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Effects Of Budget Deficits On The Balance Of Payments And Exchange Rate In Kenya: 1993-2023.

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Abstract
The balance of payments determines the extent to which a country depends on the rest of the world. On the other hand, the budget deficit is considered a significant metric for a nation's financial health. The nation's balance of payments has primarily been in a deficit, at the same time, the budget deficit continues to widen, which has raised much concern among economists and policy makers. This accentuates the necessity to investigate the relationship between budget deficits and the balance of payments. Furthermore, the study examined the effects of budget deficits on current account deficits because the current account makes up the largest portion of the balance of payment and the country's current account has primarily been in a deficit. Moreover, the study was extended to capture the effects of budget deficits on the exchange rate since imbalances in the balance of payments influence the exchange rate. Theories on how budget deficits influence the balance of payments, current account and the exchange rate are contradictory, despite attempts made by empirical studies tying budget deficits to the balance of payments, current account deficit and exchange rate, there remains to be controversy in their findings with each contention faced with a counterargument. The study utilized quantitative annual time series data spanning from 1993 to 2023 and the error correction model to establish how budget deficits affect the balance of payments in Kenya. In addition, causality tests were employed to investigate the relationship between the current account deficit, exchange rate and budget deficit. The study revealed that an increase in budget deficit deteriorates the balance of payments. The results also demonstrated bi-directional causality between the budget deficit and the current account deficit. In addition, the findings indicated a unidirectional causal relationship between the budget deficit and the exchange rate. The study concluded that since budget deficits influence the balance of payments, 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 in an effort to strengthen the balance of payments because persistent deficits in the balance of payments reduce reserves and weaken the value of local currency increasing the nation's vulnerability to external shocks.

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I. Introduction

Background of the Study

Balance of Payments

The balance of payments (BOP) is a record of all the payments for goods imported, services received, and capital transfers to non-residents, as well as all the receipts for commodities exported, services provided, and capital received by a country's citizens (Carbaugh, 2022). The current account, capital and financial account, and reserve account are some of the components that make up the BOP (Appleyard & Field, 2016). The current account records payments and receipts for imported and exported goods and services (G&S), as well as interests, profits, and unilateral transfers to and from overseas. While transactions associated with financial assets and capital transfers are factored into the capital and financial account. The reserves held by the nation's central bank, special drawing rights, and purchases and repurchases from the International Monetary Fund (IMF) are included in the reserve account. The dynamics of the BOP are influenced by the current, capital and financial, and reserve accounts (Astuti et al., 2015). Ultimately, these dynamics present themselves in either a surplus or deficit, an indication of disequilibrium in the BOP. Conversely, the balance of payments can be balanced, indicating that the BOP is in equilibrium. In addition, statistical discrepancy is a component of the BOP that is typically a balancing entry meant to offset understated or overstated BOP components (Carbaugh, 2022).

The flow of capital, goods, and services internationally over a year is measured by the BOP. It also includes capital stocks of a nation's assets owned by non-residents and international asset stocks held by citizens of that nation. Therefore, a country's economic transactions with the world are captured by the BOP (Atuahene, 2024). Since the BOP reflects the movement of resources across a nation and its trading counterparts, it becomes a crucial economic metric for an open economy that participates in international trade. The status of the BOP acts as an indicator of whether there is need to adjust the external balance (Chitra & Muregesan, 2024). Therefore, the balance of payments and its components are essential to the comprehension of a country's economic position. For

instance, policymakers can use the BOP to adjust production and exportation to the price levels, interest rates, inflation, and employment, making it a crucial statistic for decision-making, particularly at the national level. Since the BOP offers insight into economic transactions between countries, the government can also use the BOP in the formulation of trade policies.

BOP deficits are a major issue faced by developing countries because they result in mushrooming external debt, currency crises, and depletion of foreign exchange reserves (Aydin & Esen, 2016). A country's BOP is highly significant especially because it determines a nation's international economic standing and its ties with other countries. Figure 1.1 depicts the country's BOP trend from 1993 to 2023.

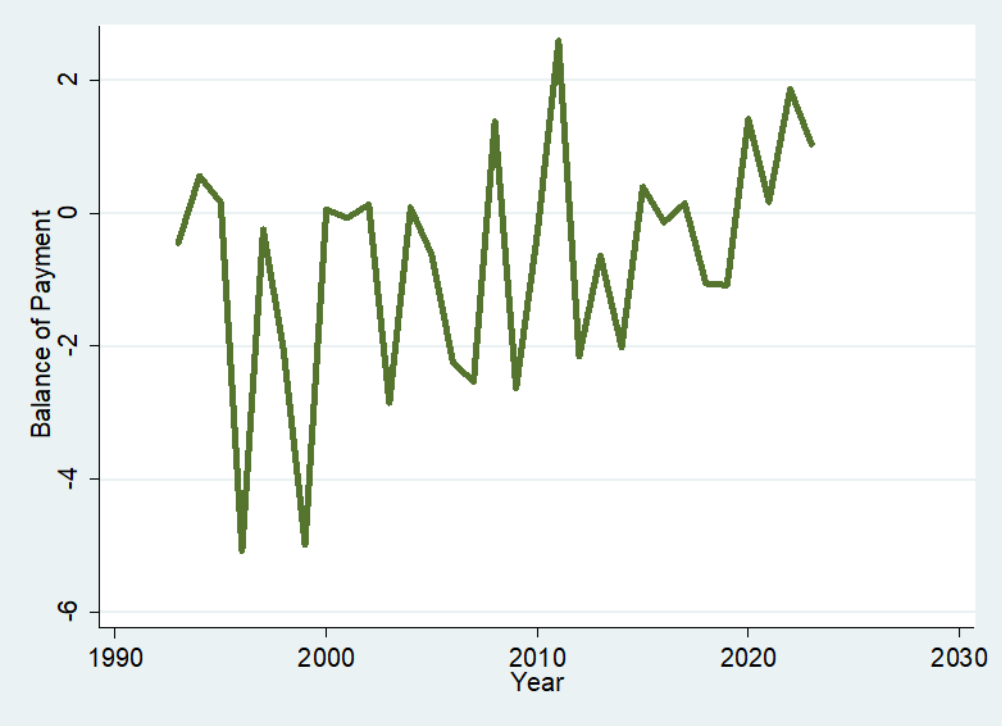

Figure 1.1 Kenya: The Balance of Payments Trend from 1993 to 2023
Source: World Bank

The country's BOP has shown significant fluctuations and has primarily been in a deficit since 1993, as seen from Figure 1.1. The persistent BOP deficits result from increased debt service, the increase in the country's imports relative to its exports, and income transfers from direct investments that have been expanding at an accelerated rate, which depletes international reserves. The volatility in the balance of payments is a result of the volatility of global oil prices. These imbalances have prevented the country from developing a strong external position. The BOP problems in Kenya are due to price increases brought by monetary expansion as a result of budget deficits. Such deficits are inevitable whenever the government increases development spending beyond income, although they can be due to large government current expenditures. While monetary expansion may occasionally boost domestic savings in the short run, inflation will inevitably have a negative long-term impact on saving. Furthermore, inflation and international payments disruptions tend to discourage foreign capital inflows while encouraging outflows. Therefore, the resources available to finance development expenditures will ultimately be reduced by inflation. Ordinarily, the balance of payments reflects the use of monetary expansion. Apart from price increases, a balance of payments deficit occurs if inflation results in an excess domestic capital formation expenditure over domestic saving and the net inflow of foreign financial resources. Furthermore, monetary expansion is linked to increases in production cost, income and domestic prices, which reduces exports and encourages imports.

Current Account

The current account is the largest component of the BOP and one of the significant indicators of external imbalance (UZ, 2010), it is the change in a nation's net foreign asset position associated with transactions in goods and services. Typically, the net income from foreign investments in the form of interest and dividends, and transfers are also included in the current account, notwithstanding that they make a very small part of the current account. A country's current account might exhibit a deficit, surplus or balance, depending on the prevailing

economic conditions. A current account deficit (CAD) indicates that a country's foreign liabilities exceed its foreign assets (Thompson, 2017). In contrast, a current account surplus demonstrates that a nation's foreign assets exceed foreign liabilities (Carbaugh, 2022). This implies that a nation with a current account surplus lends more whereas a nation with a CAD borrows more from others. Both the BOP and current account influence the exchange rate, external debt and international reserves. Therefore, the expectations and actions of all the market participants could be affected by the changes in the BOP and current account. From theory, the world's current account balance should be zero, primarily because a nation's exports are another nation's imports. However, that is not usually the case due to discrepancies from measurement inaccuracies among other factors (Wafula, 2020).

To that end, Kenya's current account has primarily been a deficit since the liberalization of the exchange rate (EXR), current account deficits can be detrimental to an economy because current account deficits raise a country's liabilities (Devadas & Loayza, 2018). These liabilities may eventually become untenable if the country is constantly running current account deficits raising interest payments. The higher interest payments interfere with private consumption, government expenditure, and public investment because more funds will go towards servicing external debt, which could overwhelm the country and thus breed sustained current account deficits. Sustained current account deficits are a major problem faced by developing countries because they result in mushrooming external debt, currency crises, and depletion of reserves (Aydin & Esen, 2016). Conversely, current account deficits might not always be harmful to the economy, especially if the resultant increased imports are used as raw materials and intermediated goods for production raising productivity, which 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, increasing exports in proportion to imports in terms of value. Figure 1.2 shows the country's CAD trend from 1993 to 2023.

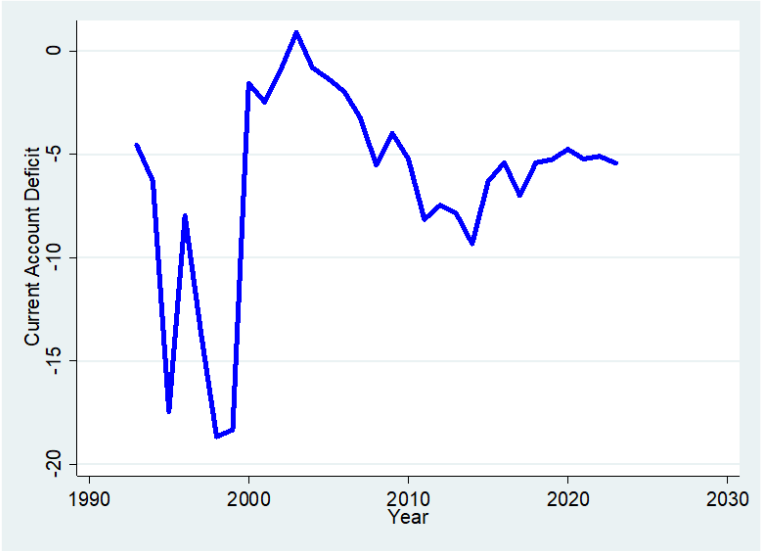

Figure 1.2 Kenya: The Current Account Deficit Trend from 1993 to 2023
Source: World Bank

Figure 1.2 indicates that since 1993, Kenya's CAD has generally been on the rise up until 1999 when it recorded a drop in 2000 and continued to fall until 2003 when there was a surplus in the current account. Following 2003, the CAD started to widen again. The highest current account deficit was recorded in 1999, which resulted from a substantial spike in oil prices and increased importation of machinery, equipment, and other intermediate goods used in the development of infrastructure. The persistent CAD implies that the economy is spending more on international trade than it is generating from it. This might be a result of preference for foreign goods or a lack of domestic production. In any case, it indicates that a sizable amount of the nation's income is spent overseas rather than circulating in the country. A sustained CAD might also be a sign of low international competitiveness. A continuous excess of imports over exports implies low demand for the country's goods and services worldwide. This could be attributed to low quality products, exorbitant costs, or lack of innovation. In addition, persistent current account deficits may indicate economic imbalance as a result of a nation spending more than it brings in. The nation might borrow money to cover its deficit, this could result in an increase in foreign debt, eventually causing economic instability and straining the exchange rate. Besides, not investing in the domestic sector may result in sustained current account deficits. An excess expenditure on imports over exports may indicate that domestic industries are not invested in, resulting in low economic growth and development. Therefore, sustained current account deficits reveal crucial information about an economy's competitiveness and overall health.

