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# Real Exchange Rate Depreciation and Domestic Tax Revenue Performance in Kenya

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## Abstract

**Purpose:** Taxation plays a critical role in raising the resources needed for financing government activities in developing countries. On the other hand, the volatility of real exchange rates (RERs) has generated significant concern among academics and policymakers in view of its effects on macroeconomic variables such as tax revenue generation. This study therefore focused on real exchange rate depreciation on domestic tax revenue performance in Kenya. The study was guided Theory of Constraints.

**Methodology:** The study employed an explanatory research design. Secondary data was collected from the CBK, KRA, and the World Bank. In this study time series data ranging from 2003 – 2023 was used to analyze the determinants of domestic tax revenue performance in Kenya. The hypotheses were tested at a significance level of .05 using the multiple regression analysis. A multivariate time series ARDL regression analysis model was used to analyze the data.

**Results:** The study ARDL model concluded that Real exchange rate depreciation led to a notable decrease in domestic tax revenue performance, with $\beta = -0.223945$ and $p = 0.000 < 0.05$. This effect is intensified when considering the lagged impact, where a one-period lagged depreciation results in an even greater reduction in tax revenue performance, $\beta = -1.927412$ and $p = 0.0004 < 0.05$.

**Conclusion:** The study recommended that government of Kenya should stabilize the exchange rate and prevent excessive depreciation by fostering a favorable trade balance and maintaining investor confidence. Additionally, future research could focus on the effects of fiscal Policy Changes on domestic tax revenue performance. Also, future studies could examine Impact of Global Economic Shocks on Domestic Tax Revenue.

**Keywords:** *Real Exchange Rate Depreciation, Domestic Tax Revenue Performance*

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|---|---|---|

## 1.0 Introduction

To a large extent, the growth and development of every nation depends on tax revenue mobilization. The World Bank (2021) defines tax as compulsory, unrequited payments made to the central government by individuals, businesses, or institutions. Globally, taxes play a significant role in the economy at both micro and macro levels. Firstly, tax is the main source

of central government revenue, since its collection is mandatory and regular. Secondly, taxes help governments to provide social and public needs by providing public goods and services. Thirdly, governments need tax revenue to establish armed forces and judicial systems to ensure security and justice for society (Aizenman, Jinjarak, Kim, & Park, 2019).

Exchange rate is the price of one country's currency in relation to another's. In the era of trade liberalization, an appropriate policy mix that ensures an effective rate of exchange is imperative because its variation has economic implications. Variation in exchange rate is an important endogenous factor that affects economic performance, due to its impact on macroeconomic variables like outputs, imports, export prices, interest rate, and inflation rate. A sound exchange rate policy and an appropriate exchange rate are crucial conditions for improving economic performance (Chang & Tan, 2018). In practice, however, no exchange rate is pure float or completely determined by market forces. Rather, the prevailing system is the managed float type, whereby there is periodic intervention by monetary authorities in the foreign exchange market to attain strategic objectives (Mordi, 2016).

Several studies have contributed to the debate on the main determinants of tax revenue efforts around the world. Studies including but not limited to Gaalya (2015), Gupta (2017), Brafu-Insaidoo and Obeng (2018), Teera and Hudson (2014), Gupta, Clements, Bhattacharya, and Chakravarti (2004), Cummings, Martinez-Vazquez, McKee, and Torgler (2016), have enumerated structural and institutional factors influencing tax revenue generation. Variables including GDP per capita, foreign aid, foreign direct investment, inflation, real exchange rate, trade openness, sectoral contribution to GDP, debt to GDP, corruption, and rule of law among others have been widely explored as the main determinants of tax performance.

Gaalya (2015) has shown that foreign aid impacts revenue negatively while Gupta (2007) and Brafu-Insaidoo and Obeng (2018) provided evidence to show that per capita income induces revenue mobilisation efforts in Sub-Sahara Africa. The Kenyan economy grew robustly in the first decade of the country's independence 1963-1974. with the growth in real Gross Domestic Product (GDP) averaging 6% per year (Ikiara and Killick 1981). This momentum was briefly interrupted by an external shock in the form of a sharp increase in petroleum products due to the Middle-East war of October 1973 that led to a global economic crisis as petroleum prices increased exponentially and world trade and investor confidence dropped. However, the economy bounced back on the back of high commodity prices, beginning with coffee and later tea resulted from a sharp drop in coffee exports from Brazil (the world's leading producer and exporter) due to a severe frost, a classic example of a domestic shock arising from natural phenomena and culminating in a global economic crisis.

