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Effects Of Budget Deficits On The Exchange Rate In Kenya: 1993-2021.

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ABSTRACT
Theexchange rate is considereda significant metric for a nation's competitivenessin the internationalmarket and economic performance in general. At the same time, the persistence and widening of the budget deficits in Kenya hasraised much concern among economists and policymakers since it determines a nation's financial health.Raising the need to examine the connection between budget deficits and the EXR. With that being said, theories on howthe EXR is influenced by budget deficits are contradictory and despite attempts made by empirical studies tying budget deficits to theEXR,there remains to be controversy in their findings with each contention faced with a counter-argument. Therefore, this study utilizedquantitativeannual time series data spanningfrom 1993 to 2021 and the ARDL model to establishhowbudget deficitsaffect the EXR in Kenya, differentiating the indirect and direct effects,which is crucialin determination of the exact relationship between these variables. The study revealed that the budget deficit has a positive effect on the EXR. The study also revealed that the CAD and TOT have a positive effect on the EXR. However, the effect of the TOT on the EXR is insignificant. The study concluded that since budget deficits influence the movements in the EXR, there is need to keep the widening budget deficit in Kenya in check. Further, the study recommended the establishment of a regulatory framework tailored towards budget deficit reduction and debt sustainability.

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I. INTRODUCTION

Background of the Study

Exchange Rate

The EXR is the rate at which a country's currency can be exchanged for another country's currency (Suvendu, 2021). EXR volatility and currency depreciationare a source of concern for many developing countries. EXR fluctuations aregenerally caused by both domestic and global shocks (Ha et al., 2019). The dollar being the arch international currency in global trade and finance indicates that the movements in the dollar EXR have significant effects on monetary and fiscal policies. The fluctuations in the dollar affect the global economy through inflation, trade and the prevailing financial conditions. While depreciation is linked to the increase in the number of external crises in these economies (Jaumotte et al., 2015). In addition, large deficits especially in developing countries endanger fiscal sustainability (Kawai & Morgan, 2013), which de-anchors inflation expectations and accelerates currency depreciations. This is because developing countries are characterized by high debt levels and weak economic fundamentals.

The significance of the EXR in the formulation of policies and economic performance particularly in developing countries cannot be underrated since it influences the allocation of resources, levels of production, the BOP, and foreign trade. Therefore, when determining a country's external position, the EXR plays a crucial role (Javed et al., 2016). The EXR is like any other price bearing in mind that it is driven by supply and demand, it is therefore considered a significant metric for determining the competitiveness of a nation's exports (Wondemu& Potts, 2016). Many developing nations continue to prioritise international competitiveness, which is influenced by EXR fluctuations. For instance, devaluation temporarily enhances an economy's competitiveness but in as much as depreciation increases the capacity of a nation's exports to compete internationally, it also increases the cost of acquiring raw materials from other countries (Adekoya&Fagbohun, 2016). Therefore, the country may experience depreciation from the increased cost of production, rendering domestic goods uncompetitive as a consequence of the reduced demand stemming from increased prices (Stocker et al., 2019)

In addition, the EXR influences the level of FDI as well as the allocation of investment expenditure among different countries (Cambazoğlu&Güneş, 2016). For instance, depreciation reduces wages, which results in reduced production costs in relation to the foreign countries' production costs, enhancing the country's attractiveness to foreign investors, which in turn expands FDI. Furthermore, fluctuations in the EXR increase or reduce investment return (Munro, 2015).In that, the return to foreign investments increases when the domestic currency depreciates against foreign currency since more domestic currency is required to purchase a unit of foreign currency.On the other hand, appreciation reduces the return on these investments since less domestic currency is required to purchase a unit of foreign currency.

The EXR in Kenya became fully liberalized in 1993, which means that the EXR regime in operation in Kenya currently is free-floating. This essentially implies that economic factors such as investment, production, trade, and so forth influence the EXR (Revelli, 2020) andthese factors affectsupply and demand for foreign currency. The shift from the fixed to the flexible regime was intended to minimize inflation and boost international competitiveness (Ndung'u, 2000).In a free-floating EXR regime currencies can be traded in the respective foreign exchange markets without trade limits or government controls which would not require the government's continuous intervention, does not result in the problem of imported inflation and does not require large exchange reserves to be maintained in order to maintain the EXR. Instead,these reserves can be used to stimulate economic growth through the importation of capital goods. Therefore, a flexible EXR regime is highly recommended because such a regime enhances market efficiency (Jin et al., 2021).

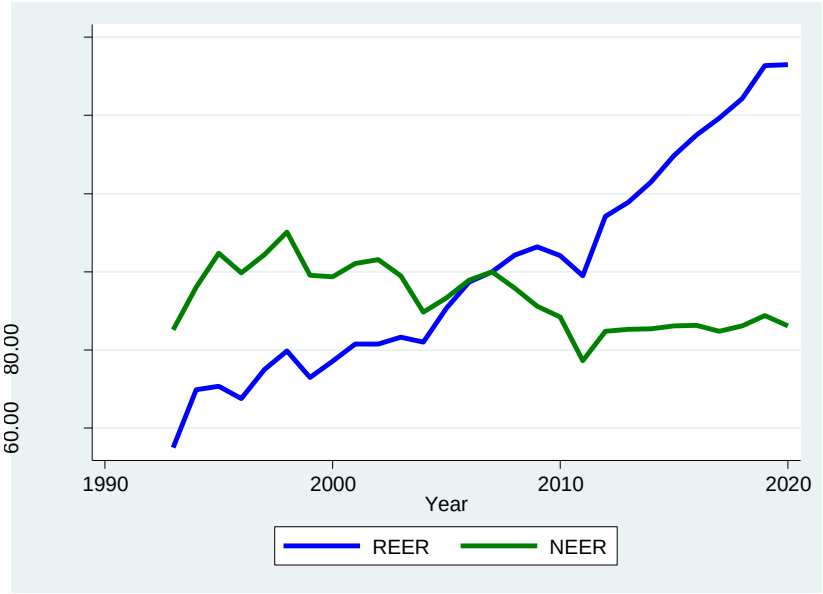

Figure 1.1 Kenya: NEER and REER Trend from 1993 to 2020
Source: Bruegel

Since the liberalization of the exchange rate, the REER has been rising exponentially while the rise in the NEER is negligible, which implies that the foreign currency demand is not particularly reflected in the EXR, which presents the issue of whether the EXR is overvalued. In 2018 the IMF claimed that Kenya's exchange rate was overvalued by 17.5 per cent, it still maintains that the country's exchange rate is overvalued by 9.1 per cent in 2021, which is a result of the frequent engagement of the CBK in FX intervention. In theory, exchange rate overvaluation lowers economic efficiency, induces capital flight, results in the misallocation of resources, and invokes the imposition of exchange and trade controls, which could be hazardous to the economy and its growth. Even though there are arguments as to the extent of the Kenyan shilling's overvaluation, the CBK maintains that throughout the years, the EXR misalignment has never gone beyond the range of 5 per cent and the shilling reflects the true currency value, maintaining that the CBK only intervenes to minimize the volatility of the EXR and not to manage the EXR.

The Kenyan shilling continues to depreciate currently standing at 113.14 KES/USD in December 2021(Central Bank of Kenya), which is roughly a 45 per cent depreciation in the last two decades from 72 KES/USD in Dec 2000(Central Bank of Kenya). The weakening of the shilling is due to the country's economic problems, particularly the widening gap between imports and exports and the increased global oil prices. A depreciating currency tends to raise the nation's vulnerability to external shocks (Kadzal&Yilmaz, 2021). Furthermore, since the adoption of the flexible exchange rate regime in 1993, Kenya has been experiencing exchange rate volatility. The volatility is mainly attributed to higher inflation, lower interest rates and increased

remittances (Abdi et al., 2020). Exchange rate volatility could give rise to serious economic costs that could affect price stability and the profitability of firms, which would in turn affect the stability of the economy (Morina et al., 2020).

There are number of studies on the effects of various macroeconomic variables on the EXR. For instance, Muchiri (2015) indicated that inflation raises the EXR, Joof and Jallow (2020) demonstrated that a higher interest rate appreciates the EXR, Chavez (2020) revealed that economic growth appreciates the EXR,Ramasamy and Abar (2015) established that the BOP influences the EXR positively and Saheed et al. (2015) indicated that a higher public debt increases the EXR. These studies illustrate the nature of the relationship that exists between these variables and the EXR. However, the relationship between the budget deficit and the EXR is not properly defined. Therefore, there is need to establish how the budget deficit affects the EXR.In that regard, the EXR can be influenced by the budget deficit, directly and/or through the current account deficit and terms of trade.

Budget deficit

Budget deficits have garnered a lot of interest from economists and policymakers owing to their prodigious growth, particularly in developing countries. Fromstandardeconomic theory, budget deficitscould boost a sluggish economysince a budget deficit implies increased government spending and/or lower taxes,this increases disposable income which raises the volume of investment, resulting in higher GDP.However,long-term deficits have proven to bedetrimental to the economy (Kurantin, 2017).Themain concern in regard tothese growing budget deficits is that they are associated with high interest rates (Gale &Orszag, 2004), higher inflation (Ishaq&Mohsin, 2015), depressed private investment (Asogwa&Okeke, 2013), increased indebtedness (Bilquees, 2003), poor economic growth (Nkrumah et al., 2016), reduced foreign exchange reserves (Njoroge, 2014) among other problems.

Keynes argued that the economy would notget backto equilibrium in case of a deficit insteadrecession will set in leading to a sustaineddeclinein economic growth and unemployment; therefore, there is need to finance budget deficits. These budget deficits can be financed throughdomestic borrowing, external debt and seignorage (Warega, 2012). Higher domestic debtraises interest rates,discouraging private investment and consumption. Increased external debt raises the RERor depletes foreign exchange reserves,leading to adebtcrisis. Finally, seigniorageraises inflation. Therefore, the consequence of budget deficits will depend on how they are financed.

Budget deficits in Kenya have been on therisesince independence, theconstant rise in deficits ismainly attributed topoor economic performance, poor tax administration, limited tax base, taking up projects that require huge capital investments, debt repayment,etc.The budget deficit currently stands at 950.235 billion, which is equivalent to 8.5per cent of GDP for the FY 2020/21 (National Treasury).The widening of the fiscal deficits is due to the growth in government spending that is persistent, currently stands at2,753.00 billion, equivalent to 24.6 per cent of GDPin the FY 2020/21 (Central Bank of Kenya). The continued increase in government spending is attributed to the rising expenditure on devolution, increased cost of security, increased expenditureonmajor infrastructure projects,public wage expansion, and increased interest payments stemming fromhigher public debt (World Bank Group, 2020). Onthe other hand, revenue performance is relatively low, as the revenue (excluding grants) for the FY2020/21 was 1,802.48billion, which is mainly attributed to reduced imports and trade in general andlowertax revenuestemming fromlower income and reduced consumption.

Despite the fiscal framework set up to support fiscal consolidationto reduce fiscal deficits and strengthen debt sustainability,the PDG ratio continues to rise and currently standsat 68.1per cent of GDP (National Treasury, 2021), putting the budget on constraint since a significant portion of the budget will go towards the repayment of debt. Consequently, augmentingthe PDS to revenue ratio, which currently stands at 50.0per cent for the FY 2020/21 (National Treasury)could adversely affect the nation's capacity to fulfil other financial commitments,resulting ina sustainedincrease in deficits, creating a vicious cycle.