In addition to Kenya primarily operating a deficit in the current account since the liberalization of the EXR, the budget deficit continues to widen. From the absorption approach, current account deficits could result from budget deficits considering that aggregate demand increases in the presence of a fiscal deficit. This raise the demand for imports in relation to the demand for exports resulting in a CAD (Abbassi et al., 2015) if the elasticity of demand for imports is greater than one. Conversely, the increase in aggregate demand resulting from the fiscal deficit might not increase the demand for imports in relation to the demand for exports, which leads to a current account surplus if the imports demand's elasticity is less than one. This makes it necessary to investigate how the fiscal deficit affects the CAD in Kenya.

Exchange Rate

EXR is the rate at which a country's currency can be exchanged for another country's currency (Suvendu, 2021). Currency depreciation is a source of concern for many developing countries. 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 (Sanyal et al., 2021)

The EXR in Kenya became fully liberalized in 1993, which means that the EXR regime in operation in Kenya is currently free-floating. This implies that economic factors influence supply and demand for foreign currency, affecting the EXR (Abdi et al., 2020). 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 does not require the government's continuous intervention, result in the problem of imported inflation and require large exchange reserves 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 1.3 depicts the country's (real exchange rate) RER trend from 1993 to 2023.

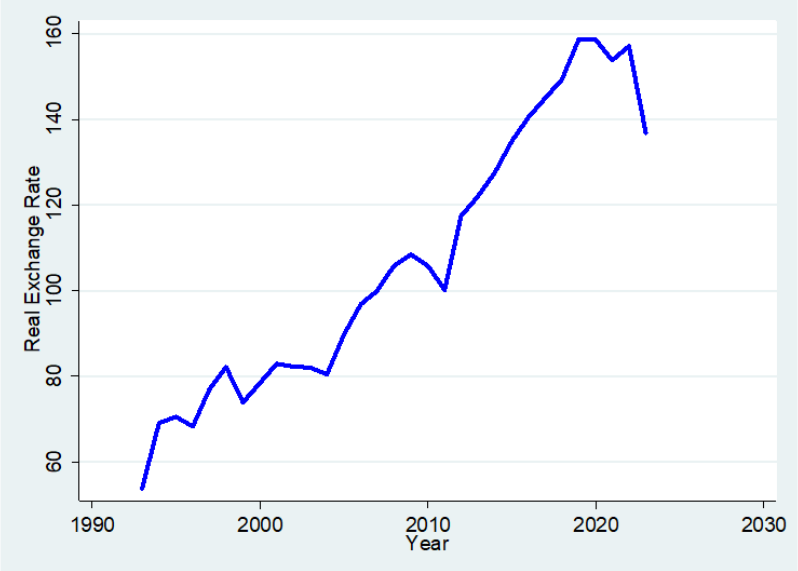

Figure 1.3 Kenya: The Real Exchange Rate Trend from 1993 to 2023
Source: Bruegel

Figure 1.3 demonstrates that the RER has been rising exponentially since 1993, which indicates the weakening of the Kenyan shilling. 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. Currency depreciation may raise the possibility of increased inflation, which would reduce purchasing power. In addition, rapid or pervasive depreciation may impact investor confidence and exacerbate financial instability, which might eventually render a nation without capital. If left unchecked, a depreciating currency tends to raise the nation's vulnerability to external shocks (Kadzal & Yilmaz, 2021).

Budget deficit

Budget deficits have garnered a lot of interest from economists and policymakers owing to their prodigious growth, particularly in developing countries. From standard economic theory, budget deficits could boost a sluggish economy since a budget deficit implies increased government spending and/or lower taxes, this increases disposable income which raises the volume of investment, resulting in a higher gross domestic product (GDP). However, long-term deficits have proven to be detrimental to the economy (Kurantin, 2017). The main concern regarding these 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 not get back to equilibrium in case of a deficit instead recession will set in leading to a sustained decline in economic growth and unemployment; therefore, there is need to finance budget deficits. These budget deficits can be financed through domestic borrowing, external debt, and seignorage (Warega, 2012). Higher domestic debt raises interest rates, discouraging private investment and consumption. Increased external debt raises the RER or depletes foreign exchange reserves, leading to a debt crisis. Finally, seignorage raises inflation. Therefore, the consequence of budget deficits depends on how they are financed.

Budget deficits in Kenya have been on the rise since independence, the constant rise in deficits is mainly attributed to poor economic performance, poor tax administration, limited tax base, taking up projects that require huge capital investments, debt repayment, etc. Despite the fiscal framework set up to support fiscal consolidation in order to reduce fiscal deficits and strengthen debt sustainability, public debt continues to rise putting the budget under constraint with a significant portion of the budget going towards the repayment of debt. Consequently, the increasing public debt could adversely affect the nation's capacity to fulfil other financial commitments, resulting in a sustained increase in deficits, creating a vicious cycle. Figure 1.4 shows the country's budget deficit trend from 1993 to 2023.

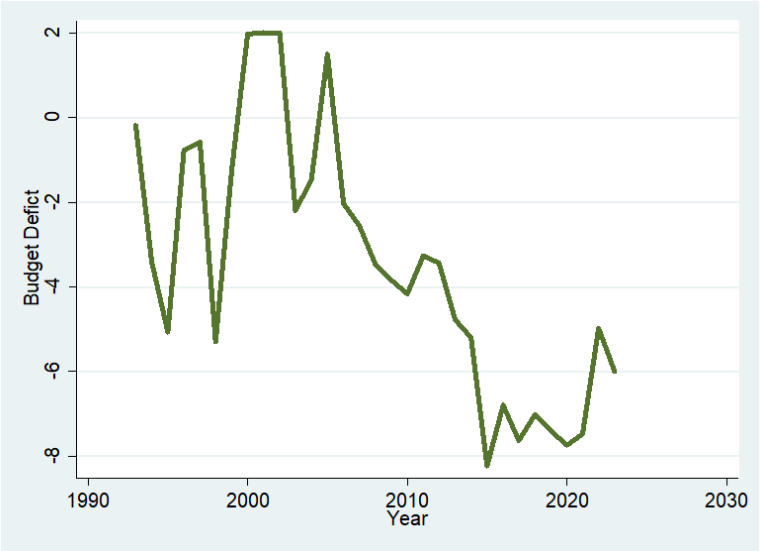

Figure 1.4 Kenya: The Budget Deficit Trend from 1993 to 2023
Source: IMF

Figure 1.4 shows that the budget balance was in a deficit from 1993 until 2000. Between 2000 and 2002, the budget balance went into a surplus with no substantial increase or decrease. In the years following 2002, the budget deficit increased steadily until 2015, where the country's budget deficit was at its highest. The budget deficit started decreasing after 2015 although it remained considerably high. The widening of the fiscal deficits is due to the persistent growth in government spending. The continued increase in government spending is

attributed to the rising expenditure on devolution, increased cost of security, increased expenditure on major infrastructure projects, public wage expansion, and increased interest payments stemming from higher public debt. On the other hand, revenue performance is relatively low, which is mainly attributed to reduced imports and trade in general and lower tax revenue stemming from low income and reduced consumption.

Budget Deficit and the Balance of Payments.

Both the budget deficit and BOP play a fundamental role in an economy. The BOP determines the nation's external position while the fiscal deficit serves as a measure of a nation's financial health. Kenya's BOP has primarily been in a deficit since the EXR was liberalized and the budget deficit continues to widen, despite the fiscal framework put in place to reduce the fiscal deficit and maintain a BOP surplus or balance. 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 & Okeke, 2013), poor economic growth (Nkurumah et al., 2016). This highlights the necessity to examine the relationship between fiscal deficit and the BOP, especially for a small economy like Kenya.

From theory, budget deficits raise aggregate demand, which in turn increases imports in relation to exports worsening the BOP. Conversely, budget deficits imply reduced national savings, which means that fewer funds are available to finance investments. The availability of lower funds bid the interest rate up. The higher interest rates are meant to attract capital inflow. The increased capital inflow in relation to capital outflow improves the BOP. Furthermore, empirical studies linking fiscal deficits to the BOP are ambiguous. For instance, Batool et al. (2015) argued that budget deficits improve the BOP. Conversely, Arabi (2019) demonstrated that a budget deficit worsens the BOP. Tsen (2014) also noted that there was no link between the budget and external balances. Therefore, budget deficits affect the BOP, but the dynamic of the relationship has not been established since several studied that link these variables 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 the BOP in developing and industrialized countries. Figure 1.5 depicts the correlation between budget deficits and the BOP.

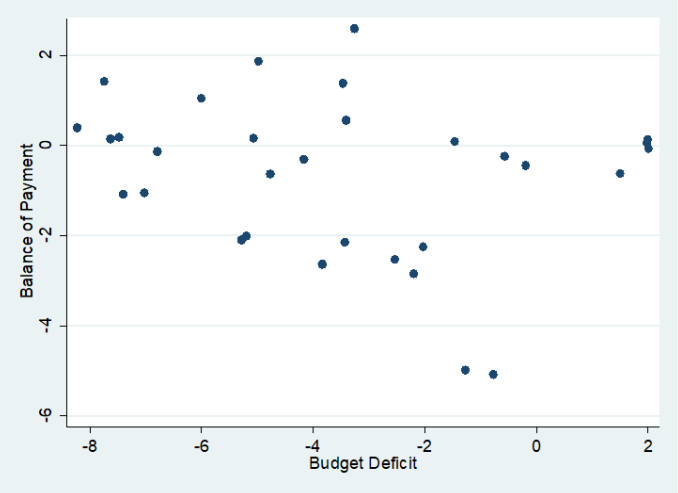

Figure 1.5 Kenya: The Relationship between the Budget Deficit and Balance of Payments from 1993-2023.
Source: World Bank and IMF

Figure 1.5 shows the relationship between the budget deficit and BOP. The plot denotes that Kenya's budget deficit and BOP are negatively correlated. This implies that if the budget deficit increases the BOP deteriorates. This can be explained by the fact that a budget deficit increases aggregate demand and disposable income. The higher demand suggests that the consumers demand more goods, including imports, and the higher income indicates that these consumers will have more money to spend on these goods. As a result, imports increase relative to exports, deteriorating the balance of payments.

In addition, the largest component of BOP is the current account and Kenya's current account has been primarily in a deficit. Since the budget deficit and CAD in Kenya continue to widen, it was crucial to determine the relationship between these variables. From the absorption approach, current account deficits could result from budget deficits considering that aggregate demand increases with a fiscal deficit. This raise the demand for imports expands the CAD if the demand for imports is elastic (Abbassi et al., 2015). Conversely, the increase in aggregate demand resulting from the fiscal deficit might not increase import demand in relation to export demand, which leads to the contraction of the current account deficit if the demand for import is inelastic. Empirical literature that links budget deficits to the CAD is also contradictory. For instance, Gakuru (2017) established that the budget deficit and CAD are positively correlated. On the contrary, Philip (2021) demonstrated a negative correlation between the budget deficit and the current account balance.

Budget Deficit and the 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 and foreign investment (Nguyen, 2023). 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 EXR does not only lead to increased external debt but also 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.

The monetary approach stipulates that the imbalances in the BOP influence exchange rate adjustments under a flexible EXR regime. For instance, a BOP deficit implies excess money supply. The demand for money and real income increase with excess money supply. Prices rise due to the rising real income and demand for money, appreciating the exchange rate. Conversely, a BOP surplus indicates reduced money supply. The real income and demand for money decline with lower money supply. The lower real income and demand for money prompt prices to decline, depreciating the exchange rate. This made it necessary to extend the study to examine how budget deficits affect the exchange rate.

Furthermore, economic theories tying budget deficits to the EXR are contradictory. For instance, the neoclassical approach asserts that budget deficits bid up interest rates, the higher interest rates intend to draw foreign lenders. These lenders seek to capitalize on the higher return on interest rates, increasing capital inflow. The increased capital inflow increases the supply of foreign currency, which leads to appreciation. Conversely, a budget deficit increases aggregate demand according to the Keynesian approach. The increased aggregate demand indicates that individuals demand more products including imports while increased income implies that individuals have more income to spend on these products (Abbassi et al., 2020). This increases imports vis-a-vis exports, widening the BOP. The widening BOP increases the demand for foreign currency, which leads to depreciation (Kılınç et al., 2016). In addition, the Ricardian approach asserts that 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). Since national savings do not change, interest rates remain unchanged, the BOP will not change either, which in turn implies that the exchange rate remains unchanged because private saving rises by an adequate amount to avoid borrowing from outside the country (Barro, 1989). Considering that budget deficits are a mere shift of resources from one generation to another, deficits will not have any real effects on an economy.

