EFFECTS OF BUDGET AND EXTERNAL DEFICITS ON ECONOMIC GROWTH EVIDENCE FROM KENYA

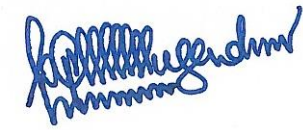**MUGO PATRICK MUGENDI**

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A Thesis Submitted to the Faculty of Arts and Social Sciences in Partial Fulfilment of the Requirements for the Award of the Doctor of Philosophy Degree in Economics at the

University of Nairobi

NOVEMBER 2022

DECLARATION

I, the undersigned, declare that this Thesis is my original work and has not been presented for a degree in any other University

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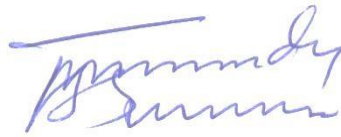
APPROVAL

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DEDICATION

In loving memory of my Mum, Mrs. Maria Mugo and Dad, Mr. Albert Mugo.

To my dear wife Fridah and our lovely children.

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ABBREVIATIONS

ADF   Augmented Dickey Fuller

AfDB   African Development Bank

AERC   African Economic Research Consortium

ARDL   Autoregressive Distributed Lag

BOP   Balance of Payments

BPM   Balance of Payments Manual

CBK   Central Bank of Kenya

CPI   Consumer Price Index

EAC   East African Community

ECT   Error Correction Term

ERS   Economic Recovery Strategy

GDP   Gross Domestic Product

GMM   Generalized Method of Moments

IMF   International Monetary Fund

KIPPRA   Kenya Institute for Public Policy Research and Analysis

KNBS   Kenya National Bureau of Statistics

NEO   Net Errors and Omissions

OLS   Ordinary Least Squares

Ph. D   Doctor of Philosophy

SVAR   Structural Vector Autoregressive

UNECA   United Nations Economic Commission for Africa

USA   United States of America

VAR   Vector Autoregressive

VECM   Vector   Error Correction Model

WDI   World Development Indicators

DEFINITIONS OF TERMS

Actual Debt Service: The set of payments actually made to satisfy a debt obligation, including principal, interest, and any late payment fees. Delays in payments on debt service, or on goods and services purchased, are considered a costly means of financing budgetary commitments. Accumulation of arrears is likely to have similar macroeconomic consequences to other forms of public borrowing, as well as jeopardizing future financing, government credibility, and the integrity of the budgetary system.

Borrowing from Abroad: Liquid resources gained from abroad can be employed to enlarge domestic demand as well as imports. Nonetheless, to the extent that external borrowing promotes the importation of additional resources from the rest of the world, the aftermath of a deficit on excess demand for domestic goods and services is lessened. Concessionality is, therefore, important for developing countries, foreign financing often have a grant element, and the larger it is, the more the government can borrow without jeopardizing the sustainability of the fiscal position. In effect, concessionality decreases the effective interest rate.

Budget Deficit: a budget deficit is a situation where outlays (outgoings) exceed incomes; where liabilities exceed assets. Deficit financing by definition is equal to the overall deficit or surplus. Financing is divided into domestic financing obtained from residents and foreign financing, obtained from non residents. The budget deficit may be a cash deficit or and accrual deficit; and it should be net of the effects of inflation and exchange rate fluctuations. By definition, budget deficit may imply fiscal deficit, revenue deficit, or primary deficit.

Current Account Balance: The sum of the balance of trade (export minus import of goods and services), net factor income (such as interest and dividends) and net transfer payments (such as foreign aid). The cyclically adjusted current account balance provides information about where the current account level would have been under a hypothetical situation in which the economic ctivity maintains its long-term trend. The cyclical repercussions of domestic or global expansion or recession periods on the current account balance can be assessed quantitatively.

Current Fiscal Balance: The difference between current revenue and current expenditure. It provides a measure of the government's contribution to national savings. Whenxpositive, it suggests that the government can at least finance consumption from its own revenue. A fundamental concern with this measure is the implicit assumption that all current expenditure is of a consumption nature that does not contribute to growth.

Cyclically Adjusted or Structural Balance: It is a measure of the fiscal position that is net of the impact of macroeconomic developments on the budget. This approach takes account of the fact that, over the course of the business cycle, revenues are likely to be lower (and such expenditure as unemployment insurance benefits higher) at the trough of the cycle. A higher fiscal deficit therefore cannot always be attributed to a loosening of the fiscal stance, but may simply reflect that the economy is moving into a trough. The calculation of a cyclically adjusted or structural balance involves an estimation of what revenues and cyclically adjusted expenditure (and thus the deficit) would be if the economy were at its potential or for some measures of the structural balance, its trend output, rather than its actual output.

Domestic Fiscal Balance: This measure includes only those components of the conventional deficit that arise from transactions with the domestic economy and omits those transactions directly affecting the balance of payments. It is applied to identify the direct expansionary impact of government on the domestic economy. It has proved to be a particularly useful indicator for some oil producing economies, where government revenues from exports do not reduce domestic absorption.

Economy's Solvency: an economy is solvent if the present discounted value of the future trade surplus is equal to the current external indebtedness.

Excessive Current Account Deficit: The notion of 'excessive' current account deficit is based on deviations from an 'optimal' benchmark, which can be calculated under some strict assumptions such as perfect capital mobility and efficient financial markets.

External Grants: These are included with other government revenue on the grounds that they do not add to debt and may finance expenditures that would otherwise not take place. But, grants reflect discretionary financing by donors that can change significantly from time to time. Their inclusion may conceal their possible impermanence and may elicit a structural increase in expenditure, which may subsequently prove difficult to reverse. As such, in assessing the fiscal position, the deficit is normally calculated both inclusive and exclusive of grants. External grants are the ultimate form of concessional financing, although they are formally treated as revenue. Reliance on non-concessional external financing leads to an accumulation of debt, which needs to be serviced and eventually repaid making the economy potentially vulnerable to changes in the exchange rate and world interest rates. It also facilitates the maintenance of a more appreciated exchange rate, damaging exports and encouraging imports. Deficits financed in this manner, therefore, need to be assessed in the context of the external debt position of the country, the medium-term balance of payments prospects, the terms under which borrowing takes place, and the uses to which external borrowing may be put.

Financial Innovation: The introduction of new financial instrument, products or the implementation of new ideas or financial technologies for the betterment of a system.

Fiscal Impulse: The initial stimulus to aggregate demand arising from fiscal policy from whatever source, whether discretionary or otherwise, during a given period.

Foreign Exchange Rate: The Kenya official exchange rate in Kenya shillings per USA dollar.

Gross Domestic Product (GDP): GDP at purchaser's prices is the sum of gross value added by all producers resident in the economy plus any taxes on products and minus any subsidies excluded in the products' value. It is calculated by excluding degradation and depletion of natural resources and depreciation of fabricated assets.

Gross Fixed Capital Formation: The acquisition (including purchases of new or second-hand assets) and creation of assets by producers for their own use, less disposals of produced fixed assets. It is indicated as annual percentages of GDP.

Growth of Real GDP: The annual percentage change in real GDP. Real GDP measures the value of all goods and services produced in a country in a year expressed in 2009 prices taking inflation into consideration.

Growth of GDP per Capita: This refers to the annual percentage change in GDP per capita. It is based on constant domestic currency. GDP per capita is gross domestic product expressed at purchasers' prices divided by midyear total population.

International Investment Position (IIP) of a Country: It is a financial statement of the value and composition of its external financial assets and liabilities. A positive NIIP value indicates that a nation is a creditor nation, while a negative value indicates that it is a debtor nation.

Net International Investment Position (NIIP): It is the difference in the external financial assets and liabilities of a country. External debt of a country includes government debt and private debt. External assets publicly and privately held by a country's legal residents are also taken into account when calculating NIIP.

Net Lending: This includes only transactions in debt and equity claims undertaken for purposes of public policy, rather than for liquidity management.

Operational Budget Balance: This measure takes account of the fact that the high interest rates paid on government debt during times of very high inflation effectively compensate purchasers of government debt for the reduced real value of the debt principal caused by inflation. In such circumstances, the ratios of interest outlays and the$_x$deficit, relative to GDP, are very high; a fortiori, the deficit-to-GDP ratio significantly overstates the extent of the deficit that would prevail in a low inflation rate environment. The "operational balance" excludes that part of interest outlays that compensate debt holders for the impact of actual inflation. Use of the operational deficit concept facilitates an analysis of the underlying stance of fiscal policy by adjusting for inflation-interest rate nexus. However, it has been criticized for imparting an inflationary bias to fiscal policy. Equally, it assumes that bondholders will save 100 percent of the inflationary component of their nominal interest earnings.

Overall Fiscal Balance: On a cash basis, total incomings and outgoings from the budget must always balance. A deficit (or surplus) is determined by drawing a balance among a subset of receipts and payments, which are then financed by other transactions. The difference between revenue and grants, and expenditure and net lending. It emphasizes the extent to which the financing of government expenditure and net lending requires the assumption of debt obligations for future repayment and (or) a rundown in the government's holding of liquid financial assets.

Overall Balance of Payment Balance: This is the sum of balances of the current account and the non-reserve portion of the capital and financial account, plus net errors and omissions. It mirrors the image of transaction changes in reserve assets.

Primary Budget Balance: It excludes interest payments from expenditure. It provides an indicator of current fiscal effort, since interest payments are predetermined by the size of previous deficits. For countries with a large outstanding public$_x$debt relative to GDP, achieving a primary surplus is normally viewed as necessary but not sufficient for a reduction in the debt to GDP ratio.

Real Interest Rate: The lending interest rate adjusted for inflation as measured by GDP deflator

Sustainable Current Account: A current account is sustainable if the continuation of the current government policy stance and (or) of the present private sector behaviour will not entail a need for a 'drastic' policy shift or a balance of payments (currency) crisis. A current account deficit that is

too large to be explained in terms of any given model of consumption, investment and production is described as unsustainable.

Terms of Trade: The ratio of export price index (or unit value index) of goods and services (or unit value index) to import price index of goods and services. The base year is 2009.

Trade Openness: Represents openness of the economy. Trade openness is the sum of imports and exports of goods and services measured as a share of GDP.

ABSTRACT

This Thesis examines the effects of budget and external deficits on economic growth. It reviews whether the long-run relationship between budget and external deficits follows the tenets of: twin-deficit hypothesis, the Ricardian equivalence hypothesis, the current account targeting hypothesis, or the feedback linkages. These have in recent years been debated both in developed and developing countries. In contributing to this ongoing debate, the study analyzes the case of Kenya for the period 1980 to 2016.

The core objectives of the study are to determine the effect of primary budget deficit on economic growth, examine the effect of current account deficit on economic growth, and to analyze the effects of fiscal and external deficits on economic growth, in Kenya. These main objectives are addressed in the three papers of this study. The study applies relatively novel estimation techniques, namely: Unit Root tests, Johansen Cointegration Analysis with allowance for structural breaks, a dynamic vector error correction Model, and a multivariate Toda and Yamamoto (1995) causality representation. It determines the causal effects of budget and external deficits on economic growth using other alternative measures of budget deficits, external deficits and economic growth. Besides establishing stable and robust causal relationships, this thesis also derives policy suggestions on the signs of the dynamic dependencies examined.

The findings reveal that the primary budget deficit has a strong and significant causal effect on economic growth. The estimates suggest a unidirectional causality running from primary budget deficit to growth of GDP per capita. In the short-run, the primary budget deficit reveals a positive relationship but a negative causal effect on growth of GDP per capita in the long run. In the second paper, the estimates suggest that the current account deficit has a significant positive causal effect on growth of GDP per capita in the long run. The estimates further reveal a bidirectional causality running from growth of GDP per capita to current account deficit, and vice versa. In the third paper, results reveal that trade deficit has significant negative causal effect on growth of real GDP with a bidirectional causal effect running from growth of real GDP to trade deficits and vice-versa. These estimates also reveal a unidirectional causal effect running from fiscal deficits to external deficits, providing evidence in support of the twin-deficits hypothesis for Kenya. Overall, the findings provide clear evidence for Kenya and further reinforce the thesis in this study that curbing high budget deficits is crucial for external stability and long-term economic growth in Kenya.

The main contribution is to provide evidence from Kenya on the dynamic interdependencies between budget deficits and economic growth, external deficits and economic growth, and between budget and external deficits. The evidence is intended to provide useful fiscal, monetary, exchange rate and balance of payments policy insights that can be employed to re-orient policy adjustment measures for macroeconomic stability, price stability, low levels of unemployment and sustained economic growth in Kenya.

The novelties of this thesis include: the application of both the trade and current account deficits in macroeconomic policy analysis that highlight whether the presence of direct transfers of capital and investment incomes influence the examined relationships; the application of relatively novel estimation techniques that include cointegration with allowance for structural break and a deeper analysis that appreciates the study objectives more exhaustively in terms of country specific time series variations; the established stable and robust causal relationships that validate the estimates, the application of the transmission mechanisms of budget and external deficits that minimize their adverse economic effects; and finally the application of primary budget deficit that deepens the originality of the research besides offering an opportunity to provide evidence of the interdependencies of discretionary fiscal policy and economic growth for shared prosperity, in Kenya.

CHAPTER ONE

INTRODUCTION

1.1   Background of the Study

The relationship between budget deficits, external deficits and economic growth has received much attention over the past few decades in both developed and developing economies. Intuitively, this is because if persistent budget and external deficits are left unattended, they could extend beyond own country and lead to a global financial instability and probably an economic crisis with dire consequences on future generations. Further, they could deter foreign investors and donors to the country as they potray a negative image of the economy which eventually would affect its growth rate (Sakyi and Opuku, 2016).

The recent developments in the global economy such as the global financial crisis of 2008 and 2009 and the debt crisis in the Eurozone in 2011 have re-ignited the debates on twin-deficits in many economies. For instance, the public sector profligacy in some economies in the post 2001 era in the United States is argued to have accounted for the accumulation of colossal global external imbalances, which possibly contributed to the genesis and severity of the financial and economic crisis of 2008. Similarly, going in for a hard-hitting economic downturn with a uncertain budget balance confines the scope for fiscal stimulus and can possibly lead to a Greek-like sovereign debt crisis (Miteza, 2012). In many developing economies, the twin-deficits have appeared relatively large and have been a matter of concern to policy makers and economists particularly in sub-Saharan Africa.

The twin deficits and their effects on macroeconomy is also key for macroeconomic stability, price stability, low levels of unemployment and sustained increases in general economic welfare. Most governments in both developed and developing countries Kenya inclusive, pursue these noble objectives. As pointed out by Wiese, et.al, (2015), fiscal policies of many developing countries across the globe are increasingly becoming unsustainable. Equally, external deficits of most countries in sub-Saharan Africa have featured significantly over the past few decades. The unsustainability of fiscal policies in many of these countries has raised concerns to policy makers particularly in sub-Saharan Africa. This is indeed the case for Kenya, where fiscal policy stance has remained continuously expansionary despite the efforts to carry out austerity measures aimed

at creating more fiscal space for development spending to spur economic growth. The failure by the Government of Kenya to control the persistent growth of expenditure and in particular the public recurrent costs that are viewed to be less growth enhancing is a matter of great concern in Kenya. Public recurrent costs consist mainly of public servants' salaries and wages, costs for: foreign and domestic travels, trainings , hospitality, conferences, catering services, task forces allowances, costs on electricity and stationery, among others.

Further, after the promulgation of the new constitution in 2010, Kenya started implementing a two-tier system of governance that include the national government and 47 county governments. Fiscal decentralization that came with the new system of governance has generated new fiscal pressures in terms of setting-up of administrative structures, additional public wage bill and operational costs of running the county governments. As highlighted by the World Bank (2014), the current pressure for expansionary public spending in Kenya emanates mainly from the administrative costs of rolling out devolution, the rise in public wage bill, the need to enhance security expenditure due to terrorism threats and internal security concerns, economic shocks, the costs of financing infrastructural development in the country's Vision 2030 blueprint, the "Big Four Agenda" and other flagship projects aimed at fulfilling the current pre-election promises of the government, among others.