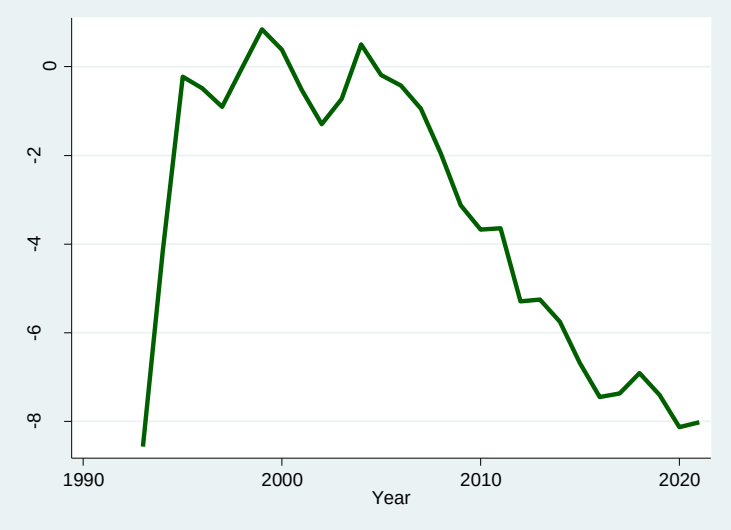

Figure 1.2 Kenya: The Budget Deficit Trend from 1993 to 2020
Source: Country Economy

Figure 1.2 indicates that the budget deficit was the highest in 1993 and declinedsteadily up until 1999 and 2000 when the country was in a budget surplus. Between 2001 and 2004, there was no substantial increase or decrease in the deficits. In the years following 2004, the budget deficit increased steadily.

Current Account Deficit

A CAD occurs when a nation's importsareworth more than its exports (Thompson, 2017). Typically, the net income from foreign investments in form of interest and dividends, and transfersare also included in the current account, notwithstanding that they make a very small part of the current account. CADs can be detrimental to an economy becauseCADsraise a country's liabilities(Devadas&Loayza, 2018). These liabilities may eventuallybecome untenable if the country is constantly running current account deficits, which raise interest payments. The higherinterest payments interfere with private consumption, government expenditure, and public investment because more funds will gotowards servicing external debt, which could overwhelm the country and thus breed sustained current account deficits.

Sustained current account deficits is a major problem faced by developing countries because it results in mushrooming external debt, currency crises, and depletion of foreign exchange reserves (Aydin &Esen, 2016). Conversely, current account deficits are not always harmful to the economy,especially in the event that the resultant external debt is used to fund lucrative investments (Gachuki, 2013) such as infrastructural development and enhancement of human capital, which will eventually generate more revenue, income and employment. The increased revenue can be used to repay the existing external debt while the increased income plus employment can be utilized in the production of exports, increasingexports in proportion to imports in terms of value. Therefore,depending on the amount of an economy's foreign debt and whether or not this debt is used to fund investments with higher marginal productivity than the interest rate on the repayment of such debt, the countrycan decide whether or not it should operate a CAD.

These CADs could result from budget deficits. Since national saving falls in the presence of a fiscal deficit raising interest rates, which results in EXR appreciation. As the interest rate rises, the imports become relatively cheaper compared to the exports, raising the demand for importsvis a vis the demand for exports, which in turn raises the overall earnings from imports in relation to that of exports,deteriorating the trade balance,which further results in a CAD (Abbassi et al, 2015).With a CAD the demand for imports is relatively higher than the demand for exports and since these imports are purchased using foreign currency, it raises the foreign currency demand. This increased demand further appreciates the EXR. Therefore, the movements in the exchange rate can be influenced by current account imbalances (Beirne et al., 2020).

Kenya's current account has been in a deficit since 2004 and over the years the CAD has continued to widen, currently standing at USD 5,518 million for the FY 2020/21 (Central Bank of Kenya). In the last decade,theCAD has increased by roughly 30 per cent, frustrating the country's efforts toward achieving industrialization. The wideningofKenya'sCADis attributed to theincreasing external debt, appreciation of the exchange rate, poor economic growth, high reliance on foreign aid, and the continual growth of imports versus thedepressed growth of exports,which is associated with the continuedincrease in oil prices raising the value of imports despite the increased receipts from transport and tourism and growth of remittances from abroad. The large and persistent CAD in Kenya imply increased vulnerability to external shocks that could intensify macroeconomic stability (Forbes et al., 2016).

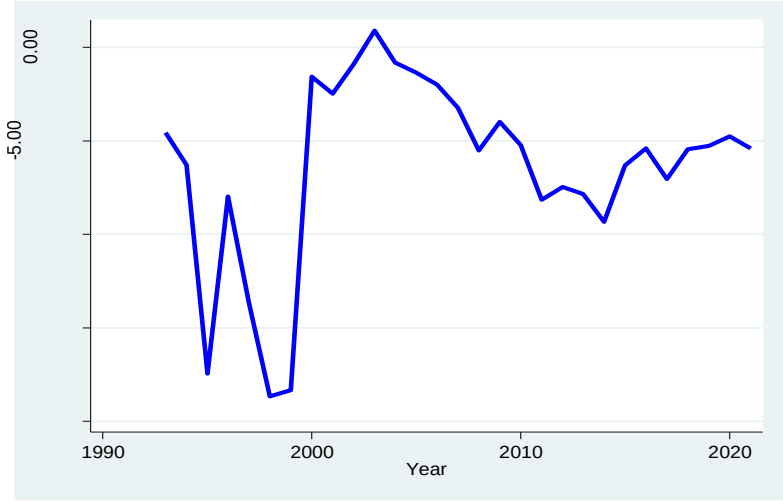

Figure 1.3 Kenya: The Current Account Deficit Trend from 1993 to 2020
Source: World Development Indicators

Figure1.3 indicates thatsince 1993,Kenya's CADhasgenerally been on the riseup until 1999 when it recorded a drop in 2000 and continued to fall until 2003 when the current account was in a surplus. In the aftermath of 2003, theCADstarted to widen again. The highest CAD(as a percentage of GDP) was recorded in 1999, whichresulted from a substantial spike in oil pricesand increased importation of machinery, equipment, and other intermediate goods used in the development of infrastructure.

Terms of Trade

TOT isthe rate at which one nation's products can be traded for another nation's products, computed by dividing export prices by import prices (Salvatore, 2020).The terms for the exchange of a country's productsfor another nation's productsare dependent on the elasticity of demand forthat country's products for the other country's products (Carbaugh, 2015). In other words, ifthe demand for a country's productsisrelatively lower, its TOT will be favourable, which implies thata country will gain from international trade if its exports face a relatively higher demand than its imports. Therefore, the TOT isconsidered a significant measure of a country's purchasing power of exports with regard to imports (Wacker et al., 2014). TOTisdeemed favourable when a country's export prices are relatively higher thanthat country's import prices at a specified period of time, which means that such anation will benefit from trade. On the other hand, TOT is considered detrimental when a country'simport prices are relatively higher than that country'sexport prices at a particular period of time. A favourable TOT is generally recommended since it is critical for economic development especially for developing countries because a relatively higher quantity of exports in relation to the quantity of imports promotes economic growth (Mputuu, 2016), expanding national income, which is a potential source of capital formation.

Singer (1950) and Prebisch (1962) argued that in international trade,the TOTadvances in favour of developed countries and against developing countries in the long run since developed countries are mainly exporters of manufactured items while developing countries are largely exporters of agricultural products and raw materials. This is because developed countriesare characterized by high wagesand their income levels are higher than their levels of production, which translates to relatively higher production costs.Subsequently, on the exportation ofmanufactured items to developing countries, they are acquired at higher prices while raw materials and agricultural products importedfrom developing nationsare characterized by relatively lower prices, resulting in gains for developed countries.

An economy's welfare improves as the TOT expands and falls when the TOTcontracts(Krugmanet al., 2017). In other words, when foreign products are bought at relatively higher prices and domestic products are sold at lower prices, the nationals'welfare is expected to ameliorate, but it's not always the case. For instance, when a country's export demand is more elastic, the relatively higher export prices will reduce the quantity of exports, which in turn reduces export earnings. Similarly, when a nation's import demand is more inelastic,the relatively lower import prices will raise the quantity of imports, increasing the spending on imports. A reduction inexport earnings accompanied byan increase in import spending implies a decline in economic welfare even if the commodity TOT is considered favourable.The TOTis significant in establishing whetherthe country willbenefit from international trade (Salvatore, 2020). Since an enhancement in a country's TOT promotes economic growth, through increased productivity which is beneficial to the nation, since increased productivity expands production, raising welfare and the standards of living in the country.

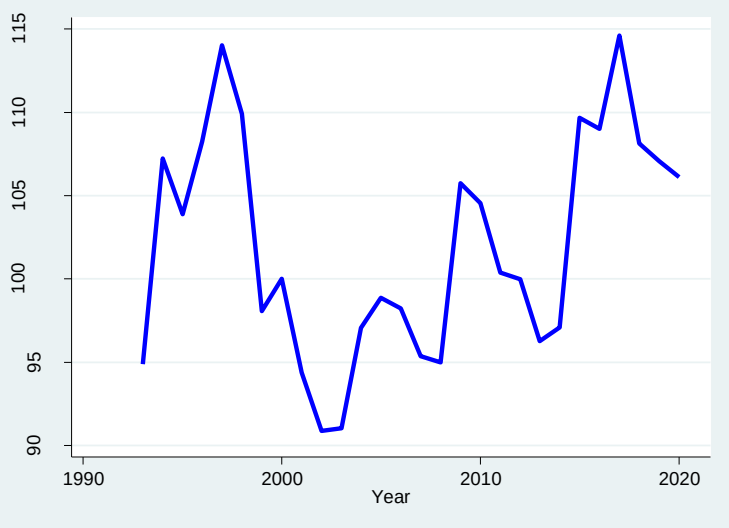

Figure 1.4 Kenya: The Terms of Trade Trend from 1993 to 2020
Source: World Development Indicators

Figure 1.4indicates that since 1993 theTOT has been on an upward trend until 1997 when it started to decline. The TOTcontinued to decline until 2002 when itstarted rising. The TOT continued to riseuntil 2017 when itstarted to decline again. The variability inKenya's commodity terms of trade exhibits the gains and losses of income associated with the changes in international prices.

Budget Deficit and Exchange Rate

Budget deficits and the EXR play a fundamental role in an economy. Clearly, fiscal deficits influence movements in the EXR, in that budget deficits imply reduced national savings, which means that lesser funds are available to finance investments. The availability of lower funds will bid up the interest rate which serves to reduce domestic investment and NFI (Omanyo, 2019). This decline in investment implies increased capital inflow, which ultimately depreciates the EXR. Besides, an expansion in the budget deficit could intensify inflation, which will appreciate the EXR (Sanya& Sunday, 2017). Further, appreciation of the EXRwill not only lead to increased external debt butalso affects foreign debt repayment, through increased interest debt repayment, which increases foreign debt service. This increase in foreign debt service results in further exchange rate appreciation (Saheed et al, 2015). Therefore,budget deficits affect the exchange rate both directly and through other variables.

Economic theories tying budget deficits to the EXR are contradictory. For instance, the value of domestic currency declines as the budget deficit rises from the Keynesian perspective while the widening of budget deficits leads toappreciation from the neoclassical point of view. Sadly, empirical studies relevant to and supporting this study do not shed more light on the issue; nonetheless, these studies suggest or offer more than one prediction. For instance, Beetsma and Giuliodori (2011) demonstrated that an expansion in government spending appreciates the RER, which was strongly supported by Bentrix and Lane (2013), indicating that fiscal expansion through increased government expenditure is associated with RER appreciation. Conversely, Monacelli and Perotti (2010) established that an expansion in government expenditure occasions the CPI RER to depreciatecorroborated by Ravn et al. (2012), demonstrating that anexpansion in government expenditure results in EXR depreciation.