Besides, empirical literature tying budget deficits to the EXR is also ambiguous. For instance, Shehu and Adamu (2021) demonstrated that there is a positive correlation between budget deficits and the exchange rate. Epildency (2022) indicated that the budget deficit is inversely related to the exchange rate. Notwithstanding, Saysombath and Kyophilavong (2013) illustrated that there is no relationship between budget deficits and the EXR. This highlights the need to extend the study to capture the effects of budget deficits on the EXR. The correlation between budget deficits and the exchange rate is demonstrated in Figure 1.6.

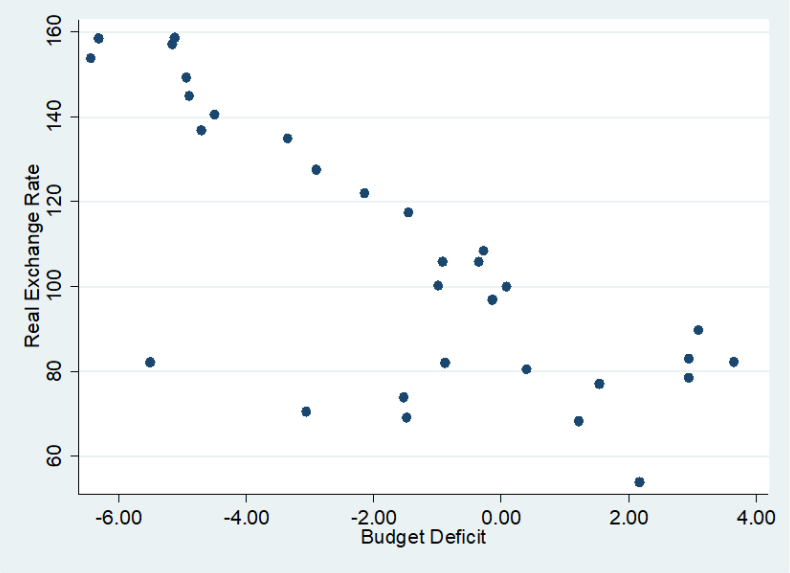

Figure 1.6 Kenya: The Relationship between the Budget Deficit and Exchange Rate from 1993-2023. Source: Bruegel and IMF

The relationship between budget deficits and the exchange rate is depicted in Figure 1.6. The plot depicts a negative correlation between budget deficits and the exchange rate in Kenya. This suggests that the exchange rate appreciates with a higher budget deficit. This can be justified by the fact that the budget deficit increases disposable income and aggregate demand. The increased demand indicates that individuals demand more products including imports and the increased income implies that individuals will have more income to spend on these products. This increases imports vis-a-vis exports. The increased imports imply increased demand for foreign currency, which leads to exchange rate appreciation.

Statement of the Problem

Kenya has consistently had deficits in its BOP since EXR liberalization. The persistent BOP deficits deplete international reserves. The BOP deficits stem from the country's attempts to accelerate economic growth through the execution of comprehensive development plans that necessitate the acquisition of intermediate products and capital that exceeds its export capacity. Therefore, the country's BOP issues arise from economic growth exceeding the capacity of existing domestic resources. The country's BOP remains in a deficit despite the government's interventions to eliminate the deficit because the country is fixated on conventional monetary and fiscal policies although they have not helped to achieve full employment. This can be attributed to the economy being reliant on the developed economies, and organizations in charge of the development of these policies are essentially not independent. The country's BOP continues to be in a deficit in addition to the budget deficit that continues to widen despite the government's attempts to expedite fiscal consolidation.

To that end, several studies have been conducted on budget deficits and the BOP, but they have not been able to fully capture several aspects. For instance, Batool et al. (2015) examined how fiscal balance relate to the BOP in Pakistan. However, the study was conducted in a nation whose balance of payments dynamics differ from Kenya's balance of payments dynamics, hence the impact of the budget deficit on the BOP might be different. Gakuru (2017) carried out a study on how budget deficits affect the CAD and exchange rate in Kenya. The study ignored the entire balance of payments. Therefore, the study filled the gap by evaluating how the budget deficit affects the entire BOP since the entire BOP is ignored in previous studies. In addition, the study utilized data from the period when the EXR was fully liberalized because the imbalances in the BOP influence the EXR.

In addition, the study examined the relationship between the budget deficit and the EXR since BOP imbalances influence EXR adjustments, especially under a flexible EXR regime. Budget deficits and the exchange rate have been the subject of various studies, but they have not been able to adequately reflect several factors. For instance, Saysombath and Kyaphilavong (2013) examined the association of fiscal deficits and RER in Laos. But the study was carried out in a country with different budget and exchange rate dynamics than Kenya, therefore, the effect of the budget deficit on the exchange rate may differ. Epildency (2022) conducted a study on the impact of budget deficit on Egypt's exchange rate. The budget deficit was decomposed into the sources of financing the deficit, which could yield different outcomes. Therefore, the study filled the gap by examining the direct effect of budget deficits on the exchange rate. In addition, the study utilized data from the period when the EXR was fully liberalized because the imbalances in the BOP influence the EXR.

Objectives of the Study

The main objective of this study is to assess the effects of budget deficits on the balance of payments and the exchange rate in Kenya.

The specific objectives of this study are:

i. To examine the effects of budget deficits on the balance of payments in Kenya.
ii. To investigate the effects of the budget deficit on the current account deficit in Kenya.
iii. To explore the effects of the budget deficit on the exchange rate in Kenya.

Research Questions

i. What are the effects of budget deficits on the balance of payments in Kenya?
ii. What are the effects of the budget deficit on the current account deficit in Kenya?
iii. What are the effects of the budget deficit on the exchange rate in Kenya?

Significance of the Study

This study contributes to a greater understanding of how budget deficits influence the CAD, the entire BOP and EXR, which is crucial in informing policies to ensure prudent budget management in Kenya. Prudent budget management would have a positive influence on the external sector. This study also adds knowledge to existing sustained deficits studies which is crucial in the formulation of policies.

Scope of the Study

Annual time series data from 1993 to 2023 was utilized in this study. The rationale behind settling for this period is that the EXR became fully liberalized in Kenya in 1993. This period is crucial in making conclusions on how budget deficits affect the CAD, BOP and EXR in Kenya because during this period the market forces of supply and demand influenced the movements in the EXR. Therefore, if there is a surplus in the BOP, there is a greater demand than the supply of domestic currency, which increases the value of domestic currency. Conversely, with a BOP deficit, there is greater demand for foreign currency than there is supply, which raises foreign currency value. Therefore, under a flexible EXR regime, BOP imbalances influence the EXR.

Organization of the Study

This project is segmented into five chapters. The study is introduced in the first chapter. The study's theoretical and empirical literature is explored in the second chapter. The third chapter describes the methodology adopted by the study. The study's results are discussed in chapter four. Lastly, the study's summary, conclusions and recommendations are advanced in chapter five.

II. Literature Review

Introduction

Three sections make up this chapter. The first component explores theoretical literature on existing theories on the determination of the BOP, CAD and ultimately the EXR. The second section reviews empirical literature on how budget deficits affect the BOP, CAD and the exchange rate. 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 the determination of the BOP. These arguments are based on the elasticity, absorption, and monetary approaches.

Elasticity Approach

The elasticity approach is an examination of the BOP adjustment grounded on the Marshall-Lerner condition. It was developed by Joan Robison in 1937. The theory assumes that the supply elasticities of imports, exports, foreign goods that compete with exports, and domestic goods that compete with imports are infinite. This implies that export prices do not increase as their demand rises, import prices do not increase as their demand expands, and the price of import substitutes does not increase as their demand increases. The theory also assumes that there is an initial balance in trade and that exchange rate fluctuations are minimal. In addition, the theory disregards the effects of EXR fluctuations on money stock. Finally, the theory takes into account the effect of EXR fluctuations on imports and exports while holding everything else constant.

Since the Marshall-Lerner condition plays a significant role in the elasticity approach to the BOP, it asserts that depreciation will enhance the current account of the BOP if the sum of the price elasticities of demand for exports and imports is greater than one (Carbaugh, 2022). The analysis of exports and imports in foreign

currency is highly significant because the scarcity of foreign currency is a fundamental component of the BOP disequilibrium.

This can be represented as:

$B = eX - M$……2.1

Where $B =$ balance of payments in foreign currency, $e =$ exchange rate, $X =$ exports in domestic currency, and $M =$ imports in foreign currency.

Devaluation only enhances the BOP if the sum of the price elasticities of import and export demand is greater than unity (Salvatore, 2020). Even though devaluation reduces export prices, the price elasticity of demand for exports determines the amount of foreign exchange earned. Similarly, devaluation reduces the demand for imports, which decreases the expenditure on imports. Therefore, the changes in foreign exchange earnings are contingent upon import and export activities (Gibson & Thirlwall, 2016). To offset the loss of foreign exchange from imports, the elasticity of demand for imports ought to be at least unitary if the demand for exports is completely inelastic. On the other hand, if the elasticity of demand for imports is completely inelastic in order to prevent the loss of foreign exchange the elasticity of demand for exports should at least be unitary (Gandolfo, 2016). To that end, devaluation increases exports in relation to imports, which raises the country's foreign exchange earnings.

Devaluation can eliminate a BOP deficit (Salvatore, 2020). Since devaluation promotes exports while discouraging imports, which in turn boosts local production of import substitutes (Carbaugh, 2022). The expansion in productivity raises real income which drives up spending. The resulting increased expenditure raises imports and reduces exports, which negates the initial improvement in the BOP. As demand rises, devaluation raises income, which shifts demand to foreign commodities. Conversely, the BOP deficit will not improve if the total price elasticities of demand for imports and exports are less than or equal to one. The BOP deficit will not improve either if the increase in import prices affects domestic prices because it negates the devaluation-induced competitive advantage (Gibson & Thirlwall, 2016). Therefore, the enhancement of the BOP depends on the economy's reaction to devaluation.

Increased domestic prices is the initial effect of devaluation (Gandolfo, 2016). The increase in domestic prices might be followed by an increase in import prices of the same magnitude. The expansion in domestic prices might be equal to the devaluation depending on the degree to which import prices increase in relation to the devaluation and the degree to which wages increase in response to the price increase. Besides, if other nations do not adjust their EXR, suppliers will not interfere with the foreign price of imports, and provided that the supply of imports has an infinite price elasticity or the demand for imports has a zero price elasticity then the domestic price of imports increases in proportion to the increase in the domestic price of foreign currency (Gibson & Thirlwall, 2016). In addition, devaluation will either enhance or deteriorate the TOT if the product of the elasticities of demand for imports and exports is greater or less than the product of the elasticities of supply for imports and exports (Salvatore, 2020). This is because a nation that is more focused on exports than imports with a high unemployment rate, raises the quantity of exports that attract low prices, worsening the TOT. In a nutshell, the theory demonstrates the impact of home and foreign goods' relative prices on trade flows, which drives the exchange rate adjustments. Therefore, the elasticity approach provides the foundation for determining the BOP and the exchange rate that offers insight into the process of economic adjustment, which is a principal building block to the absorption approach used in this study.

Absorption Approach

Sidney Alexander first created the absorption approach to the BOP in 1952, and Harris Johnson improved it in 1958. This theory assumes that local and foreign products have infinite supply elasticities and domestic income is not constant. This theory also postulates that the BOP is the difference between residents' receipts from both the residents and foreigners and their payments to both the residents and foreigners, which can be expressed as:

$B = R_R + R_F - (P_R + P_F)$……2.1

Where $B =$ balance of payments, $R_R =$ residents' receipts from other residents, $R_F =$ residents' receipts from foreigners, $P_R =$ payments by residents to other residents, and $P_F =$ payments by residents to foreigners.

Equation 2.1 can be rewritten as:

$B = R - P$……...2.2

Where $R =$ total residents' receipts and $P =$ total payments by residents.

The BOP can also be the discrepancy between a country's income and its expenditure, following the absorption approach, specified as:

$B = X - M = Y - A$……...2.3

Where $X =$ exports, M= imports, $Y =$ national income, and $A =$ absorption (national expenditure).

From equation 2.3, the BOP can be assessed based on whether income increases in relation to absorption. If national income exceeds absorption, then the BOP is favourable. Conversely, if absorption exceeds national income, then the BOP is unfavourable. Since, absorption is equivalent to the sum of consumption, investment, and government expenditure (Carbaugh, 2022), equation 2.3 can be rewritten as:

$B = X - M = Y - C - I - G$…….2.4

Where $C =$ consumption, $I =$ investment, and $G =$ government expenditure.

