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The Impact of Public Debt on Exchange Rate Stability in Iraq (2004–2023)

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Abstract: The relationship between monetary and fiscal variables is of critical importance, particularly when it influences the trajectory of economic policy. Public debt in Iraq has emerged as a chronic issue, placing a significant burden on the country's fiscal performance. A key monetary variable highlighting the Iraqi economy's weakened financial strength is the exchange rate; this serves as the primary mechanism through which the Central Bank effectively manages foreign currency operations, and fluctuations in the supply of foreign currency entail both positive and negative consequences. This research examines the principal theories regarding the variables in question, concluding that inflationary effects play a significant role in exacerbating the public debt crisis within the Iraqi economy. The findings also indicate that any increase in public debt directly contributes to the depreciation of the local currency against foreign currencies; specifically, a rise in borrowing levels expands liquidity, thereby impacting the currency's value.

Keywords: Public Debt, Exchange Rate Stability, Iraq.

1. Introduction

The Iraqi economy is rich in economic resources; however, an over-reliance on crude oil sales has rendered it vulnerable to global oil price fluctuations [1]. This situation has compelled economic policymakers to adopt measures capable of offering straightforward solutions to the financial crises facing the government due to shortfalls in public revenue [2]. Consequently, the researcher has sought to examine the relationship between exchange rates and the volume of public debt [3]. This involved analyzing the relationship and tracking time-series data spanning over twenty years to identify key changes in public debt levels and assess their impact on exchange rates.

An analysis of fiscal policy performance in Iraq reveals significant crowding-out effects involving the interplay between monetary and fiscal policy instruments. This interaction has created a new domestic burden that tangibly affects the Iraqi government's economic performance [4]. In recent years, the public debt crisis has intensified, with its impact clearly evident in the government's ability to meet its obligations to individuals and institutions.

Significance of the Research:

This study aims to establish the relationship between two key economic variables; demonstrating this link will undoubtedly lead to a realistic adjustment in the course of monetary and fiscal policies. This is necessitated by the diminishing control over the public debt ratio, which has become a major factor influencing the Iraqi economy [5].

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Research Objective:

This research aims to clarify the economic importance of coordinating fiscal and monetary policy tools to ensure economic stability. It does so by examining the government's role in influencing Central Bank decisions regarding foreign currency transactions and the resulting impact on the public debt situation [6].

Research Problem:

The research problem centers on the fact that the Iraqi economy faces a genuine challenge regarding public debt management. This issue has been exacerbated by the role of exchange rates as a significant monetary factor, given that any increase in public debt impacts liquidity levels and, consequently, exchange rates [7].

Research Hypothesis:

The study is based on the hypothesis that there is a statistically significant relationship between exchange rates and public debt; specifically, any increase in the volume of public debt tends to drive up exchange rates, thereby exerting a negative impact on the local currency.

Analyzing the Relationship Between Public Debt and Exchange Rates**The Conceptual Framework of the Exchange Rate****The Concept of Exchange Rate:**

Before analyzing the real exchange rate indicator in Iraq, we will briefly review the concept of the exchange rate, its types, and its systems, before returning to the real exchange rate in Iraq. The exchange rate refers to the price of a unit of local currency in terms of foreign currency [5]; it is the value of one currency denominated in another, a measure of the currency value that can be exchanged for the currency of another country, or the ratio at which one currency is exchanged for another [6]. In this context, it is essential to clarify the relationship between the exchange rate and the value of the local currency: a rise in the exchange rate implies a depreciation (decline in value) of the local currency, while a fall in the exchange rate implies an appreciation (increase in value) of the local currency, indicating an inverse relationship between the exchange rate and the value of the local currency. As for the types of exchange rates, they include [8]:

- 1- Nominal Exchange Rate: The previously cited definitions represent the definition of the nominal exchange rate. This rate is determined by supply and demand conditions at a specific point in time. The nominal exchange rate takes several forms, including:
 - 1- The official exchange rate, which is the rate applied to settle official current transactions; and
 - 2- The parallel exchange rate, which is the rate prevailing in the parallel market. This implies the possibility of multiple nominal exchange rates existing simultaneously within the same country [4].
- 2- The real exchange rate represents the nominal exchange rate adjusted for relative domestic price levels; it expresses the quantity of foreign goods required to purchase a single unit of a domestic good. The real exchange rate [9].

$$Re = Pd / (E * Pf)$$

Where Re represents the real exchange rate, Pd is the domestic price level, E is the nominal exchange rate, and Pf is the foreign price level.

The equilibrium exchange rate is the rate at which the quantity demanded of a currency equals the quantity supplied; that is, at this rate, the quantity demanded exactly matches the quantity supplied.

There are three exchange rate systems [8].

