EFFECT OF EXTERNAL DEBT ON EXCHANGE RATES IN KENYA

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DECLARATION

I, the undersigned, declare that this is my original work and has not been presented to any institution or university other than the University of Nairobi for examination.

Signed:  Date: 11/11/2022

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This research project has been submitted for examination with my approval as the University Supervisors.

Signed:  Date: 13 November 2022

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DEDICATION

This research project is dedicated to my mum Eunice Wanjiru Njenga.

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LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
ARDL	Auto-Regressive Distributive Lag
GDP	Gross Domestic Product
KNBS	Kenya National Bureau of Standards
REER	Real Effective Exchange Rate
SPSS	Statistical Package for Social Sciences
US	United States
VIF	Variance Inflation Factors

ABSTRACT

The external debt in Kenya has been on the rise for more than a decade now. Between 2013 and 2021, the average Kenyan external debt for example increased by half, that is, from 18.8 to 35.3 percent of the total GDP, positioning Kenya as one of the global rapidly-growing debt-accumulation states. At the same time, the value of the Kenyan shilling decreased by 45.6 percent. These demonstrate that, against expectations, macroeconomic stability has not been attained despite the role that external debt is supposed to play. The objective of this research was to determine the effect of external debt on Kenya's exchange rates. The study was anchored on debt overhang theory and supported by Keynesian theory and Ricardian equivalence theory. The independent variable was external debt operationalized using the natural logarithm of quarterly external debt while the control variables were; interest rate, inflation and trade openness. The dependent variable that the research attempted to explain was the exchange rates in Kenya. The data was collected on a quarterly basis over a period of twenty years (from January 2002 to December 2021). A descriptive research approach was employed in the research, with a multivariate regression model used to examine the connection between the study variables. The study's findings yielded an R-square value of 0.906, indicating that the chosen independent variables could explain 90.6 percent of the variance in Kenya's exchange rates, while the other 9.4 percent was due to other factors not investigated in this study. The F statistic was significant at a 5% level with a p=0.000. This suggests that the model was adequate for explaining exchange rates in Kenya. Further, the findings demonstrated that external debt and interest rate had a positive and significant influence on Kenya's exchange rates while inflation and trade openness did not have a significant effect. The study recommends the need for practitioners and policy makers to ensure to monitor the prevailing levels of external debt as this has a significant effect on exchange rates. The policy makers should also develop policies aimed at stabilizing interest rates as they have a direct effect on the prevailing levels of exchange rates. Future studies can focus on other determinants of exchange rates in Kenya such as money supply, foreign direct investments among others. Future studies can also focus on a longer study period to confirm the findings.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Variations in currency exchange rates in a free market depend on a number of variables that affect the supply and demand for foreign currency. Foreign debt repayment is one of the factors likely to influence demand for foreign currency while foreign exchange reserves availability determines the supply of foreign currency (Nurjanah &Mustika, 2021). External debt can boost capital inflows, which has a positive influence on the exchange rate. External debt can accelerate economic growth and strengthen a nation's currency when used for development expenditures (Okoh, Olowo, Hassan, Aderemi, Peter & Alejo, 2021). On the contrary, external debt increase lead to a higher demand of foreign currency needed to service the debt leading to a depreciation of the local currency (Aderemi, Fagbola, Sokunbi, & Ebere, 2021).

This research was anchored on debt overhang theory and supported by Keynesian theory and Ricardian equivalence theory. According to Krugman's (1988) debt overhang theory, external debt restricts government spending and discourages investment, which have a negative impact on the economy. The exchange rate and price level are likely to be impacted by the inflation tax, uncertainty, and capital flight. According to Keynes's (1936) Keynesian theory, foreign debt does not burden society when it is used to finance productive economic endeavors. According to the theory, external debt is more beneficial than domestic debt since it may be used to fund long-term income-generating initiatives while keeping repayment in mind from the perspective of the government. The Ricardian equivalence theory by Ricardo (1979) identifies that external debt involve reimbursement

in foreign currency. Additionally, this theory contends that capital may be driven outside by the tax burden created as a result of the requirement to service the debt.

Most countries across the world depend on external and internal financing in meeting their development and recurrent expenditure due to the occasional budget deficits. It is evident that in developing countries, the debt limit is significantly lower than in developed ones. Between 2013 and 2021, the mean Kenyan external debt for example increased by half, that is, from 18.8 to 35.3 percent of the total GDP, positioning Kenya as one of the global rapidly-growing debt-accumulation countries (World Bank, 2020). During the same time, the currency depreciated by 33.7% against the United States (US) dollar.

1.1.1 External Debt

The External debt as per Bonga, Chirowa, and Nyamapfeni (2015) is amount of issued and pending contractual obligations of citizens of a nation to noncitizens to reimburse principal, including or without interest, or to pay interest, with or without principal. Government obligations to financiers outside the nation are referred to as external debt (World Bank, 2021). Public sector borrowing is defined by Murungi and Okiro (2018) as a type of fiscal funding in which the government collects funds by issuing loans outside the nation. The current study will adopt the definition by Murungi and Okiro (2018) as it takes into account the total external debt owed at a given point in time.

Excessive debt results in problems if the debt servicing capacity of a country does not keep pace with the growth of debt; in this case, governments spend more of their tax collections on servicing the debts than delivering services to the citizens. Governments

will borrow to service already existing debt, finance the ballooning recurrent government expenditures and fail to invest in development projects thus no new source of revenue is created to repay the debts in the future. Although borrowing internally may be appealing; it often encounters challenges that steer a country to seek external debt. These challenges include; narrow tax bases, weak tax administration processes, and under subscription of bonds and bills (Onyekwena & Ekeruche, 2019).

One method of measuring external debt is by correlating it to the economy's total output or to the GDP (Musibau, Mahmood, Ismail, Shamsuddin, & Rashid, 2020). Contrary to a poor country, a rich and growing productive nation can offset and acquire significant public sector debt. As a consequence, a better way to measure debt is in percentage of a nation GDP instead of in relative terms. The capacity of a government to repay its debt and manage its overall fiscal condition can be compared across time between states using the external debt-to-GDP ratio. Nevertheless, faster GDP growth in contrast to increasing external debt can aid in limiting the debt-to-GDP ratio (Nuhu, 2020). The current research assessed external debt as the natural logarithm of external debt in a given quarter.

1.1.2 Exchange Rates

Exchange rate refers to price of one currency in terms of another (Mishkin & Eakins, 2009). Exchange rate forecasts can be explicit, indicating how much of the domestic currency must be purchased to get one unit of the foreign currency, or implicit, indicating the amount of foreign currency can be obtained from the domestic currency (Howells & Bain, 2007). When inflationary impacts are factored into the exchange rate, it is known as the nominal rate of exchange; if these impacts are not factored into the rate, it is known as

the real rate of exchange (Lothian & Taylor, 1997). The current study will focus on the real effective rate of exchange prevailing in a given period.

The importance of the exchange rate is enabling continual exchange rate adjustment in relation to the supply and demand for foreign exchange in a certain economy. Instead of impacting the reserve level, it affects the exchange rate to create an equilibrium between supply and demand. This enables a nation to pursue monetary policy with flexibility without worrying about how it may affect the balance of payments. Exchange rate changes are a reflection of external shocks and imbalance that do not affect the movement of reserves and do not require central bank involvement to regulate the adjustment process. Because of the flexible exchange rate system, the supply and demand forces on the forex market determine how much a currency will cost (Rahman & Mustafa, 2015).