It has been established that budget deficits are associated with reduced national savings (Gale &Orsag, 2004), high public debt (Folorunso, 2013), high inflation (Ishaq&Mohsin, 2015), reduced investment (Asogwa, 2013), poor economic growth (Nkurumah et al., 2016) but its relationship with exchange rate is not yet clear, especially for an open, small economy like Kenya. Depending on the substantiality of each of the individual effects, the budget deficit may affect the EXR, positively or negatively.Therefore, it will be essential to study how the budget deficit influences exchange rate movements in Kenya, assessing both the indirect and direct effects emanating from budget deficits adequately, considering that empirical studies tying budget deficits to the exchange rate are contradictory.

In addition,the majority of the studies reviewed concern developed nations, and budgetary problems in emerging nations differ from those in industrialized nations. For instance, developing countries are characterized by smaller budgets, lower incomes, poor tax structures, and most of the employment is informal thus proving difficult to tax, which is the complete opposite in developed countries. Plus, financial markets in developing countries are mostly inefficient, making it difficult for the government to finance deficits, contrastingly

industrialized countries' financial markets are highly efficient. Besides, developing countries do not spend as much on welfare programs as industrialized countries. Due to these disparities, budget deficits may yield different outcomes on exchange rates in developing and industrialized countries.

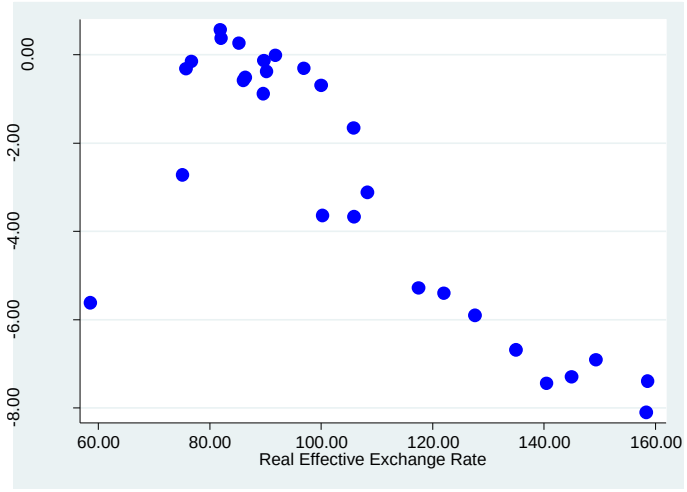

Figure 1.5Kenya: The Relationship between the Budget Deficit and REER from 1993-2020.
Source: Bruegel andCountry Economy

Figure 1.5 shows the relationship between thebudget deficit and REER. The plotdemonstratesa negativecorrelation between the BDG and the REER in Kenya exists. The two variables are strongly correlated and the correlation is highly significant.

Statement of the Problem

The EXR plays a crucial role in an economy with its volatility having a significant influence on the economy. EXR volatility in Kenya has raised much concern among policymakers since EXR instability is considered a major obstacle to macroeconomic management. In addition to fluctuations in the EXR,the EXR continues to depreciate, registering 113.4 KES/USD in December 2021 (Central Bank of Kenya). Kenyacontinues to be more vulnerable to external shocks due to the persistent wideningof deficits.In that, the widening deficits translate to increased debt, where most of the debt in Kenya is from external sources.This increase in external debt translates to increased external debt service, increasing the risks associated with FX volatility.

On the other hand, the government's attempts to expedite fiscal consolidation in order to reduce budget deficits and stabilize debt are unsuccessful because deficits continue to widen,registering 950.235 billion for the FY 2020/21, which translates to 8.5 percent of GDP (National Treasury).The widening deficits indicate that the government will be obliged to borrow more money, raising the demand for money, which in turn increases interest rates. When the investors are set to earn higher returns, they tend to sell their relatively low-yieldingforeignsecurities in order to buy thehigh-yieldingdomestic securities, increasing domestic currency demand. EXR depreciation follows the increased demand fordomestic currency (Muchiri, 2017).

On the contrary, budget deficit widening could bring about EXRappreciation as well, being that the increased demand for money by the governmentstemming from the widening deficit impliesreduced private sector demand for funds. The reduction in the private sector's demand for funds exerts downward pressureon the interest rates (Mutinda, 2014), forcing the EXR to appreciate. This decrease in the demand for fundsstems from the higher expected inflation, reduced anticipated return on domestic assets, or higher expected foreign exchange risk premium (Hakkio, 1996). Despite there being a connection between budget deficits and the EXR, the exact dynamic of that relationship is not properly defined.

From theory, the link between deficits and the EXRis equivocal in that widening deficitswould engender EXR depreciation or appreciation depending on how it affects the demand for money. Furthermore, empirical studies linking deficits to the EXRare ambiguous.For instance,Korsu (2009) argued that a budget deficit increase will appreciate the RER. In contrast, Kim and Roubini (2008) demonstrated that a budgetdeficit increase depreciates the RER. Further, Saysombath and Kyophilavong (2013) established that there is no link between the RER and budget deficits. Since deficits would affect the EXR through other variables and/or directly,it becomes essential to estimate the magnitude of each of these effects, which will governthe overall impact of budget deficits on the EXR.

Furthermore, moststudies tying budget deficits to the EXR captured either the direct or indirect effects. This study will employthe ARDL model to assess how budget deficits affect the EXR in Kenya,taking into

account both the indirect and direct effects. In addition, this studywilluse the variable GDP growth rate differential instead of the GDP, as a variable through which the EXR is influenced by the budget deficit sincethe growth rate differential is a better measure for comparison. The study will also utilize an additional variable:the current account deficit. Instead of examining whether budget deficits would result in CADs, this research will focus on establishing the exact impact of budget deficits on the EXR.

Objectives of the Study

The main objective of this study is to assess the effects of budget deficits on the exchange rate in Kenya.
The specific objectives of this study are:

i. To investigate the effects of the current account deficit on the exchange rate in Kenya.
ii. To examine the effects of the terms of trade on the exchange rate in Kenya.

Research Questions

i. What are the effects of the current account deficit on the exchange rate in Kenya?
ii. What are the effects of the terms of trade on the exchange rate in Kenya?

Significance of the Study

This study contributes to a greater understanding of howbudget deficits influenceEXRmovements, which is crucialin informing policies to ensure prudent budget management in Kenya.Prudent budget managementwould have a positive influence on the external sector.This study also adds knowledge to existing sustained deficits studieswhich is crucial in the formulation of policies.

Scope of the Study

Annual time series data from 1993 to 2021 is utilized in this study. The rationale behind settling for this period is that the EXRbecame fully liberalizedin Kenya in 1993. This period is crucial in making conclusions on how budget deficits affect the EXRin Kenya because during this period themarket forces of supply and demand influenced the movements in the EXR.

Organization of the Study

This project has been broken down into five chapters. The first chapter introduces the study. The second chapter explores theoretical and empirical literature relating to the study. The third chapter describes the methodology adopted by the study. The study's results are discussed in chapter four and the study'ssummary, conclusions and recommendations arepresented in chapter five.

II. LITERATURE REVIEW

Introduction

Three sections make up this chapter. The first component explores theoretical literature on existing theories on how the EXR is determined via monetary and fiscal policy and the different approaches to how budget deficits influence the EXR.The second section reviews empirical literature on how budget deficits and subsequent fiscal policy affect the EXR. And the final segment details the overview of literature review, which identifies the research gap that will be filled by this study.

Theoretical Literature

This section covers major theoretical arguments on how the exchange rate is determined as well as how budget deficits affect the exchange rate. These arguments are based on the IRP theory, the MFM, the DOM, the PBM,the Ricardianparadigm, theneoclassicalparadigm, and theKeynesian paradigm.

Interest Rate Parity

According to the IRP theory, the disparity between the FER and SER is equal to the IRD between two nations, in a perfectly competitive capital market with no transaction barriers and no chance for arbitrage (Bakert&Hodrick, 2017). Thistheoryassumes that the behaviour of investors is influenced bythe difference in the rates of return on similar assets, which is responsible for the changes in the currencyEXR (Suranovic, 2012). The IRP condition isexpressed as:

$i_h - i_f = (F_t - S_0)/S_0$ ……2.1

Where i_h= domestic interest rate, i_f= foreign interest rate, F_t=forward exchange rate, and S_0=spot exchange rate.

The utilization of the principles of supply and demand would be required in determining how the IRP operates (Suranovic, 2012). In that, foreign investors that require domestic currency to purchase domestic

currency-denominated assets typically supply foreign currency. Nonetheless, the supply of domestic currency might also come from domestic investors who decide to convert previously acquired foreign currency. While foreign currency is typically sought after by domestic investors, intending on supplying domestic currency in order to purchase foreign currency-denominated assets, the demand might also stem from foreign investors seeking to convert previously purchased domestic currency. Therefore, the supply curve for foreign currency slopes upwards while the demand curve slopes downwards, this is because the supply of foreign currency by foreign investors rises as the currency value increases while the demand for such currency by domestic investors reduces.The equilibrium EXR and quantity of FXareestablished onthe intersection of these two curves and at such an equilibrium, the interest rate parity is satisfied (Suranovic, 2012). If the IRP is violated, investors will move their funds from one country to another resulting in exchange ratefluctuation.

IRP can either be covered or uncovered subject to the presence or absence of a forward contract (Bakert&Hodrick, 2017). Under the CIRP, an investment made in local currency should yield the same return as a similar investment made in foreign currency (Levich, 2013). This can be achieved by mitigating the interest rate risk inherent in the currency markets through arbitraging IRDs in the spot and forward contract markets. Which can be demonstrated by the CIRP condition:

$i_t - i_t^* = f_{t+1}$……..2.2

Where i_t=domestic interest rate, i_t^*=foreign interest rate, and f_{t+1}=forward premium (discount).

Equation 2.2 implies that the DIR will be greater or lower than the FIR by a margin that is equivalent to either the local currency's forward premium or forward discount. Conversely, the UIRP assesses a scenario without hedging, in that investors are unsure about the future (Cappiello& De Santis, 2007). The UIRP condition can therefore be illustrated by:

$i_t - i_t^* = \Delta s_t^e$ ……...2.3

Where Δs_t^e=expected rate of appreciation of the foreign currency.

The UIRP theory proposed that the difference between the DIR and FIR will be equivalent to the anticipated appreciation or depreciation of the currency in question (Kwizera, 2018).This model is critical inexplainghow market forces bring about movements in interest rates and theEXRbecause it establishes the connection between the IRDand the EXRwhen an investor is trying to reduce the risk in the foreign exchange market. Therefore, this model isa principal building block to the MFMused in this study.

The Mundell-Fleming Model

The MFMis an application of the IS-LM analysis in an open economy, owing to the fact that it is a combination of the IS, LM, and BP curves, which provides insight into how the EXR is determined (Wang, 2020). Assuming perfect mobility of capital and that the economy is too small to have an impact on interest rates worldwide. The goods market, money market, and asset market are taken into account by the MFM.The goods marketis represented by:

$Y = C(Y^d) + I(r) + G + NX(e, Y, Y^*)$……..2.4

Where:Y=national income, C=consumption expenditure, I =investment, G =government spending, andNX =net exports.

The first component, consumption is a function of disposable income since consumption increases as disposable income rises. The second item, investment is inversely related to the RIR, which implies that a lower interest rate reduces investment spending. The third bit, government spending is an exogenous variable.Finally, the net exports component has a positive relationship with foreign income and the EXR and a negative relationship with national income. This is because an increase in national income raises spending including the expenditure on imports while the expenditure on exports remains constant, thus lowering net exports while an increase in foreign income is preceded by increased expenditure on exports, resulting in higher net exports.Further,as the exchange rate appreciates it means that the domestic currency depreciates, therefore,locally produced goods become relatively less expensive for foreign buyers in comparison to foreign goodsand thus the exports increase as imports fall.

