
MEASURING AND ANALYZING THE IMPACT OF PUBLIC DEBT ON FOREIGN EXCHANGE RESERVES IN IRAQ FOR THE PERIOD (2003- 2020)

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Abstract

The investigation aims to gauge and explore the effects of public debt, both internal and external, on foreign exchange reserves in Iraq, which suffers from the problem of growing the volume of public debt and the consequent benefits of this debt that shackle the economy with more restrictions. The descriptive approach was used in the analysis of the theoretical framework supported by the quantitative inductive approach to measure this effect, and the time series of the study variables were stabilized when taking the first difference and the explanatory power of the model showed relative quality R-squared 92) While the results of polytheistic integration were the lack of a balanced relationship, and the reason for this is the government's dependence on financing public debt on external loans and stimulus policies, which greatly reduce the impact of public debt on foreign reserves.

Introduction

Perhaps one of the most important of these crises is the global financial crisis in 2008, which was the first spark of the mortgage crisis witnessed by the US economy and from it to the global economy, which clearly affected the efficiency of economic policies. Every year, monetary and fiscal policies in particular, which were the cause of the large accumulation of external and internal public debt of many countries, which greatly affected the efficiency of monetary markets and financial markets and the financial sustainability of these countries and thus their inability to meet their debt obligations. Although public debt can be an important reason for activating aggregate demand and thus increasing the rates of economic growth in the recipient countries, on the other hand, this public debt can play the role of displacing the private sector from the economic activity of countries.

This investigation aims to gauge and explore the effects of public debt, both external and internal, on the size of foreign currency reserves in Iraq for the period 2004-2020, and thus find out whether public debt has an impact on the size of foreign reserves and what is the nature of this impact, and whether the monetary policy followed in Iraq had a role in reducing the impact of public debt on the size of reserves, taking into account the severe economic and political crises faced by the Iraqi economy during the study period.

The importance of the study

The importance of the study stems from the need to identify the extent of the impact of external and internal public debt in Iraq on the international balance of foreign currency reserves.

Study problem

The problem of the study is the size of the large public debt suffered by the Iraqi economy and the consequent benefits and services of this debt that shackle the Iraqi economy with more restrictions and thus the inability of the government to meet the needs of development and this is reflected negatively on the Iraqi economy.

Objective of the study

This research purpose is to determine the degree to which the volume of external funding is affected by the size of the external funding and internal public debt affects the size of foreign **currency** reserves through analysis and measurement of the structure of the development of public debt and its impact on the volume of foreign exchange reserves in Iraq.

Study hypothesis

The study proceeds from the premise that there is no clear and significant effect of the magnitude of the public debt on the magnitude of foreign currency reserves in Iraq during the study period, and the reason for this is the government's endeavor to enhance foreign reserves and currency stability.

Study Methodology

In order to achieve the goal of the investigation and assess its hypotheses., the study relied on the use of the descriptive approach in analyzing the data of economic variables and enhancing this analysis with the quantitative approach by measuring the impact using the Afioz program.

The first topic: public debt and foreign reserves - a theoretical framework

Public debt

Public debt is money borrowed by governments from internal and external parties when faced with a deficit in the volume of financial resources necessary to cover their public expenditures, and public debt represents the link between fiscal policy and monetary policy through interest rate and liquidity, and public debt at the international level has increased to unprecedented levels According to the report of the Institute of International Finance, the volume of global debt has increased to (307) trillion dollars in 2003, an increase of (10) trillion dollars for the year 2003, while the ratio of global public debt to GDP was about 36% (Tarabish, 2023, 3).

