

The impact of some financial variables on the financial sustainability of Iraq

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ABSTRACT

All countries, including Iraq, seek to achieve financial sustainability by ensuring the ability to continue in the policies of public expenditures and public revenues in the long term without reducing financial solvency or exposure to risks of bankruptcy or failure to fulfill future financial obligations, and on this basis the research aims to measure and analyze the impact of some variables Finance (oil revenues, tax revenues, other revenues and public debt) in the financial sustainability of Iraq through the use of a modern standard model to assess financial sustainability in the Iraqi economy during the period 2004-2022, and the research found that there is a short-term relationship between all indicators of financial sustainability and the indicator Net Budget/GDP at the 5% significant level. The research also found that there is a long-term relationship between the independent variable X1 and the dependent variable Y, and that the other independent variables X2, X3, X4 did not have a direct effect on Y represented by (the ratio of net budget / GDP), and the research recommended the need to work on Diversifying sources of income to increase non-oil revenues by creating an investment environment that suits the nature of economic resources in a way that contributes to raising the level of public revenues and reduces the impact of fluctuations in oil prices, as well as reviewing financial and monetary policies with the necessity of coordination between them in a way that leads to achieving financial sustainability.

Keywords:

financial sustainability, oil revenues, tax revenues, public debt.

Introduction:

The issue of financial sustainability is one of the topics that has received great attention from many governments in the developed and developing countries of the world alike. The general public, especially the oil-producing countries, and Iraq is one of the oil-producing countries whose economy was subjected to repeated shocks, which were directly reflected in a deficit in the public budget due to the instability of oil prices in the global market,

since oil revenues represent a fragile pillar that could threaten all economic activities, which caused an increase in the volume of Government debt Therefore, all countries seek to achieve financial sustainability to ensure their ability to continue in the policies of public spending and public revenues in the long term without decreasing their financial solvency or being exposed to the risks of bankruptcy and their inability to fulfill their financial obligations to others, which weakens their

financial position and weakens their financial sustainability.

Research importance:

The importance of the research comes through measuring and analyzing the reality of financial sustainability in Iraq as an indicator to judge the success or failure of fiscal policy and the extent of the government's ability to achieve its economic goals and its ability to address the problems it faces, including external indebtedness and deficit in its general budget.

Research problem:

The research problem lies in how to sustain the financial resources resulting from oil revenues in light of the exacerbation of the volume of public debt and the fluctuations of oil prices in the global market and the accompanying increase in the volume of unplanned government spending and the resulting deficit in the public budget.

Research hypothesis:

The research stems from the hypothesis that Iraq has the ability to achieve financial sustainability in the medium and long term if the oil surpluses are exploited in productive investment activities that reduce the risks of accumulating public debt directed to cover the budget deficit.

Search goal:

The research seeks to measure and analyze the impact of some financial variables (oil revenues, tax revenues, other revenues and public debt) on the financial sustainability of Iraq by using a modern standard model to assess financial sustainability in the Iraqi economy during the period 2004-2022.

Research Structure:

For the purpose of achieving the goal of the research and proving its hypothesis, it was divided into three parts, the first part dealt with the concept and importance of financial sustainability, while the second part dealt with a presentation of some indicators of financial sustainability, while the third part dealt with

measuring and analyzing the impact of some financial indicators on the financial sustainability of Iraq during the period 2004-2022. The research came out with a number of conclusions and recommendations.

First: the concept and importance of financial sustainability:

Many countries seek to diversify their sources of income and not rely solely on their rentier revenues in order to ensure financial sustainability for them, and the concept of financial sustainability refers to the ability of the government to continuously fulfill its financial obligations without exposure to the risks of bankruptcy or reducing its financial solvency in the future" (Al Tohmeh , Al-Shammari, 2018: 388), and the concept of financial sustainability refers to the extent of the government's ability to finance public spending programs in accordance with specific financial policies without exposure to cases of financial default and inability to repay the debt (Al-Baghdadi, 2010: 408), and this means that public finance becomes in A better sustainability situation when the public debt-to-GDP ratio is stable (Blanchard, 1990): i.e. it means continuing to implement the government's spending and revenue policies in the long term without resorting to public debt in order to reach the desired growth rates (Al-Shallal, 2013: 8).