On that account, government expenditure shocksprompt the IS curve to move to the right, increasing national income, and theDIR, as a result, the DIR rises above the FIR (Melvin &Norrbin, 2017). Theincrease in theDIRserves to attract foreign investors intending to take advantage of the higher interest rates,which stimulates capital inflow. This increases the supply offoreign currency, which in turn depreciates the NER as well as the RER (Wang, 2020). EXR depreciationimplies that domestically produced goods becomerelatively more expensive in relation to foreign goods,crowding out net exports, which depresses the BOP (Leigh et al., 2017). The money market is represented by:

$\frac{M}{P} = L(r^*, Y)$……2.5

Where M=money supply, P=price level, L=liquidity preference.

The liquidity preference component is an increasing function of domestic income and a decreasing function of the FIR. Owing to the fact that a lower demand for money stems from relatively lower income or

higher interest rates (Krugman et al., 2015).Asthe money supply increases the LM curve shifts to the right,whichincreasesincome andlowersthe DIRwithrespect to theFIRand as a result induces capital outflow, appreciating the RER (Wang, 2020).EXR appreciation renders domestic goods relatively cheaper compared to foreign goods, which expands net exports (Wondemu& Potts, 2016).The expansion in net exports prompts the IS curve to move to the right,expandingdomestic output and employment. Ultimately, the balance of payment is represented by:

$BP = CA + KA$……..2.6

Where BP=balance of payment, CA=current account, and KA=capital account. The capital accountcomponent is inversely related toFIR and positively related to DIR. While the current account is inversely related to the RER and positively relatedto income. With that being said, a lowerincome, EXR depreciation, and a higher FIRprompt the BOP curve to shift to the right, which results in capital outflow, appreciating the EXR (Bailey & Millard, 2005). The depreciation in domestic currency expands net exports, which occasions the IS curve to move to the right.

Assuming the central bank refrains from intervening in the FX marketandthe EXR is floating then theBOPwould be zero, whichimplies that theCAD will be financed by capital inflow. To that end, an equilibrium can be achieved concomitantly in the three markets, with an equilibrium EXR and income. Therefore,the MFM is considered a useful tool in analysingthe effects of monetary and fiscal policy on the EXR. On that account, this model will be usefulin the development of the theoretical framework thatprovidesbasis for the model that will be used in this study to evaluate how budget deficits affect the EXR.

Dornbusch Overshooting Model

The DOM is not only a model for understanding the EXR, it also provides a framework for understanding monetary policy. It further anticipates that the EXR is positively related to the IRD. With perfect foresight and mobility of capital Dornbusch (1976) stipulates that an increase in the amount of money supplied will either drive up prices or result in EXR depreciation.

Bearing that in mind, increased money supply bids downthe interest rate. The relatively lower interest rate raisesEXR depreciation expectations,as EXR depreciation expectations rise there is no immediate price increasesince the model assumes thatcompared to the assets market, the goods market adjusts rather slowly to the changes in money supply (Wang, 2020).Under theUIRP condition,the DIR and FIR are equal, therefore the DIRwillfallbelow the FIR. The fall in interest rates occasions EXR depreciation to go beyond its long-term equilibrium, forfixed real output (Chilliba et al., 2019). At that point, there is increased demand for goods because these goods command low prices, which stems from the lower interest rates experienced. Prices start to rise in order to clear the excess demand.This stems from a higher interest rate generated by the increased demand for money, which in turn increases prices.The higher interest rateserves to attract capital inflow that is just enough for the EXR to return to its long-term equilibrium (Dornbusch, 1976). In this case, EXR appreciation will only be realized if the initial prices were below the long-term prices.

However, if output adjusts to fluctuations in theAD, the EXR will just simply depreciate (Capistr , et al., 2019).This implies that interest rates respond to the demand for money more strongly. The higher response of interest rates to moneydemand seeks to dampen theovershootingoccurrence of the EXR because monetary expansionencourages a minor interest rate decrease (Donbusch, 1976). Thedecline in interest rate generatesa small expectation of EXR appreciation. Therefore, due to the characteristic of rational expectations that is fundamental to this model, the EXR appreciates reaching its long-term equilibrium level.To that end, the long-runEXR is influenced by the overshooting aspect of the EXR and domestic prices, which depends on the degree of the coefficient of expectations and the rate at which interest rates respond to the demand for money (Dornbush, 1976). The DOM proffers immense insight into the adjustment process in the economysince itexplainsthe link between EXR volatility and sticky prices, which provides basis for the introduction of the inflation component in the model that will be used in the study.

Portfolio Balance Model

Inthe PBM,investors tend to hold three different kinds of assets: domestic bonds, foreign bonds, and domestic money (Hopkins, 1992). Assuming that the economy has no influence over the world interest rate and takes it as a given, investors would be forced to take the pricesas given, the rate of return elsewhere will be unaffected by the return on domestic currency-denominated assets and the supply of assets equals the demand for those assets (Hopkins, 1992). With supply equal to demand, the asset market equilibrium can be defined by:

$M = m(r, r^*)W$……..2.7

$B = b(r, r^*)W$……...2.8

$sF = f(r, r^*)W$……...2.9

Where$M$ = money stock, B= domestic currency-denominatedassets,and sF = foreign currency-denominated assets, held bythe home country residents.Both the DIR and the FIR are negatively correlated with

money stock. While domestic currency-denominated assets are positively correlated with the DIR and negatively correlated with the FIR. Finally, foreign currency-denominated assetshave a positive relationship with the FIRand a negative relationship with the DIR. These, thereforegive rise to the wealth constraint, characterized as:

$W = B + M + sF$……..2.10

Monetary policies, budget deficits, and EXR market operations influence the stock of money and bonds (Dooley &Isard, 1979). For instance,budget deficits lower interest rates, raising the demand for foreign bonds. The increased demand forforeign bonds raises the price of domestic bonds and lowers their return, which implies thatforeign bonds becomerelativelymore attractive. This results in capital outflow, which in turn appreciates the EXR (Min & Macdonald, 1993). In addition, the demand for domestic bonds will increase as the supply of domestic bonds reduces if the domestic and foreign bonds are deemed as complements in response to lower interest rates (Hopkins, 1992). As a consequence, the lower demand for money raises the EXR.

Conversely,the transactions demand for money expands as the value of the debt stock in the home country increases. Ahigher transactions demand for money raises the interest rate, assuming that the transactions demand for money is influenced by individuals' wealth. Due to the higher interest rate, investors may choose to shift their portfolios from foreign to domestic bonds to capitalize on the higher interest rates, which in turn stimulatescapital inflow and as a result, the EXRwill depreciate (Hopkins, 1992). Therefore, the particular effect of financial assets on the EXR is unknown due to the disparate effects that arise from holdingdifferent financial assets as well as from the behaviour of investors. For instance,if domestic bonds rather than foreign bonds are offered for sale to individuals, then their effect on interest rates would be much higherbecause open market operations expand the portfolio share. The expanded portfolio share would be dueto a lowerEXR and an expansion in the nominal bond stock in the home country(Kumhof&Nieuwerburgh, 2007).

Furthermore, a CAD will reduce the domestic holding of foreign bonds in thatdomestic investors tend to hold more domestic bonds and fewer foreign bonds in their portfolio at a particular interest rate (Hopkins, 1992). Therefore, if a country is experiencing a CAD, investors will sell the foreign bonds that were initially held in order to purchase more of the domestic bonds. These bonds are bought using domestic currency, which raises the demand of local currency, forcing the EXR to appreciate (Min &Mcdonald, 1983). In a nutshell,the demand for assets fluctuates as asset stocks are adjusted, these changes in demand affect the EXR (Koijen&Yogo, 2020). Since both the current account and the rate of foreign asset accumulation are affected by the TOT and the initial amount of foreign bonds simultaneously, the accumulation of foreign assets affects the EXR (Hopkins, 1992). Consequently, the EXR consequently influences net exports through the TOT and the initial quantity of foreign bonds held by the nation's residents. Therefore, this model will be crucial in this study since it provides basis for the introduction of the CAD, TOT, and budget deficit to the model that will be used by this study.These variables will be critical to this studybecause they will be used to assess how the effects of budget deficits can be transmitted to EXR.

RicardianParadigm

Increased government spending results in higher taxes in the futurebecause this increased spending has to be financed today or in the future. Therefore,in the presence of a deficit, individuals will increase their savings by an amount equivalent to the present value of their future tax liabilities (Abbassi et al., 2015). Due to this rise in private savings, the decline in government savings ensuing from the deficit will be completely offset, leaving national savings unchanged (Orji et al., 2014).This means that taxation and budget deficits will each have equal but opposite effects on the economy that will cancel each other out (Kanchori, 2020).Consequently, the aggregate demand would not be affected by trading budget deficits for taxes. Since national savings do not change, the RIR does not change as well.For an open economy, the current account will not change either, and subsequently, the exchange rate because private saving rises by an adequate amount to avoid borrowing from outside the country (Barro, 1988).Consideringthat budget deficits are a mere shift of resources from one generation to another, deficits will not have any real effects on an economy.

NeoclassicalParadigm

By transferring taxes to future generations, rational and farsighted individualswith access to the ideal capital markets plan their lifetime consumption,this will raisetheir total lifetime consumption,which therefore means that budget deficits will stimulateconsumption (Kanchori, 2020). With full employment of resources, reduced saving will stem fromincreased consumption (Ribaj&Mexhuani, 2021). Theshrunken savings will in turnraise theinterest rates,with higher interest ratesindividuals will be reluctantto hold the initial amount of domestic financial assets and physical capital. Theinterest rates continue to riseuntilbalanceis achievedin the capital market, depressing private investment(Bernheim, 1989). The depressed private investmentfurtherdepressescapital accumulation (Kanchori, 2020).For a small open economy, budget deficits bid up interest rates, the higher interest ratesintend to draw foreign lenders. These lenders seek to capitalize on

the higher return on interest rates, increasingcapital inflow. The increased capital inflow increases the supply of foreign currency,which leads to appreciation.

Keynesian Paradigm

A budget deficitincreases disposable income.Since individuals are considered to be liquidity constrained ormyopic, the changes in aggregate consumer demand accompany changes in disposable income (Kanchori, 2020).Theincreased disposable income and increased consumer demand increaseAD, income, and employment (Orji et al., 2014). For a small open economy, an increase in the AD indicates that individualswill demand moreproducts includingimports and the increased income implies that individuals will have more income to spend on theseproducts (Abbassi et al., 2020). This increases the amount of importsvis-a-visexports,wideningthe CAD. The wideningCAD increases the demand for foreign currency, whichleadsto depreciation (Kılınç et al., 2016).

Empirical Literature

Various studies have attempted to assess how budget deficits affect macroeconomic variables.Unfortunately, empirical literature onthe effects of budget deficits on theEXR is limited, therefore this section reviews studies conducted on areas relevant to this study.

Korsu (2009) examined how Sierra Leone's external sector was affected by the fiscal deficit, the RER and the BOP serving as external sector indicators using annual time series data from 1971 to 2005, together with the money supply, price level, RER, and BOP equations to capture the indirect effects of deficits on the EXR and 3SLS. The findings revealed that budget deficit contraction reduces money supply and prices, which depreciates the RER and improves the BOP. The study advocated that the government should strive to reduce budget deficits consistently since narrower deficits help reduce the money supply and prices, which leads to RER depreciation and improvement in the BOP. The study further advanced that sustained deficit reduction can be achieved through sound fiscal policy, aimed at revenue generation. However, the direct effects of deficits on the EXR were not accounted for by the study.