Developed countries such as the United States of America, Japan and France have seen A significant rise in the ratio of public debt to GDP and this represents a great pressure on these economies and a source of concern for senior economists because of the resulting rise in inflation rates and this was one of the direct reasons for the response of the US Federal

Reserve and other central banks in the world to raise interest rates A report issued by the International Monetary Fund indicates the largest boom in 50 years in public debt in advanced economies of 70% of GDP in 2007 to 124% of GDP in 2020 (International Monetary Fund, 12). Developed countries have witnessed a significant expansion in the volume of public debt, taking advantage of low interest rates during the Corona pandemic, not to mention the significant development of their financial markets (Vitor et al., 2021, 4). A report issued by the World Bank refers to the suffering of developing countries, especially low-income countries, due to the high volume of public debt of these countries, where the amount of public debt service for these countries is about (443.5) billion dollars, which means the loss of the basic sectors of health and education for these funds and went out to service the public debt, and this was one of the reasons for the economic recession of these countries, where the cases of default on the payment of this debt increased to (18) cases in (10) developing countries. This represents a large number compared to previous periods, and information indicates that about 60% of low-income developing countries are at risk of default on their debts, and these debts represent an economic problem for more than (75) developing countries, where the amounts of public debt service for these countries reached record levels that exceeded (88) billion dollars in 2022 (World Bank, 2023, 15)

Foreign Exchange Reserves

Foreign exchange reserves in the strict sense are deposits and bonds of foreign currencies in the possession of central banks or are external resources accessible to monetary authorities and under their control, these resources can be used to finance the country's external debt, and these foreign exchange reserves have a major role in stabilizing the exchange rates of the local currency through the influence on the currency exchange rate or other associated goals like maintaining faith in the local currency and creating and maintaining a foundation for external debt (Fund International Monetary Fund, 2013, 3).

Foreign exchange reserves are characterized by international public acceptance and can be used by the monetary authorities in the country to finance a deficit that occurs in the balance of payments temporarily instead of resorting to other resources that have negative effects on the economy, such as borrowing from abroad (Al-Hindawi et al., 2022, 6). This requires successful management of foreign reserves that provide an acceptable amount of foreign assets owned by the public sector and the state has full control over these assets in order to achieve a set of goals such as (Jarrah, Ibrahim, 2022, 5)

- Enhance confidence in cash and exchange rate management and support the national currency when needed
- Reducing the impact of external shocks by maintaining a degree of liquidity in foreign currencies to absorb these shocks
- Increasing the degree of confidence in the financial and monetary markets through the ability of the country to meet its external obligations (IMF, 2000, 4)

The second topic: public debt and foreign reserves in Iraq

It seems that there is an urgent need to follow up on the developments of public debt in Iraq due to the worsening deficit and the increase in the debt-to-GDP ratio of the public sector, and it can be said that the starting point for the follow-up of public debt in Iraq is what happened from the agreement with the Paris Club in 2004 and under which the public debt in Iraq was structured, and the announcement of the Group of Seven industrial, which are members of the Paris Club for its desire to lift the debt burden on the Iraqi economy, and canceled Serbia has 90% of Iraq's debts and Bulgaria, Romania, Malaysia and Indonesia have canceled 80%, while some countries have expressed reservations about reducing Iraqi debts, while Russia has announced the possibility of exempting Iraq from 50% of its debts (Zubaidi, 2018, 41).

On this basis, there was an urgent need to follow up the development of the structure of public debt in Iraq, which is divided into:

First: External Public Debt:

Usually, oil countries, including Iraq, rely mainly on what is achieved in oil revenues and as a result of the economic, political and security conditions that Iraq went through that led to the exacerbation of economic problems and the permanent deficit in the balance of payments with the accumulation of external loans and public debt services (Faraj and Aref, 2021, 113). Where the volume of external public debt in Iraq in 2003 amounted to about \$ 120 billion, including the debt of the Gulf Cooperation Council countries, and Iraq began important negotiations with the International Monetary Fund and the Paris Club in 2003, which resulted in the amortization of 80% of the external public debt (Saleh, 2022, 8).

