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# The Nexus Between Exchange Rate Fluctuations and Public Debt in Kenya

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**Abstract**

Kenya's rising public debt and substantial exposure to foreign-currency borrowing have increased concerns about the effect of exchange rate fluctuations on the country's debt burden. Public debt increased from approximately 44% of GDP in 2013 to 73% in 2023, while depreciation of the Kenyan shilling increases the domestic-currency value and servicing cost of external debt. This study examined the nexus between exchange rate fluctuations and public debt in Kenya from 2014 to 2023. The study was anchored on the Expectations Theory of Exchange Rates and adopted a positivist research philosophy and causal research design. The study obtained secondary annual data from the Central Bank of Kenya, the Kenya National Bureau of Statistics, and the National Treasury. The data were analysed using Pearson correlation and the Autoregressive Distributed Lag (ARDL) model. The findings established a positive and statistically significant relationship between exchange rate fluctuations and public debt in Kenya ($\beta$=0.013, p=0.000), indicating that exchange rate depreciation was associated with an increase in the country's public debt burden. The study concluded that exchange rate fluctuations constitute an important factor in Kenya's public debt dynamics. The study recommends strengthening exchange rate stability through adequate foreign exchange reserves and effective foreign exchange market interventions, reducing reliance on foreign-currency borrowing, and improving strategies for managing exchange rate-related debt risks.

**Keywords:** *Exchange Rate Fluctuations, Public Debt, Exchange Rate Volatility, External Debt, Kenya.*

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## 1. Introduction

Public borrowing is an important source of government financing when domestic revenues are insufficient to meet public expenditure and development needs (Owusu-Nantwi & Erickson, 2018). However, reliance on external borrowing exposes countries to exchange rate risk because they must repay foreign-denominated debt in foreign currency. A depreciation of the domestic currency increases the local-currency value of external debt and debt-servicing obligations, potentially worsening fiscal pressures and debt sustainability. This challenge is

particularly important in developing economies where external financing constitutes a substantial component of public debt (Ali, 2022).

Across African economies, increasing reliance on domestic and external borrowing has heightened concerns about debt sustainability, particularly where exchange rate volatility increases the cost of servicing foreign-denominated obligations. Evidence from Tanzania, for example, indicates that exchange rate fluctuations have contributed to rising public debt servicing costs (Wilhelm, Ngasamiaku, & Ngong'ho, 2022). Similarly, studies in Ghana have linked rising public debt to macroeconomic pressures and rising debt-servicing costs (Musah, 2023). These experiences demonstrate that exchange rate movements can be an important channel through which external borrowing affects the public debt position of developing economies.

In Kenya, public debt has increased substantially because of persistent budget deficits, infrastructure financing needs, recurrent expenditure pressures, and greater reliance on external and commercial borrowing (CBK, 2023). Kenya's public debt exceeded KSh 8 trillion in 2021, equivalent to approximately 65% of GDP (Njenga & Kipchirchir, 2022), and reached KSh 10.28 trillion by June 2023, equivalent to 70.8% of GDP (National Treasury, 2024). Given that a significant proportion of this debt is denominated in foreign currencies, fluctuations in the Kenyan shilling have important implications for the domestic value of external debt and debt-servicing costs. Despite this exposure, limited empirical attention has focused on the specific relationship between exchange rate fluctuations and public debt in Kenya. This study therefore examines the nexus between exchange rate fluctuations and public debt in Kenya.

### 1.1 Problem Statement

Kenya's rising public debt and exchange rate volatility have increasingly raised concerns about debt sustainability, particularly because a substantial proportion of public debt is denominated in foreign currencies. As at June 2023, Kenya's public debt stood at KSh 10.28 trillion, equivalent to 70.8% of GDP, while total debt service accounted for 58.8% of government revenue (National Treasury, 2024). External debt stood at approximately KSh 5.45 trillion, exposing the country's debt position to exchange rate risk. This exposure matters because a weaker Kenyan shilling increases the domestic-currency value of foreign-denominated debt and, consequently, the cost of debt servicing. Indeed, the shilling's depreciation increased the domestic value of Kenya's external debt, with public debt rising to approximately KSh 11.14 trillion by December 2023 (National Treasury, 2024). The continued interaction between exchange rate movements and public debt therefore presents an important macroeconomic concern for Kenya, particularly given the country's reliance on external borrowing.