Monacelli and Perotti (2010) utilized VAR and quarterly panel data for the period 1980 to 2006, to determine how government expenditure in the US, UK, Australia, and Canada affects the CPI RER and trade balance, decomposing the CPI RER into the relative price of non-traded goods and the traded goods RER. The findings reveal that government expenditure growth boosts private consumption and GDP, which induces depreciation in both the relative price of non-traded goods and the traded goods RER, worsening the trade balance. However, the model was characterized by a major failure in the behaviour of private consumption equilibrium in thatthe model predicted that as government expenditure rises, private consumption falls due to wealth effect on the labour marketbut the opposite was obtained from the data.

Corsetti et al. (2012) analysed the effects of government expenditure increase on the US economy's output, consumption, net exports, investments, RIR, inflation, debt, and EXR using data from a quarterly time series spanning 1983:1 to 2007:4. To establish the transmission mechanism of government shocks, the study employed structured VAR and estimated the baseline VAR tracing their effects in the economy. Further, in order to calculate the impulse responses, the VAR model was re-estimated with the addition of a variable,the Ramey's shock measure. The findings indicated that a government expenditure increaseappreciates theRER on impact followed by RER depreciation overtime, the RER depreciation proved to be highly significant and net exports dropped briefly and quickly started to rise. In addition, the study also revealed that the RER response government expenditurevaries systematically with the EXR regime. For instance, countries with floating regimes i.e. Australia, the USA, and the UK registered EXR depreciation after a government expenditure increase while other countries in the euro area with fixed regimes recorded RER appreciation.

De Castro and Garrotte (2012) assessed the effects of shocks to government spending on net imports and the REER in the euro area as a whole in comparison with the US, employing quarterly time series data from 1981 to 2007 within anSVAR framework. The study revealed that higher government spending increases output, which results in the expansion of private consumption, EXR appreciation, and contraction in net exports. To further understand the RER responses, the REER in the VAR framework was replaced by its components that is the NEER and relative prices. The findings revealed that agovernment expenditure increaseraises relative prices and appreciates the NEER, although the NEER appreciation was more persistent. On further re-specification of the baseline VAR by replacing REER with both the RER of tradable goods and the RER of non-tradable goods. The results further revealed that a government expenditureincrease appreciates both the RER of tradable goods and the RER of non-tradable goods, although the appreciation was profound in the RER of tradable goods but was only significant in the case of non-tradable goods. Further, on separating the components of government spending, an increase in either public consumption or public investment resulted in appreciation of the RER. In contrast, an increase in government expenditure in the US depreciates the EXR with both public consumption and public investment shocks registering REER depreciation in both cases, which could not be explained by the

differences in public investment or productivity of tradable and non-tradable goods. Therefore, explaining the difference in behaviour of RER in both situations has been a challenge.

Saysombath and Kyophilavong (2013) examined the link between deficits and the RER in Lao PDRusing annual time series data from 1980 to 2010 and ARDL bounds test in conjunction with aVAR-based granger causality test together with the SVAR framework to establish the long-term and short-term dynamics of the budget deficit and the RER. The findings demonstrated that there was no granger causality between deficits and the RER in Laos. The findings also indicated that there was no long-run association between deficits and the RER.Furthermore, the SVAR results revealed that budget deficits affect the RERR both positively and negatively. Besides,the variance decomposition analysis indicated that budget deficits could only account for 10 percent of the RER. Therefore, the studyrecommended a reduction in the budget deficit in order to deter the occurrence of the Dutch disease.

Bajo-Rubio and Berke (2014) examined the connection between fiscal policy in response to thewidening government deficit and the EXR in Spain relative to the euro area,using quarterly time series data from 1995 to 2011 and the fully modified OLS method. The study went ahead to investigate the effects of government consumption and government investment shocks on both the RER assessed by the CPIs and the RER assessed using export prices. Thefindingsrevealed that the CPI-based EXR depreciates and the export prices' RER appreciates in response to a decline in government consumption while a reduction in government investment increases productivity, which results in RER appreciation in both cases. In addition,the CPI-based EXRappreciates in response to per capita income increaseand trade balance deterioration. The study further established that for a narrower fiscal deficit,the government has to reduceits expenditure, the composition of government expenditure matters in relation to its effects on the RER, and how theRER is defined also plays a significant role.

Cebi and Culha (2014) investigated how changes in government spending affected Turkey's output, RER, and foreign trade balance using quarterly time series data spanning 2002 to 2012 andtheSVAR framework. The analysis revealed that a government expenditure increase results in higher private consumption, which appreciates the RER and deterioratesthe trade balance.In relation to their individual effects on the RER, the relative effects of the composition of government expenditure were also examined, which revealed that a government consumption increaseor government investment increaseappreciates theRERbutthe effect of the government investment shockwas insignificant.The different outcomes demonstrate that the composition of government expenditureis significant. The study further pointed out thatgovernment expenditure expansion is correlated with tax increases, which demonstrates that the economy is characterized by an expenditure-driven tax adjustment process. The studyrecommended maintenance of fiscal discipline.

Gakuru (2017) assessed the effect of budget deficit on the CAD and subsequently the EXR in Kenya using time series data spanning 1980 to 2015 and the ARDL bounds test tocointegration.The findings demonstrated a positive correlation between CAD and deficits. The results also indicated a negative correlation between CAD and the RER. The study recommended a controlled budget that can be financed solely through taxation and domestic debt. The study further recommended that policymakersshould ensure properEXR management in order to ascertain that exports become globally competitive therebyeliminating the CAD.

Epildency (2022) examined the dynamic relationship between Egypt's budget deficit and RER, indicating the deficit's sources either implicitly or explicitly using annual time series from 1975 to 2020 and the SVAR. The findings indicated a budget deficit increase depreciates the RER.On decomposing the budget deficit into domestic bank financing, foreign financing, and domestic non-bank financing. It was revealed that adomestic non-bank financing shock brought about RERdepreciation, a domestic bank financing shock gave rise to RER appreciation and a foreign financing shock resulted in RER appreciation. The results indicated that the government's reliance on domestic financing sources was immense, especially on domestic banks. The study recommended budget deficit reduction as crucial to the achievement of stability in the exchange rate.

Overview of Literature Review

The theoretical literature tying budget deficits to the EXR reveals that budget deficits influence the EXR differently. For instance, Keynesiansargue that budget deficitsboost AD, which implies increased demand for goods including imports, this raises the demandforforeign currency, appreciating the EXR. On the other hand, neoclassical economists maintain that budget deficits raise interest rates, the higher interest rates are meant toattract capital inflow, depreciating the EXR. Further, the Ricardian equivalence proponents hold that budget deficits will have no impact on the EXR since the decline in national saving as a result of the deficit will be completely offset by the increase in private saving.

Besides, empirical literature related to this study does not shed more light on the matter; for instance, Monacelli and Perotti(2010) established that a government expenditure increase depreciates the EXR. On the contrary,Decastro and Garotte (2012) demonstrated that a government expenditure increase engenders EXR appreciation. At the same time,Bajo-Rubio and Berke (2014) pointed out that a wider budget deficit would

either appreciate or depreciate the EXR depending on how the RER is defined. In addition, Saysombath and Kyophilavong (2013) indicated that there was no link between budget deficits and the EXR.

Both theoretical arguments and empirical literature connecting budget deficit to the EXR have proven to be contradictory therefore there is need to conduct a study on how the budget deficit influences the EXR in Kenya.Besides, previous studies captured either the direct effect or indirect effect of budget deficits on the EXR. This study provides fresh insight into the effects of budget deficits on the EXR by using a model that will capture both the direct and indirect effects.The direct effects will be estimated by the budget deficit and the indirect effects will be derived from the domestic and foreign inflation differential, domestic and foreign IRD, domestic and foreign GDP growth differential, TOT, and CAD.

Furthermore, studies reviewed are mostly on developed economies and budgetary issues facing emerging economies are different from those in industrialized countries. The structure of budgets in developing countries varies from the structure of budgets in industrialized countries, in that developing countries focus on infrastructure development and industrialization while developed economies spend more on social welfare programs. Moreover, the population in developing countries is mostly unskilled therefore employment is often informal, which has proven difficult to tax over the years. In addition, incomes in developed economies are higher, which translates to higher government revenue. Besides, financial markets in developing countries are mostly inefficient, providing limited access to capital, making it difficult for the government to finance deficits. Since developing countries are characterized by lower revenues and strive to keep up with these low revenues through lower public spending, their budgets are generally smaller as opposed to industrialized economies' budgets, which means that budget deficits could have differential effects in developing and developed countries.

III. METHODOLOGY

Introduction

This chapter is broken down into eight sections. The research design that will be utilized by this study is described in the first section. The secondsection characterizesthe theoretical framework thatprovides ground for the empirical model that will be used inthis study.The third section specifies the empirical model that will be used to assess how budget deficits affect the EXR. The fourth section depicts the definition and measurement of variables and sources of data that will be used in this study. Finally, theremaining sections detail theprocedure for data collection, time series properties, data processing and analysis, and the diagnostic teststhat will be carried out to ensure validity of the results.

Research Design

This study will seek to empirically analyse how budget deficits influence the RER in Kenya. Longitudinal research design will be usedto model the effects of budget deficits on the EXR. Quantitative time series dataspanning 1993 to 2021 of an annual frequency, will be employed to model these effects. The period selected corresponds to the time when the exchange rate regime in Kenya was fully liberalized.

Theoretical Framework

The MFM provides basis for this study. The MFM stemsfrom the IS-LM framework, where the real sector is captured using the goods market equation represented by:

$Y_t = C_t + I_t + G_t + (X_t - M_t)$……...3.1

Where $Y_t =$ national income at time t, $C_t =$ consumption at time t, $I_t =$ investment at time t, $G =$government expenditure at time t, $X_t =$ exports at time t and $M_t =$ imports at time t. Consumption increases as income expands, whereas investment declines as interest rates increase. Government expenditure is an exogenous variable. The RER and FNI are positively correlated with exports while imports are inversely related to the RER and positively related to DNI.

Meanwhile, the income earned can be used for consumption, pay taxes, and the rest is saved under the Keynesian expenditure framework, which can be demonstrated as follows:

$Y_t = C_t + S_t + T_t$ …….....3.2

Where Y_t= income at time t, C_t = consumption at time t, S_t = saving at time t, and T_t = taxes at time t.The sum of individual incomes in an economyproduce the national income, therefore equating equation (3.1) and (3.2) gives rise to:

$C_t + I_t + G_t + (X_t - M_t) = C_t + S_t + T_t$…….....3.3

Rearranging equation (3.3):

$(X_t - M_t) = (G_t - T_t) + (I_t - S_t)$……3.4

Depending on the value of exports relative to the value of imports, net exports may be positive or negative. In that, the net exports value will be positive if the value of exports exceeds the value of imports, however, if the value of imports exceeds the value of exports, the net exports value will be negative.From equation (3.4), $(G_t - T_t)$represents the budget deficit and with the assumption that all savings are invested then:

$(X_t - M_t) = BD_t$……..….3.5

Where BD_t = budget deficit at time t.Net exports are essential in determining the amount of foreign currency demanded or supplied, which influences the movements in the EXR. Therefore,equation (3.5) can be rewritten as follows:

$X_0 + k^*Y_t^* + X_1Q_t - (M_0 + M_1Y_t - M_2Q_t) = BD_t$……3.6

Where$X_t = X_0 + k^*Y_t^* + X_1Q_t$ and $M_t = M_0 + M_1Y_t - M_2Q_t$ andX_0 = autonomous exports, $Y_t^* =$ foreign income at time t, M_0 = autonomous imports, Y_t = domestic income at time t and Q_t = exchange rate at time t.Rearranging equation (3.6), yields:

$Q_t(X_1 + M_2) = -X_0 + M_0 + BD_t + k(Y_t - Y_t^*)$…….3.7

Dividing throughby $(X_1 + M_2)$

$Q_t = \frac{M_0 - X_0}{X_1 + M_2} + \frac{1}{X_1 + M_2} BD_t + \frac{k}{X_1 + M_2}(Y_t - Y_t^*)$……..3.8

Equation (3.8) can be rewritten as:

$Q_t = \alpha_0 + \alpha_1 BD_t + \alpha_2(Y_t - Y_t^*)$……..3.9

Where $\frac{M_0 - X_0}{X_1 + M_2} = \alpha_0, \frac{1}{X_1 + M_2} = \alpha_1, \frac{k}{X_1 + M_2} = \alpha_2$ and $\frac{M_1}{X_1 + M_2} = \alpha_3$

Equation (3.9) implies that the EXR is influenced positively by the budget deficit and domestic and foreign output differential.

