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Financial sustainability of the Iraqi federal budget in 2006-2020 and its effect on governance

Abstract. The matter of financial sustainability is essential for both advanced and developing economies. It regulates the work of the policies of expenditure with revenue in the short and long term. This research assumes that the increase in the budget deficit is accompanied by an increase in the size of public debt, which will weaken the government's ability to achieve financial sustainability, the research aims to identify the extent of the government's ability to achieving to sustainability and obstacles, and it used the descriptive-analytic approach for coverage the theoretical side and then it used the pattern of econometrics for estimated the relationships among the variables (subject of study) for the period 2006-2020. The results of the econometrics analysis indicated that the approved equilibrium relationship long-term between the revenues and expenditures also indicated the causal relationship in one way, which it represented the revenues it causal the expenditures, at the last main recommendations summarized about the rehabilitation of the taxation sector, which is no less important than the oil sector under the fair legislation for guaranteeing all their rights and sacrifices.
Keywords: Financial Sustainability; Public Debt; Budget Deficit; Financial Burdens; Expenditures
JEL Classifications: E69; F30

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Фінансова стійкість бюджету Іраку в 2006-2020 рр. та її вплив на врядування
Анотація. Це дослідження припускає, що збільшення дефіциту бюджету супроводжується збільшенням розміру державного боргу, що послаблює здатність уряду досягти фінансової стійкості.

Дослідження має на меті виявити ступінь спроможності уряду досягти фінансової стійкості та перешкоди, які виникають. Результати економетричного аналізу державного бюджету Іраку за період 2006-2020 років показали довгостроковий взаємозв'язок між доходами та видатками, а також причинно-наслідковий зв'язок фінансової стійкості з відновленням податкового сектору, який є не менш важливим, ніж нафтовий сектор, в разі наявності справедливого законодавства та гарантування прав суб'єктів господарювання.
Ключові слова: фінансова стійкість; державний борг; дефіцит бюджету; фінансове навантаження; видатки.

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Финансовая устойчивость бюджета Ирака в 2006-2020 гг. и ее влияние на управление

Аннотация. Это исследование предполагает, что увеличение дефицита бюджета сопровождается увеличением размера госдолга, что ослабляет способность правительства достичь финансовой устойчивости. Целью исследования является выявление степени способности правительства достичь финансовой устойчивости и возникающих препятствий. Результаты эконометрического анализа государственного бюджета Ирака за период 2006-2020 годов показали долгосрочную взаимосвязь между доходами и расходами, а также причинно-следственную связь финансовой устойчивости с восстановлением налогового сектора, которая не менее важна, чем нефтяной сектор, в случае наличия справедливого законодательства и гарантии прав хозяйствующих субъектов.
Ключевые слова: финансовая стойкость; государственный долг; дефицит бюджета; финансовая нагрузка; расходы.

1. Introduction

Financial sustainability represents the case that the government can adopt to follow the same expenditure and revenues policies of long and short terms; in other words, it is indicating the band of financial policies that should be adopted and followed by the government in the future for refunding debts or minimize the costs of its services. Else, the government would lose confidence in its finance and ability to do its commitments, then the government would be obliged to follow a policy that aims at lowering the general expenditure, this is what actually happening in Iraq now, and the policy its followed that recessional for the operation expenditure, with a decline in the public investments as well as the increasing of public debt rate to GDP (Amagtome & Alnajjar, 2020). The critical factors it was negatively affecting the financial sustainability; hence, the government should put the economic policies that aim at achieving financial sustainability by providing the real desire of the political and economic leadership to stop and limit the growth of the current expenditure programs costs or at least to allow growth within specific rates, Also, diversification of federal public budget sources and decreasing of the dependence on the petrol revenues that reached 86% from the public revenue of 2020. Finance sustainability is considered one of the most important topics, especially in recent years, due to the situations deteriorating financial for many countries, especially after the global financial and economic crisis and collapse of the crude oil prices in the global markets, which in its turn lead to the increasing of the public budget deficit and public debt after the depression of oil revenue (Hameedi et al., 2021).