Fixed exchange rate system: This system does not allow the exchange rate to fluctuate in the market in response to daily changes in supply and demand. Instead, the government pegs the currency to a specific value—or sets upper and lower limits for the rate—allowing it to fluctuate only within those boundaries. This system was adopted in Iraq throughout the period from 1980 to 2002.

Flexible or floating exchange rate system: Under this system, the exchange rate is determined by the factors governing the supply and demand for foreign currency in the exchange market, without intervention from monetary authorities. The flexible exchange rate system is more efficient at absorbing external shocks and shocks to the domestic goods market; economic stability can be achieved by allowing the exchange rate to move and adjust in response to such shocks [2].

A managed exchange rate system implies that the exchange rate is free to move—meaning it is determined by the interaction of supply and demand forces for the currency in the foreign exchange market—yet the central bank intervenes to limit fluctuations, in order to mitigate the effects resulting from such fluctuations. This is the system currently followed in Iraq, implemented since 2003 [3].

The Concept of Public Debt:

1- Loans:

Public loans can be defined as "a debt contract under which the state borrows sums of money from individuals, banks, or local or international bodies, with a commitment to repay the loan and its interest to the creditors on a specified date, in accordance with the terms of the contract" [12], [13]. A fundamental characteristic of a loan is the commitment to repay it—distinct from other state revenues—as it is established on a contractual basis between the state and the lenders. It therefore differs from a tax; tax revenues enter the public treasury and are not returned to the payers, whereas loan proceeds enter the treasury as a debt, accompanied by the state's pledge to repay the principal and interest within a timeframe agreed upon by both parties. The state resorts to public loans for two main reasons [14]. first, when taxes have reached their maximum limit; and second, when taxation triggers strong negative social reactions. There are various types of loans—domestic and foreign—both of which impose a burden on the national economy, as the principal amount (the debt) must be repaid along with accrued interest. Furthermore, foreign loans are often tied to specific political conditions; therefore, the state must utilize such loans optimally—for instance, to finance investments and build up productive capacity [8], [14]. Loan repayment constitutes a form of public expenditure requiring the mobilization of sufficient resources; since taxes are the state's primary revenue source, the taxpayers themselves ultimately bear the burden of public debt. While both public loans and taxes require legislative enactment, they differ in that taxation is mandatory, whereas participation in a loan is voluntary for the subscriber. However, the state may occasionally issue compulsory loans requiring citizen subscription—with or without interest. Additionally, tax payments are final and non-recoverable, whereas the loan principal is eventually repaid to the subscriber, even if no interest is paid [14].

Public debt can be categorized into three main types [15]

1. Public loans, classified by method into:

- a. Voluntary loans: "Loans to which individuals and national public or private entities subscribe willingly."
- b. Compulsory loans. : "These are loans to which individuals and national public and private entities are required to subscribe; it should be noted that this type of loan is strictly domestic."

2. Public loans classified by repayment period:

- a. Short-term loans: These have a repayment period of no more than one year, and the state resorts to them to address budget deficits.
- b. Medium-term loans: These range in duration from one to five years.
- c. Long-term loans: These are loans with a duration exceeding five years.

3. Public loans, classified by source into:

- a. Domestic loans: Loans issued by the state within its territorial boundaries—in other words, loans obtained from natural and legal persons residing within the state's territory.

This type of loan does not affect national wealth, the exchange rate, or the balance of payments; rather, it merely results in the redistribution of national income.

b. External loans are defined as loans issued by the state outside its territorial boundaries—meaning they are obtained from abroad, whether from a foreign government, a natural or legal person, or international institutions such as the International Monetary Fund (IMF) or the World Bank. According to internationally recognized fiscal discipline standards, it is preferable for this ratio not to exceed 60% of the Gross Domestic Product (GDP). Table (1) shows that total public debt was high in 2004, reaching \$132,078 million; this was due to the former regime's policies, which had prompted the UN Security Council to impose economic sanctions on Iraq, leaving the country indebted to many nations worldwide. Debt levels subsequently declined in the following years due to increased oil exports and rising global oil prices—factors that boosted foreign reserves and generated a general budget surplus, enabling Iraq to settle its debts and obligations. Additionally, successful negotiations with Paris Club nations resulted in the forgiveness or write-off of 80% of external debt. However, in 2009, total public debt rose to \$71,359 million—an annual increase of 5.7%—reaching 64.1% of GDP, up from the 2008 level. This rise was driven by a decline in public revenues caused by falling oil prices—itself a result of reduced global demand for oil following the global financial crisis—which in turn impacted economic activity. During the period from 2010 to 2013, total public debt continued to decline. In 2010, it stood at \$68,747 million—representing 49.6% of GDP—with a negative growth rate of 3.7%. By 2013, the debt had fallen to \$62,950 million, with an annual growth rate of -4.5%. Thanks to increased oil revenues driven by rising oil prices and a resulting budget surplus, the Ministry of Finance was able to meet its obligations and settle the government bonds and treasury bills held by the Central Bank of Iraq.