In order to contribute to this policy debate, this thesis is motivated to seek evidence on whether a reduction in budget or external deficits will help improve external or budget deficits in Kenya. These deficits have been trending in Kenya for the last three decades. While an increasing external deficit may not necessarily be a cause of concern for a growing economy, external deficits in form of both the trade and current account, coupled with increasing budget deficit and the resultant public debt could lower the country's sovereign ratings and trigger capital flights, reminiscent of the Asian crisis, or the recent chaos in the Euro-area.

Budget and external deficits, commonly known as the twin-deficits, tend to go hand in hand, ultimately impacting on long-run economic growth. Consequently, establishing their direction of flow will go a long way in formulating the much needed public policy in Kenya. A vast body of literature has come up trying to establish the nexus between the two deficits. Theoretically, literature has generally evolved along two broad strands, viz. the conventional (or Keynesian) approach and the neoclassical (or Ricardian) approach: the conventional approach establishes a

link between budget and external deficits. On the other hand, the neoclassical approach finds no such relationships. Given this theoretical ambiguity and its policy implications, there is no surprise that the empirical literature examining the twin-deficits hypothesis and the overall impact on economic growth is quite rich particularly from a global perspective.

Moreover, from a policy point of view if the twin-deficits phenomenon holds, then taming one deficit based on the direction of flow will also tame the other. (Bahmani-Oskooee and Ratha, 2004; Bundt and Solocha, 1988; Piersanti, 2000). In the standard theoretical analysis, budget deficit leads to external deficit suggesting that external deficit in the current account is endogenously determined. Further, there exists a competing hypothesis which says that the reverse is the case (i.e. the collapse of commodity prices in the world market leads to reduced government revenue and, therefore, fiscal deficit). This motivates the need to consider a framework that recognizes the bi-directional relationships between budget deficit and external deficit.

The Keynesian absorption theory contends that budget deficits increase domestic absorption which leads to import expansion and worsens the external deficit. Budget deficits imply greater spending on domestic and foreign goods, with the former pushing the exports down and the latter pulling the imports up, especially in an economy with supply bottlenecks. In a Mundell-Fleming model, budget deficits cause interest rates to rise (Cebula, 1988, 2003; Cebula and Rhodd, 1993; Modeste, 2000), a surge in capital inflows, and currency appreciation (Feldstein, 1986; Rosensweig and Tallman, 1993). Currency appreciation implies imports get cheaper and exports dearer, deteriorating the external deficit.

On the other hand, the proponents of Ricardian equivalence hypothesis (REH) argue that since people are rational, they are already aware that the reduction in taxes, resulting from the government expansionary fiscal policy of tax cut, is temporal and therefore they will save the extra disposable income to pay for the future higher taxes. As a result, an intertemporal shift between taxes and budget deficits would have no impact on the real interest, or the trade deficit (Barro, 1974; Enders and Lee, 1990; Evans, 1988). Thus, in the event that REH holds for a country, the policy justification for persistent external deficit should not be attributed to budget deficit (Ahmed and Ansari, 1994).

This literature overview clearly demonstrates that the available evidence is mixed. However, it appears that the twin-deficits hypothesis generally holds for the developed countries: that budget deficits tend to worsen external deficits {Bernheim (1988), Rosensweig and Tallman (1993), and Salehand Harvie (2005)}. For sub-Saharan Africa, available evidence on country specific studies is rather sparse and mixed. For instance, Furceri and Zdzienicka (2018), while examining the twin deficits in developing countries affirmed that there exists heterogeneity across countries overtime. It has also been generally noted that further to this heterogeneity, different models, methodologies, data, and sample periods may yield different and fresh insights. In Kenya, available evidence is not only relatively sparse but also mixed and inconclusive.

In order to further enrich the study and provide a more robust analysis for Kenya, the study attempts to determine the causal effects of budget and external deficits on economic growth by also considering other alternative measures of budget deficits, external deficits, and economic growth. Accordingly, this study applies primary and fiscal deficits, trade and current account deficits, growth of GDP per capita and growth of real GDP, in the analysis.

Additionally, besides originality and robustness in macroeconomic policy analysis, the consideration of growth of GDP per capita in an alternative model of estimation further provides an opportunity to indirectly include the population parameter in the investigation. As an economic measure of nation's prosperity, policy responses based on growth of GDP per capita could reveal the relative performance of an individual economy for evidence based policy responses. Lastly, in order to control for inflation, which would rather make growth rates appear much higher than they really are particularly during periods of high inflation, the study applies growth of real GDP in the alternative analysis. This study therefore focuses on a developing economy in sub-Saharan Africa and aims to conduct a deeper, original, robust and comprehensive examination of the identified problem and provide country specific empirical evidence from Kenya. It focuses on three papers based on the research objectives that are related but in a very different manner. All the three papers have been published in reputable international peer reviewed journals, including a book chapter as highlighted in the last sub-section of this chapter.

Most importantly, this thesis generates new frontiers of knowledge that include but not limited to the following: First, is the consideration and application of primary budget deficit in the analysis that offers an opportunity to provide evidence of the interdependencies of discretionary fiscal

policy on economic growth. By doing so, the findings yield not only fresh evidence but also key policy insights on dynamic anlysis of discretionary fiscal policy in Kenya. Due to unavailability of data, this analysis had not been previously done in the identified studies for Kenya. Secondly, by employing both the trade and current account deficits in the analysis, the study highlights whether the presence of direct transfers of capital and investment incomes influence the examined relationships, providing not only new but also very crucial evidence for Kenya. Moreover, the study applies relatively novel estimation techniques that include cointegration with allowance for structural breaks, Zivot and Andrews (1992) structural break test as well as Toda and Yamamoto (1995) Granger causality representation (1995) in the analysis that establish stable and robust causal relationships validating the parameter estimates. This bridges the methodological gap in the analysis. Importantly, the study also takes into account the dynamism of Kenya's macro-economy and considers changes induced by the recent rebasing of GDP in Kenya in 2014, and implementation of devolved system of governance in 2013. By employing a data series spanning from 1980 to 2016, the study provides new evidence that takes into consideration the lower middle-income status for Kenya in sub-Saharan Africa. Last but not the least, the study considers and applies other alternative measures of budget deficits, external deficits and economic growth providing an excellent opportunity for macroeconomic policy analysis, that is instrumental for Kenya. This further deepens the analysis appreciating the study objectives more exhaustively in terms of country specific time series variations.

1.1.1   Economic Growth in Kenya

Kenya has had a volatile economic performance since 1980s as reflected by economic growth rates (real GDP and per capita GDP) overtime. After independence (in 1963), Kenya promoted growth through public investment, support for agricultural production and provided incentives for private industrial investment. Kenya's real GDP growth rate was 5.7 percent in the 1960s, accelerating to 7.2 percent in the 1970s. It declined in 1980s to 4.2 percent and in 1990s to 2.2 percent (World Bank, 2017). The performance was attributed to poor macroeconomic policies in the early 1980's including price control, import substitution, exchange rate control and poor international terms of trade, besides delayed structural adjustment programs (SAPs). Equally, there were factors such as poor governance, which deterred domestic investment. The economy also experienced several negative shocks that undermined growth (O'Connell 2008).

In the early 1990's SAPs were introduced by the IMF and the World Bank. The implementation of SAPs had low impact on the growth of the economy due to poor commitment by government to reform besides the poor state of governance in Kenya. Other economic shocks recorded in 1990s include the aftermath effects of the 1992 general election, where too much money was printed for the elections. These shocks coupled with poor monetary and fiscal policies led to low economic performance. Poor monetary policies led to high interest rates while poor fiscal policies led to budget deficits (Amanja and Morrissey, 2005).

After the National Rainbow Coalition government came to power in 2002, Kenya's economic performance took an upward trend and in 2007 the economy recorded a real GDP growth rate of 7 percent. However, the post-election violence that happened in financial year 2007/08 following the disputed 2007 election and the effects of the 2008 global financial crisis lowered the economic performance for Kenya. The real GDP growth fell to a low of 3.7 percent on average, between 2000 and 2009. It improved in 2010 and 2011 to an average of 6.2 percent but worsened to between 4 and 5 percent in 2012 and 2013 respectively. In 2014, real GDP growth was 5.4 percent while in 2015 and 2016 growths in real terms averaged 5.7 and 5.8 percent respectively[1].

Economic theory suggests that growth of GDP per capita is preferred when making comparisons between economies. This is justified by the fact that it is able to reveal the relative performance of individual economies besides the growth accounting for the population variables. It is mostly used since countries do not have similar aggregate production functions (Greiner et al., 2004; World Bank, 2015). In order to ensure robust macroeconomic policy analysis, this thesis considers real GDP growth and per capita GDP growth rates in the analysis. The trend of growth rate of GDP per capita reveals that in 1980 it was at 1.7 percent and declined to 0.8 percent in 1990. It further declined to 0.5 percent in 2009 and improved to 3.2 percent in 2016. Figure 1.1 shows the trends in Kenya's real and per capita GDP, growth rates.

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[1] Economic growth rates have been revised after the rebasing of the Kenyan economy in September 2014. This involved revisions in sector classifications and the base year to 2009. When rebased, GDP increased by 25 per cent in 2013 where by indicators such as the debt/GDP, CAB/GDP, and fiscal deficit/GDP improved (Central Bank of Kenya 2014, World Bank, 2017).
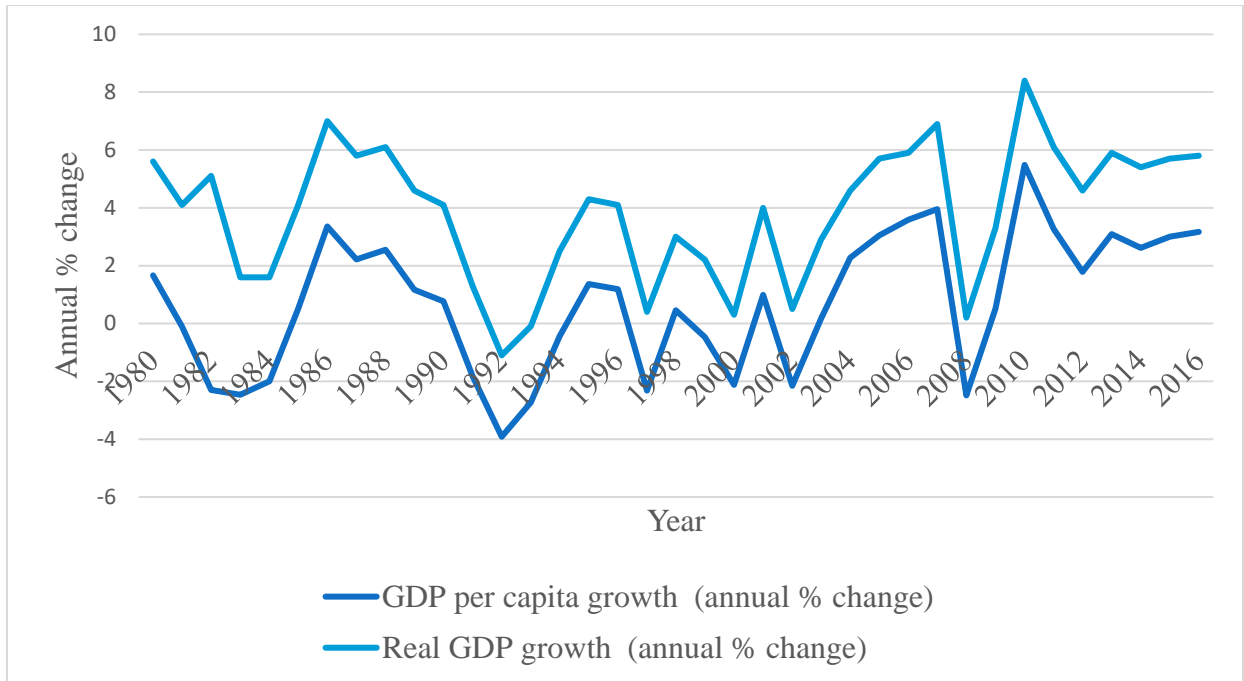
Figure 1.1: Kenya's Real GDP Growth and GDP Per capita Growth Rates
Source: *Done by the Author*

In 2014, Kenya's GDP was rebased and the economy's status rose from a low income country to a lower-middle income country as its GDP per capita increased from USD 1029 to USD 1,269 which is above the benchmark set by World Bank of USD 1,036. After the rebasing of the economy, Kenya got an opportunity for more resources at her disposal because the country was henceforth eligible to borrow from non-concessional facilities of International Monetary Fund, World Bank and African Development Bank and even access more funds in the international markets (World Bank, 2017). This opened the domestic economy to tap on commercial external financing, among others.

It was necessary to rebase the Kenyan GDP by using a more recent year in order to collate new constant price estimates. The old base year is 2001 while the new is 2009. This enhanced the process of accommodating changes in production structures due to developments, innovations and demand side changes including changes in consumption patterns (Republic of Kenya, 2016). This forms a critical study period to consider in the analysis for this thesis in particular.

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1.1.2 Budget Operations in Kenya

According to Romer (2012), government budget deficit is the rate of change of the stock of debt. Ideally, developed and developing economies aim to realize equilibrium government expenditure and revenue in order to realize Pareto efficiency. However, government expenditure on goods, services and transfers is more likely to exceed the available resource envelope in terms of collected revenues. This has been predominantly the case for Kenya since 1980s (World Bank, 2017; IMF, 2018; Republic of Kenya: various economic surveys).

The Government of Kenya describes its plans, strategies and policies in the Budget Policy Statement which is tabled in parliament for approval in every financial year. In Kenya, the financial year normally begins on the first day of July and ends on the last day of June the following year. The government usually draws its annual financial plan in terms of a Budget Policy Statement (BPS) that contains details of estimated receipts and disbursements and proposed expenditures for the financial year which is subject to annual revisions depending on the prevailing economic situations. The main fiscal instrument which the government uses to raise revenues in Kenya is tax. Other secondary measures for raising government revenue include appropriations in aid and grants (Wawire, 2006; Republic of Kenya, 2017).

The government budget is considered as a very useful tool of control for an economy because it enhances planning, management and formulation of economic policies. Since the 1980s, the Government of Kenya has only recorded a single fiscal surplus that was at 0.26 per cent of GDP in 1999. For the rest of the years, it has recorded persistent budget deficits since 1980s (IMF, 2018). This has led to accumulation of debt in Kenya. Economic theory dictates that if debt is financed by borrowing from the central bank, it is inflationary and if borrowed from local commercial banks, there is a possibility of crowding-out effect. Equally, if government debt is met hrough issuing of bonds, the cost of debt financing will be high. In general, it is clear that the deficit financing in Kenya has been met by borrowing from other sectors of the economy, issuing government securities such as treasury bills and bonds, by multi-lateral donor aid, commercial loans and recently from the international financial market by issuance of Eurobonds (Republic of Kenya, 2017).