On this basis, it can be said that financial sustainability means the ability of the country to achieve net revenues that work to cover the accumulated debt, and this is achieved through the availability of economic, political and legal capabilities and capabilities that work to find new sources of revenue or raise the current revenue rates or both. To limit public spending programs or limit their rapid growth.

The importance of financial sustainability comes through the confidence of creditors and financial markets in the ability of countries to cover their financial deficits by borrowing on easy terms and low interest rates, as the decline in market confidence in the ability of those countries to fulfill their obligations could lead to stopping their lending, or lead to raising interest rates on The loans granted to them, in

addition to the strict conditions that are placed on them, and the increase in the growth rates of government spending at a rate greater than the growth of revenues leads to a decrease in economic growth rates and a rise in real interest in the future, and this all leads to a rise in the ratio of public debt to GDP and an increase in the possibility of losing the financial solvency of the country.

On the other hand, financial sustainability is associated with a positive relationship with economic growth. When economic growth rates increase, income levels rise, which raises tax revenues, and the gap between revenues and expenditures narrows on the one hand. On the other hand, consumption, savings and investment rates rise, which limits resorting to public debt to finance spending. General (Al Shallal, 2013: 27).

Second: financial sustainability indicators:

There are several indicators that must be resorted to when analyzing financial sustainability, and these indicators are determined according to the variables of financial policy in the country. The most important of these indicators are the following:

1. Public debt index to GDP

The public debt-to-GDP index is one of the most prominent indicators used to measure the financial strength of a state. This criterion requires - as approved by the European Union (Maastricht) of 1992 - that the public debt-to-GDP ratio does not exceed 60% (Dagher, Salal, 2017: 8).

Also, the financial position of the state according to this indicator is characterized by instability when the following occurs (Samaqa Ye et al., 2015: 8)

- A. When the ratio of public debt to GDP in the country is higher than that of other countries.
- B. When the ratio of public debt to GDP in the country rises above its historical rates.
- C. When there is a need for a major change in fiscal policy to maintain a stable ratio of public debt to GDP.

2. Tax Gap Index:

The tax gap, according to the International Monetary Fund's revenue management, is

defined as the difference between potential revenues and actual revenues from basic economic activities (Udea, 2018: 7), or it is the due taxes that taxpayers should have paid during a certain period of time and the amount of taxes that actually contributed to The state's general budget (Rackowski, 2016: 2), as the tax gap index helps in analyzing the evolution of tax revenues as one of the main variables in implementing the state's public finance policies by showing the extent of tax contribution to public revenues, and the total tax collected to GDP. The total should cover total public spending (which includes public debt servicing) from the proceeds of growth in GDP. This indicator can be expressed in the following equation:

$$T = gt + (rt - nt) dt \dots \dots (1)$$

Since:

T: represents the tax-to-GDP ratio needed to stabilize public debt.

gt: represents the ratio of public spending to GDP, excluding the debt burden

rt: the real interest rate.

nt: is the rate of growth in GDP

dt: represents the ratio of public debt to GDP

And since the tax gap in this represents the difference between the actual collected taxes / GDP (T) and the target value of taxes needed to stabilize the public debt / GDP (*T), the tax gap indicator can be formulated as follows:

$$T - T^* = T = gt + (rt - nt) dt \dots \dots (2)$$

If the target tax proceeds (*T) are greater than the actual ((T), then the tax gap is positive, and this indicates a lack of financial sustainability, which requires reducing public expenditures or increasing tax revenues / GDP to the target (Mohamed, Hussein, 2016: 155).

