر من 5% وهذا دلالة على ضعف مساهمة الإيرادات الضريبية في تكوين الناتج المحلي الاجمالي في العراق.

Abstract:

The present study aims to analyze the relationship between the diversity of public revenues and the composition of Iraq's GDP by highlighting three basic public revenues approved in the Iraqi general budget. (Zedalis, 2007): (oil revenues, tax revenues, and other revenues), and then measure the extent to which the diversity of the public revenue's base affects the diversity of GDP by measuring and analyzing the relationship between these revenues and GDP. The importance of the current study stems from the fact that it focuses on the need to diversify the general revenue base to ensure that the necessary financial resources are available to spend on various economic activities. Which in turn provides the development of the composition of the GDP of the state (Fildes, 1988), The study reached several important conclusions in this regard, most notably that the variable tax revenues (TR) had no significant impact on the composition of GDP as it came (Prob) for the variable (0.077) This percentage is greater than 5% which is an indication of the weak contribution of tax revenues to the composition of Iraq's GDP. The following questions can highlight the study problem:

• Increased reliance on oil revenues will expose the State's macroeconomic structure to the risks of economic shocks affecting the development of economic activity through the impact of GDP on those shocks.

1. INTRODUCTION: Public revenues are the backbone of governments' various economic and political doctrines. In developing countries, special emphasis is placed on public revenues because public expenditure on different economic activities is based on various types and divisions of public revenues. In Iraq, the subject of public revenues is significant, especially in the subject of the state's public budget. (Al-taie & others, 2017). Most of the economic activity of the various economic and productive sectors in Iraq depends on the financial allocations of those economic units, Because Iraq is described as an oil country oil revenues capture most of the structure of public revenues, making economic activities and financial allocations to State institutions dependent on crude oil price movements that are subject to global supply and demand, not to mention political and military conciliations between countries.(Ulnicane & Others.,2021). The study assumes that the diversity of the public revenue base will positively affect the composition of Iraq's GDP. Two sub-hypotheses emerge from this main hypothesis: (There is a statistically significant correlation between the diversity of the public revenue base and the development of GDP), The study will be based on the method of verifying the previous hypothesis. (ARDL) in measuring the relationship between variables and reaching results that contribute to the acceptance or rejection of the study hypothesis, To achieve the objectives of the study, it was divided into three detectives, The first chapter included an analysis of Iraq's general revenue structure, While the second chapter involved the use of self-regression method for time-slowng gaps, As a result of the study, which contained the conclusions and recommendations of the study, The current study relied on timelines for variables in the study's model for the period 2004-2023.

2. LITERATURE REVIEW:

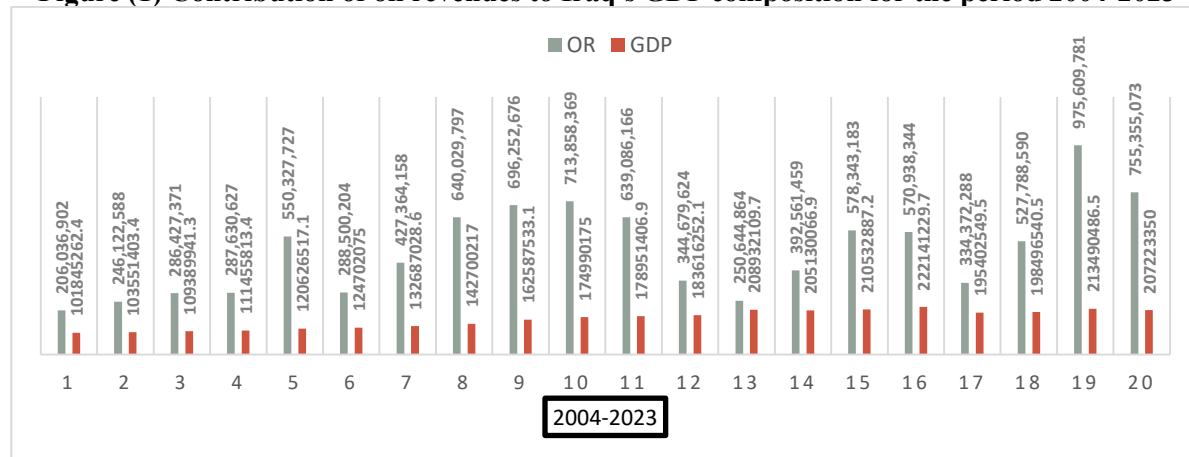
2.1: Analysis of Iraq's general revenue structure: Oil revenues constitute the largest proportion of the composition of the general revenue structure in the Iraqi general budget. Therefore, Iraq's economy is described as one of the unilateral or rent economy (Central Bank of Barbados & Financial Services Commission 2022). The fact that most economic activities depend on oil revenue in their production, and the table shows the relative importance of oil revenue relative to GDP (Aresti, 2016). Increased reliance on GDP composition on oil revenues increases the risk of exposure to supply and demand shocks. This is due to several reasons, most notably the fluctuations in oil production, which are subject to global supply and demand factors, as well as the link of oil revenues to global conditions in terms of political and military stability as well as the frequency of epidemics and natural disasters (Salman & Others, 2019).