In 2014, total public debt rose to \$66,113 million, with an annual growth rate of 5.0%. It continued to climb in subsequent years, reaching \$118,145 million in 2018—an annual growth rate of 3.8%—driven by falling oil prices, deteriorating security conditions, and the war against terrorist organizations, which necessitated increased spending on armaments and the care of displaced persons. This situation constrained the state's ability to meet its obligations, compelling it to seek new loans to cover the substantial budget deficit. However, in 2019, the debt fell to \$98,701 million—a decline of 16.5% and equivalent to 42.2% of GDP—thanks to rising oil prices, increased export volumes, and stabilized security conditions; these factors generated financial surpluses that enabled the government to repay its debts and the associated interest. In 2020, government debt saw a marked increase to \$114,539 million, representing a growth rate of 16.0% and amounting to 62.8% of GDP. This rise was attributed to the global economic disruption caused by the health crisis (the COVID-19 pandemic), which led to a slump in global oil demand; the resulting drop in revenue and the emergence of a budget deficit forced the state to secure both domestic and external loans to cope with the crisis. Regarding the years 2021 and 2022, public debt declined, reaching \$69,642 million and \$66,140 million respectively—reflecting annual growth rates of -39.2% and -5.0% and representing 33.2% and 23.0% of GDP. This decrease was driven by a rise in global oil prices following the global economic recovery after COVID-19 lockdowns; the resulting public budget surplus enabled the repayment of a significant portion of the debt. However, in 2023, total public debt rose again to \$69,094 million, marking a positive growth rate of 4.5% and reaching 25.4% of GDP. This increase was caused by falling oil prices and a public budget deficit, compounded by persistently high operational spending and a lack of sustainable funding sources.

It is evident from the foregoing that successive Iraqi governments have been unable to control spending during periods of economic shocks and declining foreign currency revenues, a situation that has driven them to incur both external and internal debt. It is evident from the foregoing that there was notable fluctuation during the 2004–2023 period; levels dropped from highs exceeding 360% in 2004 to acceptable figures within fiscal

discipline limits (below 60%) for most subsequent years. This improvement stemmed from debt relief measures—specifically the write-off of a significant portion of external debt—and increased oil revenues in certain years. However, the ratio was adversely affected during periods of crisis, such as the 2015 drop in oil prices and the 2020 COVID-19 pandemic. This led to a temporary breach of the permissible limit; however, Iraq has managed to regain relative balance in recent years, with the ratio returning to lower levels—specifically 23.0% in 2022 and 25.4% in 2023. This reflects an improvement in public financial management. Consequently, the trajectory of Iraq's public debt-to-GDP ratio demonstrates a degree of commitment to fiscal discipline, yet it remains vulnerable to fluctuations caused by economic and financial crises, necessitating the strengthening of sustainable fiscal policies and a reduction in the sole reliance on oil revenues.

Table 1. Evolution of Public Debt in Iraq (2004–2023) (in million USD).

Public debt as a percentage of GDP	(%)Growth rate	Total public debt	External public debt	Domestic public debt	Growth rate (%)	Gross Domestic Product current prices at (million USD)	year
360.5	-	132078	128000	4078	-	36638	2004
161.8	-38.7	80977	76719	4258	36.6	50057	2005
100.9	-18.8	65741	62123	3618	30.2	65159	2006
75.5	1.2	66511	63201	3310	35.1	88038	2007
51.9	1.5	67513	63963	3550	47.9	130204	2008
64.1	5.7	71359	64289	7070	-14.5	111300	2009
49.6	-3.7	68747	60900	7847	24.5	138517	2010
36.4	-1.6	67632	61267	6365	34.1	185750	2011
30.2	-2.5	65915	60300	5615	17.4	218032	2012
26.8	-4.5	62950	59300	3650	7.6	234638	2013
28.9	5.0	66113	58100	8013	-2.6	228491	2014
55.8	40.8	93111	66100	27011	-27.0	166822	2015
64.5	15.2	107300	67500	39800	-0.3	166321	2016
60.7	6.0	113766	73700	40066	12.8	187534	2017
51.9	3.8	118145	83000	35145	21.3	227512	2018
42.2	-16.5	98701	66490	32211	2.7	233636	2019
62.8	16.0	114539	61000	53539	-21.9	182455	2020
33.2	-39.2	69642	21757	47885	14.9	209692	2021
23.0	-5.0	66140	18540	47600	37.0	287372	2022
25.4	4.5	69094	15803	53291	-5.3	272139	2023

Source: Based on data from: (1, 3, 4, 5) Central Bank of Iraq, Annual Statistical Bulletin (2004–2023), and Ministry of Finance Transparency Report (2, 6, 7) Researcher's own work