Despite the apparent importance of exchange rate movements to Kenya's public debt position, existing empirical studies have largely examined public debt in relation to economic growth, fiscal deficits, interest rates, and other macroeconomic determinants, with limited attention to the specific nexus between exchange rate fluctuations and public debt. For instance, Musah (2023) examined macroeconomic determinants of public debt but did not specifically focus on exchange rate fluctuations, while Nyamongo (2023) and other studies have primarily emphasized the broader economic consequences and determinants of public debt. This leaves an empirical gap regarding the extent to which exchange rate fluctuations influence public debt in Kenya. Therefore, this study examined the nexus between exchange rate fluctuations and public debt in Kenya.

### 1.2 Research Objective

To determine the relationship between exchange rate fluctuations and public debt in Kenya.

### 1.3 Research Hypothesis

$H_{01}$: Exchange rate fluctuations have no significant relationship with public debt in Kenya.

### 1.4 Significance of the Study

The study benefits investors, policymakers, financial analysts, and scholars. Investors can use the findings to understand the relationship between exchange rate fluctuations and public debt and make informed investment and risk-management decisions. Policymakers can use the findings to develop effective exchange rate and public debt management policies, particularly to manage foreign currency-denominated debt and reduce exposure to exchange rate risk.

Financial analysts and government planners can use the findings to improve debt forecasting, budgetary planning, and resource allocation. The study also contributes to public finance literature by providing empirical evidence on the relationship between exchange rate fluctuations and public debt in Kenya, offering insights that may inform future research and the development of sustainable public debt management strategies.

### 1.5 Scope of the Study

The study examined the relationship between exchange rate fluctuations and public debt in Kenya, covering both domestic and external public debt from 2014–2023. The study obtained secondary data from the Central Bank of Kenya (CBK), the Kenya National Bureau of Statistics (KNBS), and the National Treasury. The period captured variations in exchange rates and economic conditions, including the effects of the COVID-19 pandemic, providing a basis for analysing the nexus between exchange rate movements and public debt in Kenya.

## 2. Literature Review

### 2.1 Theoretical Review

The Expectations Theory of Exchange Rates, rooted in the rational expectations framework developed by Muth (1961) and further advanced by economists such as Lucas and Sargent, explains exchange-rate movements through market expectations about future economic conditions. The theory proposes that expectations regarding future exchange rates, interest rates, inflation, and other macroeconomic conditions influence current exchange-rate movements (Hristova, 2023). This theory is particularly relevant to the present study because fluctuations in the Kenyan shilling against major foreign currencies, especially the US dollar, can directly affect the domestic-currency value and servicing cost of Kenya's foreign-currency-denominated public debt. When the shilling depreciates, the local currency required to repay external debt increases, raising the public debt burden; conversely, appreciation can reduce the domestic-currency cost of foreign debt. Thus, the theory provides a strong basis for examining the nexus between exchange rate fluctuations and public debt in Kenya.

### 2.2. Empirical Review

In South Africa, Ramphele, Hoque, and Kasaba (2023) examined the correlation between exchange rates and gross debt. Understanding this connection is imperative because rising public debt makes efficient fiscal policy harder and, similarly, creates challenges in securing economic resources in financial and capital markets. The study used a quantitative

methodology and an ARDL approach to test the association between the indicators. The outcomes indicated a weak, non-fundamental positive association between all foreign exchange rates and gross loan debt. Therefore, fluctuating exchange rates can affect the gross debt burden, and the gross debt level can also affect exchange rates. The current study focused on exchange rate changes and how they affect gross debt in Kenya.

Obwogi (2019) examined how increasing public debt affects the foreign exchange rates in Kenya. The author noted that Kenya is a developing country with constant growth in public expenditure, and to cover budget demand, the government relied heavily on borrowing. In any country dependent on foreign borrowing, the country's debt-servicing ability is largely determined by foreign exchange rate patterns. The study used monthly secondary data from 2001 to 2018. The author used a time-series regression model and trend analysis to show the impact of public debt on foreign exchange rates. The research results highlight a solid and significant association between foreign public debt and exchange rates. The research suggested that the Kenyan government needs to restructure its fiscal balance financing through healthy external debt without negatively influencing the exchange rate. In contrast, the study used annual averages of the exchange rate of the Kenyan Shilling to the US dollar.