2.2: Relative importance of tax revenues: Tax revenues are one of the most important financial resources contributing to the development and growth of GDP especially in countries that depend on this financial resource to finance their economic activities. This type of revenue is also important in funding public budgets in many countries, both developed and developing (Fildes, 1988), Many studies indicate the weak contribution of tax revenues (TR) to the composition of Iraq's GDP. This shows how deep the structural imbalance in the composition of GDP is and the weak contribution of this type of financial resource to the financing of economic activities constituting the composition of GDP

(Iriqat & Anabtawi, 2016), This imbalance increased after 2003 owing to many reasons, the most important of which are weak legislation on tax systems, increased tax evasion rates, and increased rates of financial and administrative corruption (Abd&Others., 2022).

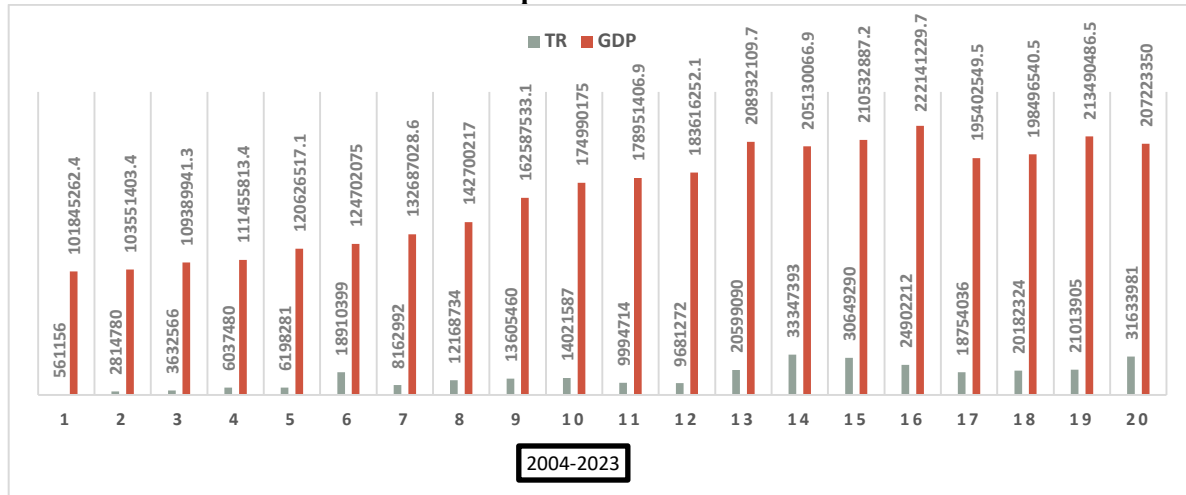
2.3: The relative importance of other revenues: Other types of revenue such as fees, fines, tourism revenues, and other non-tax and oil revenues are some of the most prominent sources of GDP composition in many countries. Some international experiences have confirmed the relative importance of this type of revenue in GDP composition (Blanchard, 2011), But the situation in Iraq is different, this type of public revenue is double its contribution to the composition of GDP. This is further evidence of the structural imbalance in the composition of GDP and the weakness of non-oil revenues in the composition and development of GDP. This weakness in the contribution of other types of revenue to the composition and development of GDP, especially after 2003, is due to several reasons, perhaps most notably security and political instability. Poor infrastructure, and lack of implementation of legislation to encourage and develop other non-oil resources (Al & Hassan, 2020). All the above can be explained by the following figures:

Figure (1) Contribution of oil revenues to Iraq's GDP composition for the period 2004-2023



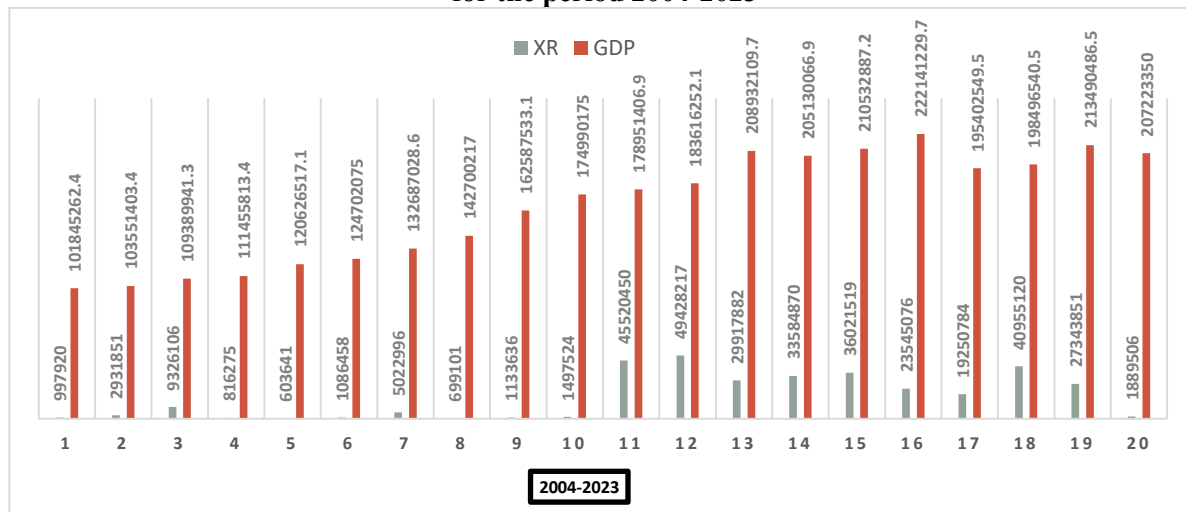
-Source: Prepared by the researcher based on the data of the Central Bank of Iraq <https://cbiraq.org>

Figure (2) Contribution of tax revenues to the composition of Iraq's gross domestic product for the period 2004-2023



- Source: Prepared by the researcher based on the data of the Central Bank of Iraq <https://cbiraq.org>

Figure (3) Contribution of other revenues to the composition of Iraq's gross domestic product for the period 2004-2023



- Source: Prepared by the researcher based on the data of the Central Bank of Iraq <https://cbiraq.org>

3. RESEARCH METHODOLOGY:

3.1: Research instrument: The author relied on the analytical standard approach to illustrate the relationship between the diversity of public revenues and the composition of GDP through research and studies published in practical journals on the topic of the study and through articles and reports published online.

3.2: Research model: The researcher uses four variables in this study: three dependent variables and one independent variable

✓ Independent variables: Oil Revenues, Tax Revenues, Other Revenues

✓ Dependent variable: GDP

3.3: Method of data analysis: Data is analysed using the program EViews12 to measure and analyse the impact of GDP.