The Golden Rule

This rule is considered a key benchmark for fiscal discipline, measuring the volume of government public debt allocated to investment expenditures. The higher this ratio, the greater the state's capacity to utilize the debt for investment—resulting in increased fiscal surpluses and a reduced general budget deficit; conversely, a lower ratio implies the opposite. Table (2) reveals that the application of the Golden Rule in Iraq showed fluctuating ratios—rising and falling—between 2004 and 2023. In 2004, the ratio hit its lowest point during the study period at 1.6%, driven by a low general budget surplus of \$595 million. This coincided with a significant spike in total public debt to \$132,078 million—the highest level recorded during the study period—representing a severe and clear violation of the rule. Subsequently, the ratios began to rise between 2005 and 2008, reaching 14.0% of total public debt in 2008. This increase was driven by a rise in the general budget surplus to \$16,613 million, which led to an increase in investment expenditures to \$9,467 million and a reduction in total public debt to \$67,513 million, all resulting from higher global oil prices and increased Iraqi oil exports. The ratios continued to rise gradually between 2009 and 2013; investment expenditure reached \$15,241 million in 2011, representing 22.5% of total public debt, a trend resulting from the rise in the general budget surplus, which reached a value of... ..\$25,684 million. Subsequently, the figure continued to rise until 2013, when investment spending reached its peak during the study period at \$29,714 million, thereby achieving its highest ratio relative to total public debt—47.2%. This was driven by rising oil revenues and the allocation of a significant portion of public debt funds toward investment expenditures during that period. However, during the 2014–2016 period, the figure declined again; investment spending in 2015 stood at \$15,601 million (representing 16.8% of total public debt, down from 31.7% in 2014). This decline was caused by a rise in total public debt incurred to cover public expenditures—particularly military spending necessitated by the security and economic conditions of the time—resulting in a general budget deficit of \$3,300 million. The downward trend continued until 2020, when the ratio fell to 2.3% due to a widening budget deficit of \$10,736 million and a surge in total public debt to \$114,539 million. Consequently, investment spending dropped to \$2,674 million, impacted by the global health crisis and a reduction in investments as the bulk of funds was diverted to healthcare and medical supplies. Finally, a gradual recovery was observed during the 2021–2023 period regarding the "golden rule" (the ratio of investment spending to total public debt); the ratio rose to 26.4% in 2023 as investment spending increased to \$18,273 million, up from the level recorded in 2022. ... (8,232) million dollars—a result of the widening deficit. The ratios cited above indicate that Iraq failed to adhere to the "Golden Rule" throughout the study period; investment expenditures never exceeded public debt in any given year. In fact, for many years, these expenditures constituted very low proportions—despite relative improvements in years such as 2012, 2013, and 2023—without ever fully meeting the Golden Rule's requirements. The primary reasons for this include heavy reliance on oil revenues, the allocation of the bulk of spending to recurrent items (such as salaries and subsidies), weak fiscal policy, and instability in the security and political landscape.

Figure 2. Evolution of the Golden Rule in Iraq (2004–2023) – Million USD

Ratio of investment expenditures to (public debt (100%	Total public debt	Investment spending	Net budget	year
1.6	132078	2075	595	2004
3.8	80977	3112	9617	2005
6.3	65741	4109	6986	2006
7.9	66511	5265	10612	2007

14.0	67513	9467	16613	2008
12.3	71359	8813	2215	2009
20.1	68747	13787	38	2010
22.5	67632	15241	25684	2011
38.2	65915	25172	12588	2012
47.2	62950	29714	-4535	2013
31.7	66113	20985	-8900	2014
16.8	93111	15601	-3300	2015
12.4	107300	13356	-16989	2016
12.2	113766	13836	1624	2017
9.8	118145	11614	21594	2018
20.8	98701	20523	-3493	2019
2.3	114539	2674	-10736	2020
13.1	69642	9125	4268	2021
12.4	66140	8232	30642	2022
26.4	69094	18273	-5101	2023

2. Method

This study utilizes a semi-annual quantitative econometric approach spanning the period from 2004 to 2023 (36 observations). The analytical framework relies on time-series econometrics to evaluate the impact of domestic and external debt on exchange rate dynamics in Iraq [10].

Model Specification

The econometric model is structured with the exchange rate (Y) as the dependent variable, influenced by two primary independent variables: domestic public debt (X_1) and external public debt (X_2). The functional model is specified as follows:

$$Y_t = f(X_{1t}, X_{2t})$$

In operational linear form:

$$Y_t = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \varepsilon_t$$

Where:

- Y_t : Exchange rate of the Iraqi Dinar against the US Dollar [3].
- X_{1t} : Domestic public debt (in million USD) [3].
- X_{2t} : External public debt (in million USD) [3].
- β_0 : Intercept term.
- β_1, β_2 : Dynamic regression coefficients.
- ε_t : White-noise error term.