1. The solvency index:

Financial solvency means the ability of the government to fulfill its financial obligations and face any losses that may occur in the future (Al-Jubouri, 2017: 118), and this indicator is one of the most important indicators used in measuring financial sustainability, and this is done by comparing the current value of cash flows (revenues - expenditures) With the nominal value of the public debt and its accumulated service at the end of the period, and financial solvency is achieved when the

present value of the cash flows is greater or equal to the nominal value of the public debt and its accumulated interest at the end of the period (Daas and Rakoub, 2018: 117).

2. Initial impotence index:

This indicator expresses the extent of the restrictions imposed on public budget decisions due to the increase in the burden of public debt. This indicator is based on a preliminary estimate of the deficit and surplus in the public budget by calculating the difference between public expenditures (excluding interest paid) and public revenues (excluding interest collected). And that this indicator of the public budget is a “necessary” condition to ensure the stability of the public debt / GDP ratio, and thus achieve financial sustainability (Penolver, 2003: 93).

3. Permanent Income Index:

The permanent income index is one of the most prominent indicators for measuring financial sustainability in oil economies. The idea of this indicator stems from the permanent income hypothesis of the American economist Milton Friedman, according to which the individual does not make his choices based on his current income, but rather on his expected permanent income. The permanent income of the oil countries It is determined by determining the ability of its revenues to cover its expenses in the long term, and financial sustainability in oil economies is based on the disengagement of the general budget from fluctuations in oil prices in the medium term at least and in line with the objectives of fiscal policy in the long term (Stum, 2009: 13).

Third: Measuring the impact of the relationship between some financial sustainability indicators and the general budget In Iraq for the period (2004-2022):

To ensure the validity of the hypothesis, the relationship of co-integration between financial sustainability on the one hand and the net

general budget on the other hand will be investigated in this analysis, based on four main indicators of financial sustainability and one indicator expressing the net general budget using the Eviews12 software. The data of the current study also cover the time period (2004-2022). 2004), and due to the short time series of the variables used for measurement, the time series were converted from annual to quarterly through the Eviews12 software.

Description of the standard model

In principle, the independent variables (Independent) and the dependent variables that are included in the standard model are defined, and the variables included in the model are described as follows:

The dependent variable Y (Dependent Variable): It expresses the ratio of budget deficit or surplus / GDP

Independent Variable X1 (Independent Variable): It expresses the ratio of oil revenues / GDP

Independent Variable X2 (Independent Variable): It expresses the ratio of tax revenue / GDP

The independent variable X3 (Independent Variable): It expresses the ratio of other revenues / GDP.

Independent Variable X4 (Independent Variable): It expresses the ratio of public debt / GDP

1. Sleep test:

It is first confirmed that all model variables are still, by performing the following model time series sleep test:

The Phillips-Peron test (PP): It is one of the tests that is used to find out the stillness of the time series, as this test shows the stillness of the time series or its integration at its original level or at the difference, and it is usually used as confirmation of the expanded Dickey-Fuller test, Table (1) It shows the results of the Phillips-Pyrone test as follows:

Table (1) Phillips - Peyron (pp) test for model variables

Variable	the level			(First - difference)		
	With Constant	With Constant	With Constant	With Constant	With Constant	With Constant
	Prob	Prob	Prob	Prob	Prob	Prob

X1	0.1785	0.9327	0.2488	0.2079	0.4165	0.0158
X2	0.0388	0.0710	0.3507	0.0000	0.0000	0.0000
X3	0.1848	0.3149	0.1167	0.0019	0.0083	0.0001
X4	0.0000	0.0001	0.0000	0.0027	0.0437	0.0001
Y	0.1672	0.2644	0.0507	0.0007	0.0000	0.0000

Source: The researcher's work based on the outputs of the E-Views12 program.

Table (1) shows the results of the static test for the variables of the model used, according to the unit root test, and that the financial sustainability variable X2 (tax revenue ratio / GDP) was static according to its original level, according to the (fixed limit), and the financial sustainability variable X4 (Public debt / GDP ratio) was static according to its original level, according to (fixed limit, fixed limit, trend and without), and after taking the first difference, it was found that all the independent variables of the model were stable and at different cases.