3.4: Descriptive analysis: The study adopted the Republic of Iraq as its spatial exception

4. RESULTS AND DISCUSSION:

4.1: Use of the ARDL model to analyze the impact of diversification of public revenues on the composition of Iraq's GDP: In the beginning, as a first stage, the model to be assessed must be described, and the description phase is one of the most important stages of the construction of the standard model because it gives an accurate description of the variables used in the model to be estimated, and highlights the importance of the characterization phase (Specification Step) The relationship between affiliate variables is determined (Approved) and independent (illustrative) variables included in the model and consistent with the data of economic theory. The process of building any standard model in the form of transforming economic theory into linear or linear equations as required by the model, working to transform those equations into mathematical form and applying standard theories to it, and for more accurate results the model will be used (ARDL) or so-called (self-regression model of slowing time gaps) Using the statistical program EViews12 to arrive at logical results of the nature of the relationship between the independent variables and the dependent variables, and to characterize a standard model that achieves the primary purpose of this study, which is to measure and analyze the relationship between the components of public revenues as separate variables and the composition of GDP as a subordinate variable. To this end, the standard model has been described as follows:

$$GDP = f(OR, TR, XR). \quad Y_t = \beta_0 + \beta_1 OR_t + \beta_2 TR_t + \beta_3 XR_t + \mu_t \dots\dots\dots 1$$

Where: Y_t : Dependent variable representing GDP

β_0 : Fixed limit. $\beta_1, \beta_2, \beta_3$: Inclination transactions for independent variable

[OR_t] : Oil revenues during the duration of the study

[TR_t] : Tax revenues during the duration of the study

[XR_t] : Other revenues during the study period, μ_t : Random error limit

➤ **Time-Series Stationary Test:** Before entering the correlation analysis and the impact of the general revenue base's diversity on the GDP's composition the research sample must be tested stationary by the time chains of those variables. The subjection of these variables to this test is necessary for applied studies this is because there are potentially random, significant trends that make the series non-stationary. In other words, the average and variability of the chain in question are not independent of time, to avoid false regression and its

misleading consequences, this test is used as a means of diagnosing normative in analysis applications and, in particular, with standard tests developed for this purpose, as demonstrated by many statistical studies. (Boateng, 2019)The absence of stationary from time chains will certainly lead to misleading results about the estimate, so the study will adopt a test (Philips-Perron) to check the stationary of time series for model variables if the time series is stationary in its original values, it is said to be integrated from the zero level, i.e. at level (0) I and, if the series stationary after taking the first difference, the original series is integrated from rank I (1), The following table shows the test results:

Table (1) PP test results

		Level			1 st difference		
		Individual intercept	Individual intercept and trend	None	Individual Intercept	Individual intercept and trend	None
GD P	Statistic	-1.192039	-1.151462	2.02216	-4.56747	-4.79357	-3.61833
	Prob	0.6553	0.8917	0.9860	0.0024	0.0066	0.0011
OR	Statistic	-2.046902	-2.543288	0.406254	-6.70057	-6.19357	-4.99291
	Prob	0.2662	0.3063	0.7906	0.0000	0.0005	0.0000
TR	Statistic	-1.409844	-2.845533	0.308771	-4.05402	-3.82508	-3.91096
	Prob	0.5555	0.1998	0.7645	0.0067	0.0394	0.0006
XR	Statistic	-1.914298	-1.731465	-1.28898	-3.72906	-4.39587	-4.00384
	Prob	0.3191	0.6968	0.1751	0.0130	0.0139	0.0005

- source: Researcher's preparation based on eviews12.

Note from the results of the previous table that the dependent variable (GDP) did not stationary at the level either with the intersection limit or the intersection limit and the time direction or without them, and decided after taking the first differences with the intersection limit, either the independent variable (OR) is not very different from the dependent variable since it has not stationary at the level as well as the variable (XR), it is noted that all model variables stationary after taking the first difference and with the intersection limit, as the probability was recorded (Prob) For all variables less than 5%, this is an indication of the statistical significance of the stationary of the time series used in the proposed model, and therefore the imposition of nowhere can be accepted (H_0) The time series of variables is devoid of the root of the unit after taking the first discrepancies, so a method can be used(ARDL)in the regression estimate because all-time series stationary at the first difference that they had a rank of first (I_1).