1.1.3 Trends in Kenya's Budget Deficits

The gap between the primary budget and fiscal deficits demonstrates the interest on stock of public debt in Kenya, which is a major non-discretionary variable, reflected in the fiscal deficit. In terms of fiscal balances, the trend has persistently been in deficits all the years under review except 1999 in which a surplus of 0.26 per cent of GDP was recorded (IMF, WEO database, 2018). On the other hand, the trend in primary budget deficit narrows as opposed to conventional deficit. The trends reveal that Kenya has had instability in its fiscal policy with fiscal and primary budget deficits dominating the scene. The trends of primary and fiscal deficits spanning from 1980 to 2016 is in Figure 1.2.
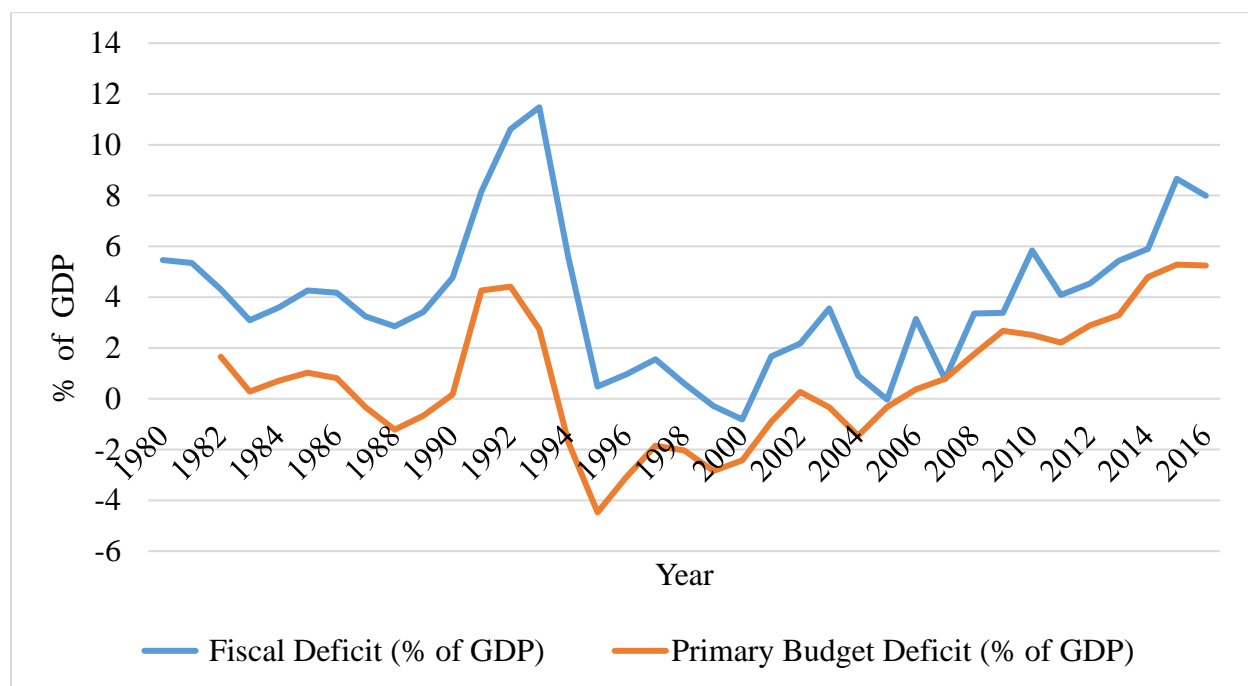
Figure 1.2: Kenya's Primary Budget and Fiscal Deficits
Source: *Done by the Author*

In spite of the persistent government primary and fiscal deficits in Kenya since 1980s, there are many economic challenges that remain unresolved. Key among them include high household and regional poverty levels, high youth unemployment rates, persistent corruption, infrastructural deficiencies, limited fiscal space and widening debt levels, among others.

1.1.4   Kenya's External Deficits

In the literature, either the trade or current account deficits interchangeably depict external deficits. The trade balance is net sum of a country's exports and imports of goods and services in a given period of time. It is a key component of the current account. Current account refers to the sum of the net revenue on exports minus payments for imports of goods and services, earnings on foreign investments minus payments made to foreign investors and cash transfers (IMF BPM6, 2009). Trade deficits have been the main cause of persistent current account deficits in Kenya. Figure 1.3 depicts the trend in Kenya's current account and trade deficits for the period 1980 to 2016.
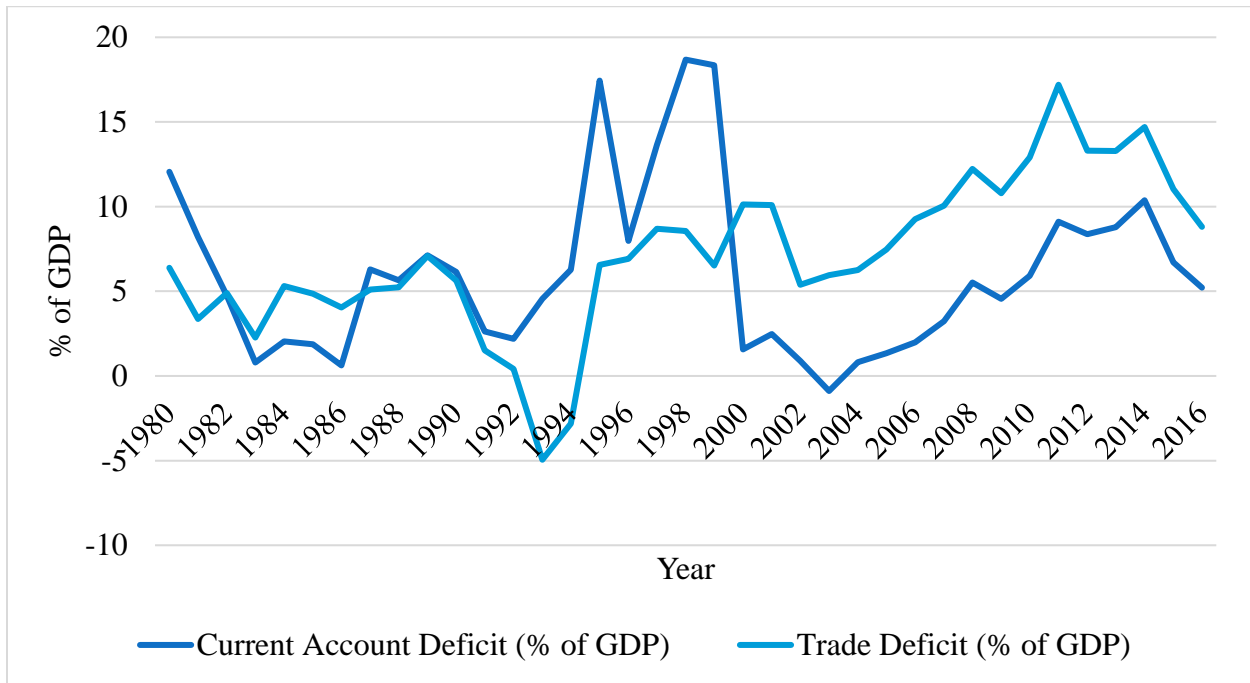
Figure 1.3: Kenya's Current Account & Trade Deficits (as a % of GDP)
Source: *Done by the Author*

Figure 1.3 reveals that Kenya has been facing persistent trade deficits resulting from imports that outpaced exports during the period under review. The trade deficit has been influencing the current account balances since 1980s. The deficit in the current account was at 5 percent of GDP in 1980s but doubled to 10 percent on average in 1990s. It reduced in the period 2000-2010 to about 2.5 percent on average. In the period 2011-2013 the deficit had risen again to an average of 9 percent of GDP and by 2014 it had reached 10.3 percent of GDP, narrowing to an average

of about 7 percent in the period 2015-2016. The widening current account deficit is due to increased imports in the context of a stagnant exports in Kenya (Republic of Kenya, 2016). This is clearly demonstrated by the trade balance statistics during the period under review.

1.2 Statement of the Problem

Many economies in Sub-Saharan Africa have been affected by a number of dynamics both at micro and macro front. Key among these dynamics is budget and external deficits that have appeared relatively large and have been persistent in most of these countries. For instance, since 1980's, Kenya's budget and external position have been in chronic deficits leading to accumulation of public debt and limited fiscal space for development spending. The fiscal balance recorded only two surpluses of 0.29 percent of GDP in 1999 and 0.81 percent of GDP in 2000. Similarly, the trade and current account balances recorded only a single surplus of 0.89 per cent of GDP in 2003 for the current account, and only two surpluses for the balance of trade (4.95 and 2.81 percent of GDP in 1993 and 1994 respectively). On the other hand, growth rate of real GDP was 4.2 percent in 1980s, and declined to 2.2 percent in 1990s. In 2007 it recorded an impressive growth of 7 percent but after the 2007 post-election violence it declined to 0.2 percent in 2008 and slightly improved to 5.8 percent in 2016 (World Bank, 2017 and IMF, 2018).

As affirmed by Wiese, et.al, (2015), fiscal policies of many developing countries across the world are increasingly becoming unsustainable. As argued and by focusing on a country specific case, the inability of Government of Kenya to raise sufficient revenue to finance its expenditure has resulted to massive borrowing from internal and external sources. This has triggered an increase in budget deficits. The issue is not that the governments occasionally engage in deficit spending during economic recessions or times of national emergency but that they do so continuously. In reference to the East Africa Monetary Union Macroeconomic convergence criteria, Kenya's conventional budget deficits (excluding grants) have persistently exceeded the targeted ceiling of 3% of GDP, and also the gross public debt ceiling of 50% of GDP in net present value (Republic of Kenya, 2018).

As a result of the country's deteriorating fiscal position and increasing public debt, international rating agencies such as Moody's Investors Service, and Standard & Poor's have in the recent period (2017-2021) downgraded Kenya's credit rating. The implication is that the Kenyan

Government will have to pay more for foreign borrowings. Additionally, combined with the existing state of debt levels in the country, the impact can result into significant deficits in future budgets. This could imply increased future tax, which may stifle economic growth rate. Further, this could signal an imminent increase in debt servicing obligations, including interest and principal payments, whose end effect is to increase recurrent expenditure and squeeze on development spending and further constrain the available fiscal space adversely affecting the growth of the economy. Moreover, as pointed out by Ng'ang'a et al., (2019) an overemphasis on expansionary fiscal policy oftenly burdens monetary policy to correct fiscal imbalances. This is because if persistent budget and external deficits are left unattended, they could extend beyond own country and lead to a global financial instability and probably an economic crisis with adverse effects on future generations. Further, they could deter prospective foreign investors and donors to the country as they portray a negative picture about the state of the economy that in due course would adversely affect its rate of growth. Other risks include heightened pressure on foreign exchange reserves and depreciation of domestic currency, among others.

To this end, the questions that remain unresolved are whether there could be a relationship between budget deficit and economic growth, external deficit and economic growth, and between budget deficit and external deficits, both in short-run and long-run for Kenya. What policy will deliver the needed fiscal adjustment in Kenya? Will a public policy on reduction of budget (or external) deficit help improve external (budget) deficit in the country? Importantly, while a growing external deficit may not necessarily be a cause of concern for a growing economy like Kenya, external deficits in form of both the trade and current account combined with increasing budget deficit and the resultant public debt could further lower the country's sovereign ratings and set off capital flight, reminiscent of the Asian crisis, or the recent chaos in the Euro-area.

Lastly, it is evident that there exists very scanty evidence particularly for country specific studies in Sub-Saharan Africa. It is also noted that there exist country heterogeneities across the globe. With the foregoing in mind, and by applying different models, data, methodologies and sample periods, the study may yield fresh insights. To address the lingering questions, we focus on a developing country and aim to conduct a deeper, original and comprehensive examination of

the identified problem and provide new empirical evidence for Kenya and also fill the identified research gaps on the subject matter.

1.3 Research Questions

i. How does the primary budget deficit influence economic growth in Kenya?

ii. How does the current account deficit influence economic growth in Kenya?

iii. What are the effects of fiscal and external deficits on economic growth in Kenya?

1.4 Objectives of the Study

The general objective of the study is to determine the effects of budget and external deficits on economic growth in Kenya.

Specific objectives of the study are:

i. To determine the effects of primary budget deficits on economic growth in Kenya.

ii. To examine the effects of current account deficits on economic growth in Kenya.

iii. To analyze the effects of fiscal and external deficits on economic growth in Kenya.

1.5 Significance of the Study

Budget and external balances allow analysts to evaluate the economic outlook of each country individually and collectively (in a region). In the analysis, macroeconomic uncertainties, such as the outlook for the current account, the size of the budget deficit and policy uncertainties including fiscal policy, monetary policy, exchange rate policy, price stability, sustained economic growth and macroeconomic stability tend to dominate the medium outlook. As Kenya strives to achieve Vision 2030 economic growth projections, the "Big Four Agenda" and the Sustainable Development Goals (SDGs), macroeconomic stability is one of the key ingredients. This being the case, it further reinforces the need for a comprehensive analysis on the subject.

Similarly, the current medium-term debt management strategy for Kenya seeks to foster fiscal consolidation to reduce the deficits and mitigate debt accumulation (Republic of Kenya, 2019). These pathways have implications on not only budget and external deficits but also fiscal,

monetary, balance of payment, exchange rate policies and economic growth in the country. From the literature, Kenya needs to manage a number of risks if it is to achieve the economic growth projections. Chief among these include the mitigation of the growing public debt and other macroeconomic shocks that are associated with persistent large deficits, high unemployment rates, currency depreciation, price stability and poverty reduction for shared prosperity in Kenya (World Bank 2012).

Further, this study contributes to the existing knowledge, by going a notch higher to distinguish and apply the alternative measures of budget and external deficits in the growth analysis and therefore enhances the decision to fine-tune the suggested policy interventions based on arrived evidence (Stiglitz et. al., 2006; Algieri, 2012).

The study provides a deeper and original analysis and attempts to appreciate the study objectives more exhaustively in terms of country specific time series variations as compared to cross-country studies. It attempts to bridge the theoretical and methodological gaps identified during the literature review. Consequently, this thesis therefore contributes further to the existing research database particularly for the frontier economies, which is key for current and future researchers. In examining the effects of public deficits on economic growth, available evidence justifies the need to consider the structure of the economy so that the suggested solutions better fit the economy under investigation. This is indeed the case for this thesis and it addresses the existing gaps that include methodology, literature and policy, among others.

For instance, empirical studies that have considered the structure of the economy to explain the effects of budget and external imbalances are relatively scarce (Bergin, 2006; Lu, 2009, Makanza and Dunne 2015). In Kenya, they are relatively scanty and by failing to consider the characteristics of developing economies, the resultant models do not fully explore the usefulness of macroeconomic policy in the management of impacts of public deficits in country specific economies. Therefore, a detailed and precise understanding of the quantitative and causal effects of public deficits on economic growth in Kenya would be very essential in enhancing evidence-based policy making and feedback to policy makers, policy analysts, economists, academia and the Government of Kenya at large, for economic planning, strategy formulation, financial stability and sound economic management and sustainable economic welfare, among others.

1.6 Scope of the Study

The study examines the effects of budget and external deficits on economic growth in Kenya. It also focuses on the nexus between alternative measures of public sector deficits and economic growth, and the nexus between budget deficits and external deficits in Kenya. The determination of the causal effects of budget and external deficits on economic growth is established by also considering other alternative measures of deficits, and economic growth. Specifically, this thesis comprises of three papers. The first paper explores the effects of primary budget deficit on economic growth in Kenya. The second paper analyses the effects of current account deficit on economic growth in Kenya, while the third paper examines the effects of fiscal and external deficits on economic growth in Kenya.

The study applies some relatively novel econometrics techniques of estimation that include cointegration, cointegration with allowance for structural break, a dynamic vector error correction model, and a multivariate Toda and Yamamoto (1995) causality representation. The study also takes into account the dynamism of country's macroeconomy and therefore, considers changes induced during the year 2014 rebasing of GDP in Kenya. Besides establishing robust and stable directions of causal relationships, the study also derives some policy suggestions on the signs of the dynamic dependencies examined.

This thesis largely utilizes annual time series data from the World Bank (2017) and IMF (2018) spanning from 1980 to 2016. Other secondary sources include Central Bank of Kenya, National Treasury and KNBS official statistics, from Government of Kenya. The two main data sources are preferred for three-folds; (i) they are able to report on all the data series on the variables employed on this study; (ii) provide a large and credible sample; and (iii) finally the two sources are globally used in majority of literature on the subject matter.

The study period (1980-2016) is preferred because many economies including Kenya faced macroeconomic imbalances manifested by persistent public sector deficits. Further, it is considered due to availability of the data on all the variables employed in the estimated models, for the entire period. Additionally, it coincides with the time when most of the developing countries, Kenya included experienced chronic public sector deficits. Moreover, in terms of the econometrics, the selected time span is sufficient for meaningful time series analysis.

Importantly, it also considers the rebasing of GDP in 2014 that upgraded the Kenyan economy to a lower middle-income status. This is crucial as it captures the dynamism of the Kenyan macroeconomy in relation to new Kenyan GDP status. Lastly but not the least, the study is limited to Kenya to give a better and deeper analysis and appreciation of the effects since cross-country studies do not allow one to examine the relationships exhaustively in terms of time series variations.