From Table (1) it is clear to us that the general trend of the volume of external public debt is decreasing with the presence of some years in the time series witnessed an increase in the volume of debt, when the volume of external public debt was 120 billion dollars, the volume of foreign reserves was 23.36 billion dollars, and the reason for the increase in the volume of debt and the decrease in reserves for this year is the conditions of wars and economic blockade experienced by Iraq before 2003, and 2005 witnessed an increase in the volume of public debt to 125 billion dollars and a decrease The size of foreign reserves to 11.43 billion dollars The reason for this can be attributed to the change in the political and economic system and the accompanying entry of foreign forces that reflected negatively on the security situation of the country, while it is noted that the general trend of external public debt from 2007 to 2020 is a downward trend except for the years (2015 and 2016, which witnessed the entry of terrorist groups to some governorates) and the reason for this decrease in the size of External debt to partial or total exemptions obtained by Iraq through the Paris Club talks, as well as to the improvement in oil prices during the study period in general, while it is noted that the general trend of the volume of foreign reserves is increasing during the study period (except for the years 2014, 2015, 2016, which witnessed the entry of terrorist groups to some provinces) Other than that, the direction of the time series of variables external public debt and the size of foreign reserves are consistent with the economic logic because the low volume of debt The year is achieved when the financial revenues increase and this increase in revenues reflects positively on the size of cash reserves.

Second: Internal Public Debt in Iraq

The internal public debt in Iraq is related to the volume of revenues derived from oil exports in an inverse relationship, the more financial revenues decrease, the volume of internal debt decreases, and vice versa, when financial conditions improved relatively during the period 2005-2008, the index of the volume of internal debt decreased from 79.35% to 21.8%, while the period from 2014 to 2020 witnessed a significant fluctuation in the volume of internal public debt due to fluctuating oil prices (Al-Jubouri and Shanta, 2021, 92). It is clear from Table (1) that the volume of internal public debt was in 2003 (2.8) billion dollars, offset by the volume of foreign reserves (23.36) billion dollars, while the year 2004 witnessed an increase in the volume of debt to 4 billion dollars, offset by a sharp decline in the volume of foreign reserves to 7.9 billion dollars, and the reason for this can be attributed to the political and economic conditions witnessed by Iraq, while the internal debt during the period 2005-2013 was semi-stable. The period 2014-2017 witnessed an increase in the volume of internal public debt, offset by a slight decrease in the volume of foreign reserves, and the reason for this can be attributed to the control of terrorism over a number of Iraqi provinces, while the year 2020 witnessed a significant increase in the volume of internal public debt amounting to 14.5 billion dollars, offset by a clear decrease in the volume of foreign reserves to 57.5 billion dollars, and the reason for this is the significant deterioration that occurred in oil prices.

Table (1) External and internal public debt and foreign exchange reserves(billion dollars)

the years	Foreign Exchange Reserves	growth rate	Internal public debt	growth rate	External public debt	growth rate
2003	23.36	-	2.8	-	120	-
2004	7.09	45.3	4.07	21.7-	93.05	69.6-
2005	11.43	3.1	4.2	34	125	61.2
2006	19.23	16.6-	3.5	26.1-	92.33	68.2
2007	30.88	14.2	4.0	11.8-	81.48	60.5
2008	49.53	7.5-	3.7	27-	100.9	60.3
2009	42.04	95.3	7.2	32.90-	67.7	15.02-
2010	48.31	28.26	9.2	11.23	75.2	14.8
2011	58.73	14.1	10.5	17.22-	62.1	21.5
2012	66.7	5.71-	9.9	22.86-	47.9	13.5
2013	74.29	27.27-	7.2	26.51-	35.2	11.3
2014	61.91	54.73	17.3	3.12	36.3	16.6
2015	50.65	47.40	25.5	12.39	40.8	18.1
2016	45.3	5.49	26.9	4.66	42.7	10.5-
2017	49.32	1.11	27.2	5.15	44.9	8.8
2018	64.72	8.03-	10.3	48.1-	23.3	31.2
2019	68.2	3.88-	9.9	96.56	45.8	5.3
2020	57.5	46.46	14.5	32.96	60.9	15.6-

Source: Ministry of Finance / Public Debt Department plus various bulletins of the Central Bank

The third topic: measuring and analyzing the impact of public debt on foreign exchange reserves in Iraq For the period (2003-2020)

First: Description of the model:

1. Dependent variable (cash reserve – Y): It is an important indicator of the state's ability to pay its external debts
2. The independent variable (public debt - X): It represents the money borrowed by the state when it faces a deficit in public revenues to cover its expenses and consists of the following:
 - A. External public debt: Its debt derived from outside funding sources.
 - B. Internal public debt: It is loans obtained by the state from internal financing bodies

Second: Standard Test Results

1- **Drawing the variables of the time series:** From the graph of the time series, it is noted that the series is oscillating and unstable, see Figure (1). It became stable when taking the first difference and the graph cannot be relied on definitively and in order to assess the consistency of the studied parameters, the unit root will be made.