From the income equation saving is equivalent to income less consumption and government expenditure, equation 2.4 can be rewritten as follows:

$X - M = S - I$…….2.5

Where $S =$ saving.

Equation 2.5 implies that policies for correcting the BOP can be assessed in terms of savings and investment.

For the BOP to improve, policies that increase income must not be preceded by an equal increase in absorption (Carbaugh, 2022). Conversely, devaluation will redirect resources from unproductive sectors to the productive sectors in the event that the non-tradable goods sector has lower productivity. This suggests that the improvement in the trade balance would not require a decrease in absorption at full employment. Moreover, when an increase in income is not possible, policies aimed at raising income must be complemented with a reduction in absorption in order to improve the BOP (Gibson & Thirlwall, 2016). On the other hand, policies that decrease absorption need to be accompanied by lower income for the BOP to improve. Therefore, the government should prioritize the development of policies intended to raise income and those intended to decrease absorption in order to minimize expenditure on tradable goods.

Devaluation raises real income as the demand shifts to domestic goods enhancing the BOP if there is a marginal propensity to consume that is less than one. Conversely, the BOP will deteriorate if the marginal propensity to consume exceeds one. In addition, devaluation raises import prices, which in turn reduces the demand for imports in relation to the demand for exports improving the BOP if the demand for imports is elastic. Inversely, increased import prices from devaluation raises the demand imports in relation to the demand for exports deteriorating the BOP if the demand for imports is inelastic. Moreover, interest rates are expected to influence the BOP (Gibson & Thirlwall, 2016). In that, higher interest rates are expected to reduce consumption and investment, which reduces absorption improving the BOP. A price increase is also expected increase absorption. Given that an increase in the price level implies increased prices of domestic goods, this raises the demand for imports in relation to the demand for exports, worsening the BOP. In a nutshell, a country's BOP performance is determined by the changes in income and absorption. This model was useful in the development of the theoretical framework that provides basis for the model that will be used in this study to evaluate how budget deficits affect the BOP.

Monetary Approach

The monetary approach dates to David Hume in the 18th Century with notable contributions by Polak (1957), Mundell (1971), Frenkel & Johnson (1976), and Johnson (1977), among others. According to the theory, the determination of the BOP is dependent on the demand and supply of money since the BOP is regarded as a monetary phenomenon. The theory assumes that the economy operates at full employment, real variables are unaffected by changes in money supply, the demand for money is a constant function of income, a nation's interest rates and prices converge towards the world's interest rates and price level, and monetary authorities do not sterilize changes in the money supply that result from variations in the amount of foreign exchange reserves (Gibson & Thirwall, 2016).

According to the national accounts, aggregate demand should be equal to aggregate supply, meaning that there is no excess demand. In cases where there is excess demand, it means that aggregate demand exceeds aggregate supply. The excess demand is considered to be the BOP. This can be represented as:

$B = A + X = Y + M$……2.6

Where $B =$ balance of payments, $A =$ domestic expenditure, $X =$ exports, $Y =$ income, and $M =$ imports.

Rearranging equation 2.6 gives:

$B = X - M = Y - A$ ……2.7

Considering a scenario where money is the sole asset in the economy then one market's excess supply is another market's excess demand. This can be represented as:

$Y - A = M_D - M_S$…….2.8

Where $M_D =$ demand for money and $M_S =$ money supply.

Since BOP is equivalent to income less domestic expenditure, equation 2.8 becomes:

$B = M_D - M_S = X_m$…..2.9

Where X_m= excess money demand.

Excess demand for money denotes a BOP surplus, whereas an excess money supply denotes a BOP deficit (Bošnjak et al., 2018).

A BOP surplus raises money supply through accumulation of reserves (Mushendami et al., 2017). The excess demand created by the BOP surplus will be eliminated as money supply rises, moving the BOP to equilibrium. Conversely, a BOP deficit results in loss of reserves, which reduces money supply. The excess money supply from BOP deficits will be eliminated prompting the BOP to equilibrium. This implies that the BOP disequilibrium is a transient, self-correcting phenomenon (Salvatore, 2020).

Adjusting the model to accommodate more than one asset, gives rise to:
$B = X_m + X_b$…….2.11
Where X_b = excess demand for bonds. If $X_m = 0$, then $B = X_b$.

The BOP deficit indicates an excess supply of bonds, whereas a BOP surplus indicates an excess demand for bonds (Gidson & Thirlwall, 2016). In the presence of a BOP surplus, there is no accumulation of reserves since the surplus will trigger capital outflow, which lower interest rates. Conversely, capital inflows will emanate from a BOP deficit raising interest rates (Salvatore, 2020). Therefore, the sale or purchase of assets increases or lowers spending, it does not increase or reduce money supply. The money demanded and supplied is equal when the money market is in equilibrium.

From the equilibrium condition, an increase in the demand for money can be funded by an increase in the country's money supply or capital inflow, which results in a BOP surplus. The excess demand for money will be met by capital inflow if the country's monetary authorities do not raise money supply (Salvatore, 2020). However, there is capital outflow when the money supply rises but money demand remains constant, resulting in a BOP deficit. The BOP deficit or surplus is transient and self-correcting (Carbaugh, 2022). In that, capital inflow or outflow eliminates the excess money demand or supply, correcting the BOP surplus or deficit. Therefore, the nation has no control over the money supply under a fixed exchange rate regime.

BOP imbalances influence exchange rate adjustments without capital flows under a flexible exchange rate regime (Salvatore, 2020). For instance, an excess money supply raises real income, which in turn expands money demand. Prices rise as a result of the increase in real income and the demand for money, appreciating the exchange rate. Conversely, prices reduce when the money supply increases slower than the real income and demand for money, depreciating the EXR. Exchange rates can also be influenced by inflation expectations and anticipated changes in exchange rates in addition to the changes in money supply and real income (Salvatore, 2020). Exchange rate appreciation would stem from inflation and exchange rate appreciation expectations. In that, an expected depreciation in local currency relative to the foreign currency would result in capital flight, which would result in a BOP deficit. Furthermore, inflation expectations will raise the demand for imports in relation to exports, depreciating local currency.

In a nutshell, the excess money demand not met by domestic monetary authorities leads to a BOP surplus. Conversely, the excess money supply not withdrawn by the country's monetary authority causes a deficit in the country's BOP. This implies that the excess supply or demand for money is eliminated through capital outflow or inflow. However, a flexible exchange rate system allows for the adjustment of BOP imbalances through exchange rate adjustments without the need for capital movements. Therefore, the monetary approach proffers insight into the economy's adjustment process because it explains how demand and supply of money affect the BOP and exchange rate which is critical to the extension of the fiscal deficits' influence on the BOP to the exchange rate.

Empirical Literature

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

Saysombath and Kyophilavong (2013) examined the link between fiscal deficits and the RER in Lao PDR using annual time series data from 1980 to 2010 and a VAR-based granger causality test together with the SVAR framework to establish the short-term and long-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. Therefore, the study recommended a reduction in the budget deficit in order to deter the occurrence of the Dutch disease.

Tsen (2014) analysed the effect of the Malaysian budget balance on the country's external balance between 1980 and 2011 using the autoregressive distributed lag (ARDL) model. The results revealed there is no relationship between the budget balance and the external balance. The study recommended that the government should implement measures to control inflation. Additionally, the study recommended that the government develop strategies to reduce government expenditure and ensure efficient use of government resources. The study further advanced that the government should prioritize raising productivity and the quality of G&S through technological advancement in order to raise the country's export competitiveness.

Batool et al. (2015) investigated the effects of fiscal balance on the BOP in Pakistan using annual time series data from 1972 to 2013 and the ARDL model. The findings revealed fiscal deficits improve the BOP. The

study recommended that the government should develop policies and strategies to boost exports in order to improve the BOP. The study also recommended that central banks should exercise caution when implementing monetary policies and take proactive measures to control the amount of money in circulation in order to reduce interest rates which in turn raise investment. Further, the study pointed out that the government should create a conducive environment for the establishment of industries that advance import substitution and exports and regulate foreign exchange by prohibiting or restricting the importation of luxury goods.

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 model. 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 policymakers should ensure proper EXR management in order to ascertain that exports become globally competitive thereby eliminating the CAD.

Arabi (2019) studied the effects of shocks from the fiscal deficit on the BOP in Sudan using time series data from 1960 to 2017 and MGARCH models. The findings indicated that an increase in the fiscal deficit deteriorates the BOP. The study recommended that policymakers should formulate policies that promote productivity of domestic industries geared towards import substitution and export promotion. The study also recommended that the government undertake fiscal reforms to generate more revenue and reduce government expenditure. In addition, the study recommended that the government put money into productive investment in order to generate more revenue. The study further recommended that policymakers formulate polices in order to stabilize prices.

Philip (2021) examined how the current account relates to the budget deficit in Kenya using annual time series data from 1976 to 2018 and the restricted VAR model. The study revealed that there is a negative correlation between the current account and the budget deficit. The study recommended that the government should adopt policies that encourage private investment in the event that the nation encounters interest rate shocks in order to reduce external borrowing and increase investment. In addition, the study recommended that the central bank should adopt monetary policies that can minimize the volatility of the exchange rates, which will enable the country to service external debt, avoid borrowing to settle existing debt, and manage external debt.

Shehu and Adamu (2021) analysed the variables that influence Nigeria's budget deficit using quarterly time series data from 1981 to 2016. The results revealed that the EXR and budget deficit have a positive relationship. The study recommended that the government should develop policies and strategies to enhance fiscal discipline. Through demonstration of a high degree of transparency in fiscal activities in order to achieve a credible budget surplus. Any budget surplus should fund productive investments in order to raise national income, which in turn reduces budget deficit expectations.

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 a domestic non-bank financing shock brought about RER depreciation, 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 on the determination of the BOP reveals that budget deficits influence the BOP and EXR differently. For instance, budget deficits raise aggregate demand, which includes the demand for imports. This increases imports in relation to exports, worsening the CAD and ultimately the BOP. A BOP deficit implies increased demand for foreign exchange in relation to supply, resulting in exchange rate appreciation. Conversely, budget deficits results in reduced national savings and higher interest rates, which triggers capital inflow improving the BOP. A BOP surplus implies increased supply of foreign exchange in relation to demand, which results in exchange rate depreciation. From the absorption approach budget deficits deteriorate the BOP. Taking the monetary effects into account, budget deficits improve the BOP. The behaviour of the BOP is explained by the elasticity, absorption, and monetary approaches. However, these concepts provide varied interpretations.

Besides, empirical literature related to this study does not shed more light on the matter. For instance, Batool et al. (2015) indicated that budget deficits enhance the BOP. On the contrary, Arabi (2019) demonstrated that fiscal deficits deteriorate the BOP. At the same time, Tsen (2014) pointed out that there was no association between budget balance and external balance. Both theoretical arguments and empirical literature connecting budget deficit to the BOP have proven to be contradictory therefore there is need to conduct a study on how the budget deficit influences the BOP in Kenya. Furthermore, as the current account makes up a significant portion

of the balance of payments, it was therefore necessary to examine how the budget deficit affects the current account.

On the other hand, both theoretical and empirical literature tying budget deficits to the exchange rate is also ambiguous. For instance, Keynesians argue that budget deficits boost aggregate demand, which implies increased demand for goods including imports. This raises the demand for foreign currency, appreciating the EXR. Conversely, neoclassical economists maintain that budget deficits raise interest rates. The higher interest rates are meant to attract capital inflow, depreciating the EXR. Moreover, 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. In addition, Shehu and Adamu (2021) demonstrated that there is a positive correlation between budget deficits and exchange rates. Epildency (2022) indicated that the budget deficit is inversely related to the exchange rate. Notwithstanding, Saysombath and Kyophilavong (2013) illustrated that there is no relationship between budget deficits and the exchange rate. Both theoretical arguments and empirical literature connecting budget deficit to the EXR have proven to be contradictory therefore there was need to extend the study to capture how the budget deficit influences the EXR in Kenya.