Most importantly, after setting up the models of analysis, annual time series data is applied. Values greater than zero (for the primary budget deficit, fiscal deficit, current account deficit and trade deficit) indicate a deficit while those less than zero, a surplus. The conversion is for ease of interpretation since Kenyas budget and external balances have largely been in deficits. The study aims to contribute to the ongoing subject debate in Sub-Saharan Africa, and further provide empirical evidence from Kenya.

1.7 Structure of the Thesis

The study is structured into five chapters. Chapter one motivates the study by outlining the introduction showing the global and national trends of economic performance, as well as budget and external deficits. Chapter two details the first paper on the effects of primary budget deficits on economic growth in Kenya, published in the Journal of Economics, Management and Trade. It is entitled "The Effects of Primary Budget Deficits on Economic Growth: Evidence from Kenya". Additionally, this paper has also been published as an international peer reviewed Book Chapter titled "Determining the Effects of Primary Budget Deficits on Economic Growth in Kenya". The title of the Book is "New Innovations in Economics, Business and Trade". Moreover, chapter three discusses the second paper on the effects of current account deficits on economic growth in Kenya, published in the Journal of Economics and Public Finance. It is entitled "The Effects of Current Account Deficits on Economic Growth: Evidence from Kenya". Chapter four focuses on the third paper on the effects of fiscal and external deficits on economic growth in Kenya, published in the Journal of Economics, Management and Trade. The tilte of the paper is "Determining the Twin-Deficits Phenomenon in Kenya". Last but not the least, Chapter five details the thesis summary, conclusion and policy implications that are derived precisely from the three papers of the thesis.

CHAPTER TWO

EFFECTS OF PRIMARY BUDGET DEFICITS ON ECONOMIC GROWTH IN KENYA

2.1 Introduction

A budget deficit is a situation where outlays (outgoings) exceed incomes; where liabilities exceed assets. Deficit financing by definition is equal to the overall deficit or surplus. Financing is divided into domestic financing obtained from residents and foreign financing, obtained from non residents. Budget deficit, therefore, may imply fiscal deficit, revenue deficit or primary deficit. The topic on the effects of budget deficits on economic performance is of great analytical interest globally. A sustainable economic growth is an important factor that can transform the welfare of the populace. Most governments, both developed and developing alike, put economic growth and stability as a fundamental objective, and strive to transform the lifes of their people by employing different development policies. Some countries that achieved high levels of economic growth serve as models for other countries and increase their prosperity and role in the comity of nations (Buscemi and Yallwe, 2012).

On a global perspective, debates on general budget deficits and economic growth connection have yielded great attention since 1980s and have been therefore at the centre of macroeconomic adjustments for economic growth and stability in both high, middle and low income economies (Easterly, Rodriguez and Schmidt-Hebbel, 1994; Obstfeld, 2012; Claessens & Ghosh, 2013, Raju et al., 2016; IMF, 2017; AfDB, 2018). The effect of the 2008 global financial crisis has also renewed the impetus on the effects of government deficits on economic growth. This has in recent past necessitated policy debates and research interests on the subject.

The role of fiscal policy in influencing economic stability and growth has been debated widely in both economic theory and empirical literature (Raju et al., 2016). It has been part of the subjects of long-standing debates as each of the identified three major schools view the situation differently. For instance, the Keynesian school advocate that budget deficits have a positive effect on economic growth, while the neoclassical school contends that budget deficits have detrimental effect on economic growth. In contrast to the two main veiws, the Ricardian equivalence school holds that budget deficits are neutral in terms of their effects on economic growth. Inspite of the fact that many empirical findings aimed at formulating suitable

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models for testing the relationship in the country are identified, the findings from both theory and empirical evidence still remains mixed and inconclusive for Kenya.

2.1.1 Measures of Budget Deficits

Generally, budget deficits and (or) budget balance appear in many governments policy documents. Evidence suggests that it has been analysed for over two centuries. Adam Smith (1723-1790) discussed the matter in his book: "An Inquiry into the Nature and Causes of the Wealth of Nations". Smith (1776) advocates for balanced public budgets. The author argues that balanced budget should be the norm of public sector budgets. Nevertheless, he pointed out that this norm may be violated during times of war or emergencies.

In the literature, the manner in which budget deficit is defined and measured determines its size and has implications for its effect on performance. As Easterly and Schmidt-Hebbel (1994) argued, different measures of budget deficit can result in major interpretational problems in relation to their effects. This was also affirmed by Blejer and Cheasty (1991) who opined that depending on how the deficit is measured and over what period of time, the deficit can reveal different fiscal stances and therefore imply prescriptions of different fiscal policies. Hebbel (1994) suggested that in order to diagnose economic problems and establish appropriate policy responses, the net public sector's requirements must be correctly measured.

In line with economic literature and practices by World Bank and the International Monetary Fund, a number of different methods to measure budget deficit exists. The most commonly accepted measure and applied by governments globally to define the conventional budget is the resources utilized by the government in a fiscal year that need to be financed after revenues are deducted from the expenditure. According to Tanzi, Blejer and Cheasty (1993), the conventional deficit is defined as the difference between current revenues and current expenditure of the government. The conventional deficit therefore shows the financing gap that needs to be met by way of net lending, including lending from Central Bank.

According to Esterly and Schmidt-Hebble (1994), the most accurate measure of a country's position and public sector resources transfer would be the deficit measure, based on the most inclusive definition of the public sector. They pointed out that such information is not always available and is subject to accounting conventions. The World Bank defines the

conventional budget deficit as the difference between expenditure items such as salaries and wages, expenditure on goods and services including capital expenditure, interest on public debt, transfer and subsidies, and revenue items including taxes, user charges, grants received and profits of non-financial public enterprises and sale of assets (Blejer & Cheasty, 1991).

As pointed out by Agenor and Montiel (1999), the conventional (fiscal) deficit is measured on cash basis or an accrual basis. In the cash basis, the deficit is equal to the difference between total cash flow expenditure and fiscal revenue. In the accrual basis, the deficit reflects accrued income and spending flows regardless of whether they involve cash payment or not. Accumulation of arrears on payments or revenue is reflected by higher deficit when the deficit is measured on an accrual basis relative to cash basis.

Further, Tanzi, Blejer and Teijeiro in Blejer and Cheasty (1993) define the conventional deficit on each basis as the difference between total government expenditure (including interest payments on public debt but excluding any amortization payments) and total cash receipts (including taxes and non-tax revenues plus grants, without loans). However, neither does it provide a direct measure of monetary expansion nor of the pressure as a result of increased demand for financial instruments in the short-term markets. This definition of a conventional budget deficit is independent of the maturity schedules of outstanding domestic public debt and the reason it relates to monetary policy. However, it also poses a challenge in that public debt management and open market transactions may in the long-run greatly influence the size of the budget deficit.

Additionally, they show that conventional balance originates from an effort to provide a measure of the government's contribution to aggregate demand in the economy and the lack of equilibrium on the current account, or to measure the crowding-out of the private sector in the financial sector. They affirmed that conventional balance measures the extent to which government expenditures (for policy) exceed government revenues without incurring new burdens. Heller et al., (1986) describes the conventional deficit as a reflection of the current flow position of government calculated by using cash receipts and cash expenditure in a specified period. The expenditure includes interest payments but excludes repayments of government debts.

Alternative indicators used to measure interpretations of fiscal policy have increasingly been adopted by a number of institutions including the World Bank, Organisation for Economic Co-operation and Development (OECD), International Monetary Fund and the European Union among others. Equally, different countries have been applying different definitions of the budget deficit mainly due to conventions, relationships with other levels of government and the structure of their budgets (Agenor and Montiel, 1999).

In order to overcome the drawbacks of the conventional deficit measures, alternative measures of budget deficit have been deemed necessary because the complications created by the changes in inflation in the interpretation of conventional deficit complicates the evaluations of fiscal performance overtime. The primary budget deficit and operational deficit measures have been identified and highlighted by a number of authors including Buiter (1983), Tanzi et al (1987), Blejer and Cheasty (1991), Easterly Schmidt-Hebble (1994), Stiglitz et.al., (2006) and Romer (2012).

Additionally, to remove the effect of inflation from the interest payments, the operational or inflation-adjusted budget deficit is applied. The operational or inflation-adjusted budget deficit is defined as conventional deficit less part of the debt service that compensates debt holders for actual inflation. Alternatively, it can be defined as the primary budget deficit plus real interest payments. When the effect of inflation is not removed, the deficit is indicated by the size of the amortization element included as interest payments above the line rather than below. This measure of deficit is useful for public policy when rate of inflation is very high (Blejer and Cheasty, 1991).

On the other hand, to remove the impact of previous deficits on the budget, Blejer and Cheasty (1991), advocates that the primary budget deficit be preferred. The primary budget deficit refers to all government outlays except interest payments, less all revenue. Anand and Wijinberger (1989) define the primary budget deficit, as the financeable deficit that does not require more financing and is compatible with sustainable external and internal borrowing and with existing targets for inflation and output growth.

Last but not the least, Islam and Wetzel (1991) define the structural or full employment deficit as the deficit that can be used to remove the impacts of fluctuations in economic activity on the budget. The structural or full employment deficit is therefore the deficit that is adjusted

for cyclical movements in the economy, as advocated by Rutayisire (1987). Blejer and Cheasty (1991) argued that, in the same manner, that budget deficit affects and is afflicted by aggregate demand; stirred by the business cycle and may have varying effects based on the stage of business cycle prevailing at the time of policy implementation.

Thus, conventional deficit shows the difference between government outlay, including interest payments but excluding amortization payment on outstanding stock of public debt, and total receipts including grants, but excluding borrowing proceeds. This indicator of budget deficit is oftenly affected by inflation; as such, an alternative measure is necessary to remove the impact of inflation from the interest payments and to correct for capital losses on external debt (due to real exchange rate changes). The operational deficit is therefore applied because if the impact of inflation and capital losses is not removed the deficit would be overstated. However, as Blejer and Cheasty (1991) observed, the calculation of the operational budget deficit is rather technically difficult. The primary budget deficit can therefore be used to remove the effects of previous deficits on the current budget deficit.

From the literature, the choice and preference of the alternative measure of budget deficit is based mainly on interpretation and management of government fiscal policy. Romer (2012) affirms that considering the primary rather than conventional budget deficit is often a better way of gauging how fiscal policy at a given time contributes to the government budget constraint. Moreover, Stiglitz et al., (2006) opines that in developing countries it makes more sense to focus on the primary as opposed to conventional deficits because interest rates can be extremely volatile and are often outside the control of many developing economies. This could be the case for Kenya and many other developing countries in Africa.

In such economies where public sector debt has accumulated over a long period of time, large fiscal deficits will continue to persist for quite some time after introducing corrective measures. Stiglitz et al., (2006) argues that developing countries with huge public debt ratios, variability of the overall fiscal position depends mostly on events outside the country. Further, the aurthor documents that many such countries would have to bear enormous internal adjustment costs if they had to reduce expenditure or raise taxes every time there are interest rate changes in the global market. Affirming the authors' view, developing economies need to focus on what they can control. The primary budget deficit shows more clearly if an observed change makes

the situation better or worse (Stiglitz et. al, 2006). Empirical evidence is very scanty on the effects of primary budget deficit on economic performance in Sub-Saharan Africa and Kenya in particular. This study bridges the research gap by considering the primary budget deficit in the analysis.

2.1.2 Primary Budget Deficit and Economic Growth in Kenya

In 1980s, economic growth recorded 4.2 per cent and worsened in 1990s to 2.2 per cent. In 2003, as cited by Mwega and Ndun'gu (2008), the Government of Kenya laid a solid foundation for a globally competitive economy. This led the government to undertake fiscal consolidation in the period 2003-2007. The Kenyan economy expanded steadily from 2.9 per cent in 2003 to 5.1 per cent in 2004, 5.9 per cent in 2005, and 6.3 per cent in 2006, to attain a peak of 7.2 per cent in 2007, the highest in over two decades and the only episode of five-year growth acceleration in Kenya. Growth of real GDP averaged 0.2 per cent in 2008 but improved to 5.4 per cent in 2016. The primary budget deficit was 0.3% in 1983 and worsened to 4.4% in 1992. It improved to 1.8% in 2008, and worsened to 2.7% in 2009, 2.9% in 2012, and 4.8% in 2014. It widened to 5.2% in 2016. On the other hand, growth of GDP per capita recorded 1.7% in 1980 and declined to 0.8% in 1990. It further recorded 0.5 % in 2009, 1.8% in 2012, and 2.6% in 2014, improving to 3.2 % in 2016 as reflected in Figure 2.1.
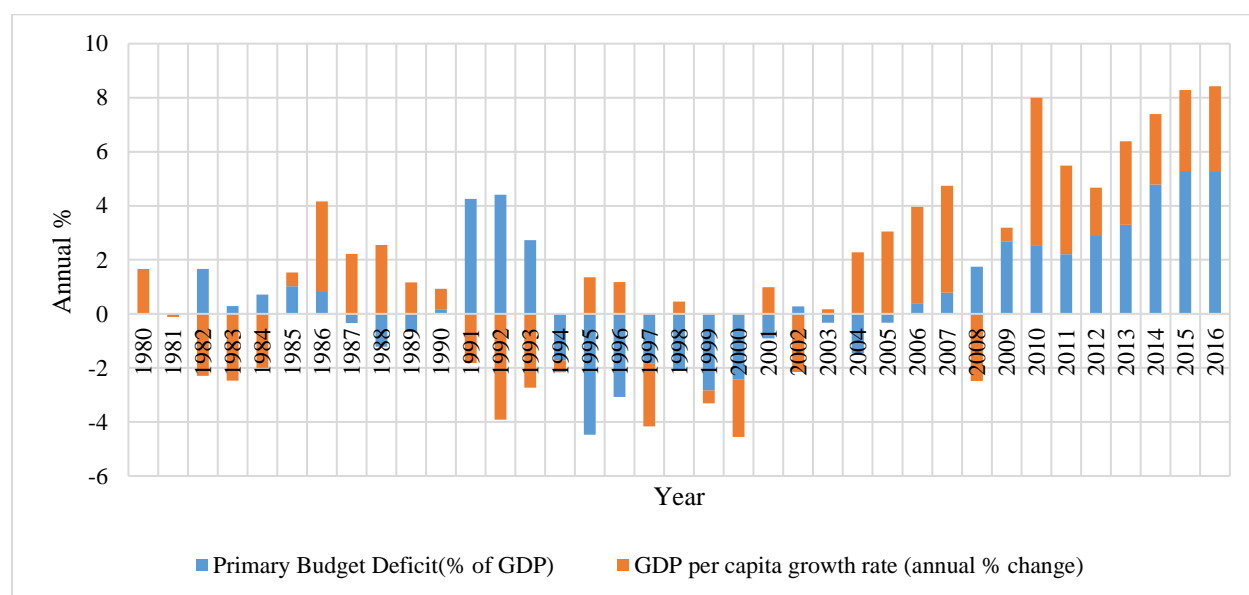
Figure 2.1: Kenya's Primary Budget Deficit and Growth of GDP per Capita
Source: Done by the Author

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2.1.3 Statement of the Problem

Fiscal policies of many developing countries across the globe are increasingly becoming unsustainable (Wiese R., et.al, 2015). As argued, the inability of Government of Kenya to raise sufficient revenue to finance its expenditure has resulted to massive borrowing from both internal and external sources. This has triggered an increase in primary budget deficits as clearly demonstated in chapter one of this thesis. The issue is not that the government occasionally engage in deficit spending during economic recessions or times of national emergency but that they do so continuously. As pointed out by Ahmad and Rahman (2017), in order to achieve sustainable economic growth of a country, balanced budget is not only important but also indispensable.

The failure by the Government of Kenya to control the persistent growth of expenditure and more so the public recurrent costs that are viewed to be less growth enhancing is a matter of great concern in the country. As a result of the country's deteriorating fiscal position, increasing public debt, international rating agencies such as Moody's Investors Service, and Standard & Poor's have in the recent period (2017-2021) downgraded Kenya's credit rating. The implication is that the Kenyan Government will have to pay more for foreign borrowings. Intuitively, combined with the existing state of debt levels in the country, the impact can result to significant future primary budget deficits. Further, thisxcould signal a looming increase in debt servicing obligations, whose ultimate effect is to increase recurrent expenditure and squeeze on development spending and further impacting on growth of the economy. This could also imply a situation of future debt distress, impact on macroeconomic stability, worsen unemployment levels and adversely impact on the economy.