The increasing of public debt size due to the increase in the budget deficit. This leads to the increase of the allocated resources to finance the burdens of debt. Consequently, the government loss it's financial sustainability means that the lenders do not trust to government ability to refund their debts and commitments; this made them stop lending money or raising the loan's interest, with imposed conditions and limitations for the loans, this causes many negative effects on the national economy. Moreover, this leads to the government's deficiency to finance its public expenditures and the collapse of the public services level that the government presents to the individuals (Mohammeda, 2020; Schlüter et al., 2021).

The research aims to know the government's ability to achieve financial sustainability, problems, and difficulties that prevent it from achieving this goal. Also, it aims at studying and showing the indicators of financial sustainability in Iraq.

2. Research Methodology

The study is adopted in descriptive and analytical approach for analytic the indicators of financial sustainability, Also, used the econometrics and statistics method for evaluating the financial sustainability in Iraq through the studying period through the studying of the relationship between expenditure and governmental revenues

2.1. The Definition of Financial Sustainability

The origin of the term sustainable to ecology, the sustainable is used to express the formulation and development of the dynamic system which is exposed, due to its dynamicity, to structural changes that lead to a change in its characteristics and elements as well as the relations of these elements with each other's. The concept of sustainability has been tackled widely since 1978; It's linked with economic development (Hameedi et al., 2021). As for financial affairs, financial sustainability is used in economic studies as a scientific term in the mid of 90s of the last century; it refers to the crisis that may face the countries due to the increase of public budget deficiency and the rise of public debt for long terms. Although, this term is spread widely, there is no specific definition among the economist, the European central bank defines financial sustainability as the government's ability to refund its commitments concerning debts for long terms. The government that has owned debts should manage initial surpluses in the future; it should be big enough to be capable of the cost intake of serving current and future debt obligations. Sustainability requires on the average range that the government can refund its debts in a certain period in the future (Amagtome & Alnajjar, 2020; Schlüter et al., 2021).

Financial sustainability depends on the future expectations for the revenues and public expenditures. It represents the financial state of the government through which it would be possible to continue adopting the same current policies for expenditure and public revenues without getting the risk of financial stumbling (deficiency), or the inability to meet its commitments and solvency in the future (Suod Ben Hashem, 2013; Najafabadi & Arimish, 2020).

Others see that financial sustainability is the government's ability to meet its commitments and invest its debts currently and in the future without the need to do great modifications in the future financial policy. As for non-sustainability, it means the case in which debt is accumulated for an unknown date with the faster average from the government's ability to invest it. The concept of financial sustainability involves the achievement of the two principles: solvency and financial liquidity (Hameedi et al., 2021). Also, this relates to the concept of the financial gap that represents the difference among the whole current commitments for the government and its future revenues.

2.2. Financial Sustainability & Public Budget Constrains

Financial sustainability is considered one of the terms of financial policies, one of the most important goals that the government aims to achieve. It reflects the increase of the government's ability to borrow for financing its budget deficiency with low interest and easy conditions. Consequently, if the government fails to achieve its sustainability, it will lose people's trust in its financial affairs and ability to meet its commitments. The lenders would stop lending it money or raise the interest with hard conditions of the loans; financial sustainability can be measured by the use of time constraints for governmental budget, which shows the relationship between revenues and public expenditures for long terms. It is as follows (Puah, et al., 2016; Amagtome & Alnajjar, 2020; Schlüter et al., 2021):

$$G + (1 + i_t)B_{t-1} = R_t + B_t, \tag{1}$$

where:
G - governmental expenditure;
R - public revenues;
B - public debt.

Equation (1) expresses the public budget constraints during the period of t. There is an identical constraint during the period $t + 2$, $t + 1$, $t + 3$;

$$B_0 = \sum_{t=1}^{\infty} \delta(R_t - G_T) + \lim_{n \to \infty} \partial_n B_n. \tag{2}$$

By solving equation (1), we get the equation (2).