A similar study was carried out in Kenya. The study captured the effects of budget deficits on the current account a component of the BOP. The study also used data that was largely from a period when the EXR in Kenya was not flexible since the current account and/or BOP imbalances do not influence the exchange rate in a fixed EXR regime as a result the findings may be significantly skewed. The study also ignored the entire BOP which might give different results since the BOP includes several components apart from the current account. This study provides fresh insight into the effects of budget deficits on the entire BOP and the EXR. In addition, the data utilized is entirely from a period when the EXR in Kenya was flexible. Moreover, the study utilized the ECM which estimates the long run relationship in addition to the short run relationship. The study also conducted causality checks on the effects of the budget deficit on the CAD and the EXR since a variable's dependence on other variables does not imply causation. In addition to correlation analysis, causal analysis is significant because causation or direction of influence cannot be implied even though variables have a relationship.

Furthermore, most studies reviewed were 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 industrialized and developing countries.

III. Methodology

Introduction

This chapter is broken down into eight sections. The research design that will be utilized in this study is described in the first section. The second section characterizes the theoretical framework that provides ground for the empirical model that will be used in this study. The third section specifies the empirical models that will be used to assess how budget deficits affect the BOP, CAD and EXR. The fourth section depicts the definition and measurement of variables and sources of data for this study. Finally, the remaining sections detail the procedure for data collection, time series properties, data processing and analysis, and the diagnostic tests that will be carried out to ensure validity of the results.

Research Design

This study examined how budget deficits influence the BOP, CAD and EXR in Kenya. The study deployed longitudinal research design in order to accomplish the study's objectives. Quantitative time series data spanning 1993 to 2023 of an annual frequency was employed to model these effects. The selected period corresponds to the period when the exchange rate in Kenya was fully liberalized.

Theoretical Framework

The absorption approach provides basis for this study. From the absorption approach the difference between the nation's income and its expenditure can also be considered the BOP. This can be expressed as:

$B = Y - A$…….3.1

Where $B =$ balance of payments, $Y =$ national income and $A =$ absorption.

The total national expenditure can also be considered as absorption. In the event that national income surpasses absorption, the BOP is favourable. Conversely, if absorption surpasses national income, then the BOP is not favourable.

Since:
$A = C + I + G$…….3.2
Where C = consumption, I = investment, and G = government expenditure.

An increase in either consumption or investment or government expenditure or any of their combinations raises absorption. Conversely, reductions in government spending, investment, consumption, or any of their combinations lowers absorption.

Incorporating equation 3.2 into equation 3.1, the BOP equation becomes:
$B = Y - C - I - G$…….3.3
Meanwhile, the income earned can be used for consumption, to pay taxes, and the rest is saved under the Keynesian expenditure framework, which can be demonstrated as follows:
$Y = C + S + T$…….....3.4
Where C = consumption, S = saving, and T= taxes. The sum of individual incomes in an economy produces the national income, therefore incorporating equation (3.4) into equation (3.3) gives rise to:
$B = (S - I) + (T - G)$……3.5
With the assumption that all savings are invested, equation 3.5 can be rewritten as:
$B = (T - G)$…….3.6

Depending on the values of its constituent, the BOP can be either positive or negative. In that, the BOP will be positive if a nation's receipts from the rest of the world surpass its total payments. However, if a nation's payments to other nations surpass its total receipts, the BOP will be negative.

Since $(T - G)$ represents the budget balance. Depending on whether government expenditure exceeds revenue or government expenditure exceeds revenue, the budget balance might be in a deficit or surplus. Assuming that the budget balance is in a deficit, equation 3.6 can be rewritten as:
$B = BD$……3.7
Where BD = budget deficit.
From equation 3.7 it can be concluded that the budget deficit influences the BOP.

Model Specification

This study's primary purpose was to examine the effects of Kenya's budget deficit on the BOP and exchange rate. From theoretical framework, the BOP would be influenced by the budget deficit. The absorption approach postulates that an excess of national income over expenditure results in a BOP surplus while excess expenditure over national income breeds a BOP deficit if the summed price elasticities of import and export demand is larger than one. However, an excess of national income over expenditure does not breed a BOP surplus nor will excess expenditure over national income cause a BOP if the total price elasticity of demand for exports and imports is less than or equal to one. In addition, prices and interest rates influence the movements in the EXR from the absorption approach. For instance, an increase in prices reduces the demand for exports in relation to imports worsening the BOP. Furthermore, higher interest rates reduce consumption and investment which in turn reduces absorption improving the BOP. Therefore, additional variables obtained from the absorption approach that are believed to influence the BOP are interest rates and inflation which substitutes prices given that inflation is the rate at which the prices of G&S change over time.

Incorporating interest rates and inflation into equation 3.7, the model that was utilized to estimate the relationship between the fiscal deficit and BOP becomes:
$BOP_t = \alpha_0 + \beta_1 BD_t + \beta_2 RIR_t + \beta_3 INF_t + \mu_t$……3.8
Where BOP_t= balance of payments at time t, BD_t= budget deficit at time t, RIR_t = real interest rate at time t, INF_t = inflation rate at time t and μ_t = disturbance term at time t.

In addition, the absorption approach postulates that it can be applied to either the current account or the entire BOP. Therefore, the BOP in equation 3.7 can be substituted for the CAD, giving rise to:
$CAD_t = \alpha_0 + \beta_1 BD_t + \mu_t$……3.9
Where CAD_t= current account deficit at time t, BD_t= budget deficit at time t, and μ_t = disturbance term at time t.

Furthermore, the monetary approach postulates that the BOP would have an impact on the exchange rate. The monetary approach also indicates that an increase or decrease in money supply affects the EXR. In that, real income and money demand expand due to an increase in money supply. Prices rise because of the higher demand for money and real income appreciating the exchange rate. Conversely, reduced money supply implies lower real income and demand for money, which in turn reduce prices depreciating the exchange rate. Moreover,

the monetary approach postulates that the EXR can be influenced by the demand for exports in relation to imports. For instance, a higher demand for imports in relation to exports raises foreign currency demand appreciating the EXR. On the contrary, foreign currency demand declines when imports reduce, which in turn depreciates the EXR. Both the export and import prices are influenced by the demand for exports and imports, respectively and the TOT serves as a measure of price ratios for imports and exports.

Therefore, the TOT, money supply, and BOP are the variables derived from the monetary approach that influence the exchange rate. Since the budget deficit is equal to the BOP from the absorption approach, the BOP was replaced with the budget deficit. On that account, the model that was utilized to estimate the relationship between the fiscal deficit and the EXR becomes:

$RER_t = \alpha_0 + \beta_1 BD_t + \beta_2 MS_t + \beta_3 TOT_t + \mu_t$.....3.10

Where RER_t= real exchange rate at time t, BD_t= budget deficit at time t, $MS_t =$ money supply at time t, $TOT_t =$ terms of trade at time t, and $\mu_t =$ disturbance term at time t.

The goal of the study was to examine how the budget deficit impacts the current account, BOP, and EXR. Equations 3.8, 3.9 and 3.10 were used to model these effects. Equation 3.8 was estimated using the error correction model (ECM) because short-term fluctuations and long-run relationships between variables can be effectively modelled by the ECM. In addition, the error correction term is incorporated into the ECM to handle non-stationarity in time series data (Pinshi, 2020). Therefore, ECM can be applied on mixed order of integration time series data. Furthermore, causality tests were run on equations 3.9 and 3.10 using the vector error correction (VEC) estimates since both long-run and short-run causality can be obtained simultaneously under the VECM.

Definition and Measurement of Variables

Table 3.1 depicts the definition and measurement of variables as well as the data sources.

Table 3.1 Definition and Measurement of Variables and Data Sources.

Variables	Definition	Measurement	Data source
Balance of Payments (BOP)	An exhaustive record of each financial transaction between a country's people and other nations.	Net financial assets associated with financial, capital, and current account transactions.	World Bank
Current Account Deficit (CAD)	Occurs when a nation's imports exceed its exports, including net income in the form of interest and dividends as well as transfers.	The sum of net exports, net primary income, and net secondary income as a percentage of GDP.	World Bank
Real Exchange Rate (RER)	A country's currency's weighted average in relation to the index of other significant currencies.	A country's currency's value compared to a weighted average of multiple foreign currencies divided by the price deflator.	World Bank
Budget Deficit (BD)	A shortfall in government revenue in relation to its spending.	The discrepancy between total government revenue and its expenditure as a percentage of GDP.	IMF
Real interest rate (RIR)	The nominal interest rate after accounting for inflation.	The lending rate charged by lenders or financial institutions adjusted for inflation.	World Bank
Inflation (INF)	The rate at which prices for products and services change over a specific period.	The annual percentage price change that a typical customer must pay to purchase a basket of goods and services.	World Bank
Money Supply (MS)	The quantity of currency in circulation within a nation.	The sum of money not held by banks and other securities including commercial paper and certificates of deposit as a percentage of GDP.	World Bank
Terms of Trade (TOT)	The export to import price index ratio.	The ratio of the export and import unit value indexes in percentage, computed in relation to the base year 2015.	World Bank

Data Collection Procedure

The prime sources of data were the world bank and IMF databases, and the kind of data used in the study was secondary data of an annual frequency. The models used in this study utilized data on the BOP, CAD, RER, budget deficit, inflation rate, RIR, money supply, and TOT. All the variables were expressed in percentages apart from the RER.

Time Series Properties

Unit Root Test

Prior to conducting regression analysis, it was essential to ensure that the associated time series is stationary, otherwise, empirical work on non-stationary time series will lead to spurious regressions, giving rise to erroneous results (Greene, 2020). A time series with constant mean, constant variance and covariance that is solely determined by the distance between the two time periods under consideration is said to be stationary (Gujarati, 2021). Stationarity was tested using the augmented dickey fuller (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).

With the null hypothesis that there is a unit root in the time series and an alternative hypothesis that the time series does not have a unit root, which can be expressed as:

$$H_0: \theta = 1$$
$$H_1: \theta < 1$$

If the ADF test's p-value is less than the 5 per cent significance level, the null hypothesis is rejected. Being that some of the time series were nonstationary, they were 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 bounds and Johansen tests were employed to check for cointegration. The ARDL bounds test follows the null hypothesis of no cointegration with an alternative hypothesis that there is cointegration in the model, which can be presented as:

$$H_0: no\ cointegration$$
$$H_1: presence\ of\ cointegration$$

If the ARDL bounds test's F-statistic exceeds all the upper bounds values, H_0 is rejected but if it is lower than all the lower bounds values, H_0 cannot be rejected. In addition, if the ARDL bounds test's t-statistic is less than all the upper bound values, H_0 is rejected but if it exceeds all the lower bound values, H_0 is accepted. The null hypothesis of the Johansen test is that there is no cointegrating equation in the model with an alternative hypothesis that there is/are cointegrating equation(s) in the model. This can be expressed as:

$$H_0: no\ cointegrating\ equation$$

$$H_1: presence\ of\ cointegrating\ equation(s)$$

H_0 is rejected if the maximum and trace statistics are greater than the 5 per cent critical values; however, H_0cannot be rejected if the maximum and trace statistics are less than the 5 per cent critical values. The presence of cointegration suggests that two or more variables have a long-run relationship.

Diagnostic Tests

Prior to making inferences from the results obtained, it was essential to ascertain that the fundamental assumptions for the analysis of linear regression models are preserved, diagnostic testing was crucial. If these assumptions are violated then the results obtained might be inefficient or misleading (Greene, 2020). Therefore, there was need to conduct these tests to ensure the validity of the results.

Linearity Test

The linearity test is used 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 forms, making it essential to test for linearity (Arai, 2020). The correct specification of the model was assessed using the Ramsey RESET test. The Ramsey RESET test's null hypothesis is that the model has no omitted variables, whereas the alternative hypothesis is that the model has omitted variables. This can be specified as:

$$H_0: model\ has\ no\ omitted\ variables$$
$$H_1: model\ has\ omitted\ variables$$

Reject H_0 if the Ramsey RESET test's p-value is less than the 0.05 significance level, but do not reject H_0 if it's greater than the 0.05 significance level.

Normality Test

The normality test is carried out to ensure that the error terms are normally distributed in 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. In order to verify normality, the Jarque-Bera (JB) test was employed. The null hypothesis of the JB test assumes normality while the alternative hypothesis assumes non-normality. This can be represented as:

$$H_0: normality$$
$$H_1: non-normality$$

Accept H_0 if the JB test's p-value is higher than the 0.05 significance level but reject H_0if it is lower than the 0.05 significance level.