Limited evidence on the effect of budget deficit on economic growth exists for Kenya (Okelo et. al., 2013). Further, based on the identified studies, none determined the causal linkages on the identified variables. Equally, none employed the primary budget deficit in the analysis. According to Romer (2012), considering the primary deficit rather than fiscal deficits is often a better way of gauging how fiscal policy at a given time is contributing to the government budget constraint. Stiglitz et al., (2006) observed that interest rates can be extremely volatile and are often outside the control of many developing economies and argued that developing economies should focus on what they can control.

The previous studies done in Kenya did not consider other significant transmission channels like the real interest rate, exchange rate, inflation growth, gross fixed capital formation, financial innovation and the ultimate effect on prosperity of the economy as measured by the growth of per capita GDP. Economic theory suggests that growth of per capita GDP is preferred when making comparisons between economies. It also reveals the relative performance of specific countries. Further, it is preferred in growth accounting for the population variables (World Bank, 2014) as a proxy for economic growth.

In the last decade, the country has also experienced a number of financial innovations. The existence of these innovations has not been looked into conclusively and thus there is a gap in terms of understanding their implications and effects on growth. The effects of primary budget deficits on growth of GDP per capita as well as the effect of the ongoing growth in financial innovations, terms of trade volatility, gross fixed capital formation, inflation pressures and rising real interestxrates in Kenya is unexplored and requires immediate answers. This paper therefore sought to answer the following questions:

2.1.4 Research Questions

i)   What are the effects of primary budget deficits on economic growth in Kenya?
ii)   What is the nexus between primary budget deficits and economic growth in Kenya?

2.1.5 Objectives of the Study

The main objective of this study was therefore to analyze the effects of primary budget deficits on economic growth in Kenya.

Specifically, the research paper aimed at determining;

   i) The effects of primary budget deficits on economic growth in Kenya.
   ii) The nexus between primary budget deficits and economic growth in Kenya.

2.1.6 Significance of the Study

This paper contributes to the scarce literature on the effects of budget deficits on economic growth in several ways. Firstly, it is timely and crucial to inform public policy in view of the

heightened concerns on the vulnerabilities on the effects of persistent primary budget deficits on economic growth and stability in Sub-Saharan Africa. The study is important in terms of providing feedback to policymakers in order to design appropriate policy response mitigation plan to minimize the adverse effects of budget deficits in Kenya.

Secondly, the study identifies a number of significant transmission channels through which budget deficits affect the growth of the economy. By understanding these transmission channels will enable policy makers to make policy decisions based on empirical evidence. This is particularly important in aiding the formulation of fiscal, monetary and exchange rate policy responses for stability and growth in Kenya.

Lastly, in many developing economies it makes more sense to focus on primary budget deficit as opposed to fiscal deficits. Developing economies like Kenya need to focus on what they can control. The primary budget deficit reveals more clearly whether the observed changes make the situation better or worse (Stiglitz et. al., 2006; Romer, 2012). The identified studies previously done on the effect of primary budget deficit on economic growth, did not consider the nature and directions of causality for Kenya. Understanding these linkages is important for the formulation of appropriate growth and stability policy responses. Soni (2014) asserts that in order to arrive at appropriate fiscal policy and economic growth responses, the correct measurement of the public sector deficit is a vital prerequisite. The study therefore contributes to new knowledge in literature for not only the Kenya policy makers but also for other Kenyans and future researchers. It therefore fills an important knowledge gap that exists and offers fresh evidence that contributes further to macroeconomic policy debates.

2.2 Literature Review

2.2.1 Theoretical Literature

The relationship between budget deficit and economic growth is an interesting topic in economic theory, empirical research and economic policy making. Accordingly, four different schools of thought concerning the subject can be identified in literature. They include classical, neoclassical, Keynesian and the Ricardian equivalence.

This study reviews theoretical literature relating to effects of budget deficit on economic growth in relation to the following identified four broad schools of thought:

(i)   The Classical Theory

(ii)   The Neoclassical Theory

(iii)   The Keynesian Theory

(iv)   Ricardian Equivalence Hypothesis

i)   The Classical Theory

In the literature, Smith (1776) examined the factors that contributed to government budget deficits, including the desire of government bureacrats to spend, the inability and fear to raise taxes, and the willingness of capitalists to lend money. Smith (1776) concluded that budget deficits led to public debts that, in the long-run probably could ruin the great nations. The mainstream economics prior to the publication of Keynes General Theory in 1936 did not favor government spending for stabilization purpose. The greater role of government was neglected not only for philosophical justifications, but also also because of views based on the crowding out hypothesis.

For instance, Smith (1776) considered the transfer of resources from the private to the public sector whether through taxation or borrowing. He opined that money borrowed from the public to finance government spending was thought to involve the "destruction of capital; by the perversion of some portion of the annual produce which had before been destined for the maintenance of labour". Smith argues that "saving is spending" because one man's saving is another man's investment. John Stuart Mill and J.B. Say saw in Adam Smith's precept a guarantee of full employment. This implied that government spending is unnecessary as a stabilization tool, since private investment was sufficient to utilize the money provided by private saving.

The most elementary scenerio for crowding out may be analysed in a "Say's Law" framework where supply creates its own demand. In an economy in which Say's law is operational, attempts by the government to raise total spending, by increasing government expenditure and financing the gap by either borrowing from public or taxation, merely induce changes in relative prices so as to reallocate the same level of real output. In classical sense, the effects of budget

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deficits through the increase in the level of government expenditures is a rightward shift in the IS curve. The equilibrium interest rate thus, rises but the level of income velocity of money remains unaltered.

### ii)	The Neoclassical Theory

Neoclassical model has three central features (capital, labour and technological progress) that play an important role in determining the effects of budget deficits on economic growth (Bernheim, 1989). According to Baxter and King (1993), the neoclassical model implies that there is a negative effect of government spending on economic growth depending on how an increase in government spending influences consumption and private investment. The theory posits that an increase in government expenditure and a tax cut "crowd-out" private sector investment by raising the interest rates.

A summary of neoclassical view on the main implications of budget deficit as pointed out by Bernheim (1989) indicates that if consumers are rational, farsighted and have accesses to perfect capital market, then permanent deficits significantly depress capital accumulation and temporary deficits have either a negligible or perverse implication on the most economic variables (consumption, savings and interest rates). If consumers are either liquidity constrained or myopic, then the effect of permanent deficits remains qualitatively unchanged. However, they pointed out that temporary deficits should depress savings and raise interest rates in the short-run. Neoclassical view does not confine the effects of temporary deficits, and evidence that bears on the impact of temporary deficits is not useful for testing this paradigm. It is clear that the fundamental lesson of the neoclassical school concerns the effect of permanent deficits on the macroeconomy.

### iii)	The Keynesian Theory

In 1936, John Maynard Keynes pointed out that government spending does not crowd-out private spending. This was in his popular book, "The General Theory of Employment, Interest and Money." The Keynesians, in the context of the existence of some unemployed resources, reveal the crowd-in effects by citing the expansionary effects of budget deficit. An increase in government expenditure enhances domestic output and stimulates the economy in short-run by making households feel wealthier, thus increasing total private and

public consumption spending. The resulting increase in the aggregate demand following a budget deficit has a positive effect on macroeconomy. This is the "crowding-in" effect, and has a positive impact on economic growth (Chakraborty and Chakraborty, 2006).

As opined by Bernheim (1989), the Keynesian theory differs from the neoclassical view in two ways: First, the Keynesian theory allows for the possibility that some economic resources are unemployedand second, the view also assumes the existence of a large number of myopic, liquidity constrained individuals whereby the second assumption guarantees that aggregate consumption is very sensitive to changes in disposable income.

In the simplest Keynesian model, Keynes (1936) multiplier based expansion of output leads to increase in demand for money. If the money supply is fixed (that is, the deficit is bond financed), interest rate must rise, and private investment fall. This in turn reduces output and partially offsets the Keynesian multiplier effect. The significance of the Keynesian multiplier may be analysed from the crowding-out point of view. In the General Theory, Keynes provides a cogent and clear crowding-out argument. However, that Keynes chose to give money a supportive rather than a leading role in his analysis. However, Keynes recognized that monetary influence could overcome the multiplier and liquidity preference constructs. Therefore, Keynes recognized a major limitation of the multiplier constructs[2].

By pointing out the limitation of the multiplier, Keynes provides a strong theoretical basis for the crowding-out hypothesis. This revelation also shifted the discussions in the literature to an empirical investigation and controversy over the basis of the IS-LM curves, and the degree to which government is a substitute for private spending. Keynes also recognized a second means, based on business psychology, by which government expenditure could crowd-out private investment. Keynes, (1936) was much concerned with expectations and confidence. He therefore did not overlook the possibility even in those times of relatively small budget deficits that government spending could adversely affect the confidence of the private sector's economic future.

In Keynes' words "with the confused psychology which often prevails, the government programme may, through its effect on confidence, increase liquidity preference or diminish the

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[2] For detailed theoretical limitation of multiplier, see Keynes (1936), The General Theory, pp. 119-120.

marginal efficiency of capital, which again, may retard other investment unless measures are taken to offset it[3]". An increase in liquidity preference, induced by an increase in government spending will lead to an increase in demand for finance. This would lead to an increase in interest rate and a decline in price of bond. This in turn would result in individuals changing their portfolios in order to hold more money than previously held (Keynes, 1936).

Thus, a diminished marginal efficiency of investment is reflected by a backward shift in the IS curve. If the shifts in the IS and LM curves result in zero net change in aggregate demand at the given price level, crowding-out would occurr. However, the actual change in aggregate demand can be positive, negative or negligible, depending on the relative shifts in the curve. However, Keynesian economists argue that an increase in demand for goods in the private sector along with multiplier moderates the crowding-out effects (Keynes, 1936).

In the traditional IS-LM analysis, the increase in demand for private goods caused by a reduction in taxes or increase in government expenditure stimulate IS curve, generating an increase in aggregate demand, eventually increasing output. Thus, an increase in government spending or a decrease in taxes should find a corresponding increase in consumption, economic growth and interest rates. The impact on economic growth is likely to be bigger if the economy "crowding-in" effect causes a much larger increase in growth of the economy. Keynesian model would therefore predict a positive relationship between increases in government expenditure, investment and output, provided that the multiplier effect outweighs the impact of higher increase in interest rates (Keynes, 1936).

In general, many traditional Keynesians argue that budget deficits need not crowd-out private investment. For instance, Eisner (1994c) points out that increased aggregate demand changes the profitability of private investment and leads to a higher level of investment at any given rate of interest. Thus deficits may stimulate aggregate saving and investment despite the fact that they raise the interest rate.

As opined by Bernheim (1989), two major objections which may be raised to the Keynesian theory of budget deficits. The Keynesian outlook on budget deficits presupposes that the government can and will "fine tune" fiscal policy. Assuming that deficits stimulate aggregate

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[3] Keynes (1936), The General Theory, pp.120

demand, it follows that there are circumstances in which the stimuli may be detrimental. Even the most steadfast Keynesian is willing to concede that at full employment real deficits crowd-out private investment and raise the rate of inflation. Keynesians primarily describe the effect of temporary deficits. Indeed, it is essentially compatible with the neoclassical paradigm which primarily concerns the effect of permanent deficits. In failing to distinguish between temporary and permanent deficits, Bernheim, (1989) argues that Keynesians provide misleading advice to policy makers.

iv)   Ricardian Equivalence Hypothesis

Another broad view on the effect of budget deficit on economic growth is referred to as Ricardian Equivalence Hypothesis (REH). The hypothesis implies that deficit is a postponement of taxes and it cannot shift the aggregate demand curve. According to REH, budget deficit is neither good nor bad in terms of its implication on economic growth. The premise of this hypothesis is on seven key restrictive assumptions (Bernheim, 1989) that include:

i)   Successive generations are linked by altruistically motivated transfer

ii) Capital markets are either perfect, or fail in specific ways

iii) Consumers are rational and foresighted

iv) The postponement of taxes is not redistribution of resources across families with systematically different marginal propensity to consume

v)   Taxes are non-distortionary

vi) The use of budget deficit cannot create value (not even through bubbles)

vii) The availability of budget deficit cannot finance as fiscal instrument does not alter the political process

In 1989, Barro and other proponents' of REH anticipated a number of challenges and responded to them in advancing the hypothesis. They based on this hypotheis argued that tax cut will not have an impact on the overall economy, but opined that if government does not finance expenditure by tax, budget deficit would occur, and if budget deficits are financed by debt, households would know that government has to increase taxes in the near future to compensate both the principle and interest payments. This inturn will result in rise in individual saving

because rational households in the economy try to adjust their expenditure in relation to movements in public spending (Barro, 1989).

They highlighted that the extra saving would increase the national saving and therefore offset any rise in interest rate, leaving investments unchanged. Thus, there is no change in interest rates and private investments. Rangarajan and Srivastava (2005) noted that (based on REH), budget deficit will not have much impact on aggregate demand if household expenditure decisions are based on present value of their incomes that take into account the present value of their future tax liability. Further, they affirmed that given the REH broad veiw, one might expect not to find any relationship between tax changes, consumption, investment and output.

In a summary, Chrystal and Daniel (1988) indicate that REH view at macroeconomic level as follows: Budget deficit will not be associated with increase in real interest rates, output prices (or) and trade deficit. The Ricardian view yields a radically different notion of the national debt arising from accumulated deficits. To those who believe in the benefits of deficit financing, the national debt should be viewed as a blessing, and not a curse. To those who believe in Ricardian equivalence, budget deficit merely results in a redistribution of income and the national debt represents the cumulative amount of this net transfer.

A critique of the Ricardian equivalence theorem by Poterba and Summers (1987) highlights five major theoretical objections that could undermine the hypothesis which include the following[4]:

i)   Finite horizons: People do not live forever and therefore do not care about taxes that are levied after their deaths.

ii)   Imperfect loan markets: REH also fail because credit markets are imperfect with the typical person's real discount rate exceeding that of the government.

iii)   Uncertainty about the future taxes and incomes: The uncertainty about individual's future taxes or the complexity in estimating them implies a high rate of discount in capitalizing these future liabilities. Therefore, if uncertainty increases the desired national saving tends to rise with a budget deficit and vice versa.

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[4] For detail theoretical objections to the Ricardian Equivalence approach see Bernhein (1989).

iv)   The timing of taxes. Taxes are not lump sum, since they typically depend on income, spending, wealth, and so on. Budget deficits thus change the timing of income taxes and affect people's incentives to work and produce in different periods. It follows that variations in deficits are non-neutral although the results tend also to be inconsistent with the standard view.

v)   Full employment and Keynesian cases: REH results depend on "full employment" and therefore do not hold in Keynesian economic growth models.

The differences among the four broad views in terms of opinions and analysis are mainly due to various factors such as time dimensions, types of economy and method of analysis as well as the assumptions about individual's behavioral responses in specified situations.

2.2.2 Empirical Literature

Given the fact that the identified theoretical views on the subject is mixed-up, some empirical studies have been conducted and various results have been obtained. From a macroeconomic perspective, the stance of fiscal policy can be summarized by movements in the primary budget deficit as a share of GDP. Historically, primary budget deficit has been highly countercyclical in developed economies like USA, implying that it increases during economic slowdowns and decreases during expansions. In the literature, the countercyclicality is driven by both the spending side and revenue side and by either discretionary or "activist" policies and automatic or "passive" policies (Mahedy and Wilson, 2018).