Macharia (2017) collected data from 1963 to 2014 to examine how external debt affects Kenya's exchange rate. The World Bank and the KNBS were the main data sources, and the analysis used the OLS approach. The analysis adopted the Error Correction Model because it combines short- and long-run dynamics in one system. PCGive, Ox-metrics, Stata, and E-views were used to obtain inferential statistics, while previous analyses of unit roots, co-integration, and Granger causality were conducted before estimation. The outcomes showed that the exchange rate and foreign debt stock, debt service costs, and foreign reserves had a positive and significant relationship. In this context, the study suggested that the Kenyan administration adopt loan-relief approaches that can help lower the foreign public debt burden. The current study expanded its scope by focusing on how exchange rate variability, not solely external debt, influences public debt.

Odera (2015) investigated how external public debt and exchange rate variability relate to Kenyan setups. The study was grounded in evidence that Kenyan public debt has been increasing amid high and persistent exchange rate fluctuations. Using quarterly statistics, the research empirically assessed how external public debt affected real effective exchange rate (REER) fluctuations between 1993 and 2013 under the complete float regime. The US dollar and British pound sterling were used to construct the REER index, and its volatility was measured using the second-order moving mean and standard deviation. The study adopted the OLS approach, regressing exchange rate fluctuations against inflation, cost of capital, GDP growth rate, money supply-to-GDP ratio, and foreign debt-to-GDP. The results showed a negative relationship between GDP growth rate, money supply-to-GDP ratio, and foreign debt, while interest rate and REER had a positive, significant association. In addition, the study reported no significant effect of inflation, GDP growth rate, money supply-to-GDP ratio, and REER volatility. However, the study used annual averages to provide insights into how macro indicators affect public debt. This differed from the reviewed study, which used quarterly data.

## 3. Methodology

The study adopted the positivist research philosophy and a causal research design to examine the nexus between exchange rate fluctuations and public debt in Kenya. The target population comprised annual government economic and public debt data for 2014–2023. Secondary data were obtained from the Kenya National Bureau of Statistics (KNBS), Central Bank of Kenya (CBK), and National Treasury. The data were analysed using Pearson correlation to determine the strength and direction of the relationship between exchange rate fluctuations and public debt, while the Autoregressive Distributed Lag (ARDL) model was employed to assess their short-run and long-run relationship. Appropriate stationarity and diagnostic tests were conducted to ensure the reliability of the econometric results.

## 4. Results and Discussion

### 4.1 Descriptive Statistics

Table 1 presents the descriptive results.

**Table 1: Descriptive Results**

| | N | Minimum | Maximum | Mean | Std. Deviation | Variance |
|---|---|---|---|---|---|---|
| Public Debt | 120 | 669423.06 | 11139693.52 | 5653631.085 | 2525590.901 | 6.379E+12 |
| Exchange rates | 120 | 86.21 | 154.09 | 106.8182 | 13.79699 | 190.357 |

From the results, Kenya recorded a mean public debt of Ksh 5,653,631.085 from 2014 to 2023. The standard deviation was Ksh 2,525,590.901, indicating high variation and an unsustainable, steady increase in borrowing. The results align with Kinuthia & Rugo (2020), who noted that Kenya's public debt had become high and unsustainable after surpassing the Ksh 10 trillion mark by 2023. The outcomes also aligned with the Institute of Public Finance Kenya (2023), which noted that 53.51% was the proportion of public debt, consistent with analyses highlighting rising debt levels. For instance, Kell (2023) highlighted that a large part of bilateral debt was dominated by Chinese loans, worsening the country's debt sustainability. Therefore, the results align with prior literature on the rapid increase in public debt, driven by excessive borrowing, fiscal instability, and currency devaluation.