Exchange rates are usually operationalized as a ratio of another currency. Exchange rate quotes can be explicit, indicating how much of the domestic currency must be purchased to get one unit of the foreign currency, or indirect, indicating how much of the foreign currency can be obtained from the domestic currency (Howells & Bain, 2007). Exchange rates have also been operationalized using natural logarithm of the direct or indirect quote or using standard deviation to establish volatility (David & Ampah, 2018). The current study measured exchange rates as the natural logarithm of the rate between Kenya shilling and the US dollar. The US dollar has been adopted as it is the most traded foreign currency in Kenya.

1.1.3 External Debt and Exchange Rates

The Keynesian and classical schools of thought are represented in the economic literature on this topic. The classical school of thought holds that an external debt should be viewed as a tax that may have long-term negative effects on the economy. Regardless of the multigenerational lag, residents will perceive this debt as a different kind of tax and act as if they must pay it in the future (Ricardo, 1979). The Keynesians, in contrast hand, contend that because these debts generate new investments, they have no short-term nor long-term negative consequences on the economy (Keynes, 1936).

Neo-Keynesians agree with Keynesians that public debt is necessary to rejuvenate the economy. Coupet (2017) explicates the concept of electoral strategies utilizing loans in line with this school of thought. On the contrary hand, David and Ampah (2018) use various tax regimes to describe indebtedness. Aderemi et al. (2021) contend that the only factor that can affect the real values of external debts and the future projected sum of actualized budget balances is the general level of price.

The model that is acceptable for a small open economy was first presented by Lim and Stein (1995). They assert that actual exchange rates have two negative effects. The immediate and long-term effects (exchange rates and productivity) (capitalistic intensity and external debts). The amount of national savings will decrease, and interest rates will rise, as consumption rates rise on real equilibrium exchange rates (with constant investment values). This circumstance draws capital into the nation, raising real exchange rates and degrading the nation's current balance. Thus, real exchange rate instability may eventually result in a gradual rise in foreign debt in the long run.

1.1.4 External Debt and Exchange Rates in Kenya

Kenya has relied heavily on borrowing from outside to finance its budget. As of now, this reliance has grown embedded in financing national government initiatives and activities. The external debt in Kenya has been on the rise for more than a decade now. Between 2013 and 2021, the average Kenyan external debt for example increased by half, that is, from 18.8 to 35.3 percent of the total GDP, positioning Kenya as one of the global rapidly-growing debt-accumulation states (World Bank, 2021).

In regards to exchange rates, Kenya has been experiencing fluctuation of foreign exchange rate which has resulted to increase in commodity prices, petroleum price, high cost of living which has made it difficult to manage economic policies. Kenya shilling has been seen fluctuating against US Dollar. The Kenyan currency depreciated by 45.6 percent between 2010 and 2021. Kenya has used economic variables as monetary tool to stabilize exchange rate fluctuation such as interest rate capping, increase in importation taxes in order to control fluctuation of exchange rate. These policies have not been having much effect of controlling exchange rate fluctuation experienced from 2010 to 2021 (World Bank, 2021).

1.2 Research Problem

It is anticipated that external debt will bring in capital, which will stimulate savings and investment, resulting in exchange rate stability and appreciation. Additionally, the financing of external debt might result in higher capital inflows, that are essential for increasing investment. External borrowing can accelerate economic growth and strengthen a nation's currency when used for development expenditures (Okoh et al., 2021). On the contrary, external debt increase lead to a higher demand of foreign

currency needed to service the debt leading to a depreciation of the local currency (Aderemi et al., 2021).

For numerous low-income nations to meet their development goals, external funding is required. Savings are complemented by external borrowing, which also enables an economy to engage in investment activities. It is anticipated to offer the capital required for infrastructure and productive economic activity investment, promoting macroeconomic stability and economic growth. Kenya has relied to a significant extent on foreign debt to finance its budget. Data from the National Treasury and Central Bank reveal that, as of December 2021, Kenya's external debt had increased from 18.8% of GDP in 2013 to 35.3 percent of GDP. Between 2010 and 2021, the value of the Kenyan shilling decreased by 45.6 percent. These demonstrate that, against expectations, macroeconomic stability has not been attained despite the role that external debt is supposed to play. The impact of Kenya's foreign borrowing on domestic exchange rates has to be researched.

There are several empirical studies conducted in this area. Globally, Okoh et al. (2021) investigated how debt from overseas and Nigerian exchange rate variations interrelated. The analyses confirmed that the exchange rate fluctuation and external debt have an insignificant direct relationship. However, the exchange rate fluctuation and debt service payments had a significant direct association. In their study Nurjanah and Mustika (2021) set out to examine how imports, foreign exchange reserves, foreign debt, and interest rates affect how much currencies in Southeast Asian nations trade for the US dollar. According to the research results, foreign exchange reserves have a negative impact on foreign debt. The connection between Nigeria's exchange rate volatility and

external debt was studied by Aderemi et al. (2020). The main results demonstrate that short-term exchange rate fluctuations in Nigeria are significantly influenced positively by external debt, debt servicing payments, and foreign reserves.

Locally, Abdalla (2021) pursued to determine macro-economic variables impact on Kenyan foreign exchange rates. The result shows a negative significant affiliation between inflation and exchange rate, positive significant connection between interest rates and GDP growth rate and exchange rate. Mani (2016) focused on the effects of particular macro-economic variables on Kenyan exchange rates. The results revealed that inflation rate had a negative effect of exchange rates in Kenya while interest rate and trade flows had a positive effect. Odera (2015) examined impacts of foreign public debt on real effective exchange rate (REER) volatility under the entire float regime for the years 1993 to 2013 were experimentally. The findings demonstrated that the ratio of external debt to GDP had a negative and significant impact on REER volatility.

Although several studies in this area have been conducted there, still exist contextual, methodology, and conceptual gaps. The conceptual gaps mostly relate to the operationalization of study variables and conflicting result findings. Further, the studies carried out were done using methodologies in varying contexts making the generalization of the findings to a specific context difficult. Additionally, none of the conclusive studies has documented interactions between external debt and exchange rates in Kenya using the measures proposed in the current study hence an empirical literature gap. This results to the study research question, what is the effect of external debt on exchange rates in Kenya?

1.3 Research Objective

This research sought to establish the effect of external debt on exchange rates in Kenya

1.4 Value of the Study

This review will enhance to the theoretical available discussion on debt overhang theory, Keynesian theory, and Ricardian equivalence theory. The research will as well add value to the practical publications on external debt and exchange rates. In addition, studies may also be conducted in line with the recommendation and suggestions for further research.

The research will too be valuable to policy makers such as the governments and other economic bodies responsible for the formulation of various policies on exchange rates and external debt. This study is useful to the bodies in charge of policy-making who may use the recommendations from the study to design effective borrowing strategies that would enhance economic growth.

The assessment will be important for organizations whose management of foreign debt and exchange rates is mandated. This study will benefit investors as well because it will enable them to understand the implications of changes in external debt and take the appropriate action.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The research guiding hypotheses are described in the theoretical review chapter along with how they relate to the study's variables and any empirical connections between them. From the review, a conceptual framework has also been created.