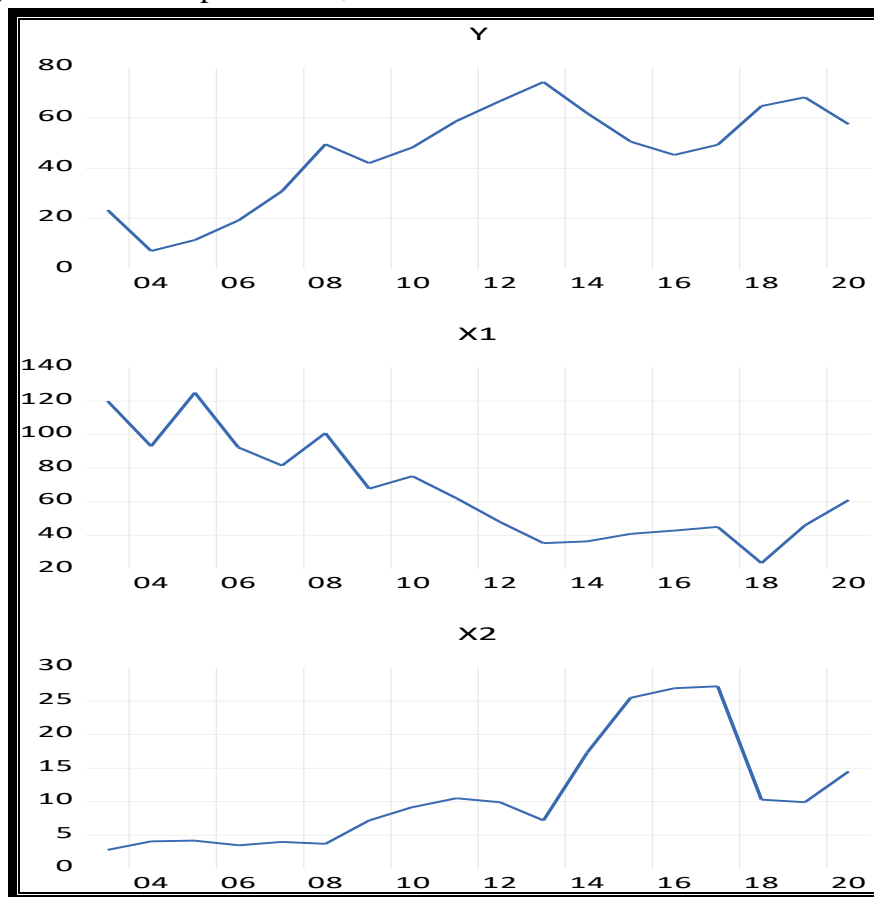


Figure (1) Time-Series Data Reduction

Source: Developed by the researcher using the statistical program (Eviews.12)

Third: Time Series Silence Test:

Considering the lack of stability in the time series, and to ensure that there is no pseudo-regression in the estimation, we perform the unit root test through the results of the Phillips-Byron test, through the results it was determined that Independent variables (X1,X2) and

dependent variables (Y). is static at the level, and after taking the first difference, it is noted that all independent variables and the dependent variable static, either with a constant or constant and direction or without constant and direction, at a significant level (1%), as in Table (2).

Table (2) Unit root test

Unit root test (PP) results table				
The null hypothesis: the variable has a constant root.				
	At Level			
		Y	X1	X2
With Constant	t-Statistic	-1.3204	-1.9824	-1.5811
	Prob.	0.6158	0.2938	0.4869
		N0	N0	N0
With Constant & Trend	t-Statistic	-1.5664	-2.1927	-1.9174
	Prob.	0.7964	0.486	0.6351
		N0	N0	N0
Without Constant & Trend	t-Statistic	0.213	-1.4881	-0.496
	Prob.	0.7453	0.127	0.4979
		N0	N0	N0
At First Difference				
		D(Y)	d(x1)	D(X2)
With Constant	t-Statistic	-8.3218	-8.313	-8.2782
	Prob.	0.000	0.000	0.000
		***	***	***
With Constant & Trend	t-Statistic	-8.2889	-8.4021	-8.2346
	Prob.	0.000	0.000	0.000
		***	***	***
Without Constant & Trend	t-Statistic	-8.3066	-8.3066	-8.3066
	Prob.	0.000	0.000	0.000
		***	***	***
Notes:				
a: (*)Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1% and (no) Not Significant				