As for the indicator of the net budget / GDP ratio in Iraq, it stabilized at its original level without a general and categorical trend, and after taking the first difference, it stabilized in the three cases (for the fixed limit, the fixed limit and the general trend, without the fixed limit and no general trend).

This means that some financial sustainability indicators, as well as the indicator of the net budget / GDP ratio, were integrated from the zero degree (0)I, in addition to their integration at the first degree (1)I.

Table (2): ARDL standard model quality tests for the relationship between study variables

R-squared	0.9721	F-statistic	193.6884
Adjusted R-squared	0.9671	Durbin-Watson stat	1.930450
Prob(F-statistic)	0.000000		

Source: The researcher's work based on the outputs of the E-Views12 program.

Also, the value of Durbin and Watson was high and reached 1.930450, which indicates that there is no autocorrelation problem in the model and that Fisher's statistic reached (0.0000), which means that the model used is an acceptable model for measuring the relationship between the variables of the study, and that the value of Durbin and Watson was greater than the coefficient of determination, and therefore the The model is free from the

This means that part of the variables were static at the original level and part became static at the first difference, and then the (ARDL) methodology can be used, the most important of which is that the variables are static at the first level and difference, and that the chains are not static at the second difference, and thus we fulfilled the methodological conditions (ARDL).

2. Cointegration test according to the ARDL frontier method:

The application of the autoregressive distributed deceleration model (ARDL) does not require that it be preceded by quiescence tests for the time series, but the basic condition for applying this model is the absence of an integrated series of type (I(2), and thus the estimate was made, and the results were as follows:

It is clear from Table (2) the interface of the standard model used to measure the relationship between the variables of the study (ARDL). The total, and that 3% was the result of other factors affecting the ratio of the net budget to the gross domestic product.

problem of false regression, and therefore other tests can be performed on the model, and this gives true results and indicates reality without falsification, such as measuring short and long-term relationships between variables. The ARDL Bounds test demonstrates the complementary or equilibrium relationship in the long term used in the standard model, that is, the complementary relationship between the dependent variable and the independent

variables through the ARDL model, which is defined as the test of the limits calculated on the statistical value of Fisher, by comparing it with the lower and upper limits (critical value

limits) at significant levels ranging from (1%-10%). Table (3) shows the test results as follows:

Table (3): Limit test for cointegration according to the ARDL methodology for the relationship between the study variables

ARDL Bounds Test		
Test Statistic	Value	K
F-statistic	6.253827	4
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.2	3.09
5%	2.56	3.49
2.5%	2.88	3.87
1%	3.29	4.37

Source: The researcher's work based on the outputs of the E-Views12 program.

Table (3) shows the co-integration test of the relationship between the dependent variable (ratio of net budget to GDP) and the independent variables (indicators of financial sustainability). The results of the test indicate that the statistical value calculated for Fisher has reached (6.253827), which is greater than the values of the critical parameter. I0 Bound)) i.e. the minimum and maximum values of the parameter (I1 Bound) which are at significant levels (1,5,2.5,1%)

Hence, this result falls in the critical area, and it is possible to accept the alternative hypothesis, which states that there is a joint integration between financial sustainability and the net budget in Iraq during the study period, and to ensure that there is a long-term relationship, one can resort to the error correction model as follows:

3. Estimating short and long term relationships according to the ARDL method:

The error correction model is based on measuring the impact of the independent variables on the dependent variable on the parameters in the short and long term. Table (4) shows the results of testing the error correction model according to the ARDL methodology as follows:

It is clear from Table (4) the short and long term relationship between the dependent variable Y and the independent variables (X1, X2, X3, X4), as the significance of all estimators was less than the level of significance of 5%, and this means rejecting the null hypothesis that states that there is no short relationship between the dependent variable and the independent variables, and accepting the alternative hypothesis, which states that there is a short-term relationship between the indicators of financial sustainability and the net budget indicator, because the probability was less than 5%.