Literature on the effects of fiscal policy and particularly macroeconomics' effects of primary deficits in open economies is scanty. A few studies examine effects of fiscal policy shocks or aggregate demand shocks in open economies, but they mostly do not explicitly discuss the effects of primary budget deficits on economic growth. A few studies have directly estimated fiscal multipliers (responses of GDP to policy change affecting government spending or tax revenue) and test whether the nature of the multiplier depends on the state of the economy. For instance, they argue that it can be challenging given the historical rarity of stimulative fiscal policy in good times or contractionary fiscal policy in bad times at the federal level. Therefore, policy analysts' have typically turned to data at country level to analyse fiscal multipliers for procyclical and countercyclical stimuli for some economies.

The findings of Mahedy and Wilson (2018) suggest that the recent USA fiscal policy has taken a procyclical turn, driven primarily by the large tax cuts enacted by the 2017 Tax Cuts and Jobs Act. Many analysts have forecasted a positive GDP growth in US over the medium term. However, they note that recent evidence shows that the effects of fiscal stimulus on overall economic activity are much smaller during expansions than during downturns. They further argue that the forecasts may be overly optimistic by noting that fiscal multiplier is pedominantly smaller during expansions than during recessions.

On the other hand, Taylor et al, (2011) applied a simple model that illustrates the analysis between the primary budget deficit, economic growth, and debt in USA. They established that primary deficit responds counter cyclically to economic growth while on the other side, growth may respond positively or negatively to the primary budget deficit. They show that the recent Great Recession in the US was typical in that there was a weak counter cyclical fiscal response. The increase in government net borrowing was significantly less than the decrease in private borrowing (an unprecedented asymmetry). The findings verify the pattern and suggest that there is a strong positive effect on growth of a higher primary deficit, even when possible increases in the interest rate are taken into account.

According to Nakamura and Steinsson (2014), Leduc and Wilson (2013) analyse GDP multipliers at state level on both federal military and highway spendings respectively. The findings show that the spending multiplier tends to be much larger in states experiencing more resource slack from such things as higher unemployment. Similarly, Shoag (2010) finds that the response of employment and personal income to a boost in state government spending increases with the level of unemployment rate in USA.

A study done by Jorda and Taylor (2016) examined the GDP multiplier on government spending using a panel of countries in the OECD and finds that the multiplier is considerably smaller in expansions than in recessions. There are few contrary studies, but importantly Ramey and Zubairy (2018) examined the multiplier on defense driven government spending in the USA using a dataset as from 1889. They argue that the long history and focus on defense spending helps overcome the empirical challenges posed by the rarity of procyclical federal spending boosts. Ramey and Zubairy (2018) establish that the GDP multiplier for this spending is relatively low and is independent of the state of the economy.

Moreover, Alesina and Ardagna (2010) investigated short term positive impact on economic activity from spending cuts. Based on data manipulation and correlation analysis for dozens of countries over nearly two hundred years, they established a debt level of 90% of GDP beyond at which a country is likely to slide into a debt crisis. However, IMF (2010) and Jayadev and Konczal (2010), and Irons and Bivens (2010) provide extensive reviews of Alesina-Ardagna's work and reveal that studies supporting expansionary austerity neglected the possibility that economic growth is not only affected by fiscal policy, but may improve public finances and contribute to fiscal sustainability. Such dynamic interactions are key for the analyses of the causes and consequences of the deterioration of the chronic deficits and prospects for the economy of USA in future.

Traditional Keynesians advocate that fiscal consolidations depress economic growth. However, this view has been critiqued by Feldstein (1986) whose evidence acknowledges a positive impact of spending cuts and tax increases on economic output. Accordingly, Feldstein argues that fiscal consolidations must not necessarily hamper economic growth but may boost the economy (at least in the short-run). He discussed potential channels for expansionary effects of fiscal consolidations by focusing on both the demand and supply sides as illustrated herein:

a) On the demand side, consumers' expectations and the effect of consolidation on interest rates are important. First, on consumers' expectations, a regime change in fiscal policy today eliminates the need for larger, maybe much more disruptive adjustments in the future (Giavazzi and Pagano, 1990). If present tax increases, imply that consumers'originally perceived future tax increases will be smaller than expected, current private consumption can increase. Another channel ascribes a reducing effect on sovereigns' risk premium, implying that if fiscal adjustments are perceived as permanent and successful, real interest rates of government bonds should decrease (Alesina and Ardagna, 1998). If this reduction transfers to a decrease of private consumers' and firms' real interest rates, private demand components that are sensitive to interest rates can increase (Alesina and Ardagna, 2010).

b) On the supply side, the channel for expansionary effects is through the labour market and labour unions. The effect are ambiguous and depend on the fiscal adjustment's configuration. If tax revenue is increased, lower net wages induce unions to negotiate on

higher pre-tax wages. If spending is cut, say through a decrease in government employment, the lower reservation wage may induce union members to demand lower wage increases which may foster firms' profits and private investment (Alesina and Ardagna, 2010).

This study also identifies other literature on the short-run and long-run effects of expansionary fiscal policy. The associated evidence is mixed. For instance, Blanchard & Perotti (2002), Mountford & Uhlig (2002) establish that short-runxshocks to government spending in the United States of America increase consumption, real wage and GDP, as in the Keynesian models. On the other hand, Hemming, Kell & Mahfouz (2002) reveal that the short-run effect of public spending on output is very small and close to zero.

Moreover, while examining the long-run impact of fiscal stimulus on economic growth, most of the identified literature (Grier and Tullock, 1989; Alesina, Ardagna, Perotti and Schiantarelli, 1999; Grossman and Helpman 1990); Fatas and Mihov, 2001b) show negative relationships. However, Li et al., (2010) established a positive effect on the Chinese economy. In addition, Edelberg, Eichenbaum & Fisher (1999) established that in the short run, government expenditure has a positive impact. However, they pointed out that beyond a year, this impact continuously falls. Using a neoclassical model, Barro and Redlick (2009) established that the short-run effect of higher public spending can be positive, but the long-run impact is likely to be very close to zero. Lastly, Ilzetzki et al (2010) examined the expenditure on government consumption. They established a negative effect in short-run, while the results for medium and long-run varied considerably. They attributed this variance to economic characteristics.

In general, literature on the effectiveness of budget deficits in developed countries is more extensive, as compared to developing economies. The economic impact of primary deficits induced growth in developed countries is varied. For example, the studies by Johnson et.al, (2006), Romer and Romer (2007) establish a positive response of consumption spending resulting from tax cut shocks in the United States of America. Equally, while focusing on the same economy, House and Shapiro (2008) show that tax cuts have a positive effect on investment.

On the other hand, the works Taylor (2009) established that tax cuts have a negative effect on consumption spending. Ramey and Shapiro (1999) concluded that government spending has

negative effects on GDP. Additionally, Aurbach & Kotlikoff (1987) pointed out that tax cuts have a negative impact on private investment. A study done on Japan, the Euro area and United States of America reveals positive effects of spending on GDP. The analysis by Barrel et al., (2004) for German suggests a positive response of GDP to government spending.

The study by Ilzetzki, Mendoza and Vegh (2012) reveal that the impact of expenditure shocks depends crucially on country characteristics that include the level of development, exchange rate regime, openness to trade and the level of public indebtedness. Based on a novel quarterly dataset of government expenditure in 44 countries the authors established that:

a) The output effects of an increase in government consumption is larger in industrial than in developing countries;
b) The fiscal multiplier is relatively large in economies operating under predetermined exchange rates but is zero in economies operating under flexible exchange rates;
c) Fiscal multipliers in open economies are smaller than in closed economies;
d) Fiscal multipliers in high debt countries are negative.

This analysis suggests that primary budget deficits may be effective in stimulating economic growth in some cases and may prove impotent in others. As pointed out by Spilimbergo et al (2009), this may be justified by the fact that the effectiveness of budget deficits varies based on various economic characteristics, including the size of the primary budget deficit.

2.2.2.1 Effectiveness of Budget Deficits in Developing Countries

To begin with, developing countries have been depending on deficit financing to accelerate growth. Generally, most of these economies are not capable of mobilising sufficient resources to gererate the desired economic development. Additionally, these countries face uncertainty with respect to foreign investment and capital flows. As affirmed by Chowdhury (2004), budget deficits become an important strategy for equity and economic growth re-engineering.

Empirical evidence on the effects of budget deficits on these economies is mixed. For instance, Ilzetzkiz et al (2010) used a Vector Auto Regression model to analyse the impact of budget deficits for twenty developed and twenty-five developing economies. Their finding suggest that in developing nations, the consumption spending multiplier is smaller and less persistent

than in high-income countries. Moreover, Dalyop (2010) analysed the case for Nigeria and established that budget deficits have an insignificant growth effect.

On the other hand, Chowdhury (2004) examined the output impact of fiscal stimulus on five developing countries and affirmed that these economies require more budget deficits than less, because budget deficits do not crowd-out investments. A case study by Vera (2009) dismissed the simplistic conclusions of neoclassicals which disregards the institutional differences between developed and developing economies, and thus provided evidence that deficits crowd-in public and private investment impacting positively on economic growth.

Narrowing the focus to Kenya, Okelo et al., (2013) anlysed the relationship between fiscal deficits and economic growth using time series data for the period 1970 to 2007. The study employed OLS estimation technique and found a positive relationship between fiscal deficits and economic growth in Kenya and recommended prudent financial management and enhanced revenue collection to avoid crowding-out of the private sector investment.

A similar study by Amanja and Morrissey (2005) categorized government expenditure into productive and unproductive and tax revenue into distortionary and non-distortionary and applied time series annual data in a Kenyan case study. They analysed various measures of fiscal policy on growth for the period 1964 to 2002. The findings indicate that unproductive expenditure and non-distortionary tax revenue had neutral (no) effects on economic growth. However, against the study expectations, productive expenditure was found to have strong adverse effect on economic growth whilst there was no evidence of distortionary effects on growth of distortionary taxes. Government investment was found to be beneficial to economic growth in the long-run.

In order to assess the effect of random discretionary fiscal policy on Kenya's economy, a small VAR model was constructed and analyzed by World Bank (2010). The study findings established that a discretionary fiscal response has a small impact on output: 0.1% for any 1% change in cyclically adjusted primary balance. The findings also confirmed that the impact persists for 9 quarters positively after which it turns negative. However, the author concludes that the finding needs to be interpreted with caution. The study suggests that there are two other fiscal policy components that include:

i)   Systemic discretionary policy which the study termed "routine responses to changing economic situations"

ii)   Automatic policy, governed by rules and laws, such as the tax code.

The study further concludes that a full assessment of the impact of overall fiscal policy on GDP needs to consider all three components. Lastly, Walaa (2016) used structural vector autoregressive model and applied quarterly data for the period 1991 to 2012 to estimate the Kenyan government expenditure multiplier. The findings indicated that the effect of government spending on output in Kenya appeared to be weak and non-persistent. The results were justified by high government debt to GDP ratio, high debt servicing and high marginal propensity to import in Kenya. Table 2.0 highlights a summary of empirical literature on the subject.

Table 2.0: Summary of Empirical Literature

Author & Year	Country of Study	Data Used	Methodology	Main Finding
Hussain and Haque (2017)	Bangladesh	Two sources of Time series annual data for 1993/94 to 2015/19: Foreign source data (WDI, 2017) Local source data (BBS[5], 2017)	Unit root test Cointegration VECM	Foreign source data revealed negative effect of budget deficit on economic growth. Local source data suggested a positive effect (Keynesian).
Navaratan and Mayandy (2016)	A Panel of South Asian Countries	Annual time series data (1980 to 2014)	VAR framework Cointegration VECM Granger-causality	Budget deficit had significant negative effect on economic growth for all the countries except Nepal that revealed a significant positive effect. The direction of causality is mixed.
Walaa (2016)	Kenyan	Quarterly data for the period 1991 to 2012	SVAR Approach	Effect on government spending on economic growth appeared to be weak and non-persistent
Bhoir and Dayre (2015)	Indian	Annual time series data for the period 1991/92 to 2013/14	OLS Method	No significant relationship
Nayab (2015)	Pakistan	Annual time series for the period 1976 to 2007	Unit root test Cointegration, VAR Granger & VECM	Positive effect of budget deficit on economic growth
Qasim et al (2015)	Pakistan	Anual time series data for the period 1976 to 2014	2SLS estimation technique	Budget deficit had non-linear association on economic growth. The author suggests curtailing both the interest payment and primary deficit.
Hassan et al (2014)	USA	Annual time series for the period 1930 to 2010	Unit root test Cointegration	Negative impact of budget deficit on economic growth

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[5] Bangladesh Bureau of Statistics

Author & Year	Country of Study	Data Used	Methodology	Main Finding
Cinar et al (2014)	Eurozone Countries	Panel quarterly data for the period 2000Q1 to 2011Q4	Panel ARDL Model Cointegration	Budget deficit had positive effect in the short-run
Okelo et al (2013)	Kenya	Annual time series data from 1970 to 2007	Dickey Fuller, ADF test, Cointegration OLS & ECM	Budget deficit had positive effect on economic growth
Taylor et al (2012)	USA	Annual time series data for the period 1961 to 2011	Dickey Fuller Cointegration VAR/VECM	Budget deficit had positive effect on economic growth
Adam and Bevan (2005)	A Panel of 45 Developing Countries	Panel data for 45 non OECD Countries for the period 1970 to 1999	Panel data analysis. Also include a set of time varying dummy variables to capture time varying factors	Evidence of a threshold effect of budget around deficit about 1.5% of GDP. Evidence of interaction effects between deficits and debt stocks exacerbating the adverse effects of large deficits.

Source: Author's Compilations

2.2.3 Overview of Literature

The reviewed literature provides great insights associated with Keynesian modelling between developed and developing economies. However, some aspects of Keynesian economics appear not to apply in the context of developing economies. For instance, Ilzetzki et al., (2010) affirms that government investment spending has a positive effect in developing countries and turns insignificant in developed countries. To this end, a Keynesian theoretical framework, centred on developing economies' characteristics, can be essential for analyzing the subject in Sub-Saharan African countries like Kenya. The framework enhances the analysis that, in the presence of productive capacity, given structural deficiency in aggregate demand, a fiscal stimulus can yield positive effects, mostly if it results in infrastructure spending or any other forms of investment spending particularly in the short-run.

The studies that have been done in Kenya and relate to the subject matter (Okelo, et al., 2013) applied the fiscal deficit in their analyses which is more applicable to developed economies. A good substitute for this measure in developing countries would be the primary budget deficit (Stiglitz et. al, 2006). The identified evidence for Kenya is Okelo, et al., (2013). Applying different models, data, methodologies and sample periods, we may yield fresh insights and further enrich evidence in this field. Further, the study notes that the identified study did not explore the causal nexus between budget deficit and economic growth. This study addresses these shortcomings. Lastly, presence of structural breaks in the variables may lead to distortion of results where a

unit root may be rejected (accepted) while it is actually supposed to be present (absent). In the identified literature for Kenya, it is confirmed that the authors had not taken into consideration the distortions which would be brought about by presence of structural breaks in the data series. This study therefore goes further to include structural breaks in the analysis.

2.3 Methodology

2.3.1 Theoretical Framework

The study is premised on an extended framework originally developed by Domar (1944). The growth model has been applied by Rangarajan and Srivastava (2005) in the analysis of India's state finances and recently by Taylor et al., (2011) for the analysis of the finances and growth of USA economy. The necessary conditions for fiscal sustainability in line with the Keynesian economics as formulated by Domar (1944) can be best suited for developing countries that are chacterised by huge unemployment of productive resources in the economy.

The model has been extended by Buiter (1985) and further by Blanchard et al. (1990). In the model, the share of public debt to GDP will converge in the end to its initial level to attain fiscal sustainability. The problem of debt levels lies in the ability to make output grow rather than in attempting to reduce it without taking account of the effects of such a reduction on income. A higher growth of output can be achieved if sufficient amount of expenditures is directed toward increasing the productions' efficiency.