Econometric Methodology

1. Unit Root Tests: To ensure data stationarity and avoid spurious regression, the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests are conducted at both Level and First Difference [10], [15].
2. ARDL Bounds Testing: Given that the series are integrated of order $I(1)$ or $I(0)$, the Autoregressive Distributed Lag (ARDL) cointegration approach developed by Pesaran et al. is employed to examine long-run equilibrium relationships [15]. The ARDL model representation is:

$$\Delta Y_t = \alpha_0 + \sum_{i=1}^p \gamma_i \Delta Y_{t-i} + \sum_{i=0}^{q_1} \delta_i \Delta X_{1,t-i} + \sum_{i=0}^{q_2} \theta_i \Delta X_{2,t-i} + \lambda_1 Y_{t-1} + \lambda_2 X_{1,t-1} + \lambda_3 X_{2,t-1} + \varepsilon_t$$

3. Error Correction Model (ECM): The short-run dynamics and adjustment speed back toward long-run equilibrium are estimated via the dynamic error correction term ($COINTEQ_{t-1}$).
4. Diagnostic & Residual Testing: Residual robustness is validated using the Breusch-Godfrey Serial Correlation LM test, Breusch-Pagan-Godfrey Heteroskedasticity test, and Jarque-Bera Normality test [10].

3. Result and Discussion

Time Series Stationarity Analysis

The unit root test results using Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests are reported below.

Analysis of Foreign Currency Exchange Rates Against the Iraqi Dinar

Table (3) presents data on exchange rates in Iraq, covering both the official rate set by the Central Bank and the parallel market rate. This analysis aims to identify key economic variables and events that directly influenced exchange rate fluctuations in the parallel market and to reveal the actual impact of public debt—both external and internal. The data indicates that since assuming responsibility for monetary management, the Central Bank of Iraq has maintained a strictly managed float system. This approach was adopted to curb inflation—an inevitable consequence of Iraq's transition from an era of UN sanctions and three decades of isolation from the outside world. This transition was accompanied by several positive factors, most notably the global rise in oil prices and Iraq's return to exercising its natural role in the global oil market, marking the first major shift.

Monetary policy also faced a critical challenge: the burden of external public debt resulting from the transfer of debt obligations following the political changes in Iraq after 2003. Consequently, the primary concern for monetary policymakers was restoring confidence in the local currency and convening international conferences to settle or reduce the volume of this massive debt. Monetary policy played a pivotal role in managing debt rescheduling to rescue the Iraqi economy. These efforts successfully reduced the debt volume to its lowest levels by 2023, although it remains a burden for monetary policymakers. The table below illustrates the extent of control exercised by the monetary authority over exchange rates, notwithstanding certain crises—most notably the 2020 shock and the Iraqi government's decision to devalue the dinar to 1,450 per dollar. This devaluation was prompted by a sharp global decline in oil prices, driven by the COVID-19 pandemic and the halt in global production.

Table 3. Official and Parallel Exchange Rates and Public Debt.

Parallel exchange rate	Official exchange rate	External debt	Domestic debt	year
1510	1450	128000	4078	2004
1500	1470	76719	4258	2005
1520	1475	62123	3618	2006
1270	1255	63201	3310	2007
1205	1190	63963	3550	2008
1190	1170	64289	7070	2009
1180	1170	60900	7847	2010
1180	1170	61267	6365	2011
1180	1166	60300	5615	2012
1180	1166	59300	3650	2013
1200	1166	58100	8013	2014
1285	1182	66100	27011	2015
1280	1182	67500	39800	2016
1260	1182	73700	40066	2017
1205	1190	83000	35145	2018
1205	1190	66490	32211	2019
1500	1450	61000	53539	2020
1750	1455	21757	47885	2021
1500	1450	18540	47600	2022
1475	1450	15803	53291	2023

Source: Central Bank of Iraq, annual exchange rate bulletins for the years.

The Analytical Aspect of the Study

Specification of the Econometric Model

This section addresses the stage of formulating and specifying the econometric model—one of the most critical and challenging phases of model construction. Relationships between economic variables are generally not precise; the selection of independent variables influencing the dependent variable (or those upon which the model is built) is determined by a set of factors. Some of these factors are defined by economic theory concepts—where economic logic plays a key role in their interpretation—while others are derived from existing studies in the field. Econometric analysis is a quantitative method based on testing and estimating relationships among the variables under study, valued for its simplicity, precision, and ability to interpret results. The table below outlines the specification of the econometric model.

Variable name	Symbol	Type
Domestic debt	X1	Independent
External debt	X2	Independent
exchange rate	Y	Continued

Time Series Stationarity Testing

Testing for stationarity is a fundamental requirement in time series analysis for obtaining logical and valid results. Time series are often characterized by non-stationarity due to the presence of a unit root, which causes the variable's mean and variance to be time-dependent. Standard time series tests were employed to assess stationarity, specifically the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. These tests were used to determine whether the variables are stationary or non-stationary and to identify the order of integration for the series. Table () presents the test results for the economic variables (Al-Saidi, 2108).