### 1.1 Problem statement

The Kenyan economy has experienced persistent budget deficits despite numerous tax reforms aimed at increasing revenue, enhancing economic efficiency, and promoting equity in the tax system. These reforms have mainly focused on adjusting the tax structure, but other macroeconomic variables, such as exchange rate volatility, have significantly impacted tax policy and revenue generation. Research into the relationship between real exchange rate depreciation and tax revenue in Kenya is limited, despite its importance for the government's fiscal policy and economic development.

For example, the Kenya Revenue Authority (KRA) has consistently failed to meet its revenue collection targets over the past financial years, even after implementing various tax reforms. In the 2017/2018 fiscal year, KRA aimed to collect Kshs 1.541 trillion but only achieved Kshs 1.435 trillion. The following year, the target was Kshs 1.65 trillion, with an actual collection

of Kshs 1.58 trillion. In 2019/2020, the target was Kshs 1.53 trillion, but only Kshs 1.51 trillion was collected. Similarly, in the fiscal year ending June 2022, KRA missed its revenue target by Kshs 107 billion, achieving only a 95.3% performance rate against the set target of Kshs 2.273 trillion (KRA, 2023). The KRA's failure to meet its revenue targets has been attributed to various economic shocks and a challenging economic environment, including projected GDP growth fluctuations.

In FY 2022/23, GDP growth was forecasted at 5.8%, down from 6.5% in FY 2021/22 (Budget Policy Statement, 2023). This reflects how broader economic conditions impact revenue collection efforts. Studies on the determinants of tax revenue in Kenya have yet to fully explore the influence of exchange rate volatility. This volatility can directly and indirectly affect tax revenues, impacting the government's capacity to finance public expenditures and development programs. Despite increasing government revenue, these gains have not always translated into proportional economic growth, underscoring the need for further research on the effects of real exchange rate depreciation on domestic tax revenue performance in Kenya.

## 2.0 Literature Review

### 2.1 Theoretical Review

The framework of constraints theory rests on the fact that an organization must always have constraints or a limiting factor that stands in the way of achieving its goals. The theory of constraints identifies the organization’s weakest link or the most limiting factor that stands in the way of achieving its goal and then systematically works towards improving that constraint or limiting factor until it is no longer a limiting factor (Goldratt, 2017).

The theory has five focusing steps. One is identifying the current constraint. This is that single part that hinders the organization from achieving its goal. The second step is to exploit. This ensures making quick improvements to the constraint using existing resources“ by making the most out of what is available. Thirdly is to subordinate. This ensures reviewing all activities in the process to ensure that they are all aligned with and support the needs of the constraint. Fourthly is to elevate. If the constraint has not been removed consider further action that can be taken to eliminate that constraint (Barausse, Yunes & Chamberlain, 2016).

This is to ensure that the constraint is addressed completely. The last step is repeating the whole process. It is a continuing improvement cycle. Because in every organization there is a challenge at every point therefore once a certain constraint has been removed the next constraint should be tackled. It is a reminder to the organization not to be complacent but to aggressively improve the current situation and move to tackle the next challenge (Puche & De la Fuente, 2016). Every organization seeks to have a system that will provide an effective and efficient way to do its operations. The system should be tailor-made to specific needs that suit the organization. KRA to yield better results in terms of revenue collection one of the challenges identified as a factor attributing to this is the manual tax system of operating like the filling of returns and penalties imposition.

### 2.2 Empirical Review

#### 2.2.1 Real Exchange Rate Depreciation on Domestic Tax Revenue Performance

Easterly (2019) examined the effects of real exchange rate depreciation on public sector deficits in developing countries, finding that depreciation increases public revenue through surpluses of traded goods and taxes on their production and sale. However, it also raises public expenditure by increasing the cost of traded goods and foreign payments, with the net impact on the deficit depending on the balance between traded and non-traded items in public

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expenditure and revenue. Ayoki et al. (2019) studied the impact of exchange rate depreciation on tax revenue in Uganda, finding a positive correlation between depreciation and import volumes. A 1% depreciation of the Uganda shilling increased import revenue by 1% of GDP and overall tax revenue by 0.4% of GDP, driven by increased domestic prices of imports. However, higher duty rates could reduce import volumes if price elasticity exceeds one.