ModelSpecification

This study willutilize the model used by Khan et al. (2002), which associates the exchange rate with budget deficits with some modifications. The estimated model can be expressed as follows:

$q_t = \alpha + \beta_1(\pi_t - \pi_t^*) + \beta_2(i_t - i_t^*) + \beta_3(y_t - y_t^*) + \beta_4 TOT_t + \beta_5 BD_t + \beta_6 CAD_t + \mu_t$……..3.10

Whereq_t=real exchange rate at time t,$\pi_t - \pi_t^*$= the domestic inflation rate and foreign inflation differential at time t, $i_t - i_t^*$= the domestic interest rate and foreign interest rate differential at time t, $y_t - y_t^*$= the domestic GDP growth and foreignGDP growth differential at time t,$TOT_t =$ ratio between the country's export prices and its import prices at time t,BD_t= budget deficit as a percentage of GDP at time t, CAD_t= current account deficit as a percentage of GDP at time t and$\mu_t =$ disturbance term at time t.

From equation (3.9), taking into account other factors through which the budget deficit influences the EXR, additional variableswill be included, giving rise to equation (3.10). $\beta_1$istheorized to be positive because lower foreign inflation compared to domestic inflationappreciates the EXR.$\beta_2$is postulated to be negative on account ofa higher DIR relative toFIRdepreciates the EXR.β_4 is assumed to be negativesinceanincreasing TOT indicates increased demand for the nation's exports, which raises the demand for domestic currency lowering theEXR. β_5 is expected to be positive due to the fact that a wider budget deficit implies increased borrowing, which makes the country less attractive to foreign investorsbecause huge debt encourages inflation, which raises concernabout the increased risk of defaulting on its obligation among investors. This discourages capital inflow and encourages capital outflow,appreciating the EXR.

In addition to the variables described by Khan et al. (2002), the model will include additional variables:GDP growth differential and current account deficit. Where $\beta_3$will bethe coefficient estimate for the effects of the domestic and foreignGDP growth differential, hypothesized to be positive sincea higher domestic economic growth compared to the foreign economic growth implies that the demand for products including imports rises,which increases the demand for foreign currency, raising the EXR. Similarly, $\beta_6$is speculated to be positive as well because a CAD indicates that a country spends more than it earns from foreign trade, which forces it to borrow money from foreign sources to counteract the deficit, raising the demand for foreign currency. Thehigherforeign currency demand generated appreciates the EXR.

Since the intent of this study is to establish howdeficitsinfluence the EXR, theassessment of the magnitude of boththe direct and indirect effects will be critical.This assessment will govern the net effect of deficits on the EXRbut these multiple indirect effects of different intensitiesmake it difficult to establish how deficits influence the EXR.Besides, the widening ofdeficitsand growth of international trade make it essential to study the relationship between budget deficits and the EXR.

Definition and Measurement of Variables

Table 3.1Definition and Description of Variables and Data Sources.

Variables	Definition	Measurement	Data source
Real Exchange Rate (q_t)	The measure of Kenya's currency value againstthe foreign currency valueadjusted by the GDP deflator.	Kenya shillings per US dollar.	World Bank
Domestic and foreign inflation rate differential	The difference between Kenya's inflation rate and foreign inflation	percentage	World Bank

$(\pi_t - \pi_t^*)$	rate, adjusted by the GDP deflator.		
Domestic and foreign interest rate differential $(i_t - i_t^*)$	The difference between Kenya's interest rate and the foreign interest rate, adjusted for inflation.	percentage	World Bank
Domestic and foreign GDP growth rate differential $(y_t - y_t^*)$	The difference between Kenya's economic growth and foreign economic growth.	percentage	World Bank
Terms of Trade (TOT_t)	The ratio of export to import price indices	percentage	IMF
Budget deficit (BD_t)	The budget deficit as a percentage of GDP.	percentage	CBK
Current account deficit (CAD_t)	Current account deficit as a percentage of GDP	percentage	World Bank

NB: The reference foreign country will be the USA because the Kenya shilling is usually pegged to the USD. Besides the USD is considered the arch international currency.

Data Collection Procedure

The prime source of data is the WDI, IMF and CBKdatabases and the kind of data used in the study is secondary data of an annual frequency. The model utilized data onthe RER in KES/USD, inflation rates for both Kenya and the USA, interest rates for both Kenya and the USA, annualGDP growth for both Kenya and the USA, TOT for Kenya, budget deficit for Kenya and CAD Kenya. All the variables will be expressed in percentages apart from the RER.

Time Series Properties

Unit Root Test

Prior to conducting regression analysis, it will be essential to ensure that the associated time series is stationary, otherwise, empirical work on non-stationary time series will lead to the issue of spurious regressions giving rise to erroneous results (Greene, 2020). A time series with a constant mean and variance and covariance that is solely determined by the distance between the two time periods under consideration is said to be stationary (Gujarati, 2021).Stationarityis tested using the ADF test since it caters for the problem of serial correlation and can accommodate a higher-order autoregressive process in the error term (Mushtaq, 2011). Being that some of the time series is were nonstationary, to avoid problems associated with spurious regressions, they are transformed to stationary.

Cointegration Test

The cointegration test is also considered a pre-test to avoid spurious regressions. Therefore, if two or more time series are individually integrated to a certain order but their linear combination has a lower order integration, they are said to be cointegrated (Greene, 2020). The ARDL cointegration test is employed to check for cointegration. The presence of cointegration suggests that two or more variables have a long-term or equilibrium relationship.

Data Processing and Analysis

The objectives of this study are by equation (3.10),which estimates both the direct and indirect effects of budget deficits on the EXR.Equation (3.10) is estimated usingthe ARDL model.

Stability Test

A stability test is carried out to ensure that the model is stable. In order for a model to be deemed stable, the intercept and slope coefficients must be constant for the entire period under study (Mills, 2014). The stability of the parameters and the suitability of the model is assessed using the CUSUMQ test since the CUSUMQ test is more robust than the CUSUM test, especially in small samples (Tanizaki, 2001). Parameter stability translates to model stability.

Diagnostic Tests

Prior to making inferencesfrom the results obtained, it will be essential to conduct diagnostic tests to ensure that the underlying assumptions for the analysis of LRMsare not violated.If these assumptions are violated then the results obtained might be inefficient or misleading (Greene, 2020). Therefore, there is need to conduct these tests to ensure the validity of the results.

Linearity Test

The test for linearity is a general test to test for specification errors that might arise as a result of correlation between independent variables and the error term, omitted variables, or incorrect functional form,

making it essential to test for linearity (Arai, 2020). The Ramsey RESET test is employed to determine whether the model is correctlyspecified.

Normality Test

The normality test is carried out to ensure that the error terms are normally distributedin that the error terms are uncorrelated and independently distributed (Greene, 2020). When working with a small sample, the normality assumption becomes crucial because it allows for the use of the t, F, and χ^2 statistics.SW and JB tests are used to check for normality.

Multicollinearity Test

The multicollinearity test is not carried out because the ARDL approach eliminates multicollinearity through the selection of the proper lag length of the variables (Menegaki, 2019). In other words, the ARDL model is robust in that it deals with multicollinearity beforehand.

Autocorrelation Test

To ensure that an error term associated with one observation is not influenced by an error term associated with another observation, the autocorrelation test is carried out. Autocorrelation could be due to inertia, a trait that is notable in numerous economic time series, issues of specification bias, data manipulation and/or data transformation, or the presence of lags including the cobweb phenomenon (Gujarati, 2021).The DW and BG testsare used to test for autocorrelation. In the presence of autocorrelation, the resultant t and F values are no longer valid, $R^2$is probably overestimated and the residual variance is presumably underestimated (Gujarati, 2021).

Heteroscedasticity Test

A heteroscedasticity test is meant to ensure that theerror terms have constant variance across observations (Greene, 2020). The t and F tests are inclined to produce invalid results in the presence of heteroscedasticity, which implies that the variance of the coefficients is inordinately large (Gujarati, 2021).The BPand the CWLM testsare used to test for heteroscedasticity.

IV. EMPIRICAL FINDINGS

Introduction

This chapter details the empirical findings of the study, which include descriptive statistics, time series properties tests, diagnostic tests, and model estimation results.

Characteristics of the Data

The study utilized annual time series data from 1993 to 2021 because the market forces of demand and supply influenced the fluctuations in the EXR during this time period. The data was sourced from the CBK, WDIsand IMF databases. Data on the real effective exchange rate(REER), inflation differential (INFD), real interest rate differential (IRD), economic growth differential (GDPD), commodityterms of trade (TOT), budget deficit as a percentage of GDP (BD) and current account as a percentage of GDP (CAD) was collected.

Descriptive Statistics

Descriptive statistics present a summary of the data, demonstrating how the data is distributed. Table 4.1 shows descriptive statistics for the REER, inflation differential, IRD, EGD, TOT, budget deficit and CAD. All these variables are expressed in percentages apart from the REER. The mean, median, minimum, maximum, variance, standard deviation, skewness and kurtosis, are among the statistics included in the table.