The analysis of exchange rate changes showed that from 2013 to 2023, the exchange rate had a mean, maximum, minimum, and standard deviation of 106.8182, 154.09, 86.21, and 13.779699, respectively. These figures indicate high exchange-rate variability. The outcomes aligned with those of Ramphele, Hoque, and Kasaba (2023) and Obwogi (2019), who found that public debt and the exchange rate are closely linked, with each affecting the other. Further, the findings agreed with Macharia (2017) and Odera (2015), who underscored the influence of the exchange rate on public debt.

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### 4.2 Trend Analysis

The outcomes below show the trend analysis of the study variables.

#### 4.2.1 Trend Analysis Results for Public Debt

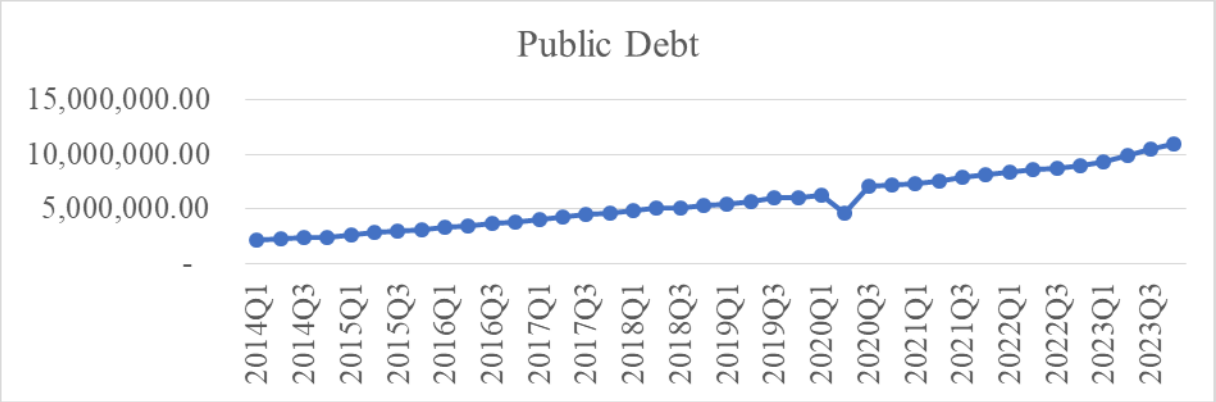



**Figure 1: Trend Results for Public Debt**

Figure 1 captures the public debt trend in Kenya from 2014 to 2023. This supports findings by Kinuthia & Rugo (2020), the Institute of Public Finance Kenya (2023), and Cytonn (2023). The studies noted that local and external borrowing drive debt levels in any economy. External loans are often denominated in foreign currencies, which raises borrowing costs. Hilton (2021) reported that the COVID-19 pandemic disrupted economic efficiency and borrowing in most countries, as seen in Kenya's declining trend in 2020.

#### 4.2.2 Trend Analysis Results for Exchange Rate

Figure 2 shows the exchange rate trend outcomes.