➤ **Bounds-Test:** To ensure a long-term balance between the variables of the proposed model, the study will resort to the boundary test proposed by Pesaran(Pesaran, 1999), The nihilistic hypothesis of this test (the absence of a long-term balance between model variables) and the table shows the results reached:

Table (2) Bounds test results for estimated model variables

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic k	4.812051 3	Asymptotic: n=1000		
		10%	2.37	3.2
		5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

- source: Researcher's preparation based on eviews12.

From the results of the previous table, the rejection of the nihilistic hypothesis and the acceptance of the alternative imposition, which confirms a long-term balance between the variables of the proposed model by a count (F) indicating that its value (4.812051) is greater than the minimum (I_0) and the upper limit (I_0) At a morale level of 5%.

➤ **Homoscedasticity test:** To detect that the proposed model of the study is free from the problem of heteroscedasticity of variability between random error limit values, the study will use an ARCH test to detect that the temporal chains of the model variables are free from the problem of asymmetric heteroscedasticity. The table shows the results of the test:

Table (3) ARCH Test Results

Heteroskedasticity Test: ARCH			
F-statistic	0.829031	Prob. F(1,15)	0.3770
Obs*R-squared	0.890360	Prob. Chi-Square(1)	0.3454

- source: Researcher's preparation based on eviews12.

The previous table shows that the model does not have the problem of asymmetry. This is evidenced by the Chi-Square's probability value of (0.3454), which is greater than 5%, and therefore can be said to accept the imposition of non- (H_0).

➤ **Autocorrelation Test:** The LM test proposed by Breusch Godfrey will be conducted to detect the existence of a self-correlation problem between the indiscriminate error limits of the proposed model. According to this test, the imposition of nowhere assumes (the absence of self-serial correlation between the retention values), and the alternative imposition assumes (the presence of a serial link to the estimator).