Table 4.1Descriptive Statistics

	Real Exchange Rate	Inflation Differential	Interest Rate Differential	Economic Growth Differential	Terms of Trade	Budget Deficit	Current Account Deficit
Mean	103.9146	8.259396	4.834367	1.348924	103.0892	4.27931	6.447556
Median	100	5.586612	6.894303	1.955973	103.2	4.5	5.39701
Minimum	53.94616	-0.6798321	-12.73596	-3.972273	99.54932	-1.0	0.818703
Maximum	158.3708	40.15781	14.2895	5.906828	106.10678	8.9	18.67982
Variance	944.4136	84.39907	53.95924	6.36922	4.217074	10.1267	24.65798
Std. Dev.	30.73131	9.186897	7.345695	2.523731	2.053551	3.182248	4.96568
Skewness	0.4197172	1.924265	-1.219676	-0.4216683	-0.3280948	-0.0928919	1.265371
Kurtosis	1.951277	6.56106	3.884279	2.567154	1.865052	1.650082	3.941764
Observations	29	29	29	26	29	29	29

Source: Author Computations

Table 4.1 shows that the REER has a mean of 103.9 and a standard deviation of 30.7, with minimum and maximumvaluesof 53.9 and158.3 respectively, which indicatesthat the REER follows a normal distribution since 68.3 per cent of the data falls within one standard deviation of the mean, 95.3 per cent of the data falls within two standard deviations of the mean and 99.7 per cent falls within three standard deviations of the mean, forming an interval of (11.7,196.1) with at least 99.7 per cent of the data lying within the interval.The inflation differential has a mean of 8.3 and a standard deviation of 9.2, with minimum and maximum values of -0.7 and 40.2 respectively, which suggests that the inflation differential follows a normal distribution because 68.3 per cent of the data falls within one standard deviation of the mean, 95.5 per cent of the data falls within two standard deviations of the mean and 99.7 per cent falls within three standard deviations of the mean, forming an interval of (-19.3, 35.8) with at least 99.7 per cent of the data within the interval. The IRD has a mean of 4.8, with minimum and maximum values of -12.7 and 14.3 respectively, which implies that the IRD follows a normal distribution since 68.3 per cent of the data falls within one standard deviation of the mean, 95.5 per cent of the data falls within two standard deviations of the mean and 99.7 per cent of the data falls within three standard deviations of the mean, forming an interval of (-17.2, 26.9) with at least 99.7 per cent of the data covered by the interval. The EGD has a mean of 1.3 and a standard deviation of 2.52,with minimum and maximum values of -4.0 and 5.9 respectively, which indicates that the EGD follows a normal distribution since 68.3 per cent of the data falls within one standard deviation of the mean, 95.5 per cent of the data falls within two standard deviations of the mean and 99.7 per cent of the data falls within three standard deviations, forming an interval of (-6.2, 8.9) with at least 99.7 per cent of the data lyingwithin the interval. The TOT has a mean of 103.2 and a standard deviation of 2.1, with minimum and maximum values of 99.5 and 106.2 respectively, which indicates that the TOT follows a normal distribution because 68.3 per cent of the data falls within one standard deviation of the mean, 95.5 per cent of the data falls within two standard deviations of the mean and 99.7 per cent of the data falls within three standard deviations, forming an interval of (96.9, 109.3) with at least 99.7 per cent of the data covered by the interval. The budget deficit has a mean of 103.1 and a standard deviation of 2.1, with minimum and maximum values of 99.6 and 106.2 respectively, which indicates that the budget deficit follows a normal distribution because 68.3 per cent of the data falls within one standard deviation of the mean, 95.5 per cent of the data falls within two standard deviations of the mean and 99.7 per cent of the data falls within three standard deviations of the mean, forming an interval of (96.9, 109.3) with at least 99.7 per cent of the data covered by the interval. Finally, the CAD has a mean of 6.4 and a standard deviation of 5.0, with minimum and maximum values of 0.8 and 18.7 respectively, which demonstrates that the CADfollows a normal distribution since 68.3 per cent of the data falls within one standard deviation of the mean, 95.5 per cent of the data falls within two standard deviations of the mean and 99.7 per cent of the data falls within three standard deviations of the mean, forming an interval of (-8.4, 21.3) with at least 99.7 per cent of the data being within the interval.

Time Series Tests

Both the unit root and correlation testsare carried out. The unit root test is meant to ensure that the data is stationary. On testing for stationarity, variables that are not stationary at level are differenced to make them stationary. The correlation testis carried out as well.

Unit Root Test

The ADF testis used to check for the presence of unit roots. From the ADF test at level, the inflation differential, IRD and EGD are stationary, which implies that they are integrated of order zero I(0). However, the REER, TOT, budget deficit and CADcontain unit roots.

Table 4.2 ADF Unit Root Test Results

		REER	INFD	IRD	GDPD	TOT	BD	CAD
Constant	t-statistic	-0.515	-4.518	-4.237	-3.177	-2.086	-1.664	-2.696
	p-value	0.8890	0.0002	0.0006	0.0213	0.2501	0.4497	0.0747
	Conclusion	Non-stationary	Stationary	Stationary	Stationary	Non-stationary	Non-stationary	Non-stationary
Constant & Trend	t-statistic	-2.136	-4.815	-4.202	-3.792	-2.282	-4.460	-2.843
	p-value	0.5262	0.0004	0.0044	0.0170	0.4439	0.0018	0.1817
	Conclusion	Non-stationary	Stationary	Stationary	Stationary	Non-stationary	Non-stationary	Non-stationary

Source: Author's computations

Table 4.2 shows that at the 0.05 significance level, the null hypothesis of the presence of a unit rootis rejected for inflation differential, IRD and EGD hence these variables are considered to be stationary at level. While the null hypothesis of the presence of a unit root is not rejected at the 5 per cent significance level, for the REER, TOT, budget deficit and CAD, hence these variables contain unit roots. Non-stationary variables are further differenced in order to make them stationary. On differentiation, the REER, TOT, budget deficit and CAD became stationary at first difference, which implies that they are integrated of order one I(1).

Table 4.3First Difference ADF Unit Root Test Results

		d(REER)	d(TOT)	d(BD)	d(CAD)
Constant	t-statistic	-5.606	-4.969	-5.731	-6.244
	p-value	0.0000	0.0000	0.0000	0.0000
	Conclusion	Stationary	Stationary	Stationary	Stationary
Constant& Trend	t-statistic	-5.601	-4.867	-5.990	-6.121
	p- value	0.0000	0.0004	0.0000	0.0000
	Conclusion	Stationary	Stationary	Stationary	Stationary

Source: Author's Computations

Table 4.3indicates that the null hypothesis for the presence of a unit root was rejected at the 0.05 significance level, which implies that the REER, TOT, budget deficit and CAD are stationary at first difference.

CointegrationTest

The Cointegrationtestisalso carried out in order to avoidspurious regressions. It is carried out using the ARDL bounds test in other to determine whether there exists a long-run or short-run relationship between the REER and the rest of the variables. Prior to cointegration analysis, the optimal lag is established using the AIC criterion.

Table 4.4AIC Criterion for Optimal Lag Selection Results

Variable	REER	INFD	IRD	GDPD	TOT	BD	CAD
Optimal Lag	2	2	2	2	2	2	0

Source: Author's Computations

The AIC criterion is used to determine the optimal number of lags for each of the variables. Table 4.4 shows that the optimal lag for all the variables is 2 apart from the CAD. On determination of the optimal lag for each variable, the ARDL bounds test for cointegration was performed and the results are outlined below.

Table 4.5ARDL Bounds Test Results

	Lower Bound	UpperBound		Lower Bound	Upper Bound
F-statistic(1.005)			t-statistic(-2.016)		
	2.12	3.12		-2.57	-4.43
	2.45	3.61		-2.86	-4.38
	2.75	3.99		-3.13	-4.38
	3.15	4.43		-3.43	-4.99

Source: Author's Computations

Table 4.5 shows that the F-statistic is 1.005, which is less than all the lower-bound values. In addition, the t-statistic is -2.016, which is greater than all the upper bound values. This implies that there is no cointegration between these variables in that there is no long-run relationship between the REER and the rest of the variables. This suggests that there exists a short-run relationship between the REER and the rest of the variables, which implies thatthe implied short-run relationship would be estimated by the ARDL model.

Stability Test

The CUSUMQ test is used to test for the stability of the parameters.

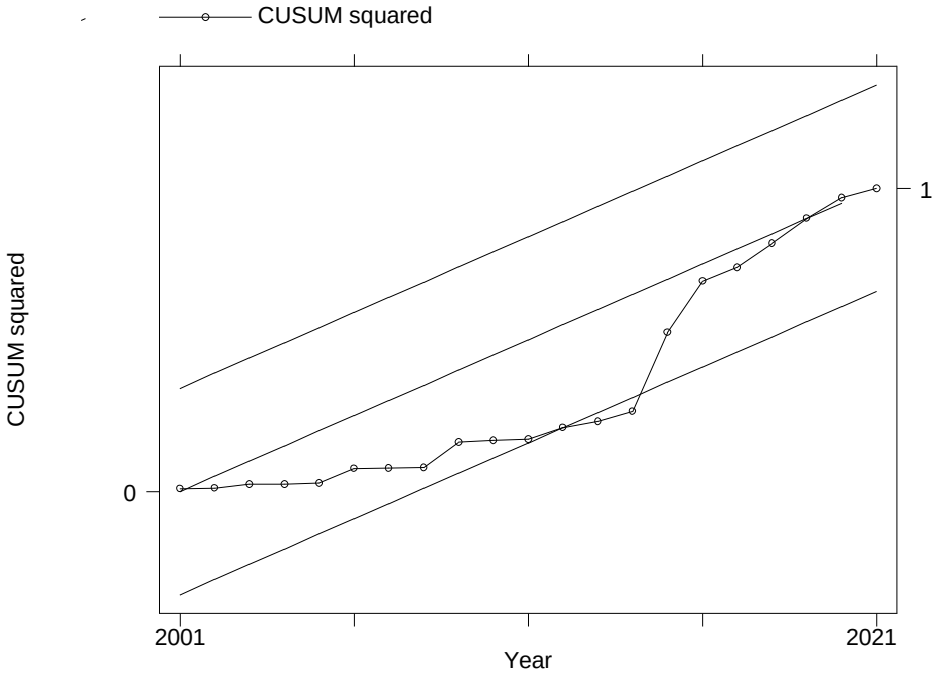

Figure 4.1 CUSUMQ Plot for the REER.

The plot of the CUSUMQ test statistic falls within the 5 per cent confidence interval of parameter stability, which implies that there is stability in the coefficients over the period under study in Kenya.

Diagnostic Tests

Linearity Test

The Ramsey RESET test is used to test for model misspecification which includeschecking for omitted variables and/or incorrect functional forms. The p-value of the Ramsey RESET test is 0.5407 which is greater than the 0.05 significance level. This implies that the model is not misspecified.

Normality Tests

In order to determine whether the estimated residuals are normally distributed, normality tests are conducted. The SW and JB tests are used to test for normality of the residuals.

Table 4.6 Shapiro-Wilk Test for Normality Results

Variable	Observations	W	V	z	Prob>z
residuals	27	0.98478	0.4447	-1.652	0.95078

Source: Author's Computations

Table 4.6 shows that residuals are normally distributed since normality requires that the p-value be greater than the 0.05 significance level hence the null hypothesis cannot be rejected, which implies that the residuals are normally distributed with zero mean and variance $\square^2$. These results are supported by the JB test which also demonstrated that the residuals are normally distributed. The JB value is 0.9099, which is greater than the 0.05 significance level implying that the estimated residuals are normally distributed.

Autocorrelation Test

The BG test is used to test for serial correlation amongst residuals.

Table 4.7Breusch-Godfrey Test for Autocorrelation Results

Lags(p)	Chi2	df	Prob>chi2
1	6.880	1	0.0087

Source: Author's Computations

Table 4.7 shows that the p-value is 0.0087, which is less than the 0.05 significant level resulting in the rejection of the null hypothesis, which implies the presence of serial correlation. In order to correct for serial

correlation, the study employed the NW method to obtain standard errors that are corrected for serial correlation.

Heteroscedasticity Tests

The BP and White tests are used to test for heteroscedasticity under the null hypothesis of constant variance. The BP test results are summarized in table 4.9.

Table 4.8Breusch-Pagan/Cook-Weisberg Test for Heteroscedasticity Results

Variables	Chi2(1)	Prob>chi2
Fitted values of REER	0.23	0.6342

Source: Author's Computations

Table 4.8 shows that the p-value of the chi-square statistic is 0.6342 which is greater than the 0.05 significance level resulting in not rejecting the null hypothesis and henceno heteroscedasticity. These results are supported by the White test as shown in table 4.9 below.