2.2 Theoretical Foundation

The primary theories utilized in the literature in interpretation of the external debt impact on exchange rates are debt overhang theory, Keynesian theory, and Ricardian equivalence theory.

2.2.1 Debt Overhang Theory

This is the anchor theory of the current study and it was developed by Krugman (1988); deficit overhang is defined as a situation in which the expected payment of principal and interest on foreign debt incurred by a country falls short of its contractual value. If a country accrues unsustainable levels of debt that exceed its ability to repay by a given future probability, the anticipated debt benefit is anticipated to be rising operation of the country's tier of output. High foreign interest payments can raise domestic interest rates and also increase the budget deficit, thereby slowing investments and reducing public savings since a large share of a country’s financial resources are allocated to debt service.

The theory is on the premise that as the amount of outstanding debt surpasses a certain threshold level known as the debt overhang level; the ability or willingness of a country to repay its debts begins to diminish. This is predominantly the case when governments begin to default on debt payments to impede the adverse effects of very high debt service.

Borensztein (1990) emphasizes that debt overhang is a position in which the debtor country gains significantly low from the return of any additional investment due to the increasing debt service obligations.

The benefit of this approach is that it acknowledges how government restrictions and decreased investment due to external debt have a negative impact on the economy. The currency rate and price level are likely to be impacted by the inflation tax, uncertainty, and capital flight. Moreover, the theory presupposes that different nations have different social, economic, and political systems. Additionally, it fails to explain clearly how foreign debt can affect inflation and the currency rate.

2.2.2 Keynesian Theory

Keynes established the Keynesian theory in 1936, which postulates that an economy's resources are underused in addition to its lack of credit (Lwanga & Mawejje, 2014). It continues by stating that a budget deficit and increase in government spending results in a rise in overall demand, leading in the exploitation of idle resources and an increase in output on a national level. Renjith and Shanmugam (2018) contend that public sector borrowing will boost overall demand and promote economic growth. Increased government autonomous expenditure via debt procurement boosts growth in output through the multiplier effect, and borrowing is simply a reallocation of resources from taxpayers to bondholders.

This theory is critiqued by Ricardo (1979); Solow (1956) and Metwally and Tamaschke (1994) for being self-contradictory and also for the fact that it leans towards a centrally planned economy. In order to improve aggregate demand during periods of high

unemployment, governments are supposed to increase spending. Governments might therefore be compelled to restrict aggregate demand, which would lead to inflation. The concept also minimizes the role that money plays in the economy (Renjith & Shanmugam, 2018). The theory has also drawn criticism for asserting that borrowing by the public sector is unrelated to any form of genuine burden and has no effect on economic growth (Metwally & Tamaschke, 1994).

The Keynesian theory holds that governments may be able to stop recessions by borrowing from the private sector and using the money to fund reinvestment. Since overall expenditure affects economic stability and growth, borrowing by the government to pay for this spending does not harm the economy. This theory's flaw is that it only recognizes the constructive role that foreign debt plays in an economy. The main goal of this research, which is how high foreign debt influences exchange rates, is not explained.

2.2.3 Ricardian Equivalence Theory

As developed by Ricardo (1979), Ricardian Equivalence examines the role of debt management in monetary policy, especially whether the quantity and nature of the debt place any restrictions on the government's ability to regulate monetary policy. It uses macroeconomic models with representative agents, infinite horizons, and thorough market hypotheses. In these simulations, the level of government debt has no impact on economic activity. Households make the necessary savings because they are aware that, for any given spending pattern, a higher debt level now will result in higher taxes later on. In the case of a shift in the government debt composition, households can select a suitable portfolio of assets to sustain their initial spending plan (Ricardo, 1979).

Metwally and Tamaschke (1994) and McConnel and Brue (1990) both criticize the Ricardian Equivalence Theorem for relying on the following premises: households acknowledge that changes in debt financing costs result in shifts in future tax liabilities, enabling them to adjust their consumption and savings to counteract the effects of the government's budget constraint; taxes are non-distortionary, meaning that changes in taxes have no effect on economic behavior; and households fully comprehend that changes in debt, The private sector's investment portfolio decisions must take into account the same risk-return trade-offs as government securities in order to prevent government borrowing from opening up new investment opportunities that would otherwise be unavailable (Wray & Tymoigne, 2008).

According to this theory, external debt must be repaid in a foreign currency. Domestic currency value is influenced by the need for foreign currency for debt payment and redemption. Furthermore, this argument contends that capital may be sent outside due to the tax burden created as a result of the requirement to service the debt. Moreover, this theory does not clearly link domestic prices in a country to external debt.

2.3 Determinants of Exchange Rates

This section presents the determinants of exchange rates. It has been globally acknowledged that exchange rates are a multidimensional issue and its improvement necessitates an in-depth and comprehensive approach as outlined below:

2.3.1 External Debt

External debt is anticipated to offer capital inflow that results in increased savings and investment thus attaining exchange rate stability and appreciation. Additionally, the

financing of external debt might result in higher capital inflows, which are essential for increasing investment. External borrowing can accelerate economic growth and strengthen a nation's currency when used for development expenditure (Okoh et al., 2021). On the contrary, external debt increase lead to a higher demand of foreign currency needed to service the debt leading to a depreciation of the local currency (Aderemi et al., 2021).

The Keynesian and classical schools of thinking are represented in the economic literature on this topic. The classical school of thinking holds that an external debt should be viewed as a tax that may have long-term negative effects on the economy. Regardless of the intergenerational lag, citizens will perceive this debt as a different kind of tax and act as if they must pay it in the future (Ricardo, 1979). The Keynesians, on the contrary side, contend that because these debts generate new investments, they have neither short-term nor long-term negative consequences on the economy (Keynes, 1936).

2.3.2 Interest Rates

Interest rates are important in the determination of exchange rate movements. It is highly correlated with inflation and exchange rates. By adjusting interest rates, the central bank can have an impact on the rate of inflation and the value of currencies. Lenders in an economy facing high interest rate levels benefit from high interest rates since their returns are increased relative to other countries. As a result of this foreign capital is attracted forcing the exchange rates to rise (Barksenius & Rundell, 2012).

According to Razin and Collins (2007) the impact caused by high rates of interest is reduced if inflation ranks higher in the country than in others, or if there are other factors

that drive the currency down. The opposite is true for falling rates of interest. Khan and Sattar (2014), state that exchange rates can be affected either negatively or positively by the interest rates based on the shift. A decline in bank interest rates and higher consumption inhibit savings.

2.3.3 Inflation Rate

Exchange rates fluctuate in accordance with the amount needed to compensate for varying rates of inflation, claim Elbadawi and Sato (2005). For example, in the scenario of a currency that is already overvalued, depreciation is required to counter this position and conversely. Because the exchange rate is a relative price, it weighs all related elements in terms of their relative importance. This argument is supported by the fact that excessive inflation will erode a nation's competitive advantage and impair its capacity to market its goods abroad. Because there is less demand for the domestic currency relative to the higher demand for foreign money, the value of the domestic currency will decline.

The economy of a nation can be significantly impacted by inflation rates. For example, property prices will rise during periods of price fluctuations and increases. When a result, the overall cost of goods is likely to grow as inflation develops in an economy. As a result, exchange rates will shift as the purchasing power decreases. As a result, many investors who participate in the market's sale of goods and services typically make an allowance for inflation (Biller, 2007).