Table (4): Error correction model (short and long term) according to the ARDL methodology for the relationship between the variables of the study

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(X1)	1.061026	0.137731	7.703591	0.0000
D(X2)	-0.098326	0.950389	4.349939	0.0001

D(X3)	4.134134	0.407271	3.968670	0.0002
D(X4)	-0.098326	0.032269	-3.047045	0.0034
CointEq(-1)	-0.281397	0.044164	-3.487211	0.0015
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
X1	0.706897	0.251433	2.811476	0.0066
X2	2.138898	2.106346	1.015454	0.3139
X3	0.442623	0.956543	0.462732	0.6452
X4	0.016217	0.049787	0.325733	0.7457
C	-29.47928	11.99629	-2.457366	0.0169

Source: The researcher's work based on the outputs of the E-Views12 program.

It is also clear from the results that the error correction coefficient was negative and significant and less than the real one, that is, it meets the error correction condition.

However, the long-term relationship between the variables was of a very high probability, except for the probability of the independent variable X1, as the probability for them was (0.0066), which is less than 5%, and this indicates a long-term relationship between the oil revenue ratio /GDP index and the net budget index /GDP. Thus, we reject the null hypothesis, which states that there is no long-term relationship between the dependent variable and the independent variable, and accept the alternative hypothesis, which states that there is a long-term relationship between the independent variable X1 and the dependent variable Y. From the above, we conclude that the variables X2, X3, X4 did not have a direct impact on Y represented by (the ratio of the net budget to the gross domestic product), that is, the ratio of tax revenues / GDP, the ratio of

other revenues / GDP, and the ratio of public debt / GDP

It did not play its required role by working to expand economic activity that increases local production, which reflects positively on the budget situation in terms of achieving sufficient additional revenues to cover the increased spending, and this corresponds to the reality of the Iraqi economy, as oil revenues in Iraq are the only financing source for the budget that it achieves financial flows to it, and constitutes the largest percentage of the gross domestic product and shortcomings for other sources of revenue, and this applies with the reality and application of economic theory in Iraq

4. Quality tests: ARDL model quality tests include several tests, including:

- a. **Variance stability test:** The homogeneity variance stability test is one of the tests that will be used to ensure the validity of the model used and depends on the probability value of the chi-square. The results are as in the following table (5)

Table (5): Variance stability test for the study model

Heteroskedasticity Test: ARCH	
Prob Chi-Square(1)	0.3698

Source: The researcher's work based on the outputs of the E-Views12 program.

It is clear from Table (5) that the null hypothesis is accepted, which indicates that there is no problem in the consistency of homogeneity, by relying on the probability value (chi-square) of

(0.3698), which is greater than 5%, and therefore the model does not suffer from the problem of consistency of homogeneity.

b. ARDL autocorrelation test:

The autocorrelation test is one of the tests that is used to ensure the validity of the model used and depends on the probability value of Kai. The results are as shown in the following table (6):