Further, Taylor et al., (2011) shows the effects of the public debt burden that result from cumulative primary budget deficits on macroecony. Moreover, in the lenses of Domar's (1944) framework that focuses on the effects of deterioration of the deficit and prospects for the future economic growth in the USA, we draw a similar analysis. Indeed, the Domar (1944) concentrates on long-term fiscal arithmetic and debt sustainability while ignoring capital gains and concludes that the change in total government debt is the sum of the primary budget deficits and interest payments onoutstanding debt Abstracting Δ as the ratio of debt to output (Y), and δ the ratio of primary budget deficit to Y, the growth rate of Y is g, and $j = i - \hat{P}$ is the real interest rate with i as the nominal rate and $\hat{P}$ the rate of inflation. In a continuous time, equation 2.1 shows the change in debt to income ratio:

$$\dot{\Delta} = \frac{d\Delta}{dt} = \delta + (j - g)\Delta \qquad (2.1)$$

Equation 2.1 shows that the share of debt to GDP ratio increases with the ratio of primary budget deficit to GDP and the difference between real effective interest rate and real GDP growth. A constant debt to GDP ratio with $\dot{\Delta}= 0$ is attained when condition (2.2) is met:

$$\delta = (j - g)\Delta \qquad (2.2)$$

The debt to GDP ratio decreases when the primary budget deficit is less than the term in the right hand side of (2.2) which means that the government can grow out of its deficit. This relationship has been emphasized in a number of World Bank publications (Taylor et al., 2011) and according to Taylor et al., (2011) it is referred to as the solvency condition and is expressed as:

$$\Delta = {\delta}/{(g - j)} \qquad (2.3)$$

In equation 2.3, the denominator indicates the difference between two small numbers. A faster growth or a lower interest rate has a very large effect on reducing the steady state debt to GDP ratio and it is not the case for a reduction in the ratio of the primary budget deficit to GDP in the numerator. In cases whereby both interest rate and growth rate of GDP cannot be influenced by the government, Buiter (2010) suggests that the government need to promote a permanent tightening of the primary budget deficit, or would have to inflate away the real burden of its debt in order to attain fiscal sustainability as highlighted in Figure 2.2.
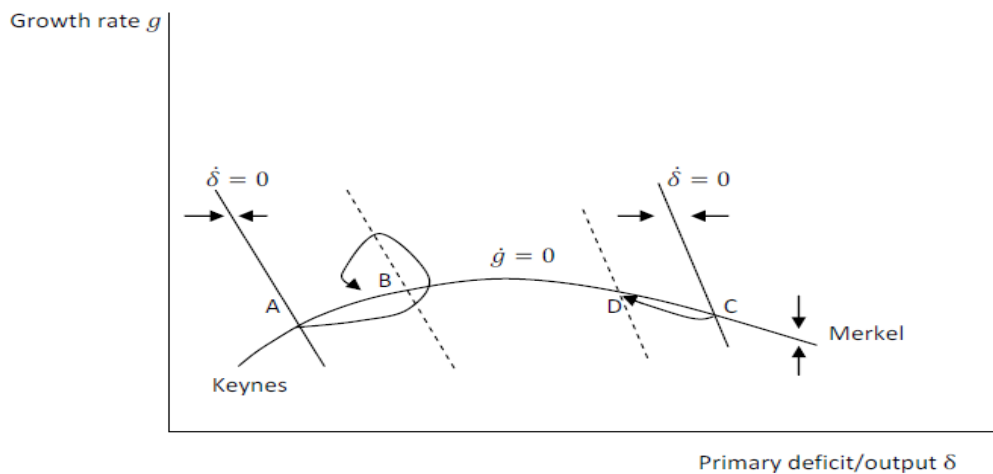
Figure 2.2: The Effects of Primary Budget Deficit on Economic Growth
Source: Taylor et al., (2011)

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The effect of a fiscal expansion through primary budget deficits in the Keynes case has positive effects. On the contrally, it is clearly highlighted in Figure 2.2 that fiscal expansion via primary deficits has negative effects on growth in the Merkel case. In the Merkel case, a permanent reduction in fiscal stimulus (γ) shifts the steady state debt to output ratio (Δ) downwards. This effect is however, reversed in the Keynes case. Domar's (1944) growth model shows that it is better to consider the solvency condition as stated as in equation 2.4;

$$g - j = g - i + \hat{P} \qquad 2.4$$

where i is the nominal interest rate and $\hat{P}$ the inflation rate. Assuming that the growth rate is relatively low and the nominal interest rate is close to zero, so that;

$$g - j \approx g - i + \hat{P} \qquad 2.5$$

A reduction in g (to a level less than zero) could also force price deflation with $\hat{P} < 0$. The implication is that the solvency criterion ($g - j$) could turn negative and destabilize the system. In a Keynesian situation the growth rate would steadily fall and, the deficit to output ratio increase without limit resulting back to Irving Fisher's (1933) debt deflation scenario. In a Merkel economy, the deficit hawks nightmare that could play out if aggressive inflation targeting of the nominal interest rate (i) in response to an increase in g (and presumably $\hat{P}$ makes ($g < j$) whereby, the inflation targeting could be courtesy of a central banker.

Additionally, Taylor et al., (2011) observes that the adjustment in the debt ratio (Δ) in the model will be slow in comparison to δ (the ratio of primary budget deficit to output) and g (the growth rate of output) implying that shifts in the debt ratio (Δ) will affect the other macroeconomic variables in situations in which $\dot{\delta}$ and $\dot{g}$ are close to zero. Through the various crowding-out arguments, a higher debt ratio (Δ) would reduce the growth rate, shifting the $\dot{g} = 0$ downwards. In the Keynes case, the outcome would be lower output growth (g), higher (primary budget deficit to output ratio) δ and a higher steady state level of debt ratio (Δ).

In summary, a higher debt ratio could slow growth with an ambiguous effect on primary budget deficit. The steady state debt ratio would probably increase worsening the long-run

outcome. In line with Domar's economic growth theoretical model, active fiscal policy could offset these dynamics (Taylor et al., 2011).

2.3.2 Empirical Model

The objective of the study was to examine the effect of primary budget deficits on economic growth and also determine the direction of causality between the primary budget deficits and growth of GDP per capita in Kenya. In line with the fiscal growth equation, the specified model included both fiscal and non-fiscal variables affecting economic growth. Excluding them could lead to bias in the direction of causality between primary budget deficits and economic growth in Kenya. The study assumes that the private sector is more competitive than the public sector. This is in tandem with microeconomic theory where the first theorem of welfare economics posits that competitive markets (private sector) lead to more Pareto efficient resource allocation. This is a restatement of Smith's (1776) invisible hand theorem. To enhance a more Pareto efficient outcome, the government expenditure should not crowd-out the private investment via the real interest channel in relation to deficits growth connection.

The model could be limited if it assumed a closed economy. Economies will always be open and therefore do trade with other economies. The role of trade in economic development cannot be ignored (Adul et al., 2013; Jalil and Feridun, 2011 and Khan, 2008). In line with the Kenyan situation, terms of trade variable in annual percentage was included to capture the role of trade on economic growth (Beck, 2002, Do and Levchenko, 2004).

Moreover, in the new era of innovation, competing sorely has become complex. No single innovative agent has resources and competences to act alone. As documented by Organisation for Economic Co-opertion and Development (OECD 2009), interdependence of instititutions is because of merging innovation economies. This study affirms that the introduction of M-pesa in Kenya in 2007 also signals an important milestone on technical innovation that cannot be overlooked. To control for the effects of financial innovation on economic growth in Kenya, the study includes a dummy variable with a value of 1 for year 2007 onwards and zero if otherwise. From the literature, M-Pesa mobile banking leads digital mobile payments worldwide and therefore cannot be overlooked (Buku & Maredith, 2013, Nyamongo and Ndirangu, 2013).

Lastly, the presence of structural breaks in the variables may distort the results where a unit root may be rejected while it actually supposed to be present due to the influence of structural breaks. Most of the studies done in Kenya had not taken into consideration the distortions that are triggered by the presence of structural breaks in the data. This paper therefore included structural breaks in the analysis. The augmented model is specified as;

$$Y = (BD, K, RIR, ToT, CPI, FI) \qquad 2.6$$

where Y is growth of GDP per capita, BD is the primary budget deficit, K is gross fixed capital formation, RIR is real interest rate, ToT is terms of trade, CPI is the rate of growth of inflation and FI represents the financial innovation dummy. To control for the effect of financial innovation on economic growth in Kenya, the study includes a dummy with a value of 1 for year 2007 onwards and zero if otherwise. The study notes that M-Pesa mobile banking has been the leading mobile payment in the world and therefore cannot be overlooked when analyzing economic growth in Kenya. Further, and based on the time series aspects of the macroeconomic data, if the unit root and co-integration exist in the data series, we estimate the VEC model as in equaton 2.7:

$$\Delta X_t = \sum_{i=1}^{k} \Delta A_i X_{t-i} + \alpha D_t + \Pi ECM_{t-1} + \vartheta_t \qquad 2.7$$

Where X_t is a vector of endogenous variables, which include growth of GDP per capita, primary budget deficit as measure of fiscal variable and other non-fiscal measures applied as control variables. D_t is the dummy capturing the effects of financial innovation on economic growth in Kenya and ϑ_t is a vector of white noise (error term). Π is the error correction parameter. It displays how the cointegrated variables adjust to deviations from long-run equilibrium.

2.3.3 Definition and Measurement of Variables

Variable	Definition and Measurement	Expected Sign	Data Source
GDP per capita growth (Y)	The percentage change of GDP per capita expressed in annual percentage.		World Development Indicators, 2017
Primary Budget Deficit (BD)	The total government revenue including grants received less total expenditure excluding interest payments expressed as a percentage of GDP. Values greater than zero represents deficits and vice-versa. For most of the study period, the balances were in deficit.	Positive	IMF, World Economic Outlook, 2018
Gross Fixed Capital Formation (K)	The acquisition (including purchases of new or second-hand assets) and creation of assets by producers for their own use, less disposals of produced fixed assets. It is in annual percentages of GDP.	Positive	World Development Indicators, 2017
Real Interest Rate (RIR)	The lending interest rate adjusted for inflation as measured by the GDP deflator	Negative	World Development Indicators, 2017
Terms of Trade (ToT)	The ratio of export price index (or unit value index) of goods and services (or unit value index) to import price index of goods & services. It is in annual percentage. The base year is 2009.	Negative	IMF, World Economic Outlook, 2018
Inflation Growth (CPI)	Annual percentage change of average consumer prices based on year on year changes. The base year is 2009	Negative	IMF, World Economic Outlook, 2018
Financial Innovation (FI)	A dummy variable taking a value of 1 from year 2007 onwards when M-Pesa was introduced in Kenya and zero if otherwise.	Positive	Justified by Krishnan, 2011

Source: *Author's Compilations*

2.3.4 Econometrics Approach

a) Descriptive Statistics

To determine the statistical properties of the data and further select a suitable model, it was necessary to do descriptive analysis of the data. To test for normality of the variables, we applied Jarque-Bera test. The test compares the skewness and kurtosis coefficients of the variables. For a variable to be normally distributed, its skewness should be equal to zero, kurtosis equal to three and Jarque-Bera (1980, 1987) statistics equal to zero. Further, the study sought to determine the spread of the data by estimating the mean and the first movement away from the mean for all the variables. The study also conducted graphical analysis of the variables to capture their movements overtime as indicated in the appendix.

b) Unit Root Tests

Unit root test for determining stationarity properties of all the variables was conducted to avoid spurious results of regression. In determining the properties of stationarity, the study applied Augumented Dickey Fuller (ADF) (Dickey and Fuller, 1979) unit root test. The null hypothesis is that there is a unit root. Equation 2.8 depicts the ADF test as:

$$ADF: \quad \Delta Y_t = \alpha + \beta T + \rho Y_{t-1} + \sum_{i=1}^{k} \delta_i \Delta Y_{t-1} + u_t \qquad 2.8$$

Where Δ is the first difference and k is the number of optimal lags dealing with serial correlation. By adding sufficient lagged differences of the dependent variables, facilitates the ADF unit root test to deal with errors that are correlated in the model.

According to Perron (1989), ADF tests is limited and therefore could lead to failure to reject the null hypothesis in the presence of unit root in case there is presence of structural breaks in the series. The tests could find the series to be $I(1)$ while in real sense they could be stationary, $I(0)$ around the structural breaks or vice versa and therefore wrongly classified. To counter this limitation, it was therefore important to incorporate structural breaks. From the literature, there are two ways of incorporating structural breaks, either exogenously where break date is known or endogenously where break date is not known (Zivot and Andrew's, 1992).

The conventional unit root tests do not include the structural shocks. These tests are also prone to and more likely to yield biased estimates. This deficiency spearheaded the evolution of Zivot and Andrews's unit root test (1992). The specialty of this test is that it detects the presence of one major breakxin the data series (Mallick et al., 2018). The structural break tests such as Chow (1960) tests determine breaks exogenously and this may lead to an over-rejection of unit root hypothesis. In this context, the Zivot and Andrews (1992) advocate for the break dates to be determined endogenously as it is correlated with data series (Narayan, 2005).

The study utilized Zivot and Andrew's (1992) test for unit root which determines the structural breaks endogenously instead of assuming that they are known or are as a result of an estimation procedure. This test is considered superior because it identifies the dates of structural breaks in each of the series and therefore it enhances the analysis of whether a structural break in each

of the series can be linked to a particular event or policy. Zivot and Andrews test allows for one structural break in the intercept and in the trend of each variable. As a result, there is a different dummy for each possible structural break in each variable. Zivot and Andrew's test therefore estimates three models whereby the first model allows for one structural break in the level, the second model allows for one structural break in the trend while the third model allows for one structural break in both the level and trend of each series as follows;

$$Model\ 1: \qquad \Delta y_t = \alpha + \beta y_{t-1} + \delta_t + \gamma DUM_t + \sum_{i=1}^{k} d_j \Delta y_{t-j} + u_t \qquad 2.9$$

$$Model\ 2: \qquad \Delta y_t = \alpha + \beta y_{t-1} + \delta_t + \theta DUT_t + \sum_{i=1}^{k} d_j \Delta y_{t-j} + u_t \qquad 2.10$$

$$Model\ 3: \qquad \Delta y_t = \alpha + \beta y_{t-1} + \delta_t + \gamma DUM_t + \theta DUT_t + \sum_{i=1}^{k} d_j \Delta y_{t-j} + u_t \qquad 2.11$$

Where DUM_t is dummy variable depicting structural break at level at any possible break date and DUT_t is the trend shift dummy variable and;

$$DUM_t = \begin{cases} 0, & \text{If } t > BD, \\ Otherwise \\ 1 \end{cases}$$

$$DUT_t = \begin{cases} 1, & \text{If } t > BD \\ Otherwise \\ 0 \end{cases} \text{, and } BD \text{ is the break date.}$$

The null hypothesis for all the models is that there is a unit root in the presence of one unknown structural break. The third model was adopted because it is superior in comparison to to the first and second models. The values of (γ) and (θ) show the range within which structural breaks are detected for the variables and fall between zero and one. This is achieved at the point that minimizes the t-statistic for stationarity (Perron and Rodriquez, 2003).

c) Cointegration Analysis

Prior to estimation of the model, the first step involved confirming the stationarity of the variables. In instances where variables are stationary, then the normal Ordinally Least Squares (OLS) approach is applied for analysis. However, if the variables were not stationary, but transformed to stationary after the first difference, we would proceed with cointegration analysis. Ino rder to determine the possibility of long-run relationship between the variables, Johansen cointegration (Johansen, 1988; Johansen and Juselius, 1990) test was applied based on Vector Autoregressive (VAR) approach.

$$X_t = \alpha + \beta_1 X_{t-1} + \beta_2 X_{t-2} + \quad \ldots \quad + \beta_k X_{t-k} + u_t \qquad \text{2.12}$$

By introducing changes, we express equation 2.12 as;

$$\Delta X_t = \alpha + \beta_k X_{t-k} + \sum_{i=1}^{k-1} \rho_i \, \Delta X_{t-i} + u_t \qquad \text{2.13}$$

where X_t is a vector of endogenous variables including growth of GDP per capita, primary budget deficit and control variables including gross fixed capital formation, real interest rates, trade openness and financial innovation and β and ρ show the p by p matrices of unknown parameters.

d) Vector Autoregressive (VAR) Model

After conducting the tests, the cointegration results determined whether to run a Vector Autoregressive (VAR) system (Sim, 1980) or a Vector Error Correction Model (VECM). The VAR model allows for analysis of the joint dynamic behavior of variables without requiring strong restrictions on parameters. VECM is a cointegrated VAR with an error correction term (ECT). The ECT allows for detection of short-term or long-term causal relationships and captures the long-run adjustment of cointegrated variables. VECM specification restricts the long-run behavior of the endogenous variables to converge to their cointegrating relationships while allowing a wide range of short-run dynamics. The cointegration term is known as the error correction term since the deviation from long-run equilibrium is corrected gradually through a series of partial short-run adjustments. The resulting VECM representation has more efficient coefficient estimates (Engle and Granger, 1987).