2.3.4 Trade Openness

Presumably, depending on the trade policies of the host nation, trade openness has a positive or negative effect on exchange rates (Liargovas & Skandalis, 2012). Trade

openness is regarded to be an important factor in exchange rate determination and is valuable for analyzing the export-import balance of the nation when trade policies are effective. The level of output and economic activity is impacted by globalization and trade policies that are more open to international investment. Determining how much the trade policies have been liberalized is crucial (Makoni, 2018).

Trade openness impact on exchange rate inclines to be presented as either positive or negative (Ashraf, 2017). By restricting the openness of the capital markets, the literature advancing the neoliberalism ideology suggests that liberalization may have positive impact. This body of work makes the notion that removing statutory barriers to foreign investment alone is insufficient to reap the benefits of trade openness. The availability of knowledge, country risk, investor protection, and compatibility across various economic and political sectors should all be inspiration instruments to promote foreign investment (Naghavi & Lau, 2016).

2.4 Empirical Studies

Various surveys related to the research variables that have been conducted by various authors throughout the world were examined in the empirical studies section to determine the methodology employed and the gaps in those researches.

2.4.1 Global Studies

Okoh et al. (2021) utilized Dynamic Ordinary Least Square alongside Granger causality techniques in investigating how debt from overseas and exchange rate fluctuations interacted in Nigeria. The principal variables were analysed from 1990 to 2017. The analyses confirmed that the exchange rate fluctuation and external debt have an

insignificant direct link. However, the exchange rate fluctuation and debt service payments had a significant direct affiliation. Also, the foreign reserves positively and significantly influenced the exchange rate fluctuation. Similarly, one-way feedback flows from foreign reserves to external debt. The research offers a contextual gap as it was explicit to Nigeria and therefore findings cannot be generalized to other countries.

In Nurjanah and Mustika's (2021) study, it is their goal to examine how imports, foreign exchange reserves, foreign debt, and interest rates affect how much currencies in Southeast Asian nations are worth in relation to the US dollar. The research conclusion revealed that, from 2010 to 2017, Southeast Asian nations' currency exchange rates continued to decline against the US dollar (depreciate). Indonesia experienced the biggest growth in its exchange rate relative to the US dollar, whereas Singapore experienced the lowest rise. In the Southeast Asian region, imports have a positive impact on nations' exchange rates relative to the US dollar while foreign exchange reserves have a negative impact on foreign debt. Interest rates, on the contrary side, do not appear to have much of an impact. Due to its concentration on South East Asia, whose financial and economic situation is distinct from Kenya's, the research has a contextual gap.

Aderemi et al. (2020) scrutinized the link between external debt and exchange rate fluctuations in Nigeria over the duration ranging 1981-2018. In order to achieve the research goal, the Autoregressive Distribution Lag Model was used. The following are the main conclusions drawn from this study: In Nigeria, short-term changes in exchange rates are significantly influenced by external debt, debt service payments, and foreign reserves. The research presents a contextual gap as it was explicit to Nigeria and therefore findings cannot be generalized to other countries.

Cahyadin and Ratwianingsih (2020) examine the empirical model of external debt, exchange rate, and unemployment in selected Asian Nations during 1980-2017. Indonesia, Malaysia, Thailand, and the Philippines were among the nations. The data was gathered from World Bank publications. The research goals were addressed using the ARDL and Granger Causality Test. The results showed that each empirical model experienced transient effects (external debt, exchange rate, and unemployment). The models were accurate and stable, as demonstrated by the stability test. The findings indicated a connection between external debt, exchange rates, and unemployment, particularly in Indonesia. The research has a conceptual gap as the effect of external debt on exchange rate was not established.

Kumar et al. (2019) surveyed external debt impact and exchange rate volatility on domestic consumption in Pakistan by utilizing the annual data (1980–2014). To examine the short- and long-term effects on domestic consumption of cointegration and error-correction modeling, they employ the limits testing approach. The results of this study have made two contributions to the body of literature already in existence: According to the outcomes of the bound test, domestic consumption has a long-term link with income, interest rates, exchange rates, exchange rate volatility, and external debt. Income, interest rates, and exchange rates have a positive impact on domestic consumption while exchange rate volatility and external debt have a negative impact both immediately and over the long term. This research offers a contextual gap as it was conducted in Pakistan and thus the conclusions cannot be generalized to Kenya which is the current research focus.

2.4.2 Local Studies

Abdalla (2021) pursued to determine the effect of macro-economic variables on foreign exchange rates in Kenya. Specifically, the research pursued investigating the impact of inflation, political instability, broad money supply, interest rate and GDP growth rate for 10 years duration ranging January 2010 to December 2019. From the regression the result shows a negative significant link between inflation and exchange rate, positive significant association between interest rates and GDP growth rate and exchange rate. A conceptual gap is presented by the research as external debt was not taken into account.

Murungi and Okiro (2018) performed an analysis of the empirical and theoretical literature on how economic growth was impacted by government debt. Most of the results from the government debt literature analysis suggested that government debt possessed effect on financial growth; some researches indicated favorable exchange rates whereas others revealed adverse financial growth. This study leaves a gap in methodology since being a critical literature review means it needs an empirical study for confirmation of the findings.

Mwangi (2017) set out to investigate the individual effects of internal and external debt on the expansion of Kenya's economy. The research used a modified version of Solow's growth model. To empirically verify the occurrence of a long-term link between GDP and the chosen measure, cointegration analysis was used. The study showed that, in the case of public debt, it has a positive insignificant impact on economic expansion. The issue of external deficit, reveals a substantial but negative link with growth. The research presents a conceptual gap as it focused on economic growth leaving a gap on exchange rates.

Mani (2016) aimed at determination of selected macro-economic variables effect on Kenyan exchange rates. The dependent variable in this study was exchange rates while independent variables were inflation, interest rates and aggregation of trade flows. The study period was for ten years from January 2006 to December 2015 using secondary data. Multiple linear regression was utilized in the research descriptive research methodology to see how the variables related to one another. Research conclusion showed that interest rate had a positive correlation with exchange rate, Inflation rate and exchange rate had a negative correlation while the level of aggregation of trade flows had a positive correlation with exchange rate. A conceptual gap as is presented by the research since external debt was not taken into account.

Using quarterly data, Odera (2015) empirically examined the impact of foreign public debt on the volatility of the real effective exchange rate (REER) under the entire float regime for the years 1993 to 2013. British Sterling Pounds and US Dollars were used to create the REER index. The second order moving average's standard deviation was used to calculate the REER volatility. A linear model was created, and using the Ordinary Least Squares method, exchange rate volatility was regressed against inflation, interest rates, GDP growth rate, money supply to GDP ratio, and external debt to GDP ratio. The findings demonstrated that whereas interest rates had a positive and substantial impact on REER volatility, the external debt to GDP ratio had a negative and significant impact. Due to the operationalization of external debt as a ratio of GDP without accounting for absolute numbers, this research has a conceptual gap.

2.5 Summary of the Literature Review and Research Gaps

The theoretical reviews depicted the projected link between external debt and exchange rates. The key factors influencing exchange rates have been discussed. There is a knowledge gap that should be filled based on the research that has been examined. Various conclusions about the link between external debt and exchange rates have been drawn from the studies that have been analyzed. Conceptual, contextual, and methodological gaps can explain the disparities in the studies.