Table (6): Autocorrelation test according to the study model

Breusch-Godfrey Serial Correlation LM Test:	
Prob. Chi-Square(2)	0.8877

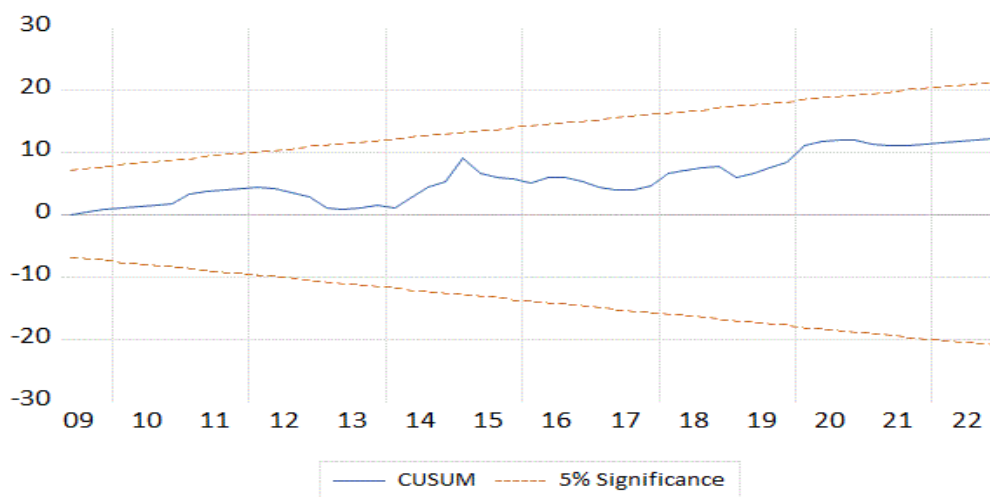
Source: The researcher's work based on the outputs of the E-Views12 program.

It is clear from Table (6) that the null hypothesis is accepted, which indicates that there is no autocorrelation problem, by relying on the probability value (chi-square) of (0.8877), which is greater than 5%, and then the model does not suffer from the autocorrelation problem from By relying on a probability that was greater than 5%.

c. Stability Test:

Stability Test depends on the critical limits of the graph at critical limits at the level of 5% by relying on the red lines, which represent the critical limits, and the blue line, which represents the cumulative sum of the residuals, as follows:

Figure 1: The cusum test of the study model



Source: The researcher's work based on the outputs of the E-Views12 program.

It is evident from Figure (1) that the cumulative total of the residuals was stable

throughout the study period because it falls within the critical limits at the level of 5%.

Conclusions:

1. The financial sustainability index is an "important" indicator that expresses the success or failure of the country's fiscal policy.
2. The results of the standard analysis proved that the coefficient of determination reached 97%, which means that the changes in financial sustainability indicators were able to explain 97% of the changes that occurred in the ratio of net budget / GDP, and that 3% was the result of other factors affecting the ratio of net budget to GDP. gross domestic product.
3. The results of the standard analysis proved the existence of a cointegration relationship, i.e. a balancing relationship between the dependent variable (net budget / GDP ratio) and the independent variables (financial sustainability indicators), according to the statistical value calculated for the Fisher limits test, which amounted to (6.253827), which is greater than the parameter values. Critical (I0 Bound)) i.e. the lower limit and the upper limit values of the parameter (I1 Bound) at significant levels (1,5,2.5,10%)
4. The results of the standard analysis and by testing the error correction model proved that there is a short-term relationship between all financial sustainability indicators and the net budget / GDP indicator at a significant level of 5%.
5. The results of the standard analysis proved that there is a long-term relationship between the independent variable X1 and the dependent variable Y, and that the variables X2, X3, X4 did not have a direct effect on Y represented by (the ratio of net budget / GDP), that is, the ratio of tax revenues / GDP And the ratio of other revenues / GDP and the ratio of public debt / GDP and did not play its required role in affecting economic activity that increases domestic production, which reflects positively on the budget situation in terms of achieving sufficient additional revenues to cover the increased spending, and this corresponds to the reality of economic theory in the economy Iraqi

Proposals:

1. Work on carrying out structural reforms in order to diversify income sources to increase non-oil revenues by creating an investment environment that suits the nature of economic resources in a way that contributes to raising the level of public revenues and reduces the impact of oil price fluctuations.
2. Reconsidering financial and monetary policies, with the necessity of coordination between them in a way that leads to achieving financial sustainability.
3. Reducing the unjustified excessive expansion of public expenditures, while working to reduce the public debt-to-GDP ratio in the long term.
4. Building a successful and efficient integrated electronic tax system that adopts an appropriate strategy for the application of electronic government that works to address tax evasion on the one hand, and limit financial and administrative corruption on the other hand.

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