Augmented Dickey – Fuller Phillips – Perron (PP)

UNIT ROOT TEST TABLE (PP)				
		At Level		
		Y	X1	X2
With Constant	t-Statistic	-1.424	-0.279	-2.447
	Prob.	0.561	0.919	0.136
		n0	n0	n0
With Constant & Trend	t-Statistic	-1.387	-2.315	-2.705
	Prob.	0.849	0.416	0.240
		n0	n0	n0
Without Constant & Trend	t-Statistic	-0.140	0.908	-2.358
	Prob.	0.629	0.900	0.020
		n0	n0	**
		At First Difference		
		d(Y)	d(X1)	d(X2)
With Constant	t-Statistic	-6.012	-6.375	-6.449
	Prob.	0.000	0.000	0.000
		***	***	***
With Constant & Trend	t-Statistic	-6.506	-6.379	-6.432
	Prob.	0.000	0.000	0.000
		***	***	***

Without Constant & Trend	t-Statistic	-6.091	-6.092	-6.103
	Prob.	0.000	0.000	0.000
		***	***	***
UNIT ROOT TEST TABLE (ADF)				
At Level				
		Y	X1	X2
With Constant	t-Statistic	-1.327	-0.279	-6.327
	Prob.	0.608	0.919	0.000
		n0	n0	***
With Constant & Trend	t-Statistic	-1.402	-2.309	-6.398
	Prob.	0.845	0.420	0.000
		n0	n0	***
Without Constant & Trend	t-Statistic	-0.134	0.908	-2.384
	Prob.	0.631	0.900	0.018
		n0	n0	**
At First Difference				
		d(Y)	d(X1)	d(X2)
With Constant	t-Statistic	-6.000	-6.375	-4.434
	Prob.	0.000	0.000	0.002
		***	***	***
With Constant & Trend	t-Statistic	-6.489	-6.380	-4.423
	Prob.	0.000	0.000	0.008
		***	***	***
Without Constant & Trend	t-Statistic	-6.083	-6.083	-4.651
	Prob.	0.000	0.000	0.000
		***	***	***

Notes: (*)Significant at the 10%; (**)Significant at the 5%; (***) Significant at the 1%. and (no) Not Significant

The Phillips-Perron test results for the study variables indicate that they are not statistically stationary at the “level” in the absence of a constant and trend—with the exception of variable X2 (external debt), which was stationary at the level without a constant and trend. However, upon taking the “first difference,” the probability values for both variables fell below 0.05 with strong statistical significance. This confirms that the variables became fully stationary after the first difference, rendering them integrated of order one, I(1). Based on this result, the most appropriate methodological step is to proceed to a cointegration test to verify the existence of a long-term equilibrium relationship between them before estimating the final model.

Regarding the ADF test results at the “level,” the variables were found to be statistically non-stationary—except for variable X2 (external debt)—and exhibited a “unit root” problem in the scenario without a constant and trend (where probability values exceeded 0.05), indicating non-stationarity in that case. However, upon taking the “first difference,” the probability values for both (X) and (Y) became zero (0.000). This provides conclusive evidence that the series became stationary at the first difference with a very high level of significance, confirming that the variables are integrated of order one, I(1). Autoregressive Distributed Lag (ARDL) Model: The ARDL model analyzing the impact of independent variables on the dependent variable was estimated using EViews 13 software.

Dependent Variable: Y

Method: ARDL

Date: 05/02/26 Time: 14:35

Sample: 2006S1 2023S2

Included observations: 36

Dependent lags: 4 (Automatic)

Automatic-lag linear regressors (4
max. lags): X1 X2
Deterministics: Restricted constant
and no trend (Case 2)
Model selection method: Akaike
info criterion (AIC)
Number of models evaluated: 100
Selected model: ARDL(1,1,4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Y(-1)	0.3913	0.0978	4.0027	0.0004
X1	0.0047	0.0011	4.2248	0.0002
X1(-1)	-0.0028	0.0012	-2.3359	0.0272
X2	-0.0030	0.0009	-3.4810	0.0017
X2(-1)	0.0007	0.0011	0.6874	0.4977
X2(-2)	-0.0012	0.0010	-1.2488	0.2225
X2(-3)	-0.0002	0.0007	-0.3003	0.7662
X2(-4)	0.0032	0.0007	4.6052	0.0001
C	721.4704	131.2823	5.4956	0.0000
R-squared	0.9451	Mean dependent var		1258.8333
Adjusted R-squared	0.9288	S.D. dependent var		125.6550
S.E. of regression	33.5341	Akaike info criterion		10.0753
Sum squared resid	30362.5518	Schwarz criterion		10.4712
Log likelihood	-172.3558	Hannan-Quinn criter.		10.2135
F-statistic	58.0525	Durbin-Watson stat		1.6675
Prob(F-statistic)	0.0000			
*Note: p-values and any subsequent test results do not account for model				

The estimation results of the ARDL(1,1,4) model for the 2004–2023 period indicate that the selected model incorporates a single lag for the dependent variable (Y) and the independent variable (X1), and two lags for the independent variable (X2). The R-squared value of 0.94 suggests that the model explains approximately 94% of the variation in the dependent variable. The Durbin-Watson statistic of 1.667 indicates the absence of autocorrelation in the residuals, while the F-test probability value (0.000) is significant at the 10% level.