The conceptual gaps mostly relate to the operationalization of study variables and conflicting result findings. Further, different methodologies were used to carry out the studies in different contexts making the generalization of the findings to a specific context difficult. Additionally, none of the conclusive studies have documented interactions between external debt and exchange rates in Kenya using the measures proposed in the current study hence an empirical literature gap. From this emanates the research query, what is the effect of external debt on exchange rates in Kenya?

2.6 Conceptual Framework

This research conceptual model comprises external debt and exchange rates as the independent and dependent variables while interest rates, inflation rates and trade openness were incorporated as the control variables. External debt was measured as the natural logarithm of quarterly external debt. Depicted in Figure 2.1 is the research conceptual model.

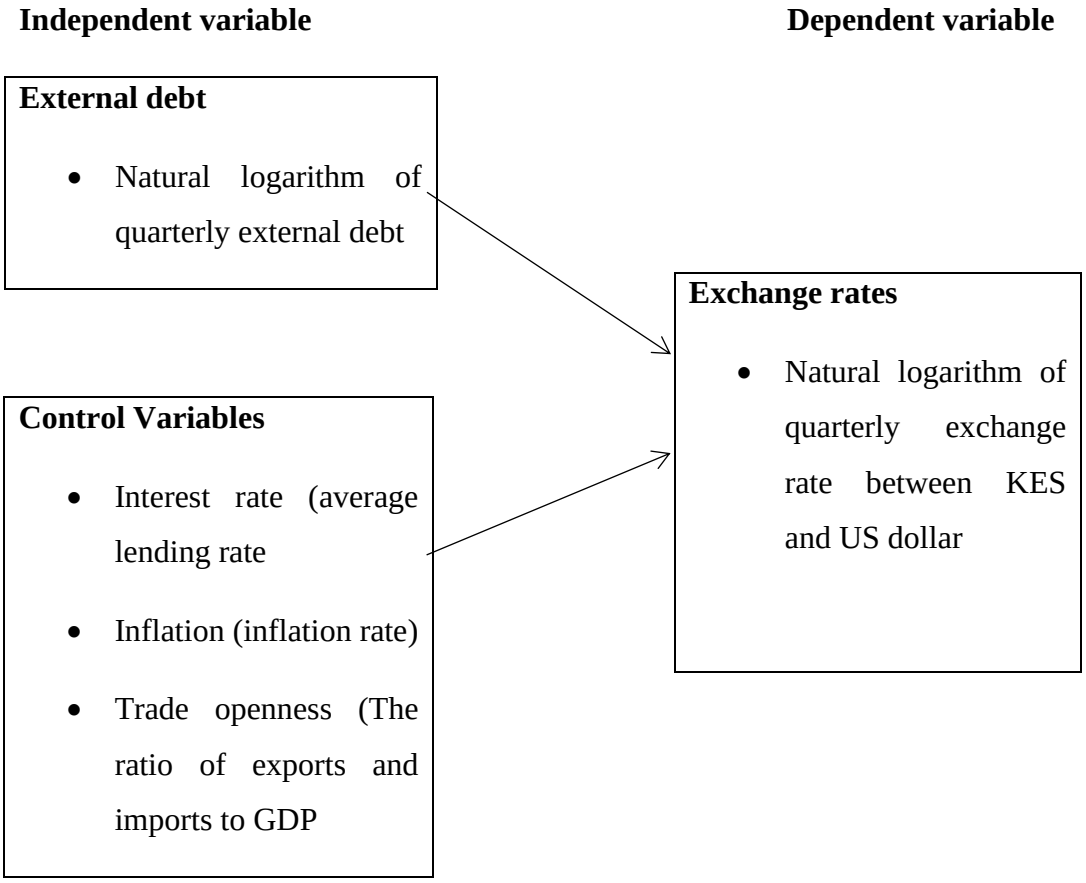

Figure 2.1: Conceptual Model

Source: Author (2022)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The chapter highlights the steps and methods embraced in the execution of the proposed study. It particularly converses the data collection methods, research design, operationalization of the variables, and data analysis techniques.

3.2 Research Design

The descriptive study design was adopted in this study to estimate the effect of Kenya's external debt on exchange rates. Cooper and Schindler (2013), suggest that the most systematic research design is the descriptive one as it consists of a practical inquiry whereby the researcher does not directly control the independent variable due to their manifestation having already occurred or their inherent inability to manipulate. A defining study method was the most suitable as the researcher sought to creating a profile about the link between exchange rates and external debt.

3.3 Data Collection

This research used Secondary data only. The gathering of the secondary data was done through Central Bank reports and KNBS reports for the quarterly periods between January 2002 and December 2021 then it was recorded in a data sheet collection. The 20-year quarterly period was thought to be long enough to give sufficient data to meet the study's goals. The secondary data was compiled using a secondary data collecting sheet. The specific data collected included; exchange rate between Kes and US dollar, external debt, total exports, total imports, interest rate, inflation rate as well as GDP.

3.4 Diagnostic Tests

The linear regression was based on a number of assumptions including, no auto-correlation, no or little multi-collinearity, stationarity and multivariate normality. The diagnostic tests performed are outlined in Table 3.1

Table 3.1: Diagnostic Tests

Test	Meaning	Statistical method	Interpretation	Diagnosis
Autocorrelation	Occurs when the residuals lack independence from each other.	Durbin-Watson statistic	When the test outcomes fall within critical values (1.5<d<2.5) there is no autocorrelation	Correlogram (Auto Correlation Function-ACF plot) Review model specifications
Multicollinearity	How closely related are the independent variables of the study	Variance Inflation Factors (VIF)	VIF less than 10 implies that there is no multicollnearity	Data that was causing Multicollinearity was adjusted using log transformation
Normality Test	When linear regression analysis for all variables is multivariate normal	Goodness of fit test Shapiro-Wilk test	Shapiro-Wilk test prob.> 0.05. If the test is not substantial, the distribution is possibly normal.	Data that was not normally distributed was adjusted for using log transformation and non-linear log transformation.
Stationarity	a unit-root test to establish if the data was stationary	Jarque Bera unit root test	A p value less than 0.05 implies that the data is stationary	Robust standard errors were utilized wherever data failed the test.

3.5 Data Analysis

Data analysis was done via the SPSS software version 24. Tables presented the quantitative conclusions. Measures of central tendency and dispersion were calculated using descriptive statistics, and standard deviation was provided for all the variables. Regression and correlation were relied on by the inferential statistics. The correlation determined the extent of the relationship that exists among the study variables whereas the reason and impact of the variables was defined using regression. A multivariate regression linearly determined the link between independent and dependent variables.

3.5.1 Analytical Model

The following equations was applicable:

$Y= \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$

Where: Y = Exchange rates measured by natural logarithm of the rate between KES and US dollar per quarter

β_0 =y intercept of the regression equation.

$\beta_1, \beta_2, \beta_3, \beta_4$ =are the regression coefficients

X_1 = External debt measured as the natural logarithm of external debt per quarter

X_2 = Interest rate measured as quarterly average lending rate

X_3 = Inflation rate measured as the quarterly inflation rate

X_4 = Trade openness measured as ratio of exports and imports to GDP per quarter

ε =error term

3.5.2 Tests of Significance

The relevance of the overall model and each individual variable was determined via parametric testing. ANOVA was used to establish the significance of the overall model using the F-test, and a t-test was used to assess the coefficients significance.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND FINDINGS

4.1 Introduction

This chapter presents the findings of this research. The main aim of the study was to determine how external debt influences exchange rates in Kenya. The following sections consist of descriptive statistic, diagnostic test, analysis of correlations, regression and discussion of results.