Table (4) LM test results for self-correlation detection

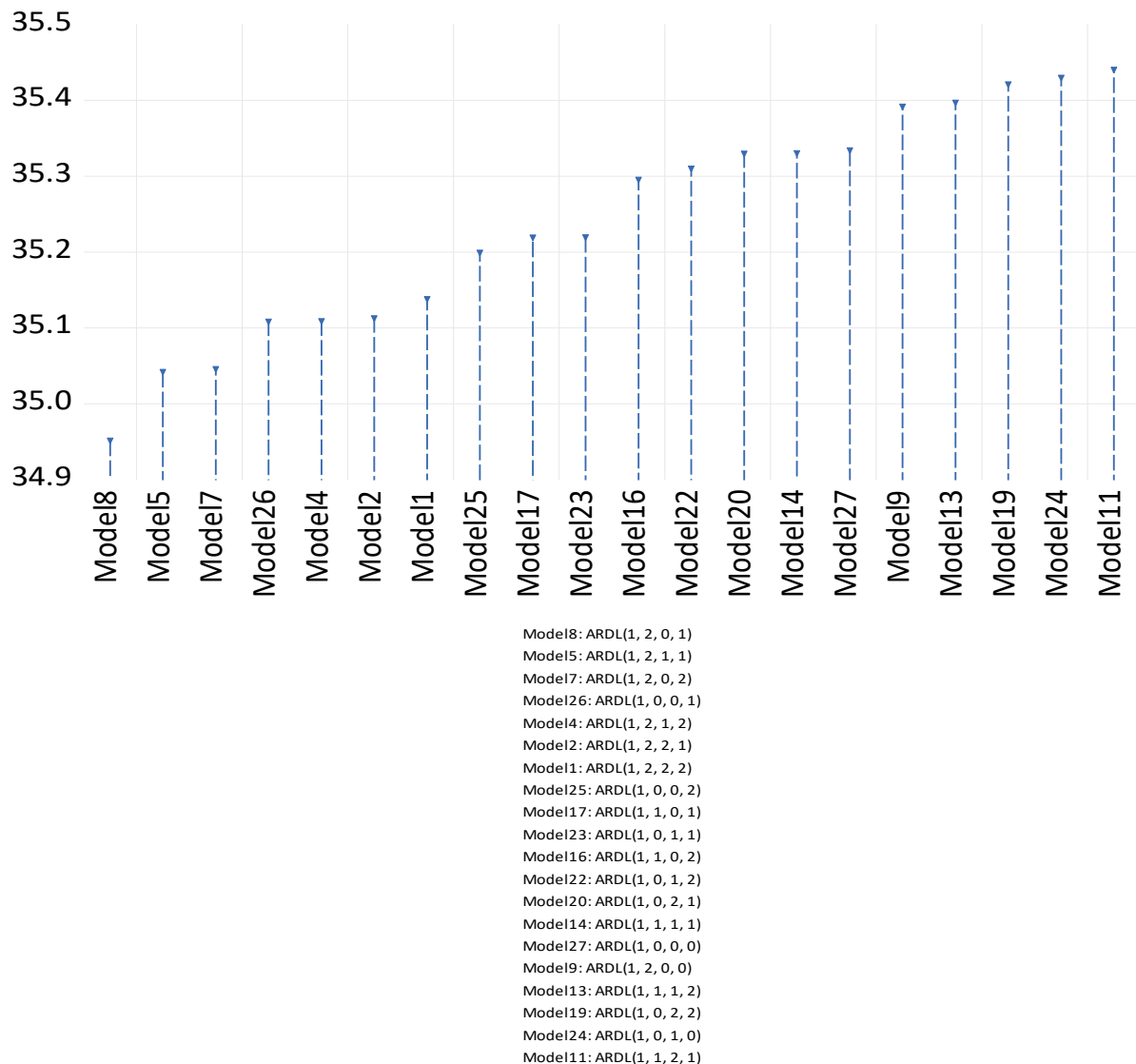
Breusch-Godfrey Serial Correlation LM Test: Null hypothesis: No serial correlation at up to 2 lags			
F-statistic	0.273895	Prob. F(2,8)	0.7673
Obs*R-squared	1.153539	Prob. Chi-Square(2)	0.5617

- source: Researcher's preparation based on eviews12.

From the previous table and the measured results, it is clear that the study model is free of the problem of self-ligaments, since the Chi-Square's probability value of (0.5617) is greater than 5%, and therefore can be said to accept the imposition of nowhere (H_0).

➤ **Proposed study model:** After the diagnostic tests have been performed and all their results have been confirmed that the proposed model of the study is free of standard problems, the regression can be estimated using the ARDL method to detect the nature of the relationships between the autonomous templates of the model and the dependent variable. To choose the optimal model, an Akaike test is required to select the best model.

Figure (5) Akaike Information Standard
Akaike Information Criteria (top 20 models)



- source: Researcher's preparation based on evIEWS12.

From the previous figure, it is clear that the optimal model of the study is model (8) which suggests slowing periods (1,2,0,1) of model variables, and therefore the proposed model of the study is as follows:

Table (5) Proposed model for study using ARDL assessment method

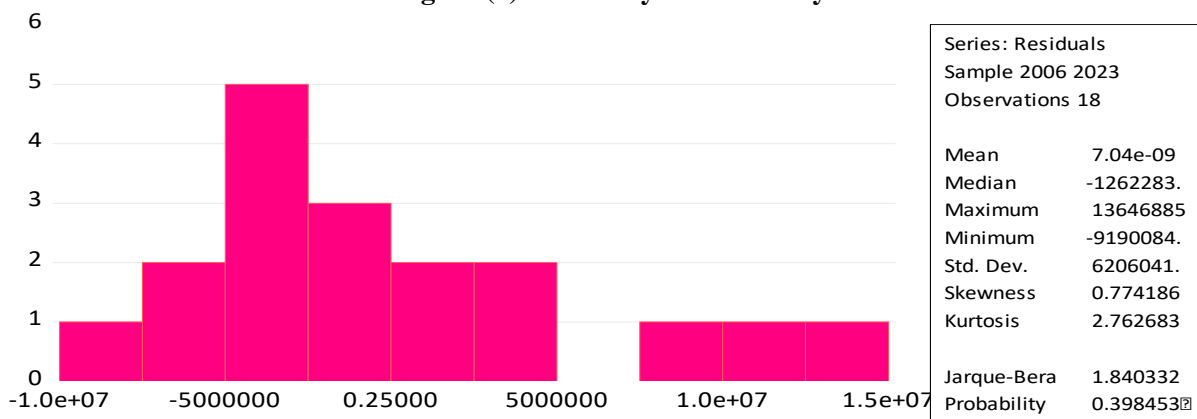
Dependent Variable: GDP				
Method: ARDL				
Date: 06/20/24 Time: 17:21				
Sample (adjusted): 2006 2023				
Included observations: 18 after adjustments				
Maximum dependent lags: 2 (Automatic selection)				
Model selection method: Akaike info criterion (AIC)				
Dynamic regressors (2 lags, automatic): OR01 TR XR				
Fixed regressors: C				
Number of models evaluated: 54				
Selected Model: ARDL(1, 2, 0, 1)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GDP(-1)	0.455682	0.148787	3.062644	0.0120
OR01	0.042478	0.012483	3.402814	0.0067
OR01(-1)	-0.015260	0.015000	-1.017378	0.3330
OR01(-2)	0.040675	0.018954	2.145959	0.0575
TR	0.952546	0.483588	1.969748	0.0772
XR	0.129442	0.182159	0.710600	0.4936
XR(-1)	0.496614	0.183112	2.712075	0.0219
C	36507091	11900084	3.067801	0.0119
R-squared	0.974638	Mean dependent var	1.72E+08	
Adjusted R-squared	0.956885	S.D. dependent var	38969341	
S.E. of regression	8091687.	Akaike info criterion	34.95167	
Sum squared resid	6.55E+14	Schwarz criterion	35.34740	
Log likelihood	-306.5651	Hannan-Quinn criter.	35.00624	
F-statistic	54.89871	Durbin-Watson stat	1.965681	
Prob(F-statistic)	0.000000			

-source: Researcher's preparation based on eviews12.

From previous findings, it is clear that (97%) of changes in the composition of GDP are caused by changes in the public revenues selected in the study model this is illustrated by the value of the model's reconciliation quality coefficient (R^2) as well as that the proposed model has total morale due to the high value of the test index (F) and (54.89871).

➤ **Test the appropriateness of the estimated model:** To ascertain the appropriateness of the proposed model for the study, a test (Normality-Test) will be used to test the natural distribution of the proposed model's protectors, as shown in the following figure:

Figure (6) Normality test for study model

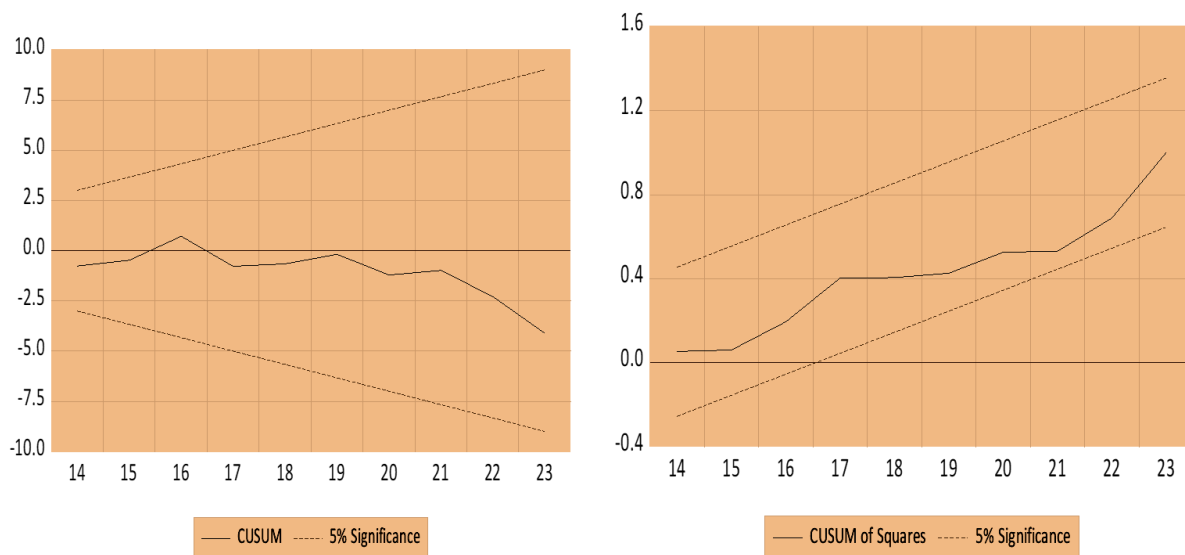


- source: Researcher's preparation based on eviews12.

From the previous figure, it is clear that the total threshold of the proposed model of the study follows the natural distribution and this is evident from the value (Jarque-Bera) since the value (Prob) of the test is greater than 5%.

➤ **Model Structural Stability Test:** In this test, (CUSUM) and (CUSUM of Sequers) tests are relied upon (Brown & Others., 2011). These tests are based on two hypotheses: the nihilistic hypothesis (structural instability of the estimated parameters) and the adverse alternative hypothesis. This test is conducted to ensure that the proposed model is free of any structural changes. After previous tests, the results shown in the following figure were obtained:

Figure (7) Structural test results for estimated model parameters



- source: Researcher's preparation based on eviews12.

From the previous figure, the cumulative total of the protectors between the two lines can be observed in red, i.e. within an area below 5% morale level, as well as the cumulative aggregate of the remaining boxes. Therefore, it can be said to accept the alternative imposition, which emphasizes the structural stability of the parameters of the estimated model proposed in the long term. The study's hypothesis (that there is a statistically significant correlation between the diversity of public revenues and the composition of Iraq's gross domestic product (GDP)).

5. Conclusions:

1. The results of the estimated decline model show that the oil revenue variable has a moral impact on the composition of the gross domestic product (Prob) of the variable (0.006) and that an increase in oil revenues by 1% will lead to increases in the composition of the gross domestic product (GDP) by 0.042.

2. The tax revenue variable (TR) did not have a moral impact on the composition of the gross domestic product (Prob) of the variable (0.077). This percentage is greater than 5%. This is an indication of the weak contribution of tax revenues to the composition of Iraq's gross domestic product (GDP).

3. Previous results show that the other income variable (XR) has a moral effect on the composition of GDP, as it reaches (Prob) of the variable (0.021) is smaller than the morale level of 5%, as an increase in other non-tax and non-oil revenues by 1% will increase the composition of GDP by (0.496), this ratio is not small about the impact of other types of revenue, indicating the importance of other types of non-oil and non-tax revenues in the composition of GDP.

4. All the standard tests proved that the estimated model of the study is free of standard problems and therefore can be said to rely on the results obtained.

6. Recommendations:

1. Need to focus on Iraq's oil sector revenues as a locomotive for economic growth and an important component of the composition of Iraq's gross domestic product (GDP) by optimizing oil revenues in support of other income-generating economic sectors, and expediting the vote on the Federal Oil and Gas Act to support this trend.

2. Tax legislation should be reviewed and made more flexible to ensure that tax vessels respond, reduce tax evasion, and make tax revenues an influential factor in the composition of GDP, thereby reducing reliance on depleted oil revenues.

3. Need to increase the state's reliance on other non-tax and non-oil revenues due to their importance in the composition of GDP. through increasing the security and political stability of the country, developing infrastructure and tourism facilities, and controlling borders to ensure cash flows constituting other sources of reliance on oil revenues.

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