Kabubi (2020) investigated the effects of real exchange rate depreciation on tax revenue in Kenya, concluding that it had a positive impact on direct taxes and customs duties but a negative effect on other indirect taxes. The overall fiscal impact of depreciation depends on whether the positive effects on direct taxes outweigh the negative effects on indirect taxes. Additionally, Ayoki et al. (2018) noted that depreciation could reduce foreign direct investment (FDI), impacting tax revenue. Overall, the impact of exchange rate depreciation on tax revenue is complex, depending on factors like trade balance, FDI inflows, and tax type. Policymakers should consider these effects and adopt measures to mitigate potential negative impacts, such as stimulating exports and diversifying the tax base (Smith, 2018).

### 2.3 Conceptual Framework

A conceptual framework is a group of concepts that are well organized to provide a focus, a tool, and a rationale for interpretation and integration of information and is usually achieved in pictorial illustrations. This is to explain how they are related to each other (Adom, 2016). The conceptual framework was independent variables (real exchange rate depreciation) to the dependent variable (Domestic tax revenue performance).

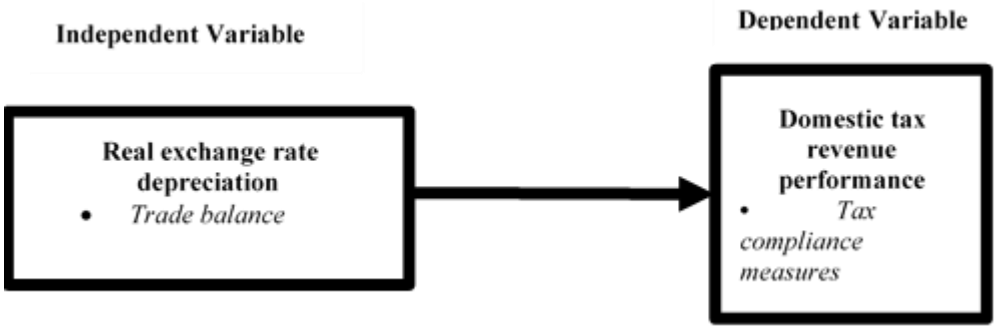


**Figure 1: Conceptual Framework**

### 3.0 Methodology

A research design is a roadmap for carrying out a research study (Schallmo, Williams & Lang, 2018). In this study, the explanatory research design was employed. The design provides a foundation for establishing a relationship between the independent and dependent variables (Rahi, 2017). The choice of explanatory research design in this study is justified since the intention is to establish the effect of real exchange rate depreciation, on domestic tax revenue performance in Kenya. The target population for this study is also known as the master blueprint because it provides the definitive characteristics of the variables. Using the response or findings from the target population, the researcher can make a general conclusion on the study topic. This study assumes that the population has a peculiar characteristic which includes knowledge of the issue under study. Secondary data was collected from the CBK, KRA, and the World Bank. In this study time series data ranging from 2003 - 2023 was used to analyze the determinants of domestic tax revenue performance in Kenya. The Exploratory data analysis (EDA) focuses on dataset analysis and then grouping in accordance with characteristics determined. The current study sought to explore on impact of real exchange rate depreciation on domestic tax revenue performance of Kenya. Independent variables include; real exchange rate depreciation. The EDA technique enables grouping of each variable data and enables

development of a model to predict their independent effect on the predicted variable which is the economic growth, examined using changes in per-capita income.

## 4.0 Results and Discussion

### 4.1 Descriptive statistics

#### 4.1.1 Real Exchange Rate Depreciation

**Table 1: Descriptive Statistics for Real Exchange Rate Depreciation**

| | Mean | SD | Min | Max | Skewness | Kurtosis |
|---|---|---|---|---|---|---|
| Real Exchange Rate Depreciation | 0.488 | 0.563 | -0.05 | 1.15 | 0.115 | -2.187 |

Table 1 shows that the real exchange rate depreciation had an average rate of 0.488, indicating a typical depreciation of about 48.8% across the periods studied. The standard deviation was 0.563, suggesting modest variability, with the rate of depreciation being relatively consistent. The depreciation ranged from -0.050 to 1.15, showing a balance between periods of appreciation and depreciation. The skewness was nearly zero at 0.115, indicating an almost symmetric distribution, while the kurtosis of -2.187 suggested a platykurtic distribution, with thinner tails and fewer extreme values.