4.2 Descriptive Analysis

Descriptive statistics of all variables on which analysis was done are listed in the table below. Quarterly information was gathered and analyzed using SPSS version 24 software during a twenty-year period (2002 to 2021).

Table 4.1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Exchange rate	80	62.6467	111.8967	87.222378	13.3179837
External debt (shs Million)	80	367141.6	4122259.6	1288626.946	1128636.1418
Interest rate	80	5.9	18.5	10.722	3.5218
Inflation rate	80	2.0	19.2	7.602	4.1281
Trade Openness	80	.1	.2	.121	.0412
Valid N (listwise)	80				

Source: Research Findings (2022)

4.3 Diagnostic Tests

Diagnostic tests were done before conducting the regression model. Normality, Multicollinearity, autocorrelation and stationarity tests were conducted in the study.

4.3.1 Normality Test

To establish if the data was normally distributed, the researcher used the Shapiro-wilk test. If the p-value falls above 0.05, we conclude that there is normal distribution of data and vice versa. Table 4.2 summarizes the results of the test.

Table 4.2: Normality Test Results

	Shapiro-Wilk	P-value
Exchange rate	0.918	0.102
External debt	0.881	0.094
Interest rate	0.874	0.091
Inflation rate	0.892	0.101
Trade openness	0.923	0.120

Source: Research Findings (2022)

Since the data displayed a p value of above 0.05 therefore having a uniform distribution, the researcher adopted the alternative hypothesis. This data was fit to be subjected to tests and analysis like for variance, regression and Pearson's Correlation analyses.

4.3.2 Multicollinearity Test

In a multiple regression model, multicollinearity is displayed whenever predictor variables exhibit a substantial relationship. An event where independent variables have great correlations is unfortunate. Parameters are said to have multicollinearity if they have a perfect linear connection. Outcomes for the test on multicollinearity were displayed in Table 4.3.

Table 4.3: Multicollinearity Test

	Collinearity Statistics	
	Tolerance	**VIF**
External debt	0.937	1.067
Interest rate	0.718	1.393
Inflation rate	0.592	1.689
Trade openness	0.245	4.082

Source: Research Findings (2022)

VIF value is used where values that fall below 10 are not multi-linear. One condition for multiple regressions to occur is that no strong connection should be evidenced among variables. Given by the outcomes, every VIF variable is below 10 as indicated in table 4.3 which shows that independent variables in the study experience no significant statistical multi-linearity.

4.3.3 Autocorrelation Test

A serial correlation test established the relationship of error terms for different times. For the research to obtain the desired model parameters, the Durbin Watson serial correlation test was used to carry out the analysis of autocorrelation in the data, which is a major shortcoming in the data analysis that must be examined. The findings are shown in Table 4.4.

Table 4.4: Autocorrelation Results

Durbin Watson Statistic
2.112

Source: Research Findings (2022)

From the null hypothesis, no first-order serial/auto correlation exists. The 2.112 Durbin Watson statistical varies from 1.5 to 2.5 indicating no serial correlation.

4.3.4 Stationarity Test

The research variables were subjected to a unit-root test to establish if the data was stationary. The unit root test was ADF test. With a standard statistical significance level of 5%, the test was compared to their corresponding p-values. In this test, the null hypothesis states that every variable has a unit root, and the alternative hypothesis is that the variables are stationary. Findings depicted in Table 4.5.

Table 4.5: Stationarity Test

Variables	Statistic	P-value
Exchange rate	5.2129	0.0000
External debt	7.2036	0.0000
Interest rate	6.8613	0.0000
Inflation rate	5.8337	0.0000
Trade openness	5.8049	0.0000

Source: Research Findings (2022)

As demonstrated in Table 4.5, this test concludes that the data is stationary at a 5% level of statistical significance since the p-values all fall below 0.05.

4.4 Correlation Analysis

Pearson correlation was employed to establish the relationship linking exchange rates in Kenya to the characteristics of the study (external debt, trade openness, inflation and interest rate). The results are as shown in Table 4.6.

Table 4.6: Correlation Analysis

		Exchange rate	External debt	Interest rate	Inflation rate	Trade Openness
Exchange rate	Pearson Correlation	1				
	Sig. (2-tailed)					
External debt	Pearson Correlation	.946**	1			
	Sig. (2-tailed)	.000				
Interest rate	Pearson Correlation	-.421**	-.516**	1		
	Sig. (2-tailed)	.000	.000			
Inflation rate	Pearson Correlation	-.217	-.275*	.065	1	
	Sig. (2-tailed)	.053	.014	.566		
Trade Openness	Pearson Correlation	-.517**	-.508**	.409**	.105	1
	Sig. (2-tailed)	.000	.000	.000	.352	

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
c. Listwise N=80

Source: Research Findings (2022)

From the study's findings, a strong positive that is statistically significant relationship exists between external debt and exchange rates (r = .946, p = .000). The correlation results further revealed a moderate negative and significant statistical connection between interest rate and exchange rates (r = -.421, p = .000). The rate of inflation displays a not significant negative interrelationship to exchange rates in the Kenyan economy (r = -.217, p = .053). Trade openness also exhibited a moderate negative and significant association with exchange rates in Kenya (r = -.517, p = .000).

4.5 Regression Analysis

External debt, trade openness, interest rate, together with the rate of inflation was utilized as agents to predict exchange rates in Kenya. The test was done at 5% level of significance. Table 4.7 to 4.9 displays the results.

Table 4.7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.952[a]	.906	.901	.0208500

a. Predictors: (Constant), Trade Openness, Inflation rate, Interest rate, External debt

Source: Research Findings (2022)

The R squared indicator indicates how the explanatory variables may describe variations in the response variable. As indicated in Table 4.7, the R square was 0.906, indicating that change in external debt, trade openness, interest rate and inflation account for 90.6 percent of the exchange rates in Kenya. Other factors not included in this research account for 9.4 percent of the variance in exchange rates in Kenya. The correlation coefficient (R) of 0.952 showed a significant connection amongst predictor factors and exchange rates.

The value of P obtained by ANOVA is 0.000, which is less than p=0.05. This demonstrates that the model's importance described how external debt, trade openness, rate of interest and inflation, affect Kenya's exchange rates.

Table 4.8: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.315	4	.079	181.108	.000[b]
	Residual	.033	75	.000		
	Total	.348	79			

a. Dependent Variable: Exchange rate

b. Predictors: (Constant), Trade Openness, Inflation rate, Interest rate, External debt

Source: Research Findings (2022)

The relevance of various variables was determined using the model coefficients. The statistics of t and values of p were used to accomplish this. This study is significant since it allowed the researcher to determine which independent variables were chosen (external debt, interest rate, inflation and trade openness) significantly influences the exchange rates of the Kenyan economy. Table 4.9 summarizes the findings.