Multicollinearity Test

The multicollinearity test was carried out using the variance inflation factor (VIF) and the correlation matrix. A high VIF implies multicollinearity (Greene, 2020). For instance, multicollinearity is indicated by a VIF value larger than 10. The correlation matrix was also used to check for multicollinearity. High pairwise correlation indicates multicollinearity (Gujarati, 2021). For instance, a pairwise correlation value of 0.8 and above indicates high multicollinearity.

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 Breusch-Godfrey (BG) and langrage multiplier (LM) tests were used to test for autocorrelation. The BG test follows a null hypothesis of no serial correlation with an alternative hypothesis that there is serial correlation, which can be expressed as:

$$H_0: no\ serial\ correlation$$
$$H_1: presence\ of\ serial\ correlation$$

H_0 is accepted if the BG test's p-value is higher than the 0.05 significance level; however, if it is below, the H_0 is rejected. On the other hand, the LM test's null hypothesis is that there is no autocorrelation at a particular lag order, with an alternative hypothesis of autocorrelation exists at a particular lag order. This can be stated as:

$$H_0: no\ autocorrelation\ at\ lag\ order$$
$$H_1: presence\ autocorrelation\ at\ lag\ order$$

If the LM test's p-value is greater than the 0.05 significance level, H_0 is accepted; if it is less, $H_0$is rejected. 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 the error 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 Breusch-Pagan (BP), White and autoregressive conditional heteroscedasticity (ARCH) LM tests were used to test for heteroscedasticity. The BP test's null hypothesis is that residuals have constant variance, and the alternative hypothesis is that residuals do not have constant variance. This can be presented as:

$$H_0: constant\ variance$$
$$H_1: non-constant\ variance$$

H_0 is accepted if the BP test's p-value is greater than the 0.05 significance level; if it is lower, $H_0$is rejected. On the other hand, the alternative hypothesis for the White test is that residuals have conditional heteroscedasticity, and the null hypothesis is that the residuals are homoscedastic, which can be stated as:

$$H_0: homoscedasticity$$
$$H_1: unrestricted\ heteroscedasticity$$

If the white test's p-value is greater than the 0.05 significance level, H_0 is accepted; if it is less, H_0 is rejected. The ARCH LM test was also used to check for conditional heteroscedasticity in models 3.9 and 3.10, which follows a null hypothesis of no arch effects in the model and an alternative hypothesis that there are arch effects in the model, which can be expressed as:

$$H_0: no\ ARCH\ effects$$
$$H_1: ARCH(p)\ disturbances$$

H_0 is accepted if the p-value for the ARCH LM test is higher than the 0.05 significance level; if it is below, $H_0$is rejected.

Stability Test

A stability test was 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 3.8 was assessed using the CUSUM and CUSUMQ tests. The stability of both models 3.9 and 3.10 was assessed using the eigenvalue stability condition. Parameter stability translates to model stability.

Data Processing and Analysis

Data on the BOP, CAD, RER, total government revenue, total government expenditure, RIR, inflation rate, money supply and TOT were obtained. The total government revenue and expenditure were used to generate

the budget deficit, which was transformed to a percentage of GDP. The BOP, CAD and money supply were also in their percentages of GDP. The variables of interest were the BOP, CAD, RER and budget deficit while the rest of the variables were control variables. Data analysis was done using STATA. Summary statistics, correlation analysis, causal analysis, regression analysis and diagnostics were derived from the analysis.

The study sought to examine how the budget deficit affects the BOP, CAD and EXR in Kenya. Correlation analysis was employed to determine how independent variables relate to the dependent variable because it aids in the comprehension of the degree to which variations in the dependent variable are influenced by changes in the independent variables. Causal analysis was used to ascertain whether the budget deficit and CAD are helpful in predicting each other. Causal analysis was also used to determine whether the budget deficit and EXR are useful in forecasting each other. Causality was inferred using the VEC estimates since the short-run VECM coefficient estimates imply short-run causality while long-run VECM coefficient estimates imply long-run causality. In addition, the effects of the budget deficit on the BOP were evaluated by regression analysis. The ECM was used to estimate these effects.

IV. Empirical Findings

Introduction

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

Characteristics of the Data

This subsection outlines the data and variables the study used. The study utilized annual time series data from 1993 to 2023 because the market forces of demand and supply influenced the fluctuations in the EXR during this period. The data was sourced from the World Bank and IMF databases. Data on the balance of payments (BOP), current account deficit (CAD), real exchange rate (RER), budget deficit (BD), inflation (INF), real interest rate (RIR), money supply (MS) and terms of trade (TOT) was obtained.

Descriptive Statistics

This segment presents a summary of the data and demonstrate how the data is distributed. Table 4.1 shows descriptive statistics for the BOP, CAD, RER, budget deficit, inflation, RIR, money supply and TOT. All these variables were expressed in percentages apart from the RER. The mean, median, minimum, maximum, variance, standard deviation, skewness and kurtosis, are among the statistics included in the table.

Table 4.1: Descriptive Statistics

Variable	Mean	Median	Min.	Max.	Variance	Std. Dev.	Skewness	Kurtosis	Obs.
BOP	-0.6867	-0.2500	-5.0753	2.5852	3.1650	1.7791	-0.7139	3.4011	31
CAD	-6.3144	-5.3970	-18.6798	0.8885	23.8536	4.8840	-1.2571	4.1748	31
RER	106.7737	100.2491	53.8945	158.6693	1011.0260	31.7966	0.2867	1.7690	31
BD	-3.5083	-3.4604	-8.2256	2.0019	9.5679	3.0932	0.2813	2.1040	31
INF	10.1862	7.6714	1.5543	45.9789	77.6334	8.8110	2.6846	10.5416	31
RIR	8.1574	7.8311	-10.0960	21.0963	55.4461	7.4462	-0.5949	3.2858	31
MS	37.8820	38.0160	31.8736	42.8194	6.2160	2.4932	0.0399	2.8337	31
TOT	96.8756	96.7279	86.1675	114.5036	51.3763	7.1677	0.6251	2.7937	31

Source: Author's computations

Table 4.1 shows that the BOP has a mean of -0.69 and a standard deviation of 1.78, with minimum and maximum values of -5.08 and 2.59 respectively. The CAD has a mean of -6.31 and a standard deviation of 4.88, with minimum and maximum values of -18.68 and 0.88 respectively. The RER has a mean of 106.77 and a standard deviation of 31.80, with minimum and maximum values of 53.89 and 158.67 respectively. The budget deficit has a mean of -3.51 and a standard deviation of 3.09, with minimum and maximum values of -8.23 and 2.00 respectively. Inflation has a mean of 10.19 and a standard deviation of 8.81, with minimum and maximum values of 1.55 and 45.99 respectively. The RIR has a mean of 8.16 and a standard deviation of 7.45, with minimum and maximum values of -10.10 and 21.10 respectively. Money supply has a mean of 37.88 and a standard deviation of 2.49, with minimum and maximum values of 31.87 and 42.82 respectively. Finally, The TOT has a mean of 96.88 and a standard deviation of 7.17, with minimum and maximum values of 86.16 and 114.50 respectively.

Time Series Tests

Time series tests undertaken prior to the regression to guarantee non-spurious findings are described in this subsection. Both the unit root and cointegration tests were carried out. The purpose of the unit root test is to verify that the data is stationary. The unit root test is meant to ensure that the data is stationary. On testing for stationarity, variables that were not stationary at level were differenced to make them stationary. Additionally, the cointegration test was used to determine whether a long-term relationship between the variables exists.

Unit Root Test

The existence of unit roots was examined using the ADF test and the results presented in table 4.2. From the ADF test the BOP, inflation, and RIR were stationary at level, which implies that these series are integrated of order zero. However, the CAD, RER, budget deficit, money supply, and TOT contain unit roots.

Table 4.2: Unit Root Test Results

Variable	Test Type	Form of Test	p-value	Test Statistic	5% Critical Value	Conclusion
BOP	ADF	Intercept	0.0000	-5.615	-2.986	Stationary I(0)
		Intercept & Trend	0.0000	-6.542	-3.580	Stationary I(0)
BD	ADF	Intercept	0.2446	-2.100	-2.986	Not stationary
		Intercept & Trend	0.1360	-2.986	-3.580	Not stationary
d(BD)	ADF	Intercept	0.0000	-6.329	-2.989	Stationary I(1)
		Intercept & Trend	0.0000	-6.200	-3.584	Stationary I(1)
INF	ADF	Intercept	0.0000	-6.354	-2.986	Stationary I(0)
		Intercept & Trend	0.0000	-5.974	-3.580	Stationary I(0)
RIR	ADF	Intercept	0.0010	-4.103	-2.986	Stationary I(0)
		Intercept & Trend	0.0021	-4.415	-3.580	Stationary I(0)
CAD	ADF	Intercept	0.0654	-2.752	-2.986	Not stationary
		Intercept & Trend	0.1688	-2.881	-3.580	Not stationary
d(CAD)	ADF	Intercept	0.0000	-6.467	-2.989	Stationary I(1)
		Intercept & Trend	0.0000	-6.348	-3.584	Stationary I(1)
RER	ADF	Intercept	0.5680	-1.430	-2.986	Not stationary
		Intercept & Trend	0.7312	-1.744	-3.580	Not stationary
d(RER)	ADF	Intercept	0.0001	-4.592	-2.989	Stationary I(1)
		Intercept & Trend	0.0013	-4.534	-3.584	Stationary I(1)
MS	ADF	Intercept	0.0306	-3.048	-2.986	Stationary
		Intercept & Trend	0.0703	-3.276	-3.580	Not stationary
d(MS)	ADF	Intercept	0.0000	-7.283	-2.989	Stationary I(1)
		Intercept & Trend	0.0000	-7.151	-3.584	Stationary I(1)
TOT	ADF	Intercept	0.2440	-2.101	-2.986	Not stationary
		Intercept & Trend	0.4729	-2.230	-3.580	Not stationary
d(TOT)	ADF	Intercept	0.0000	-6.442	-2.989	Stationary I(1)
		Intercept & Trend	0.0000	-6.377	-3.584	Stationary I(1)

Source: Author's computations

Table 4.2 shows that at the 0.05 significance level, the null hypothesis of the presence of a unit root was rejected for the BOP, inflation, and RIR, which implies that these variables are considered to be stationary at level. Conversely, the null hypothesis of the presence of a unit root was not rejected at the 5 per cent significance level for the CAD, RER, budget deficit, money supply, and TOT, which implies that these variables contain unit roots. Non-stationary variables were further differenced in order to make them stationary. On differentiation, the CAD, RER, budget deficit, money supply and TOT became stationary on first difference, which implies that they are integrated of order one.

Cointegration Test

The Cointegration test was also carried out in order to avoid spurious regressions. The ARDL bounds test was used to conduct the cointegration test, which was meant to ascertain whether the BOP budget deficit, inflation and RIR have a short-term or long-term relationship. To ascertain whether there is a short-term or long-term relationship between the CAD and budget deficit, the Johansen test was employed. The budget deficit, money supply, TOT, and RER were also examined for a long-term or short-term association using the Johansen test. Prior to cointegration analysis, the optimal lag was established using the Akaike information criterion (AIC). The AIC test results for model 3.8 are outlined in table 4.3.

Table 4.3 AIC Results

Variable	BOP	BD	INF	RIR
Optimal Lag	1	2	0	0

Source: Author's computations

The AIC was used to determine the optimal number of lags for each of the model variables. Table 4.3 shows that the optimal lag for the BOP, budget deficit, inflation and RIR is 1, 2, 0 and 0 respectively. On determination of the optimal lag for each variable, the ARDL bounds test for cointegration was performed and table 4.4 outlines the results.

Table 4.4 ARDL Bounds Test Results

	Lower Bound	Upper Bound		Lower Bound	Upper Bound
F-statistic (9.743)			t-statistic (-4.768)		
	2.72	3.77		-2.57	-3.46
	3.23	4.35		-2.86	-3.78
	3.69	4.89		-3.13	-4.05
	4.29	5.61		-3.43	-4.37

Source: Author's computations

Table 4.4 shows that the F-statistic is 9.74, which is greater than all the upper-bound values. In addition, the t-statistic is -4.77, which is less than all the lower-bound values. This suggests that there is cointegration between the BOP, budget deficit, inflation, and RIR, which implies that a long-term relationship exist between these variables. This implies that the inferred relationship would be estimated by the ECM. The optimal lags for the variables in models 3.9 and 3.10 were also identified using the AIC. The joint optimal lag for the variables in model 3.9 was 1 and the joint optimal lag for the variables in model 3.10 was 4. On the determination of the optimal lag, the Johansen test was performed to check for cointegration, and the findings are presented in table 4.5.