Source: Prepared by the researcher based on the statistical program (Eviews.12)

Fourth: The results of the standard analysis: Through the results of the unit root tests, it is noted that it is stable in the first difference, and therefore we can apply the self-regression model for slowing gaps (ARDL) to the data by the statistical program (12).EViews) after converting it into quarterly data and the results were as follows :

1.Explanatory power of the model: Using the ARDL method of the slowing gap model, the cointegration model was estimated and it was found that statistical tests show the relative quality of the estimated model through the coefficient of determination. which shows that the model interpreted (93%) of the changes in the foreign exchange reserve variable (Y) as a result of the change in the independent variable (public debt - (external - internal) (7%) by

other variables outside the model, and the quality of the model corresponds through the test (F) at a significant level (5%), see Table (3) below.

Table (3) Results of the application of the slowing gap model – preliminary estimate

Dependent variable: LOG(Y)				
manner: ARDL				
Date: 02/27/24 Time: 10:25				
Sample (adjusted): 2003Q2 2020Q4				
Included reports: 71-75 after alterations.				
Max. dependent length: 4 (automatic choice)				
Model selection methods: Akaike's information criterion (AIC)				
Dynamic regressors (4 lags, automatic): LOG(X1) LOG(X2)				
Fixed regressors: C				
Number of models evaluated: 100				
Selected Model: ARDL(1, 1, 1)				
Note: The sample of the final equation is more extensive than the initial selection.				
Variable	Coefficient	Std. Error	t-Statistic	Problem.*
LOG(Y(-1))	0.955577	0.049569	19.27754	0.0000
LOG(X1)	0.214732	0.15425	1.392106	0.1686
LOG(X1(-1))	-0.22775	0.146958	-1.54973	0.1261
LOG(X2)	-0.46013	0.115645	-3.97879	0.0002
LOG(X2(-1))	0.45778	0.115091	3.977546	0.0002
C	0.246952	0.521197	0.473817	0.6372
R-squared	0.929187	Mean dependent var		3.687397
Adjusted R-squared	0.923739	S.D. dependent var		0.641997
S.E. of regression	0.17729	Information criteria		-0.54134
Sum squared resid	2.043055	Schwarz criterion		-0.35013
Log-likelihood	25.21765	Hannan-Quinn critter.		-0.4653
F-statistic	170.581	Durbin-Watson stat		1.999797
Prob(F-statistic)			0.000	

Source: Developed by the researcher using the statistical program (Eviews.12)

2. Long-term equilibrium relationship test Joint integration : To determine if a long-term relationship with a shared integration between (public debt) as independent variables and variable (foreign exchange reserve) as a dependent in Iraq using the (F-Bounds Test), the results were presented as follows in Table (3)

Table (3) Cointegration test results

F-Bounds Test	The null hypothesis: No association between levels.
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Test Statistic	Value	Signif.	I(0)	I(1)
Asymptotic: n=1000				
F-statistic	0.4797	10%	3.17	4.14
K	2	5%	3.79	4.85
		2.5%	4.41	5.52
		1%	5.15	6.36
Actual Sample Size 71			Finite Sample: n=75	

Source: Developed by the researcher using the statistical program (Eviews.12)

Through Table (3) of the test results, it can be seen that the value of a test according to the statistics (F) is (0.479), which is less than the highest and lowest value at the level of significance (5%), and thus there is no long-term common integration relationship between the research variables, so the analysis will be limited to the short-term.

Short-term relationship: The results showed the following:

A. The absence of a significant impact at the level of (5%) of the external public debt in the foreign exchange reserves.

The absence of a significant impact at the level of (5%) of the internal public debt in the foreign exchange reserves.