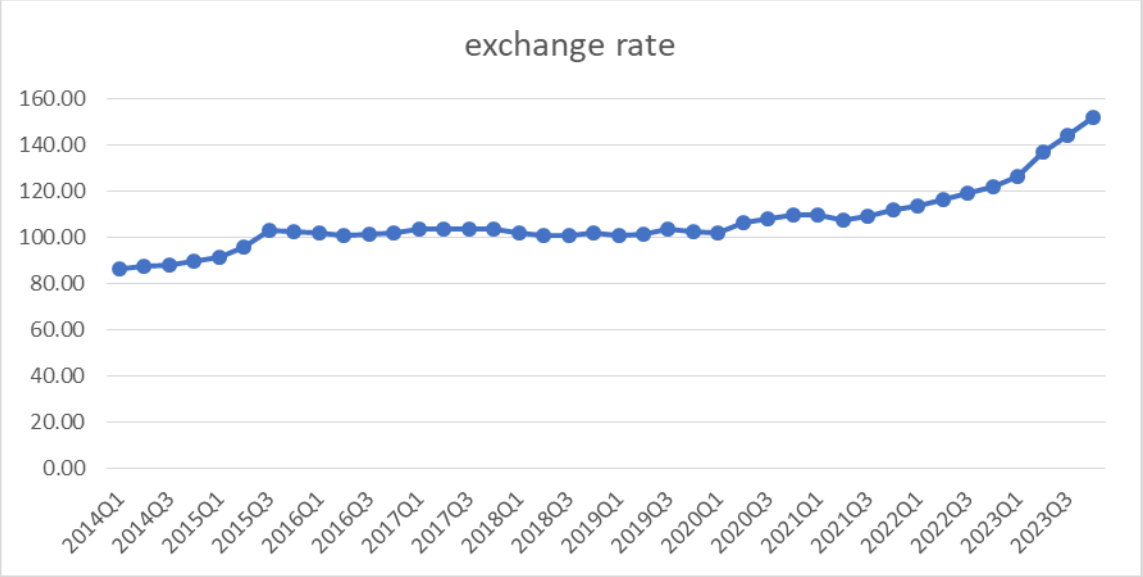



**Figure 2: Trend Analysis Results for Exchange Rate**

Research findings by Macharia (2017) and Obwogi (2019) on foreign borrowing and the exchange rate align with the current study's findings. Figure 2 above shows a rising pattern in Kenya's exchange rate between 2014 and 2023. The results confirmed that a decrease in currency value negatively affects foreign loans because the amounts are denominated in foreign currency. Also, a country's central bank must ensure exchange rate stability through policy implementation, as noted by Odera (2015) and Ramphele, Hoque, and Kasaba (2023).

### 4.3 Correlation Analysis

Correlation analysis assesses the extent of the association between the dependent and independent variables.

**Table 2: Correlation Analysis**

| | public debt | exchange rate |
|---|---|---|
| Public debt | 1.000 | 0.860 |
| Sig. (2-tailed) | | 0.000 |
| Exchange rate | 0.860 | 1.000 |
| Sig. (2-tailed) | 0.000 | |

Table 2 shows that the exchange rate and public debt in Kenya had a strong positive correlation (r = 0.860). This means that higher exchange rates generally lead to a surge in public debt. These findings agree with Ramphele, Hoque, and Kasaba (2023), who found a weak non-fundamental positive association between all foreign exchange rates and gross loan debt.

### 4.4 Time Series Regression Analysis

Time series regression analysis was used to define the relationship between the research variables. The model outputs include coefficients (Coef) and p-values, which indicate the strength and significance of each relationship. Table 3 presents the time series regression results.

**Table 3: Time Series Regression Analysis**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| Exchange Rate | 0.013 | 0.001 | 11.944 | 0.000 |
| C | 4.616 | 0.600 | 7.696 | 0.000 |

The Time series regression analysis results disclosed that the exchange rate had a positive and significant effect on public debt in Kenya (β=0.013, p=0.000). This indicates that a 1-unit increase in the exchange rate would increase public debt by 0.013. The study findings also agreed with Macharia (2017), who showed that the exchange rate and foreign debt stock, debt service costs, and foreign reserves had a positive and significant connection. The findings also agreed with Obwogi (2019), who reported a positive and strong correlation between foreign public debt and exchange rates.

## 5. Conclusion

The findings disclosed that Exchange rate fluctuations had a significant effect on public debt. The study concluded that a positive and significant relationship manifested between exchange rate fluctuations and public debt in Kenya. A depreciating exchange rate can increase the external debt burden, making it more expensive to repay. Conversely, a strengthening exchange rate can reduce the cost of repaying foreign debt. That is because when a country's currency depreciates, the cost of servicing external debt (debt owed in foreign currencies) rises. This is because the Kenyan shilling (Ksh) is worth less in relation to other currencies, so more Ksh are needed to repay the same amount of foreign debt.

## 6. Recommendations

The government must stabilize the economy and maintain sustainable public debt levels by adopting effective exchange-rate stabilization policies. This is because stabilizing the exchange rate and avoiding volatility is vital, as it could increase debt-servicing costs since a large percentage of Kenyan public debt is denominated in foreign currency. The CBK needs to ensure the country has sufficient, sustainable foreign exchange reserves to protect it from global shocks and maintain local currency stability.

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