Table 4.9: Model Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.831	.060		13.889	.000
	External debt	.183	.009	.982	21.180	.000
	Interest rate	.002	.001	.111	2.613	.011
	Inflation rate	.001	.001	.052	1.414	.161
	Trade Openness	-.112	.068	-.069	-1.658	.101

a. Dependent Variable: Exchange rate

Source: Research Findings (2022)

Table 4.9 shows that external debt and interest rate were a significant predictor of exchange rates in Kenya. This is evidenced by high t values and p values less than 0.05. Inflation rate and trade openness did not have a significant effect on exchange rates in Kenya.

The following regression was estimated:

$Y = 0.831 + 0.982X_1 + 0.111X_2$

Where,

Y = Exchange rates

X_1= External debt

X_2= Interest rate

X_3= Inflation

X_2= Trade openness

Using the constant = 0.831, we can see that if selected independent variables (external debt, interest rate, inflation and trade openness) were rated zero, the exchange rates would increase by 0.831. Increasing external debt by one unit would increase exchange rates by 0.982 units, increasing interest rate by one unit would cause the exchange rates to increase by 0.111. Inflation rate and trade openness do not have a significant effect on exchange rates in Kenya.

4.6 Discussion of Research Findings

This research had an aim of establishing the way in which the predictor variables impacted the exchange rates in the Kenyan context. Independent variables included external debt, interest rate, inflation and trade openness. This research tried to show exchange rates being a dependent variable. The natural logarithm of KES to USD on a quarterly basis measured exchange rates. Correlation as well as regression analysis were

utilized to show the connection linking the independent to dependent variables.

The Pearson model showed a strong positive that is statistically significant relationship exists between external debt and exchange rates. The correlation results further revealed a moderate negative and significant statistical connection between interest rate and exchange rates. The rate of inflation displays a not significant negative interrelationship to exchange rates in the Kenyan economy. Trade openness also exhibited a moderate negative and significant association with exchange rates in Kenya.

The independent variables accounted for 90.6% of variances in exchange rates, in accordance with the summary of the model. The predictor variables of this research had explanatory power that fitted a 95% confidence level like indicated by the 0.000 p value, which was way below the threshold of significance that is 5%. Therefore, the overall model employed in this study is a good and sufficient prediction model to determine the exchange rates in Kenya.

This research is in agreement with Aderemi et al. (2020) who scrutinized the link between external debt and exchange rate fluctuations in Nigeria over the duration ranging 1981-2018. In order to achieve the research goal, the Autoregressive Distribution Lag Model was used. The following are the main conclusions drawn from this study: In Nigeria, short-term changes in exchange rates are significantly influenced by external debt, debt service payments, and foreign reserves.

This study is also in agreement with a study conducted by Cahyadin and Ratwianingsih (2020) who examine the empirical model of external debt, exchange rate, and unemployment in selected Asian Nations during 1980-2017. Indonesia, Malaysia,

Thailand, and the Philippines were among the nations. The data was gathered from World Bank publications. The research goals were addressed using the ARDL and Granger Causality Test. The results showed that each empirical model experienced transient effects (external debt, exchange rate, and unemployment). The models were accurate and stable, as demonstrated by the stability test. The findings indicated a connection between external debt, exchange rates, and unemployment, particularly in Indonesia.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The major motive of this study was to investigate the way external debt influences the exchange rates in Kenya. The findings from the above sections are outlined in this chapter together with the conclusions and limitations of this study. This section also outlines the strategies that can be adopted by policymakers. It also provides the recommendations.

5.2 Summary of Findings

The study assessed how external debt influenced the exchange rates in Kenya. External debt, interest rates, inflation rate as well as trade openness was adopted to be the predictor variables of the research. The study used descriptive design to do analysis and data collection. Secondary data was obtained from CBK as well as KNBS and prepared using SPSS version 24 program. The study used data of 20 years compiled quarterly.

The Pearson model showed a strong positive that is statistically significant relationship exists between external debt and exchange rates. The correlation results further revealed a moderate negative and significant statistical connection between interest rate and exchange rates. The rate of inflation displays a not significant negative interrelationship to exchange rates in the Kenyan economy. Trade openness also exhibited a moderate negative and significant association with exchange rates in Kenya.

The independent variables accounted for 90.6% of variances in exchange rates, in accordance with the summary of the model. The predictor variables of this research had explanatory power that fitted a 95% confidence level like indicated by the 0.000 p value, which was way below the threshold of significance that is 5%. Therefore, the overall model employed in this study is a good and sufficient prediction model to determine the exchange rates in Kenya.

The regression results further discovered that if selected independent variables (external debt, interest rate, inflation and trade openness) were rated zero, the exchange rates would increase by 0.831. Increasing external debt by one unit would increase exchange rates by 0.982 units, increasing interest rate by one unit would cause the exchange rates to increase by 0.111. Inflation rate and trade openness do not have a significant effect on exchange rates in Kenya.

5.3 Conclusion

The results of the research indicate that Kenya's exchange rates are positively affected by external debt and interest rates. The research finds that higher external debt and high interest rates leads to a significant rise in exchange rates in Kenya. The study therefore concludes that a rise in these two variables can lead to a depreciation of the Kenya currency against the US dollar. The study also concludes that inflation and trade openness do not have a significant effect on exchange rates in Kenya.

The study concludes that the factors under research – external debt, interest rates, inflation rate as well as trade openness – affect exchange rates by describing 90.6% of the variations. This means that the non-model variables are only responsible for 9.4% of

variations of exchange rates in the country. It is therefore substantial to infer that the outlined factors affect the exchange rates as shown in the ANOVA summary by p values less than 0.05.

The conclusions of this research concurred with Mani (2016) who aimed at determination of selected macro-economic variables effect on Kenyan exchange rates. The dependent variable in this study was exchange rates while independent variables were inflation, interest rates and aggregation of trade flows. The study period was for ten years from January 2006 to December 2015 using secondary data. Multiple linear regression was utilized in the research descriptive research methodology to see how the variables related to one another. Research conclusion showed that interest rate had a positive correlation with exchange rate, Inflation rate and exchange rate had a negative correlation while the level of aggregation of trade flows had a positive correlation with exchange rate.

5.4 Recommendations

Outcomes show that external debt possesses a positive and considerable effect on exchange rates in Kenya implying a rise in external debt leads to depreciation of the Kenyan currency. This also means that external debt leads to higher demand of the foreign currency leading to depreciation of the local currency. The research proposes that policy makers to adopt measures aimed at reducing the level of external debt to protect the Kenyan shilling.

This study also demonstrated that interest rate impacts positively on exchange rates in Kenya. This implies that an increase in interest rate is likely to lead to a depreciation of the Kenyan currency. The research suggests that factors leading to interest rate rise

should be addressed and measures taken to stabilize the interest rate as high interest rate may have a negative effect on the prevailing levels of exchange rates.

5.5 Limitations of the Study

This study embraced a 20 years period (2002-2021). It gives no substantial evidence that in an added timeframe, the findings will not change. Additionally, it is not certain that these findings will be sustained after 2021, things might change. Extra timeframe is reliable because it comprises instances with economic shifts like recessions and booms.

The main drawback of the study was the quality of data. It is not possible to reliably state the results obtained in the survey as the correct reflection of the general situation. Accuracy and reliability of the data collected are assumed to a certain point. Additionally, because of the existing circumstances, computing the data has been incoherent. This study uses secondary data as opposed to primary data. The determinants of exchange rates have been partially considered because of unavailability of data for all determinants.