Economic interpretation of the research results: The study demonstrated a strong relationship between external public debt and the general price level (inflation), driven by the appreciation of foreign currency against the local currency, which leads to an expansion of the money supply in circulation. The results were as follows:

The independent variable X1 has a positive coefficient (0.0047) and is statistically significant. This indicates that an increase in this debt leads to an immediate rise in the exchange rate (i.e., a depreciation of the local currency). This may be explained by the fact that increased borrowing—such as domestic borrowing—raises cash liquidity, thereby exerting pressure on the currency.

The independent variable X2 has a negative coefficient (-0.0030). This indicates that the inflow of debt (particularly external debt) temporarily provides hard currency liquidity, leading to a lower exchange rate (currency appreciation) initially, though this effect reverses in the long run.

Dependent Variable: D(Y)

Method: ARDL
Date: 05/02/26 Time: 14:35
Sample: 2006S1 2023S2
Included observations: 36
Dependent lags: 4 (Automatic)
Automatic-lag linear regressors
(4 max. lags): X1 X2
Deterministics: Restricted
constant and no trend (Case 2)
Model selection method: Akaike
info criterion (AIC)
Number of models evaluated:
100
Selected model: ARDL(1,1,4)

Variable	Coefficien t	Std. Error	t- Statistic	Prob.
COINTEQ*	-0.6087	0.0821	-7.4156	0.0000
D(X1)	0.0047	0.0010	4.7331	0.0000
D(X2)	-0.0030	0.0007	-4.0404	0.0003
D(X2(-1))	-0.0018	0.0007	-2.3626	0.0248
D(X2(-2))	-0.0030	0.0007	-4.4270	0.0001
D(X2(-3))	-0.0032	0.0006	-4.9311	0.0000
R-squared	0.7491	Mean dependent var		-0.5556
				58.803
Adjusted R-squared	0.7073	S.D. dependent var		5
S.E. of regression	31.8133	Akaike info criterion		9.9087
	30362.551			10.172
Sum squared resid	8	Schwarz criterion		6
		Hannan-Quinn		10.000
Log likelihood	-172.3558	criter.		8
F-statistic	17.9160	Durbin-Watson stat		1.6675
Prob(F-statistic)	0.0000			
* p-values are incompatible with t-Bounds distribution.				

The results of the Error Correction Model (ECM) used to estimate the short-run relationship indicate that the speed of adjustment toward equilibrium—represented by the (COINTEQ) coefficient—is negative and statistically significant at -0.6087. This ideal result confirms the existence of a cointegrating relationship and a long-run equilibrium between the two variables; the value implies that approximately 79% of short-run shocks are corrected, returning the system to its equilibrium path within a single time unit.

Regarding the short run, changes in the independent variable (D(X)) and its first lag (D(X(-1))) exert a highly significant impact on the dependent variable. With p-values of 0.003 and 0.004—both well below the 5% threshold—the results reflect the dependent variable's high sensitivity to fluctuations in the independent variable in the near term.

Null hypothesis: No levels relationship

Number of cointegrating variables: 2

Trend type: Rest. constant (Case 2)

Sample size: 36

Test Statistic

Value

F-statistic

12.372857

	10%		5%		1%	
Sample Size	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
35	2.845	3.623	3.478	4.335	4.948	6.028
40	2.835	3.585	3.435	4.26	4.77	5.855
Asymptotic	2.63	3.35	3.1	3.87	4.13	5

* I(0) and I(1) are respectively the stationary and non-stationary bounds.

When comparing this value to the critical limits at a 1% significance level, we find that the calculated F-statistic (12.37) exceeds the upper bound (6.028). This indicates the presence of a cointegration relationship (a long-term relationship); thus, an equilibrium relationship exists and is quite strong in the long run.

Deterministics: Rest. constant (Case 2)

CE = $Y(-1) - (0.003081 \cdot X1(-1) - 0.000847 \cdot X2(-1) + 1185.286688)$

The results of the long-run coefficient estimation indicate that the independent variable (X1) has a significant effect on the dependent variable (Y) in the long run; the probability value (Prob) was approximately 0.000—well below the standard significance threshold—implying that domestic debt exerts an influence on the exchange rate over the long term. Although the coefficient for variable (X2) carries a negative sign (-0.0008), this effect remains statistically weak in the long run. This suggests that the relationship involving external debt may be driven by external factors that do not impact the exchange rate, given that the exchange rate is determined domestically by the Central Bank.