And the equation (2) suppose that the current value for the public debt B_0 equals the expected value for all initial future surpluses $\left[\sum_{t=1}^{\infty} \delta_t (R_t - G_t)\right]$ in addition to the current expected values for public debts. This makes the governmental debt equals zero when the $n = \infty$. According to the economic literature, we hypothesize the fixing of interest rate around its average, or we express it by the use of the real interest, so the equation (2) became as follows:

$$GE_t - R_t = \sum_{s=0}^{\infty} \frac{\Delta R_{t+s} - \Delta GE_{t+s} r \Delta B_{t-1+s}}{(1+r)^{s-1}} + \lim_{s \to \infty} \frac{B_{t+s}}{(1+r)^{s+1}} \, , \tag{3}$$

where:

GE represents the total governmental expenditure on the goods, services, transformations, and the interest on the public of debt.

r - interest rate.

It is possible to rewrite the equation (3) as follows:

$$GE_t = \alpha + R_t + \lim_{s \to \infty} \frac{B_{t+s}}{(1+r)^{s+1}} + \varepsilon_t \, . \tag{4}$$

Considering that the debts will be zero, so the final part equals zero so the equation would be:

$$R_t = \alpha + bGE_t + \mu_t \, . \tag{5}$$

Equation (5) is used in testing the conditions of financial sustainability for the temporal budget constraint. Amagtome & Alnajjar (2020) have determined four scenarios for testing the conditions of achieving sustainability which are:

1. The deficiency would be greatly sustainable if R&GE are integrated $b = 1$.
2. Deficiency would not be very much sustainable if R&GE are integrated, $1 > b > 0$. This would be enough for the deficiency to be sustainable. $1 > b$ shows that the government expenditure is larger than the public revenues.
3. Deficiency would be non-sustainable if b was less or equals zero.
4. If $b > 1$, that means the public revenues grow on a greater average than the public expenditures.

3. Results and Discussion

3.1. General Assessments

The financial indicators have been witnessed during the period of the study. It is noticed from Table 1 that the public local debt value after 2006 has witnessed a reduction while the total expenditure and revenues have risen during the same period due to the rise of oil prices and petrol products. This led to a surplus in the budget in spite of the continuing increase in governmental expenditure.

Table 1:
Developed financial data in Iraq for the period of 2006-2020

Years	Public Debt. Of Local	Public Revenues	Public Expenditures	Budget Deficit
2006	5543684	2146346	1982548	163798
2007	5925061	32982739	32117491	865248
2008	6255578	40502890	26375175	14127715
2009	5307008	49063361	38076795	10986566
2010	5193705	54599451	39031232	15568219
2011	4455569	80252182	59403375	20848807
2012	8434049	55209353	52567025	2642328
2013	9180806	70178223	70134201	44022
2014	7446859	108807392	78757666	30049726
2015	6547519	119817224	90374783	29442441
2016	4658549	113840076	119127556	-5287480
2017	9520019	105609846	113473517	-7863671
2018	2756600	94048364	119462420	-25414056
2019	4351000	81700803	105985722	-24284919
2020	6786521	79011421	100671160	-21659739

Source: Compiled by the authors based on General budget law of Iraq for 2006-2021

However, this increase did not continue so long; the budget has made a deficiency during 2016 and 2020. The reason is attributed to the financial crisis that Iraq had passed through during those years due to the lowering of oil prices in the international markets and semi- absolute dependence on the oil revenues in financing the public finance; this led to the increase of the absolute value for the federal total budget deficiency for Iraq, the government has borrowed more internal borrowing to finance the budget deficiency, external borrowing to finance the expenditures of the army and governmental institutes of public sectors and investment projects on another side.

3.2. Estimating of Econometrics Model

We check the validity of the hypothesis by using annual data for the revenues and expenditures for a federal budget of Iraq during 2006-2020. The steps of the econometrics model are:

1. Stability test: to analyze the study's variables, we determine the rank of the integration using the Dickey-Fuller test (1979) of public expenditure and public revenues (Table 2).