Regression models were used to conduct data analysis. It would be impossible for the researchers to generalize outcomes because of the setbacks accruing from model utilization like erroneous and deceptive conclusions resulting from a change in value of variable. Whenever data is put in a regression model, it is impossible to process it through another previous model.

5.6 Suggestions for Further Research

The aim of the study was to determine the impact of external debt on exchange rates of the Kenyan economy. A research that focuses on primary data or a mix of primary data with secondary data is recommended so as to recognize other elements that might have

been overlooked in the current research. A qualitative study can also be conducted to complement the current study.

This research did not consider all independent variables that affect exchange rates of an economy. A suggestion therefore arises to include other factors in future studies in order to come up with more specific findings. These factors include money supply, economic growth, balance of payments, foreign direct investments among others. Providing details how each of them affects exchange rates will enable policymakers make decision on the steps to take in order to control their exchange rates.

Because of unavailability of data, this study focused on the latest 20 years. Other future studies should employ a wider range to come up with a valid conclusion. This study was also under restriction because it only focused solely on Kenya. Additional survey should be conducted in other nations to determine results. In conclusion, the investigator adopted a regression model to do a confirmation or rejection of the findings. Any studies in future should adopt other independent methods to confirm or reject their findings.

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APPENDICES

Appendix I: Research Data

Year	Quarter	Exchange rate	External debt (shs Million)	Interest rate	Inflation rate	Trade Openness
2002	1	78.3033	381,323	18.4533	1.9613	0.1433
	2	78.4167	378,273	18.4533	1.9613	0.1455
	3	78.7267	376,205	18.4533	1.9613	0.1363
	4	79.4733	371,402	18.4533	1.9613	0.1337
2003	1	77.0467	367,142	16.5733	9.8157	0.1541
	2	73.6633	377,463	16.5733	9.8157	0.1560
	3	76.2033	402,530	16.5733	9.8157	0.1389
	4	76.8433	408,700	16.5733	9.8157	0.1398
2004	1	76.6500	409,537	12.5317	11.6240	0.1575
	2	78.8067	420,552	12.5317	11.6240	0.1795
	3	80.5133	447,837	12.5317	11.6240	0.1749
	4	80.7233	449,732	12.5317	11.6240	0.1772
2005	1	76.5567	438,876	12.8825	14.3200	0.1977
	2	76.4100	427,266	12.8825	14.2400	0.2391
	3	75.3800	429,704	12.8825	7.6333	0.1928
	4	73.8533	414,972	12.8825	4.2733	0.1791
2006	1	72.0967	407,227	13.6355	8.8767	0.1996
	2	72.1567	414,754	13.6355	4.7300	0.2183
	3	73.1333	428,137	13.6355	5.0033	0.2085
	4	71.0167				

Year	Quarter	Exchange rate	External debt (shs Million)	Interest rate	Inflation rate	Trade Openness
			419,030	13.6355	7.0567	0.2040
2007	1	69.6000	414,345	13.3403	3.2800	0.2346
	2	67.4500	412,191	13.3403	2.6267	0.2251
	3	67.0133	409,420	13.3403	5.4367	0.2155
	4	65.2133	416,968	13.3403	5.7200	0.0688
2008	1	67.8733	425,089	9.0000	10.6267	0.0673
	2	62.6467	431,868	9.0000	17.5333	0.0703
	3	68.5967	433,145	9.0000	18.0600	0.0752
	4	77.6267	467,136	9.0000	18.7033	0.0710
2009	1	79.5800	513,578	8.3750	14.1700	0.0688
	2	78.4467	521,685	8.0000	10.2100	0.0673
	3	76.2433	529,068	7.7500	7.5133	0.0703
	4	75.1367	544,701	7.0000	5.6467	0.0752
2010	1	76.4900	529,693	6.7500	5.0333	0.0710
	2	78.9367	548,285	6.7500	3.6767	0.0763
	3	80.9267	574,444	6.0000	3.3333	0.0795
	4	80.5800	599,087	6.0000	3.8433	0.0877
2011	1	82.2367	629,618	5.8750	7.0500	0.0887
	2	86.1233	683,817	6.2500	13.1600	0.0950
	3	93.0167	770,944	7.0000	16.5067	0.1101
	4	93.8700	741,422	15.1600	19.1867	0.1061
2012	1	84.1400	675,366	18.0000	16.8700	0.0919

Year	Quarter	Exchange rate	External debt (shs Million)	Interest rate	Inflation rate	Trade Openness
	2	84.1200	728,637	18.0000	11.7767	0.1021
	3	84.2767	780,536	14.7500	6.3833	0.0997
	4	85.5767	819,621	11.0000	3.5300	0.1019
2013	1	86.7233	824,192	9.5000	4.0767	0.1000
	2	84.6100	816,353	8.5000	4.3667	0.0910
	3	87.2533	884,035	8.5000	6.9967	0.0970
	4	85.9067	907,532	8.5000	7.4233	0.0984
2014	1	86.3267	932,744	8.5000	6.7800	0.0933
	2	87.2467	1,015,793	8.5000	7.0333	0.1030
	3	88.2400	1,089,489	8.5000	7.5433	0.1116
	4	89.8767	1,116,160	8.5000	6.1800	0.1048
2015	1	91.5267	1,246,069	8.5000	5.8167	0.0899
	2	95.8467	1,377,082	8.5000	6.9933	0.0965
	3	102.9700	1,518,018	11.5000	6.1433	0.1053
	4	102.3833	1,556,138	11.5000	7.3500	0.1032
2016	1	101.9100	1,655,626	11.5000	7.0233	0.0850
	2	101.0367	1,720,700	10.5000	5.3567	0.0890
	3	101.3367	1,816,659	10.5000	6.3333	0.0907
	4	101.7333	1,858,611	10.0000	6.5000	0.0881
2017	1	103.4133	2,048,346	10.0000	8.7700	0.0973
	2	103.3600	2,216,211	10.0000	10.7967	0.0963
	3	103.5200	2,308,504	10.0000	7.5233	0.1016

Year	Quarter	Exchange rate	External debt (shs Million)	Interest rate	Inflation rate	Trade Openness
	4	103.3533	2,353,212	10.0000	4.9833	0.0971
2018	1	101.8333	2,484,342	10.0000	4.4900	0.0968
	2	100.7567	2,567,901	9.5000	3.9867	0.0981
	3	100.7033	2,605,936	9.0000	4.6967	0.0942
	4	101.9100	2,695,811	8.5000	5.6067	0.0907
2019	1	100.7233	2,719,454	8.5000	4.3967	0.0892
	2	101.3033	2,900,155	8.5000	5.5900	0.0901
	3	103.4200	3,135,123	8.5000	5.0333	0.0916
	4	102.5200	3,116,461	8.5000	5.4433	0.0939
2020	1	101.8733	3,147,524	7.7500	6.2633	0.0891
	2	106.4967	3,443,191	7.0000	5.3100	0.0758
	3	107.9400	3,656,106	7.0000	4.3067	0.0931
	4	109.4933	3,756,913	7.0000	5.2633	0.0900
2021	1	109.7467	3,801,285	7.0000	5.7900	0.1003
	2	107.7300	3,858,897	7.0000	5.9833	0.0931
	3	109.1767	4,045,999	7.0000	6.6767	0.1043
	4	111.8967	4,122,260	7.0000	5.9933	0.1118