Variable *	Coefficient	Std. Error	t-Statistic	Prob.
X1(-1)	0.0031	0.0006	5.0586	0.0000
X2(-1)	-0.0008	0.0007	-1.1960	0.2402
C	1,185.2867	53.3154	22.2316	0.0000

Note: * Coefficients derived from the CEC regression.

When testing the model for variance—specifically using the Breusch-Pagan-Godfrey (BPG) test, as shown in Table 1.20—the calculated F-statistic was found to be [value], with a significance level of 0.31. This value exceeds the 0.05 significance threshold. Furthermore, the results of the homoscedasticity test confirmed that the Chi-Square statistic was 0.20—also exceeding the 0.05 significance level—leading us to accept the null hypothesis that there is no issue regarding the homogeneity of variance.

Breusch-Godfrey Serial Correlation LM Test:

Null hypothesis: No serial correlation at up to 2 lags

F-statistic 1.208380149851 Prob. F(2,25)

0.31553563959

Obs*R-squared 3.173364325105 Prob. Chi-Square(2)

0.20460332091

Jarque-Bera Test for Residual Normality

As shown in Figure (), the residuals in the model follow a normal distribution. The Jarque-Bera statistic is (0.99), indicating acceptance of the null hypothesis—which states that the estimated model's residuals follow a normal distribution—since the p-value exceeds (0.05). This confirms the acceptance of the null hypothesis that random errors are normally distributed, thereby serving as a positive indicator for the estimated model.

4. Conclusions

Successive Iraqi governments have been unable to control their spending during periods of shocks and declining foreign currency revenues, a situation that drove them to incur both external and domestic debt. It is evident from the foregoing that there was marked fluctuation between 2004 and 2023; debt levels dropped from extremely high peaks—exceeding 360% in 2004—to acceptable ratios within the bounds of fiscal discipline (below 60%) for most subsequent years. This improvement resulted from debt relief measures—specifically the write-off of a significant portion of external debt—and increased oil revenues in certain years; however, the ratio was adversely affected during periods of crisis.

Investment expenditures have never exceeded public debt; in fact, in many years, they constituted a very small proportion of the total—despite relative improvements in years such as 2012, 2013, and 2023. Yet, full adherence to the "Golden Rule" was never achieved. The primary reasons for this include a heavy reliance on oil revenues, the allocation of the bulk of spending to recurrent costs (such as salaries and subsidies), weak fiscal policy, and an unstable security and political situation.

Monetary policy faced a critical challenge regarding the burden of external public debt—a consequence of the transfer of debt obligations following the political changes in Iraq after 2003. Consequently, the primary concern for monetary policymakers was restoring confidence in the local currency and convening conferences across various nations to secure the forgiveness or reduction of this substantial debt. Monetary policy played a pivotal role in managing debt rescheduling to rescue the Iraqi economy; while these efforts succeeded in bringing debt levels to a historic low by 2023, the debt continues to pose a burden for monetary policymakers.

The study demonstrated a strong relationship between external public debt and the general price level (inflation), driven by the appreciation of foreign currency against the local currency—a dynamic that leads to an expansion of the money supply in circulation. The results were as follows: The independent variable X1 is positive (0.0047) and statistically significant. This indicates that an increase in this debt leads to an immediate rise in the exchange rate (i.e., a depreciation of the local currency). This may be explained by the fact that increased borrowing—such as domestic borrowing—raises cash liquidity, thereby exerting pressure on the currency. The independent variable X2 is negative (-0.0030); this indicates that the inflow of debt (particularly external debt) temporarily provides hard currency liquidity, leading to a lower exchange rate (currency appreciation) initially, though this effect reverses in the long run.

Regarding recommendations, the researcher recommends establishing an effective coordination mechanism between fiscal and monetary instruments to achieve an acceptable level of economic stability, while also emphasizing the need to deepen this coordination to ensure there are no conflicts between the economic objectives associated with these instruments. Furthermore, formulating a realistic policy for managing public revenues by diversifying revenue sources and directing oil revenues more clearly is needed to achieve tangible results that contribute to realizing a targeted level of economic stability within the Iraqi economy. Additionally, limiting external borrowing is necessary because this type of borrowing entails long-term negative consequences. The high cost of servicing external public debt effectively nullifies the loans' original purpose; instead of resolving the initial crisis, the country finds itself facing a new crisis: how to meet the

resulting debt obligations. Finally, it is essential for government bodies responsible for domestic public revenue collection to perform their roles proactively; numerous recommendations highlight a clear link between public debt and declining public revenue, a situation that can, at times, impact the performance of monetary policy by influencing the local currency's exchange rate against foreign currencies.

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