Table 4.5 Johansen Test Results

	Maximum Rank	Trace Statistic	5% Critical Value of the Trace Statistic	Maximum Statistic	5% Critical Value of the Maximum Statistic
Model 3.9	0	12.8359	15.41	9.0042	14.07
	1	3.8317	3.76	3.8317	3.76
Model 3.10	0	59.5201	47.21	25.9398	27.07
	1	33.5803	29.68	16.8676	20.97
	2	16.7127	15.41	13.6485	14.07
	3	3.0642	3.76	3.0642	3.76

Source: Author's computations

Table 4.5 demonstrates that model 3.9's trace and maximum statistics of rank 0 are less than their 5 per cent critical values, which implies that there is no cointegrating equation in that rank. In addition, both rank 1's maximum and trace statistics exceed their 5 percent critical values, which implies that there is a maximum of one cointegrating equation in the model. Ultimately, concluded that there is cointegration in model 3.9. This suggests that the CAD and budget deficit have a long-term relationship. Unfortunately, there is a discrepancy between the maximum and trace statistics for model 3.10. Although the maximum eigenvalue test presents fewer size distortions than the trace test, the trace test is superior to the maximum eigenvalue, especially for small samples (Lütkepohl, 2001). Therefore, the trace test results were adopted. These results illustrate that there is cointegration between the variables in model 3.10. Since the trace statistics for ranks 0, 1, and 2 are greater than their 5 per cent critical values, which implies that there is cointegration in these ranks. On the other hand, the trace statistic for rank 3 is less than its 5 per cent critical value, which implies that the model contains a maximum of 2 cointegrating equations.

Diagnostic Tests

The diagnostic tests performed prior to drawing conclusions from the findings are described in this subsection.

Linearity Test

The Ramsey RESET test was used to test model misspecification in the ARDL model, which includes checking for omitted variables and/or incorrect functional forms. The p-value of the Ramsey RESET test was 0.7929, which exceeds the significance threshold of 0.05. This implies that the model was not misspecified.

Normality Test

To determine whether the estimated residuals are normally distributed, a normality test was conducted. Normality was tested using the JB test, and the findings presented in table 4.6.

Table 4.6 Jarque-Bera Test Results

	Equation	Chi2	Degrees of Freedom	p-value
Model 3.8	Residuals	0.3587		0.8358
Model 3.9	D_CAD	1.963	2	0.37468
	D_BD	1.484	2	0.47613
	ALL	**3.447**	**4**	**0.48591**
Model 3.10	D_RER	2.575	2	25.9398
	D_BD	0.615	2	16.8676
	D_MS	0.666	2	13.6485
	D_TOT	0.436	2	0.45885
	ALL	**4.293**	**8**	**0.29192**

Source: Author's Computations

Table 4.6 shows that the p-value for model 3.8 residuals is 0.84, which is greater than the 0.05 significance level. This indicates normality in model 3.8. Table 4.6 also shows that the p-value for model 3.9 is 0.49, which exceeds the 0.05 significance level. This demonstrates normality in model 3.9. In addition, the p-value of model 3.10 is 0.29, which is greater than the 0.05 significance level. This denotes normality in model 3.10.

Multicollinearity Test

The VIF was used to test for multicollinearity in model 3.8. The VIF value was 1.48, which is less than 10. This implies that there was no multicollinearity in the model. In addition, model 3.10 was tested for multicollinearity using the correlation matrix; the findings are outlined in table 4.7.

Table 4.7 Correlation Matrix for Model 3.10

Variables	RER	BD	MS	TOT
RER	1.0000			
BD	-0.7865	1.0000		
MS	0.3678	-0.4809	1.0000	
TOT	-0.1678	-0.1075	0.0861	1.0000

Source: Author's computations

From table 4.7 there are no values that are greater than 0.8 which implies that there is no multicollinearity in model 3.10.

Autocorrelation Test

The BG and LM tests were used to test for serial correlation amongst residuals. The BG test was used to test for serial correlation in model 3.8 and the results summarized in table 4.8.

Table 4.8 Breusch-Godfrey Test Results

Lags	Chi2	Degrees of Freedom	p-value
1	0.001	1	0.9708

Source: Author's Computations

Table 4.8 shows that the p-value is 0.97, which is greater than the 0.05 significance level, which implies no serial correlation in the model. The LM test was also used to test for autocorrelation in models 3.9 and 3.10 and table 4.9 presents the findings.

Table 4.9 Langrage Multiplier Test Results

	Lags	Chi2	Degrees of Freedom	p-value
Model 3.9	1	2.5677	4	0.63255
Model 3.10	1	11.9125	16	0.74998
	2	15.9524	16	0.45629
	3	19.1544	16	0.26074
	4	14.8291	16	0.53719

Source: Author's Computations

Table 4.9 indicates that the p-value for the first lag of model 3.9 is 0.63, which is greater than the 0.05 significance level. This implies that there is no autocorrelation in model 3.9. Table 4.9 also shows that the p-values for the first, second, third and fourth lags of model 3.10 are 0.75, 0.46, 0.26 and 0.54 respectively, which are greater than the 0.05 significance level. This indicates that there is no autocorrelation in model 3.10.

Heteroscedasticity Tests

The BP, White and ARCH LM tests were used to test for heteroscedasticity. The BP test was used to check for heteroscedasticity in model 3.8 and the results are summarized in table 4.10.

Table 4.10 Breusch-Pagan/Cook-Weisberg Test Results

Variables	Chi2(1)	p-value
Fitted values of D.BOP	0.84	0.3581

Source: Author's Computations

Table 4.10 shows that the p-value of the chi-square statistic is 0.36, which is greater than the 0.05 significance level. This implies that the model error terms are homoscedastic. These results were supported by the White test whose results are outlined in table 4.11.

Table 4.11 Cameron & Trivedi's Decomposition of IM Test Results

Source	Chi2	Degrees of Freedom	p-value
Heteroscedasticity	28.64	27	0.3788
Skewness	8.58	6	0.1988
Kurtosis	0.65	1	0.4185
Total	37.87	34	0.2972

Source: Author's Computations

Table 4.11 shows that the p-value of the chi-square statistic is 0.38 which is greater than the 0.05 significance level. This implies homoscedasticity of the model's error terms. In addition, the ARCH LM test was used to test for the presence of heteroscedasticity in models 3.9 and 3.10.

Table 4.12 ARCH LM Test Results

Model	Lags	Chi (2)	Degrees of Freedom	p-value
Model 3.9	1	0.125	1	0.7234
Model 3.10	1	0.364	1	0.5465
	2	0.335	2	0.8458
	3	0.515	3	0.9156
	4	0.903	4	0.9241

Source: Author's computations

Table 4.12 shows that the p-value for model 3.9 is 0.72, which indicates there is no heteroscedasticity in the model. Table 4.12 also shows that the p-values for lags 1, 2, 3 and 4 of model 3.10 are 0.55, 0.85, 0.92 and 0.92 respectively. This indicates that model 3.10's residuals are homoscedastic.

Stability Test

The CUSUM and CUSUMQ tests were used to test for the stability of model 3.8 parameters.

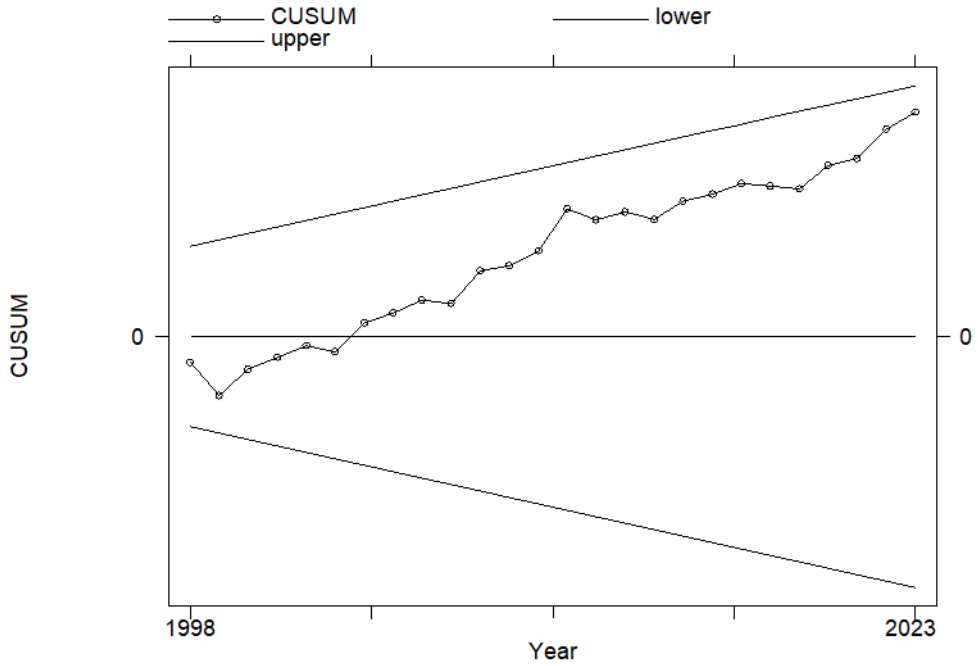

Figure 4.1 CUSUM Plot for the Balance of Payments

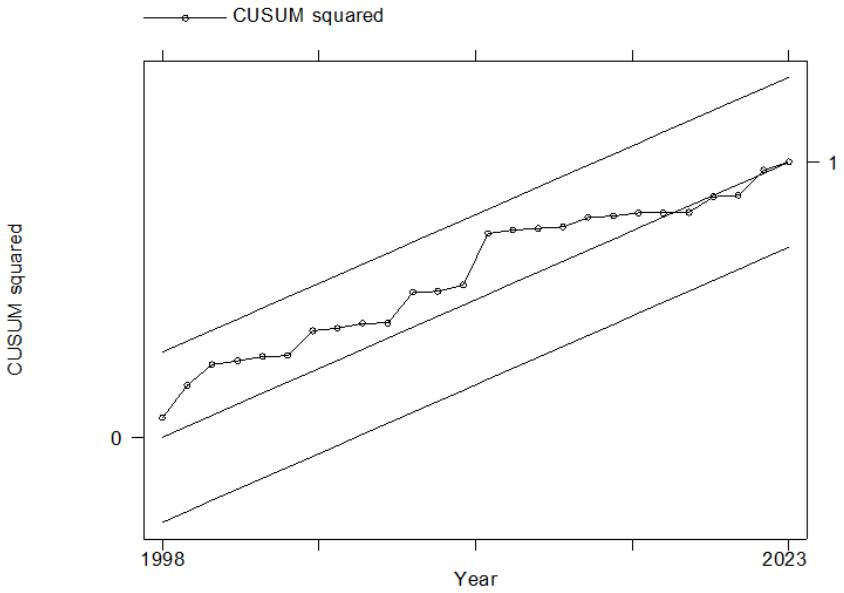

Figure 4.2 CUSUMQ Plot for the Balance of Payments

The CUSUM and CUSUMQ plots fall within the 5 per cent confidence interval of parameter stability, which implies that the coefficients were stable over the period under study in Kenya. In addition, the eigenvalue stability condition was used to check for stability in both models 3.9 and 3.10. The VECM specification under model 3.9 imposes a unit modulus, which indicates that the model was stable in the period under study. The VECM specification under model 3.10 imposes 3 units moduli, which indicates that the model was stable in the period under study.

Regression Results

A regression was performed for each of the three models specified in Chapter 3. The results for each of the models listed in Chapter 3 are described in depth in this subsection.

Effects of Budget Deficits on the Balance of Payments

Model 3.8 was used to model the effects of budget deficits on the BOP. The ECM was used to estimate the relationship between these variables and the results are presented in table 4.13.