#### 4.1.2 Domestic Tax revenue collection

**Table 2: Descriptive statistics Domestic Tax revenue collection**

| | Mean | SD | Min | Max | Skewness | Kurtosis |
|---|---|---|---|---|---|---|
| Tax Revenue Performance | 0.125 | 0.044 | 0.06 | 0.20 | 0.329 | -1.412 |
| N | 21 | | | | | |

The descriptive summary of domestic revenue performance on Table 2, indicates an average performance of 12.5%, The standard deviation of 0.044 reflects low variability, indicating that revenue performance does not significantly fluctuate from year to year, pointing to stability in revenue collection or influencing factors. The minimum and maximum collection performances range between, 6% and 20% respectively, highlight the range within which domestic revenue performance varied. The lower end may correspond to a challenging period, perhaps due to economic downturns or policy shifts, while the upper end likely represents a period of strong economic growth or effective tax collection strategies. The distribution of the data is nearly asymmetric, with a positive skewness of 0.329, indicating a high tendency for the data to lean towards lower values. The kurtosis value of -1.412 suggests a slightly flatter distribution than a normal curve, indicating fewer extreme values and a generally stable performance.

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### 4.2 Correlation Analysis

The correlation analysis determined the relationship between t royalty payments and tax revenue collection and the subsequent significance and impact of the relationship.

**Table 3 Correlation Analysis**

| Variables | (1) | (2) |
|---|---|---|
| (1) **Domestic tax revenue performance** | 1.000 | |
| (2) **Real exchange rate depreciation** | -0.603* | 1.000 |
| | 0.000 | |

Table 3, Real exchange rate depreciation had a negative and significant correlation with Domestic tax revenue performance at -60.3% (p-value = 0.000 < 0.05). This suggests that as the real exchange rate depreciates, domestic tax revenue performance tends to decrease.

### 4.3 Optimal Lag length structure

Choosing the appropriate lag length is essential to capture the dynamics of the underlying data without introducing bias (Lütkepohl, 2005).

**Table 4: Optimal Lag length selection**

| Lag | LogL | LR | FPE | AIC | SC | HQ |
|---|---|---|---|---|---|---|
| 0 | 200.9424 | 122.0092 | 2.13e-15 | -19.59424 | -19.34530 | -19.54564 |
| 1 | 253.5873 | 157.4443 | 9.58e+40 | 25.6974 | 17.0873 | 16.2248 |
| 2 | 309.3431 | 151.7610* | 5.59e-19* | -27.93431* | -26.44071* | -27.64274* |

Table 4 showed that the optimal lag length for the ARDL model is 2, as evidenced by the lowest values in the Akaike Information Criterion (AIC), Schwarz Criterion (SC), and Hannan-Quinn Criterion (HQ) at this lag. Specifically, the AIC (-27.93431), SC (-26.44071), and HQ (-27.64274) are minimized at lag 2, suggesting that this lag length best balances model fit and complexity. The likelihood ratio (LR) test also supports this choice with a significant value of 151.7610. Selecting lag 2 ensures that the ARDL model captures the necessary dynamics without overfitting, enhancing its predictive accuracy and robustness.

### 4.4 Regression Results

The regression coefficient results are summarized in Table 5 through the equation below.

$$Y_{it} = 0.415520 - 0.222945 LnX_{1t-i}$$

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**Table 5: ARDL Regression Model**

Number of models evaluated: 4374

Included Observations:20

Selected Model: ARDL (2, 0, 1, 1, 0, 2, 2, 0)

| Variable | Coefficient | Std. Error | t-Statistic | Prob.* |
|---|---|---|---|---|
| Domestic_Tax _Revenue_Performance (-1) | 1.264 | 0.152 | 8.296 | 0.000 |
| Domestic_Tax_Revenue_Performance(-2) | -0.367 | 0.142 | -2.588 | 0.017 |
| Real_Exchange_Rate_Depreciation | -0.223 | 0.041 | -5.483 | 0.000 |
| Real_Exchange_Rate_Depreciation(-1) | -1.927 | 0.462 | -4.170 | 0.000 |
| C | 0.416 | 0.201 | 2.071 | 0.044 |

A unit increase in Real Exchange Rate Depreciation causes a significant reduction in Domestic Tax Revenue Performance by 0.223. The effect is further exacerbated when considering the lagged impact, where a one-period lagged depreciation decreases tax revenue performance by 1.927. This indicates that both current and past depreciations have a strong negative impact on Domestic Tax Revenue Performance