Table 2:
Dickey-Fuller test

Decision	1st Difference			Level			
	Trend & Intercept	Intercept	None	Trend & Intercept	Intercept	None	Variables
	-3.828	-3.119	-1.974	-3.933	-3.098	-1.96	T- table
I(0)	-5.02	-4.90	-1.19	-2.27	-0.83	0.79	G
I(1)	3.51	-3.23	-3.32	-1.29	-2.48	0.14	R

Source: Elaborated by the authors using Eviews 9.0

From Table 2 we notice that the data of public expenditures and revenues for (2006-2020) are unstable on the original level according to the Augmented Dickey-Fuller test, but These data become stable when the first difference, that means the variables of public expenditures and revenues are stable in the first differences which refers to that these variables are connected with the first order.

2. Co-integration test: In light of the root unit test results, it is obvious that the variables are integrated by the first level. Therefore, we have used Johansen-Giselius (F. R. Birău and J. Trivedi, 2013) test for co-integration, indicating the ability or not measuring the co-integration among the study's variables (public expenditure and revenues) by depending on the value of trace test and maximum eigenvalue as shown in Table 3.

Table 3:
The results of Co-integration tests by Juselius (2006)

Unrestricted Cointegration Rank Test (Trace)				
	0.05	Trace		Hypothesized
Prob.**	Critical Value	Statistic	Eigenvalue	No. of CE(s)
0.0011	15.49471	25.65503	0.823945	None *
0.0795	3.841466	3.074563	0.210618	At most 1
Trace test indicates 1 Cointegrating eqn(s) at the 0.05 level				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
	0.05	Max-Eigen		Hypothesized
Prob.**	Critical Value	Statistic	Eigenvalue	No. of CE(s)
0.0020	14.26460	22.58047	0.823945	None *
0.0795	3.841466	3.074563	0.210618	At most 1
Max-eigenvalue test indicates 1 co-integrating eqn(s) at the 0.05 level				

Source: Elaborated by the authors using Eviews 9.0

Table 3 shows the test's results of Juselius for integration. Trace and max-tests have shown an unacceptable eigenvalue hypothesis of nothingness H0: $r = 0$ on the confidence level of 5%. Instead, it accepts the alternative hypothesis of H0: $r > 0$, and consequently, there would be common integration. This means that there is long term relationship between public expenditure and revenues.

3.3. VAR model evaluation

For evaluation, the VAR model (Juselius, 2006; Hameedi et al., 2021) must be that all variables within the model are stable and have co-integration (this should be already tested). To make VAR test, must determine the optimum lag time which will be used in the model and as given in Table 4.

From the tests' results, it is noted that the optimal period lag of its second period for all variables, this is because it carries fewer values according to comparison with the other and Table 5 explain the VAR model test.

Using Table 5 and Figure 1 we explained the stability of the econometrics model results, and noted that the results of the VAR model meet the stability conditions. It means it is good and stable. Consequently, it is possible to use causes tests as shown in Table 6.

Table 4:
The optimal lag of model

HQ	SC	AIC	LR	Log L	Lag
73.41684	73.52758	73.44676	NA	-438.6806	0
71.26751	71.59973	71.35727	24.80539	-422.1436	1
69.91564*	70.46934*	70.06525*	13.71082*	-410.3915	2
70.21701	70.99219	70.42646	1.527277	-408.5588	3