Table 4.13 Regression Results for the Balance of Payments

Dependent variable: BOP				
Variables	Coefficient	Std. Error	t-statistic	p-value
BD	-0.2905804 **	0.1367728	-2.12	0.045
INF	0.1379919	0.1106506	1.25	0.225
RIR	0. 0857534	0.067328	1.27	0.216
Adjustment Term	-1.001144***	0.2099834	-4.77	0.000
R-squared = 0.6661				
Adjusted R-squared = 0.5751				
No. of Observations = 29				

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

Source: Author's Computations

Table 4.13 shows that the budget deficit, inflation and RIR explain 58 per cent of the variation in the BOP in Kenya. The budget deficit is significant at the 5 per cent level. However, the RIR and inflation are not significant. In addition, the adjustment term is -1.00 and significant at the 1 per cent level, which implies that the previous period errors are corrected in the current period. This suggests that the variables have a long-term relationship. Furthermore, the coefficient of the budget deficit is -0.29 and significant at the 5 per cent level, which implies that a percentage change in the budget deficit is associated with a 0.29 per cent decline in the BOP on average ceteris paribus. This suggests that a budget deficit increase deteriorates the BOP. This can be justified by the fact that a budget deficit raises aggregate demand. The degree to which the budget deficit affects the BOP depends on the extent to which consumption and imports relate with income. However, if real wages are fixed and some percentage of the government spending is allocated to non-tradables, the budget deficit would have a greater effect on the BOP. A higher budget deficit raises aggregate demand, which boosts output and raises inflation. Since a budget deficit indicates higher government spending over income, it causes an equivalent boost in output unless the economy is operating below its potential. In the short term, rising government spending tends to expand the demand for imports over exports, which deteriorates the BOP. These results resonate with the absorption approach. The study's findings indicated a negative relationship between the budget deficit and the BOP, which is consistent with Arabi (2019), who demonstrated that the fiscal deficit deteriorates the BOP. In a nutshell, there exists a negative relationship between the budget deficit and the BOP in Kenya. Therefore, policy makers should develop policies meant to curtail the growing deficits since wider deficits have spillover effects on the external sector. The BOP provides investors with insight into the nation's economic stability because a country's BOP balance can reveal underlying economic problems.

Effects of Budget Deficits on the Current Account Deficit

Model 3.9 was used to model the effects of budget deficits on the CAD. The causality between the budget deficit and CAD was inferred using the VEC estimates, and the results are presented in table 4.14.

Table 4.14 Causality Test Results

Variables	Adjustment Coefficient	Std. Error	t-statistic	p-value
D_CAD (adjustment term)	-0.3519975**	0.1410401	-2.50	0.013
D_BD (adjustment term)	-0.1759381***	0 .0681012	-2.58	0.010
No. of Observations = 30				

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

Source: Author's Computations

Table 4.14 shows that the adjustment term of the CAD equation is -0.35 and significant at the 5 per cent level, which suggests that short run shocks affect movements in individual series, converging to equilibrium in the long run. This implies that the budget deficit causes a CAD in the long run. The twin deficits hypothesis can account for the negative relationship between the budget deficit and the current account. Since the twin deficits hypothesis indicates that a wider budget deficit will result in an expansion of the interest and exchange rates. Foreign investors are more inclined to invest in the domestic market as a result of the increased interest rate. As a consequence of the increased interest and exchange rates, domestic demand and domestic currency value rise, making imports more affordable and exports more costly. The demand for imports will rise in proportion to exports as a result of the home currency appreciation, generating a current account deficit.

Table 4.14 also shows that the adjustment term of the budget deficit equation is -0.18 and significant at the 1 per cent level, which indicates that short-term shocks affect the movement of individual series that eventually converge to equilibrium. This implies that the CAD results in a budget deficit. Since a CAD implies reduced export productivity, which reduces the country's capacity to generate foreign exchange. The lower foreign exchange implies reduced savings and investment. In the presence of lower savings and investment, the

government will expand expenditure in order to maintain aggregate demand and employment, which in turn widens the budget deficit. The study indicated bidirectional causality between the budget deficit and the CAD, which is consistent with Rajakaruna and Suardi (2021). Given that the current account deficit expands with a wider budget deficit, and the budget deficit expands with large current account deficits. This could result in a vicious cycle if left unchecked. Therefore, the government needs to develop policies which ensure fiscal discipline.

Effects of Budget Deficits on the Exchange Rate

Model 3.10 was used to model the effects of budget deficits on the EXR. The causality between budget deficits and the EXR was inferred using the VEC estimates, and the results are given in table 4.15.

Table 4.15 Causality Test Results

	Variables	No. of Lags	Coefficient	Std. Error	t-statistic	p-value
D_RER	Adj. Term	1	0.0229821	0.1277203	0.18	0.857
	BD	1	0.5286313	1.396058	0.38	0.705
		2	0.0341997	1.173804	0.03	0.977
		3	-0.9681369	1.102353	-0.88	0.380
D_BD	Adj. Term	1	-0.0758846 ***	0.0199407	-3.81	0.000
	RER	1	-0.1650256***	0.059606	-2.77	0.006
		2	-0.0678273	0.0616884	-1.10	0.272
		3	0.1508296**	0.0640319	-2.36	0.018

***, ** and * denote significance at 1%, 5% and 10% respectively

Source: Author's Computations

Table 4.15 shows that the adjustment term of the RER equation is 0.23 and not significant, which indicates that short-term shocks do not affect movements in individual series, therefore, no convergence to equilibrium in the long run. This implies that there is no long-run causality in the RER equation. Table 4.15 also indicates that the adjustment term of the budget deficit equation is -0.08 and significant at the 1 per cent significance level, which indicates that short-term shocks influence movements in individual series, converging to equilibrium in the long run. This implies that there is long-run causality in the budget deficit equation.

In addition, the p-value of the first and third lag of the RER in the budget deficit equation is 0.006 and 0.018 respectively, which indicates that the first lag of the RER has a 1 per cent causal effect on the budget deficit in the short-run and the third lag of the RER has a 5 per cent causal effect on the budget deficit in the short-run. This indicates that RER adjustments would engender a budget deficit in the short run. Therefore, there is unidirectional causality between the RER and the budget deficit. In that, the budget deficit does not cause movements in the RER, but RER adjustments influence budget deficits, which is consistent with Saxena and Singh (2019) indicating unidirectional causality that advances from the EXR to the fiscal deficit. These findings can be reinforced by the fact that interest rates rise, and prices fall as a result of exchange rate appreciation. The increased interest rates encourage capital inflow while the demand for domestic goods rises with reduced prices. The increased capital inflow and exports in turn lower interest rates and stimulate government expenditure, which widens the fiscal deficit. In a nutshell the exchange rate affects capital flows that are accompanied by an equivalent domestic resource transfer from the private to the public sector. Therefore, the government ought to develop exchange rate policies in order to prevent frequent depreciation of the local currency, which could have an impact on the nation's fiscal stance.

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 BOP and exchange rate in Kenya. Specifically, the study aimed to examine how the budget deficit affects the BOP, CAD and EXR in Kenya. 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 BOP and exchange rate.

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 under constraint. On the other hand, increased taxes act as a disincentive since they would reduce income, consumption, and private investment, which in turn inhibit 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, budget deficits continue to widen. Despite the fact that there exists a relationship between the budget deficit and BOP, the dynamics of the relationship are not properly defined. Because theoretical arguments are ambiguous and empirical literature is contradictory. This made it necessary to examine the relationship between budget deficits and the BOP.

In addition, the influence of the current account on the BOP cannot be underrated because the current account makes up the largest portion of the BOP. This accentuated the vitality of assessing the association between the budget deficit and current account deficit. Furthermore, BOP imbalances influence the exchange rate. This necessitated the expansion of the study to capture the effects of budget deficits on the EXR. It is also unclear how budget deficits and the exchange rate are related because theoretical justifications and empirical literature are incongruous. In addition, budgetary issues in emerging nations differ from those in developed nations and developing nations' financial markets are inefficient, which makes it difficult to finance deficits, generating different outcomes on the BOP and exchange rate. Therefore, the study sought to examine the effects of budget deficits on the BOP, CAD and EXR in Kenya. To achieve the research objectives, data on the BOP, CAD, RER, budget deficit, inflation, RIR, money supply and TOT was obtained. The data was sourced from the world bank and IMF databases. The study utilized the error correction model and causality checks in order to answer the research questions. Prior to the regression, 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, multicollinearity, autocorrelation, heteroscedasticity and stability tests were carried out before making inferences from the findings.

The first objective of the study was to assess the effects of budget deficits on the BOP in Kenya. Empirical results revealed that the coefficient of the budget deficit is -0.29 and significant at the 5 per cent level, which implies that a percentage change in the budget deficit is associated with a 0.29 per cent decline in the BOP on average ceteris paribus. Therefore, there is a negative relationship between the budget deficit and the BOP in Kenya. Furthermore, the model explains 58 per cent of the variability in the BOP. Therefore, we can conclude that 58 per cent of the variability in the BOP can be explained by the budget deficit, inflation and RIR and the rest through other variables.

The second objective of the study was to investigate the effects of the budget deficit on CAD in Kenya. Empirical results revealed that the CAD equation’s adjustment term was -0.35 and significant at the 5 per cent level, which implies that a budget deficit leads to a CAD in the long run. The findings also revealed that the budget deficit equation's adjustment term was -0.18, and significant at the 1 per cent level, which suggests that the CAD causes the budget deficit in the long run. Therefore, there exists bidirectional causality between the fiscal deficit and the CAD. This implies that the budget deficit would result in a CAD and the CAD would lead to a budget deficit. Therefore, the growing budget deficit in Kenya needs to be kept in check since it could lead to a CAD, and the CAD would in turn widen the budget deficit creating a vicious cycle.

The third objective of the study was to examine the effects of the budget deficit on the EXR in Kenya. The findings revealed that the p-value of the first and third lag of the RER in the budget deficit equation was 0.006 and 0.018 respectively, which implies that the first lag of the RER has a 1 per cent causal effect on the budget deficit in the short-run and the third lag of the RER has a 5 per cent causal effect on the budget deficit in the short-run. This indicates that RER adjustments cause the budget deficit in the short run. Conversely, the budget deficit does not cause movements in the RER. Therefore, there is unidirectional causality between the fiscal deficit and the RER. In that, the budget deficit does not cause movements in the RER, but RER adjustments influence budget deficits.

Conclusions

Based on the empirical findings, the study concluded that budget deficits influence the BOP in Kenya. The study adopted the BOP, budget deficit, inflation and RIR to estimate the effects of the budget deficit on the BOP. The coefficient of the budget deficit was significant while the coefficients of inflation and the RIR were not significant. The study established there is a negative relationship between the budget deficit and the BOP. The study also used the CAD and the budget deficit to establish causality between these variables. The findings revealed bidirectional causality between the CAD and the budget deficit. In that, a CAD would result in a budget deficit and a budget deficit would cause a CAD. In addition, the study utilized the RER, budget deficit and TOT to establish causality between the RER and the budget deficit. The results revealed unidirectional causality between the RER and the budget deficit. In other words, a budget deficit does not cause movements in the RER while the adjustments in the RER influence the budget deficit.

Empirical findings reveal that budget deficit increase deteriorates the current account and BOP. 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 or negative effect on 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 deficit has a negative effect on the BOP in Kenya, which implies that the continued growth of budget deficits expands the BOP deficit. An indication that there is need for prudent budget management because it promotes fiscal discipline. Fiscal discipline is necessary to the elimination of persistent budget deficits in order to prevent deterioration of the BOP since a BOP deficit signifies the nation's reliance on external financial sources, such as foreign borrowing or investment, which raises the nation's susceptibility to economic shocks. In addition, a BOP deficit indicates increased spending on imports than its earnings from exports and other sources, which depletes foreign reserves and depreciates domestic currency. Therefore, the government should endeavour to keep the growing deficits in check, which is particularly significant because the increasing fiscal deficit expands the BOP deficit depleting the country's international reserves, depreciating domestic currency and raising the country's susceptibility to external shocks.

Furthermore, the budget deficit results in a CAD and the CAD causes a budget deficit creating a vicious cycle. This might increase the nation's dependence on external debt, making the country more susceptible to economic shocks, put pressure on domestic currency to depreciate, lower international reserves and inhibit economic growth. On that note, the study recommends the establishment of a regulatory framework tailored towards budget deficit reduction and effective utilization of government resources. The study also recommends that the government should strive to increase the nation's export competitiveness, which in turn improves the current account and the entire BOP through the creation of a conducive environment for industries, prioritizing the expansion of productivity and the quality of G&S using technology. In addition, clear lines of accountability must be established to boost budget management. Furthermore, policymakers 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 BOP and exchange rate. The study focussed on the effects of budget deficits on the CAD, BOP and EXR. The study proposes extensive research on other channels through which the BOP can be assessed.

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