Table (4) Long and short term results

ARDL's Long Run Method and Bounds Test				
Dependent Variable: DLOG(Y)				
Selected Model: ARDL(1, 1, 1)				
Case 3: Unrestricted Constant and No Trend				
Date: 02/27/24 Time: 10:29				
Sample: 2003Q1 2020Q4				
Included remarks: 71				
Conditional error correction regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.246952	0.521197	0.473817	0.6372
LOG(Y(-1))*	-0.04442	0.049569	-0.89618	0.3735
LOG(X1(-1))	-0.01301	0.085962	-0.15137	0.8801
LOG(X2(-1))	-0.00235	0.04621	-0.05083	0.9596
DLOG(X1)	0.214732	0.15425	1.392106	0.1686
DLOG(X2)	-0.46013	0.115645	-3.97879	0.0002
The p-value is not in agreement with the t-Bounds distribution.				
The equation of levels				
Case 3: Constant Unlimited and No Trends				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(X1)	-0.29292	1.780119	-0.16455	0.8698
LOG(X2)	-0.05288	1.048516	-0.05043	0.9599
EC = LOG(Y) - (-0.2929*LOG(X1) -0.0529*LOG(X2))				

Source: Developed by the researcher using the statistical program (Eviews.12)

The reason for the low impact of public debt on foreign reserves in Iraq can be explained to the political and economic instability during the study period, which was reflected in the form of financial crises and fluctuations in the value of the local currency, hence the government's main priority was to achieve financial and monetary stability through its dependence on foreign exchange reserves regardless of the size of the public debt, in addition to that, the state's resort to financing public debt through stimulus policies and international loans greatly reduces the impact of debt. General on the size of foreign currency reserves available to the government.

4. Diagnostic tests:

To In order to ensure the accuracy and validity of the results obtained by the previous tests, we will conduct some diagnostic tests to prove the results. Using the data of the autocorrelation problem test (LM test) in Table (), we found that the statistical magnitude (F - The probability level of the statistics) is (Prob = 0.999), which is not significant at the (5%) level, which means that there is no autocorrelation problem. The test result (ARCH) does not detect the heterogeneity problem. From the probability level, it is The (F-statistic) value of (Prob = 0.749) can be clearly seen that it is not significant at the (5%) level, which means there is no problematic variance difference, so we accept the null hypothesis and reject the alternative hypothesis, This hypothesis suggests that there is a problem of variance heterogeneity among random residues.

Table (5) Diagnostic tests of the model

Breusch-Godfrey LM test for serial correlation:			
Null hypothesis: No serial correlation at up to 2 lags			
F-statistic	0.000191	Prob. F(2,63)	0.9998
Obs*R-squared	0.000431	Prob. Chi-Square(2)	0.9998
Heteroskedasticity Test: ARCH			
F-statistic	0.10312	Prob. F(1,68)	0.7491
Obs*R-squared	0.105992	Prob. Chi-Square(1)	0.7448

Source: Developed by the researcher using the statistical program (Eviews.12)

Conclusions

1. The interest of public debt or not depends on the mechanism of allocation of financial resources resulting from borrowing and does not necessarily have to be a burden on the economy.
2. Foreign reserves play a major role in serving the economy through their role in increasing economic growth rates and stabilizing the exchange rate of the local currency.

3. The general trend of the volume of debt in Iraq after 2003 is a downward trend, due to the increase in oil exports on the one hand and the amortization of a large percentage of Iraq's foreign debt through the Paris Club on the other hand.
4. The results of the standard estimation of the unit root proved the stability of the time series of the study variables when taking the first difference during the study period.
5. The results of the standard analysis proved the weakness of the relationship between the variables of the study and in the short and long term, and the reason for this can be the economic procedures followed by politicians, which depend on the sustainability of public debt and not to display the value of the national currency to large fluctuations.

Recommendations

1. Establishing sovereign funds in which part of the foreign exchange reserves are harnessed to ensure the rights of future generations.
2. The need for the efficient management of foreign exchange reserves and not directing them to finance the budget deficit and to keep political influences away from them.
3. Harnessing the revenues of the public debt obtained to serve investment expenses and not for operational expenses.
4. Revitalizing the productive sectors in the country and reducing dependence on oil revenues.

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