### 4.5 Discussion of Findings

The study sought to determine the effect of real exchange rate depreciation on domestic tax revenue performance in Kenya. The study correlation analysis established that Real exchange rate depreciation had a negative and significant correlation with Domestic tax revenue performance at -60.3% (p-value = 0.000 < 0.05). This suggests that as the real exchange rate depreciates, domestic tax revenue performance tends to decrease. The study ARDL model further found that Real Exchange Rate Depreciation caused a significant reduction in Domestic Tax Revenue Performance $\beta$ = -0.223, p=0.000<0.05. The effect is further exacerbated when considering the lagged impact, where a one-period lagged depreciation decreases domestic tax revenue performance $\beta$ =-1.92, p=0.0004<0.05 This indicates that both current and past depreciations have a strong negative impact on Domestic Tax Revenue Performance. Easterly (2019) conducted a study on the public sector deficit in developing countries. He concluded that public revenue is boosted by real depreciation from higher surpluses of traded goods-producing firms and direct and indirect taxation of production or sale of traded goods. Ayoki et al (2019) carried out a study in Uganda focusing on the link between tax reforms and revenue mobilization. The study also found that the coefficients on the exchange rate are positive and significant for import (1.331) and overall tax/GDP (0.447) equation. They indicated that the import revenue was therefore found to be highly sensitive to changes in the exchange rate.

### 5.0 Conclusion

The study concluded that real exchange rate depreciation significantly decreases domestic tax revenue performance. It highlighted that both current and past depreciations adversely affect

tax revenue, underscoring the importance of a stable exchange rate for better tax revenue outcomes.

**6.0 Recommendations**

The KRA should closely monitor exchange rate trends and collaborate with financial institutions to anticipate the impact of exchange rate volatility on tax revenue. The findings support the Theory of Constraints by highlighting that exchange rate depreciation are significant constraint on domestic tax revenue performance. The study confirms that addressing these constraints can improve overall tax revenue outcomes.

**References**

Adom, D. (2016). Conceptual Framework in Research.

Aizenman, J., Jinjarak, Y., Kim, J., & Park, D. (2019). "Tax Revenue Trends in

Ayoki, M., Obwona, M., & Ogwapus, M. (2018). Depreciation and Foreign Direct Investment.

Brafu-Insaidoo, W. G., & Obeng, C. K. (2018). "Tax Revenue Mobilization in Sub-Saharan Africa: The Role of Per Capita Income." African Development Review, 30(2), 123-135.

Budget Policy Statement. (2023). Government of Kenya.

Chang, C., & Tan, C. Y. (2018). "Student engagement and mathematics achievement: Unraveling main and interactive effects." Educational Psychology, 38(6), 737-7561.

Compliance: Experimental and Survey Evidence." Behavioral Public Finance, 12(1), 1-34.

Cummings, R. G., Martinez-Vazquez, J., McKee, M., & Torgler, B. (2016). "Effects of Tax Morale on Tax

Easterly, W. (2019). Effects of Real Exchange Rate Depreciation on Public Sector Deficits in Developing Countries.

Gaalya, M. S. (2015). "The Impact of Foreign Aid on Tax Revenue in East Africa." Journal of Economics and International Finance, 7(3), 62-74.

Gacanja, J. (2019). Correlation between economic growth and tax revenue in Kenya.

Gelan, A. (2019). Study on the effects of real exchange rates on tax revenue.

Giersch, H. (2007). Operational Significance of Bowen's Model.

Gupta, A. S. (2017). "Determinants of Tax Revenue Efforts in Developing Countries." IMF Working Papers, 2007/184.

Gupta, S., Clements, B., Bhattacharya, R., & Chakravarti, S. (2004). "Fiscal Consequences of Armed Conflict and Terrorism in Low- and Middle-Income Countries." European Journal of Political Economy, 20(2), 403-421.

Ikiara, G. K., & Killick, T. (1981). "Kenya's Economic Performance, 1963-1974: An Overview." World Development, 9(9-10), 791-812.

Kabubi, J. (2020). Effects of Real Exchange Rate Depreciation on Tax Revenue in Kenya.

Kenya Revenue Authority (KRA). (2023). Annual Revenue Performance Report.

Kibritcioglu, A. (2021). Research on real exchange rates and tax revenue.

Lütkepohl, H. (2005). New Introduction to Multiple Time Series Analysis.

Mordi, I., Mordi, N., Delles, C., & Tzemos, N. (2016). "Endothelial Dysfunction in Human Essential Hypertension." Journal of Hypertension, 34(8), 1464-14721.

Munyoro, G. (2017). Benefit Theory in Taxation.

Rahi, S. (2017). Explanatory Research Design.

Samuelson, P. A. (2012). Analysis of the Benefit Approach.

Schallmo, D., Williams, C. A., & Lang, K. (2018). Research Design as a Roadmap.

Smith, J. (2018). Mitigating Negative Impacts of Exchange Rate Depreciation.

Teera, J. M., & Hudson, J. (2014). "Tax Performance: A Comparative Study." Journal of International Development, 16(6), 785-802.

The World Bank. (2021). World Development Report 2021: Data for Better Lives. Washington, DC: The World Bank