Source: Elaborated by the authors using Eviews 9.0

Table 5:
VAR test

R	G	
-0.277791	0.047715	G(-1)
(0.54429)	(0.24953)	
[-0.51037]	[0.19122]	
0.134882	0.246691	G(-2)
(0.47593)	(0.21819)	
[0.28341]	[1.13060]	
0.919386	0.399025	R(-1)
(0.41871)	(0.19196)	
[2.19577]	[2.07868]	
-0.042315	0.311775	R(-2)
(0.45686)	(0.20945)	
[-0.09262]	[1.48852]	
24266596	5401561.	C
(1.5E+07)	(6859332)	
[1.62192]	[0.78748]	
0.681381	0.957195	R-squared
0.522072	0.935792	Adj. R-squared
2.64E+15	5.54E+14	Sum sq. resids
18158067	8324741.	S.E. equation
4.277095	44.72327	F-statistic
-232.5805	-222.4421	Log likelihood
36.55085	34.99109	Akaike AIC
36.76814	35.20837	Schwarz SC
80972353	77956971	Mean dependent
26265662	32853129	S.D. dependent

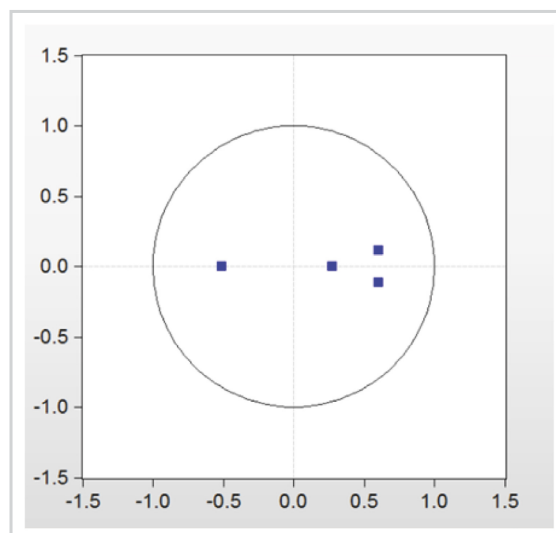Source: Elaborated by the authors using Eviews 9.0

Figure 1:
Inverse roots of characteristic polynomial
Source: Elaborated by the authors using Eviews 9.0

Table 6:
Stable model test

Modulus	Root
0.613528	0.602486 - 0.115875i
0.613528	0.602486 + 0.115875i
0.510848	-0.510848
0.272978	0.272978

Source: Elaborated by the authors using Eviews 9.0

3.4. Causality Test

From the co-integration test, we notice that there is one direction for the causal test (Caprariello et al., 2009), at least, between public expenditures and revenues. Yet this test did not determine the causal direction. So, we would use Granger causality in determining the direction, whether it was in one or two directions. The results of the Granger causality test in Table 7 in its first part show the refusal of the null hypothesis, which states that the public revenues do not cause public expenditure; this means that the variable R effects in the change of G by the value chi-sq and confidence interval & p-value at level 0.005, the second part of the results refer to the acceptance of the null hypothesis (public expenditures do not cause revenues). That indicates to there is no causality relationship between public expenditures and revenues.

Table 7:
Granger Causality test

Dependent variable: G			
Excluded	Chi-sq	DF	Prob.
R	10.49108	2	0.0053
All	10.49108	2	0.0053
Dependent variable: R			
Excluded	Chi-sq	df	Prob.
G	0.643913	2	0.7247
All	0.643913	2	0.7247

Source: Elaborated by the authors using Eviews 9.0

4. Conclusions

1. Noted increasing size of the public expenditures with public revenues, especially in recent years, will lead to the expand of the budget deficit and the Iraqi government dependence on the public debt for financing this deficit.
2. The Iraqi government's financial state does not have the essential requirements to achieve financial sustainability. This is due to the large and fast increase in public debt, which negatively affects financial sustainability.
3. The financial sustainability indicators refer to the great dependence on the oil revenues with no other important revenues especially taxing revenues. Also, the continuity of the public deficiency, which turned from planning to actual, is considered a risk for financial sustainability and financial stability.
4. The econometrics model results, depending on the test of Juselius, refer to the existence of a long-term relationship between public revenues and expenditures.
5. The causality test results show that there is one direction causative relationship that is represented in that the public revenues cause public expenditure. Consequently, the government can modify its expenditure depending on the number of its public revenues.

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