Table 4.9 Cameron & Trivedi's Decomposition of LM Test Results

Source	Chi2	df	p
Heteroscedasticity	27.00	26	0.4073
Skewness	18.71	18	0.4097
Kurtosis	0.07	1	0.7957
Total	45.78	45	0.7957

Source: Author's Computations

Table 4.9 shows that the p-value is 0.4073 which is greater than the 0.05 significance level. Therefore, the null hypothesis of the presence of homoscedasticity cannot be rejected, which implies no heteroscedasticity.

Regression Results

A multivariate regression is performed for the model specified in Chapter 3. The independent variables include the inflation differential, IRD, EGD, TOT, budget deficit and CAD, with the dependent variable being the REER. The regression used the NW standard errors that are corrected for serial correlation. Table 4.10 shows the regression results for the model.

Table 4.10 Regression Results for the REER

Dependent variable: REER				
Variables	Coefficient	Std. Error	t-statistic	p-value
Inflation Differential	-2.936814***	0.868607	-3.38	0.003
Interest Rate Differential	-3.091158***	0.803275	-3.85	0.001
Economic Growth Differential	1.321699	1.957853	0.68	0.507
Terms of Trade	0.8864996	1.49321	0.59	0.559
Budget Deficit	6.107688***	1.310561	4.66	0.000
Current Account Deficit	1.347642**	0.5912341	2.28	0.033
R-squared = 0.778097				
Adjusted R-squared = 0.715777				
F-statistic = 14.86				
Prob (F-statistic) = 0.0000				
No. of Observations = 29				

*** and ** denotes significance at 1% and 5% respectively

Source: Author's Computations

Table 4.10 shows that the inflation differential, IRD, EGD, TOT, budget deficit and CAD explain 72 per cent of the variation in the REER in Kenya. The inflation differential, IRD, budget deficit and CAD are significant, however, the EGD and TOT are not significant. A 1 per cent change in the inflation differential is associated with a 2.94 per cent decline in the REER on average ceteris paribus at a 0.01 significance level. This implies that an increase in domestic inflation relative to foreign inflation reduces the REER.This can be justified by the fact that a relatively higher domestic inflation reduces the demand for domestic goods lowering the

demand for money. The lower money demand reduces interest rates. The lower interest rate results in capital outflow depreciating the EXR.Thisis consistent with the DOM,which indicates that an increase in domestic prices in relation to foreign pricesdepreciates the EXR. This indicates that the inflation differential influences the movements in the EXR, which is consistent withNdiaye (2021).

A 1 per cent change in the IRD is associated with a 3.09 per cent decrease in the REER on average ceteris paribus at a 0.01 significance level. This implies that an increase in the DIR relative to the FIR depreciates the REER, which is consistent with the sticky prices hypothesis' prediction that the EXR and IRD have a short-term negative relationship. This can be explained by the fact that with a higher DIR in relation to the FIR, investors will seek to maximize on the higher interest rate resulting in capital inflows, depreciating the EXR. These findings are consistent with Andrieș et al.(2017) and Golit et al. (2019). This demonstrates that the IRD influences the EXR.

In addition, a 1 per cent change in the budget deficit is associated with a 6.11 per cent increase in the REER on average ceteris paribus at a 0.01 significance level. This suggests that a widening budget deficit increases the REER, which is in line with the Keynesian paradigmwhich demonstrates that the budget deficit appreciates the EXR. This can be explained by the fact that a budget deficit raises disposable income. The increase in disposable income raises aggregate demand, which implies that individuals will demand more goods including imports. The increase in imports in relation to exports widens the CAD. The wider CAD raises the demand for foreign currency, which in turn appreciates the EXR. These results concur with Korsu (2009), which indicates that budget deficits affect the EXR.

Furthermore, a 1 per cent change in the CAD is associated with a 1.34 per cent increase in the REER on average ceteris paribus at a 0.05 significance level. This implies that rising CADs are associated with a higher REER, which is consistent with the MFMwhichindicates that aCAD appreciates the EXR. This can be explained by the fact that a CAD raises the demand for foreign currency in relation to domestic currency, which in turn appreciates the EXR. These results are consistent with Beirne et al. (2021). It follows that the CADhas an impact on the EXR.

V. SUMMARY, CONCLUSIONS AND POLICY RECOMMENDATIONS

Introduction

This chapter details a summary of the study's findings, conclusions and recommendations. It also accentuates policy implications drawn from the findings and identifies areas that warrant further research.

Summary

The study's overarching goal was to examine the effects of budget deficits on the exchange rate. Specifically, the study aimed to examine how these effects are transmitted through other variables such as the inflation differential, IRD, EGD, TOT, CAD and directly. The widening budget deficit has been a long-standing issue, especially in developing countries given that it is associated with high interest rates, increased inflation, depressed investment, high debt, poor economic growth, and reduced foreign exchange reserves among other ills. Taking into account the critical role played by budgetary instruments in an economy. It was, therefore, necessary to examine the effects of the budget deficit on the EXR.

The motivation behind the study was that the budget deficit in Kenya continues to widen and in order to finance this deficit the country would have to borrow both domestically and externally or increase taxes. The increased debt has to be financed sometime in the future, which could continue to widen the deficit putting the budget on constraint. On the other hand, increased taxes will act as a disincentivesince it could reduce income, consumption, and private investment, which would in turn reduce economic growth. In as much as the budget deficit could boost a sluggish economy, sustained deficits could be detrimental to an economy. Despite the fiscal framework set up to support fiscal consolidation to reduce deficits and strengthen debt sustainability, budget deficits continue to widen.

Furthermore, the relationship between budget deficits and the EXR is not properly defined since theoretical arguments are ambiguous and empirical literature is contradictory. In addition, budgetary issues in emerging nations differ from those in developed nations and financial markets in developing countries are mostly inefficient making it difficult to finance deficits, generating different outcomes on the EXR. Therefore, the study sought to examine the effects of budget deficits on the EXR in Kenya using a model that will capture both the direct and indirect effects of budget deficits and ARDL.

To achieve the research objectives, data on the REER, inflation differential, real IRD, GDP growth differential, commodity TOT, budget deficit as a percentage of GDP and CAD as a percentage of GDP was collected. The data was sourced from the CBK, WDI and IMF databases. The study utilized the ARDL model in order to answer the research questions. Prior to theregression, the data was subjected to time series property tests such as the unit root and cointegration tests. In addition, diagnostic tests such as linearity, normality,

autocorrelation, heteroscedasticity and stability tests were carried out prior to making inferences from the findings.

The first objective of the study was to investigatethe effects of CADs on the EXR in Kenya. Empirical results revealed that CADs have a positive effect on the REER since a percentage change in the CAD will result in a 1.35 increase in the EXR. This implies that an expansion in the CAD will lead to depreciation of the Kenya shilling. In a nutshell, budget deficits result in CADs which could result in exchange rate appreciation (Banday&Aneja, 2016). Therefore, the growing budget deficits in Kenya need to be kept in check since they could lead to the widening of the CAD, which in turn could depreciate the domestic currency.

The second objective of the study was to examine the effects of TOT on the EXR in Kenya. The findings revealed that the relationship between the TOT and EXR is positive since a percentage change in the TOT leads to a 0.88 increase in the EXR. This implies that a higher TOT leads to the depreciation of the Kenyan shilling since a higher TOT ratio indicates that the nation exports more goods than it imports. These exports are purchased using foreign currency which means increased foreign currency demand in relation to supply, raising the EXR. However, the coefficient of the TOT is not significant.

Finally, the overall objective of the study was to assess the effects of budget deficits on the EXR. Empirical results reveal that budget deficits have a positive effect on the REER since a percentage change in the budget deficit engenders a 6.11 per cent EXR appreciation. This implies that a wider budget deficit means reduced national savings. This increases DIR in order to attract capital, which is meant to finance the deficit, raising capital inflow, which depreciates domestic currency. Furthermore, the model explains 72 per cent of the variability in the EXR, considering that all the variables in the model were derived from the fact that the effects of budget deficits can be transmitted through these variables. We can conclude that 72 per cent of the variability in the EXR can be explained by the budget deficit, with 6.1 per cent being directly from the budget deficit and the rest through other variables.

Conclusions

Based on the empirical findings, the study concluded that budget deficits influence the movements in the EXR both directly and indirectly. The study adopted the inflation differential, IRD, EGD, TOT and CAD to estimate the indirect effects of budget deficits and the budget deficit was used to measure the direct effect. The coefficients of inflation differential, IRD, CAD and budget deficit were significant,which implies that inflation divergence, interest rate divergence, budget deficits and CADs breed fluctuations in the EXR. The study found that budget deficits depreciate the Kenya shilling. This confirms the Keynesian paradigm, which demonstrates that budget deficits raise the AD, which suggests that households will demand more goods, including imports. The relatively higher imports in relation to exports widens the CAD. As a result, EXR depreciation will be realised from the increased foreign currency demand that stems from the CAD. Therefore, movements in the EXR are influenced by the budget deficit.

The study also found out that the inflation differential raises the value of the Kenya shilling.This is in line with the DOM, which suggests that an increase in domestic prices in relation to foreign prices depreciates the EXR.Anincrease in domestic inflation in relation to foreign inflationdepreciates the EXRsince a relatively higher inflation rate reduces the demand for domestic goods and money, which in turn lowers interest rates resulting incapital flightappreciatingdomestic currency.The study further revealed that the IRD increases the value of the Kenya shilling.This supports the sticky prices hypothesis prediction that there is a negative relationship between the IRD and EXR in the short run. A higher DIR compared to the FIR appreciates the domestic currency since an increase in the DIR in relation to the FIR leads to capital inflow since investors strive to capitalize on the higher interest rate raising the value of the domestic currency. Finally, a wider CAD reduces the value of the Kenya shilling. This is consistent with the MFM that demonstrates that a CAD appreciates the EXR since a CAD raises foreign currency demand, which decreases the value of domestic currency. Therefore, the inflation differential, IRD and CAD influence the fluctuations in the EXR.

Empirical findings reveal that budget deficitsresult in domestic currency depreciation. Therefore,there is need to keep the widening budget deficit in Kenya in check. This can be accomplished through the formulation of policies to reduce government expenditure and/or increase taxes.However, it is important to exercise caution when raising taxes because too much taxation could inhibit economic growth. Alternatively, the rising budget deficit could be reduced by stimulating economic growth which can also increase tax revenue.Furthermore, the composition of government expenditure is a critical determinant of economic growth. Government spending can be productive or unproductive, productive government expenditure boosts economic growth through the expansion of private sector productivity while unproductive government expenditure may have no effect or negative economic growth. Optimal growth can be realized by raising the share of government expenditure allocated to productive areas. Economic growth translates to increased tax revenue. Therefore, there is need to increase the budgetary share of productive expenditure.

Policy Implications

In light of the empirical findings, the widening budget deficits have a positive effecton the EXR in Kenya, which implies that the continued growth of budget deficits depreciatesthe Kenyan shilling. Therefore, policymakers should ensure that the widening budget deficits are controlled in the event of increasing debt levels. This is particularly significant since the country depends on external debt to fund budget deficits. An indication that there is need for prudent budget management because it promotes fiscal discipline. Fiscal discipline is necessary for debt reduction, which is critical to the elimination of persistent budget deficits. The study also implies that the effects of budget deficits on the EXR can be transmitted through other variables and directly as well. On that note, the study recommends the establishment of a regulatory framework tailored towards budget deficit reduction and debt sustainability. In addition, clear lines of accountability must be established to boost budget management. Furthermore, policy maker should develop policies to enhance fiscal forecasting and expenditure analysis and strengthen budget management.

Areas of Further Research

The study was limited to examining the exact impact of budget deficits on the EXR. The study focussed on how the effects of budget deficits are transmitted to the EXR through other variables and directly. The study proposes extensive research on other channels through which EXR volatility can be assessed.

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