One of the reasons why the above technique is preferred over other methods of analysis like OLS is because it considers the dynamic relationships between variables. OLS would give spurious estimates in instances where variables are not stationary. The VAR model is represented as;

$$X_t = \sum_{i=1}^{k} A_i X_{t-i} + \alpha D_t + \vartheta_t \hspace{2cm} 2.14$$

Where, X_t is a vector of endogenous variables, which include growth of GDP per capita, primary budget deficit as measurexof fiscal variable and other non-fiscal measures, applied as control variables. D_t is the dummy capturing the effects of financial innovation on economic growth in Kenya and ϑ_t is a vector of white noise (error term). Based on time series aspects, if the unit root and cointegration is confirmed to exist in the variables, we estimate VEC model as;

$$\Delta X_t = \sum_{i=1}^{k} \Delta A_i X_{t-i} + \alpha D_t + \Pi ECM_{t-1} + \vartheta_t \hspace{2cm} 2.15$$

Where Π the error correction parameter and is shows how the cointegrated variables adjust to deviations from equilibrium in the end.

e) Lag - Order Selection Criteria

It was necessary to determine the optimal lag length before estimating the model. Akaike information criteria (AIC), Schwarz-Bayes information criterion (SBIC), Hannan-Quinn information criteria (HQIC) and final prediction error (FPE) techniques applied to determine the optimal lag length of both the variables in the model (Nielsen, 2001; Lukkepohl, 2005; Abdulnasser and Scott, 2011). Underestimating the number of lags could lead to auto-correlated errors in the model while overestimating lags could lead to errors with high means implying that the model is over fitted.

f) Granger-Causality Methodology

To establish the causality between the primry budget deficits and economic growth, the study applies Granger-causality technique. The technique was introduced by Granger (1969) and adopted by Kokaveshi and Kola (2013), among others. The intuition of the causality is that past values of a series can cause another in the future (Takaendesa and Odhiambo, 2007). Granger (1988) notes that a time series variable can be predicted by using past values of another

time series variable. This implies that X_t Granger causes Y_t if past values of X explain Y_t. However, Granger causality does not imply with certainty that one series causes another but rather one series might cause another. Budget deficit causes economic growth if it can be predicted better by past values of budget deficits and economic growth. Equally, a budget deficit is Granger-caused by economic growth if it can be predicted better by past values of economic growth and budget deficits. The following equations on budget deficits and economic growth relates to the standard VAR Granger-causality (1969) approach.

$$Y_t = \sum_{i=1}^{k} b_1 Y_{t-1} + \sum_{i=1}^{k} b_2 BD_{t-1} + u_t \qquad \qquad 2.16$$

$$BD_t = \sum_{i=1}^{k} d_1 Y_{t-1} + \sum_{i=1}^{k} d_2 BD_{t-1} + \vartheta_t \qquad \qquad 2.19$$

Where BD depicts the primary budget deficit and Y denotes economic growth depicted by growth of GDP per capita. The limitation of the standard VAR granger-causality is that it fails to consider the possibility of a non-stationarity or any cointegrating relationship among the variables. The Toda and Yamamoto (1995) technique applies a standard VAR model while variables are in levels rather than first differences implying that the risk of wrongly identifying the order of integration of the series is minimized (Mavrotas and Kelly, 2001).

The Toda and Yamamoto (1995) modified WALD hypothesis test is done with an extra lag to the VAR model. This is in accordance with the maximum cointegration relationship of the series and it has a chi-square ($\chi 2$) distribution. This approach fits into a standard VAR model in variable levels (instead of first differences as in granger-causality tests) and minimizes the risks resulting from the possibility of wrong detection of cointegration levels of the series (Mavrotas and Kelly, 2001). This study therefore applied Toda Yamamoto causality analysis technique in the context of VAR model as $k + d_{max} = 2 + 1 = 3$ level by adding the maximum cointegration level of 1 to the optimal lag length. In the VAR model, k represents the number of lags, and d_{max} is the maximum cointegration level of the variables entered into the model.

g) Post-Estimation Diagnostics

To confirm the validity of the estimates, it was necessary to conduct post estimation diagnostic tests to ascertain the fitness of the estimated model. Examining the structure of residuals was necessary to ascertain the validity of derived inferences from the estimates. The diagnostic tests included the stability of the model test and the residual autocorrelation (LM) test.

2.3.5 Data type and Sources

Annual time series data from 1980 to 2016 was utilized in this study. The period was considered due to availability of the data. The period also coincides with the time when most of the developing countries, Kenya included experienced chronic public sector deficits. Further, the study considers the selected time span sufficient for meaningful time series analysis. The period also considers the rebasing of GDP in 2014 that upgraded the Kenyan economy to a lower middle-income status. This was crucial to capture the dynamism of the Kenyan macroeconomy in relation to new Kenyan GDP status. The study differs from other studies done in Kenya by considering growth of GDP per capita and primary budget deficits as opposed to growth of GDP and conventional (fiscal) deficits. Affirming Stiglitz *et al*, (2006) assertion, developing countries need to focus on what they can control and therefore the primary budget deficit can show more clearly whether an observed change makes the situation better or worse in terms of macroeonomic policy analysis. Moreover, evidence show that the growth of GDP per capita is superior to growth of GDP for international comparisons (World Bank, 2016)[6]. Data was mainly from the World Bank (WDI, 2017) and the IMF, WEO (2018). Other sources included the Central Bank of Kenya and the National Treasury official statistics.

2.4 Empirical Results and Discussion

2.4.1 Descriptive Statistics

The objective of the study was to establish the effect of budget deficits on economic growth in Kenya and to examine the nature and direction of causality of the key variables of interest. First, the study highlights a description of the variables used in the model. Further, we describe the measures of central tendency that include the mean or average, standard deviation, minimum and

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[6] Economic theory suggests that GDP per capita growth is preferred when making comparisons between economies. This is justified by the fact that it is able to reveal the relative performance of individual economies besides the growth accounting for the population variables. It is mostly used since countries do not have similar aggregate production functions (World Bank 2016; Greiner et al., 2004)

maximum values. Table 2.1 reveals that all variables had full information for the entire study period except primary deficit, which had 35 out of 37 observations. Growth of GDP per capita was found to be on average 0.7255 percent. On the other hand, the minimum value for growth of GDP per capita recorded was below zero by 3.9163 per cent with the maximum being 5.4846 percent. The primary budget deficit had a mean of 4.474 percent with the minimum being below zero by 4.474 percent and a maximum of 5.28 percent. In general, the descriptive statistics indicated that the data series was well distributed. Other variables are as indicated in Table 2.1

Table 2.1: Summary Statistics

VARIABLE	OBS	MEAN	STD. DEV.	MIN	MAX
Growth of GDP per Capita	37	0.7255	2.3442	-3.9163	5.4846
Primary Budget Deficit	35	0.6983429	2.497535	-4.474	5.28
Gross Fixed Capital Formation	37	18.58817	1.915688	15.3879	22.881
Inflation Growth	37	105.1995	91.30347	7.495	313.742
Real Interest Rates	37	7.45	6.60	-8.01	21.10
Terms of Trade	37	105.1295	14.69693	83.24	139.59
Financial Innovation	37	0.2703	0.4502	0	1

Source*: Author's Computations*

In order to determine the technique of estimation, the study subjected data to various diagnostic tests. They include the multi-collinearity tests to determine the degree of correlation, Jarque-Bera (1987) test for normality of the data, Augumented Dickey Fuller, Phillip-Perrons and Zivot Andrew's unit root tests to examine the stationarity of the data and Johansen cointegration analysis to determine if cointegration exists among the variables. The results are presented in the next sub-sections.

2.4.2 Correlation Matrix

Multicollinearity promotes bias which arises when one or more pairs of independent variables are perfectly correlated to each other. To this end, Table 2.2 shows a mix of positive and negative correlations among the variables. Growth of GDP per capita has a positive correlation with primary budget deficit, gross fixed capital formation, inflation growth and financial innovation while being negatively correlated with real interest rates and terms of trade. Further, primary budget deficit was only negatively correlated with real interest rates and positively

correlated with the rest of the variables. The result on correlations of examined variables is as shown in Table 2.2.

Table 2.2: Correlation Matrix

Variables	Economic Growth	Primary Budget Deficit	Gross Fixed Capital Formation	Real Interest Rates	Terms of Trade	Inflation Rate	Financial Innovation
Growth of GDP per Capita	1.0000						
Primary Budget Deficit	0.1003	1.0000					
Gross Fixed Capital Formation	0.5325	0.3759	1.0000				
Real Interest Rates	-0.0623	-0.3450	-0.1234	1.0000			
Terms of Trade	-0.3482	0.0444	-0.0294	-0.1832	1.0000		
Inflation Growth	0.4797	0.5138	0.3390	0.0841	-0.7263	1.0000	
Financial Innovation	0.4510	0.6281	0.5080	-0.0876	-0.4636	0.8549	1.0000

Source: Author's Computations

If correlation among the coefficients of the variables is more than $|0.7|$ then it shall be an indicative of multicollinearity. Multicollinearity amplifies the variance of parameter estimates and therefore yields biased estimates. Table 2.2 had correlation coefficients that were less than the threshold, implying absence of multicollinearity.

2.4.3 Unit Root Tests

Unit root tests were applied to detect non-stationarity of the variables. If variables are non-stationary, there is a tendency of the estimates to change over time, a characteristic that leads to spurious estimates. If variables are found to be non-stationary, successful differencing is applied until the bias is eliminated. The results of ADF a unit-root tests is as in Table 2.3.

Table 2.3: Augmented Dickey Fuller Tests Results

Variables		Unit Root Tests			
		Augmented Dickey Fuller test		P-Value	Order of integration
		Statistic	Critical value (5%)		
GDP Per Capita Growth	Levels	-3.086(-6.055)	-3.682 (-3.689)	0.0276 (0.000)	I (1)
Primary Budget Deficit	Levels	-2.841 (-5.114)	-3.568 (-3.572)	0.1143 (0.000)	I (1)
Gross Fixed Cap Formation	Levels	-3.188 (-5.148)	-3.560 (-3.564)	0.0227 (0.000)	I (1)
Real Interest Rates	Levels	-3.057 (-7.308)	-3.682 (-3.689)	0.0299 (0.000)	I (1)
Terms of Trade	Levels	-1.820 (-4.148)	-3.560 (-3.564)	0.3359 (0.001)	I (1)
Inflation Growth	Levels	-2.478 (-10.21)	-2.969 (-2.972)	0.0281(0.000)	I (1)
**Values in parenthesis are the figures obtained after first differencing *These variables have a unit root. H_o: Variable is non-stationary					

Source: Author's Computations

The study applied annual time series data from 1980 to 2016. Firstly, as it is often the case with macroeconomic data, the series is likely to be I (1) process, and therefore the first stage in the empirical investigation is to analyse the time series properties of the data. In all cases, the assumption of stationarity was rejected. The results confirmed that the variables are integrated of order one and therefore become stationary after first difference. However, before concluding on the unit roots test results of ADF test, the study suspected presence of structural breaks in the macroeconomic variables in the estimated growth model as claimed by Ndirangu and Gitau (2014).

Structural breaks (changes) are the main issue to consider in a time series data particularly on macroeconomic variables. Leybourne and Newbold, (2003) affirms that if structural policy changes are present in the data generation process but not incorporated in unit root test specification, results may be biased towards flawed non-rejection of non-stationarity hypothesis.

A well-known weakness of the ADF unit-root test with I (1) as a null hypothesis is, its potential to confuse structural breaks in the series as evidence of non-stationarity. This study therefore endogenously determined the timing of structural breaks in Kenya's macroeconomy on all the variables employed in the model through Zivot-Andrews's unit root test and the results are as presented in Table 2.4.

Table 2.4: Zivot-Andrew's (1992) Unit-Root Test Results

Variables	Year of structural break	Level		First difference		Order of integration
		t-statistics	5% critical value	t-statistics	5% critical value	
GD per Capita Growth	1998	-4.078	-4.42	-5.914	-4.42	I (1)
Primary Budget Deficit	2000	-3.656	-4.42	-5.146	-4.42	I (1)
Gross Fixed Capital Formation	1999	-3.515	-4.42	-4.755	-4.42	I (1)
Real Interest Rates	1999	-2.433	-4.42	-7.332	-4.42	I (1)
Terms of Trade	2006	-3.647	-4.42	-10.362	-4.42	I (1)
Inflation Rate	2008	-1.792	-4.80	-8.696	-4. 42	I (1)

Source: *Author's Computations*

The result of Zivot-Andrew's (1992) unit root tests confirmed existence of structural breaks at different periods. Growth of GDP per capita had a structural break in 1998 whereas both

gross fixed capital formation and real interest rates experienced structural changes in 1999. Primary deficit had structural breaks in 2000 with terms of trade experiencing the same in 2006 and 2008 for the growth of inflation. Considering order of integration, all variables are of order one $I(1)$ and therefore confirmed the outcome of both Augumented Dickey Fuller tests for stationarity. The results of Zivot-Andrew's unit root tests complement those of the ADF tests that revealed that all the variables become stationary after first difference. At this point, this study therefore ignores the I (2) tests for these variables.

According to Ndirangu and Gitau (2014) study in Kenya, structural breaks that are associated with the most of the macroeconomic variables in Kenya coincide with identifiable poor and erratic climatic conditions, shocks in terms of trade, trade liberalization, policy changes and political shocks in the economy. In the literature, these structural breaks may also be attributed to the global domestic shocks that includes the Asian financial crisis in 1997 (Haque and Kim, 2002), global financial crisis in 2008, economic spillovers and cycles experienced by the business world around 2007 and transition in the demographic structure of the globe in 2004.

The fact that the resultant series were of order $I(1)$ suggest that one may first determine lag selection and confirm if cointegration exists among the variables. If cointegration is confirmed the study can apply a vector error correction model and determine the nature of causality on key variables. The study therefore examined if cointegration exists between the variables. To estimate the error correction model, all variables have to be integrated of the same order. Following the Zivot-Andrew's (1992) unit-root test results, the study proceeded with lag selection and Johansen test for cointegration in order to determine if VEC model was approriate.

Further, upon estimating the proposed model and obtaining results, we applied a series of tests for confirming the validity and reliability of the estimated model. After the model passed all the post estimation tests, we concluded the results were reliable for further discussion.

2.4.4 Cointegration Tests

It was necessary to establish the nature of the relationship existing between the dependent variable (economic growth) and variable of interest (primary budget deficit). Besides stationarity tests of the variables, cointegration analysis was deemed necessary. If we detect cointegration, it is then incorporated into the model. As affirmed by Enders (2004), the principal feature of

cointegrated variables is that their time paths are influenced by the degree of any deviation from the long-run equilibrium.

This study did not assume that the initial variables actually had unit-roots (order of integration), but actually tested and confirmed their presence which allowed the application of Johansen cointegration test. The trace statistic of maximum rank zero represents the null hypothesis of no cointegration expected to be less than the critical value at 5% significance level. The null hypothesis states that there is no cointegration. Assuming absence of cointegration while in actual sense it is present amounts to a mis-specification error. Table 2.5 indicates the results for the Johansen test for cointegration.

Table 2.5: Johansen Tests for Cointegration

Johansen Tests for Cointegration					
Trend – Constant, Sample: 1985 to 2016				Number of Observations = 32, Lags = 2	
Maximum Rank	Parms	LL	Eigenvalue	Trace Statistic	5% Critical Value
0	42	-395.17088		152.2152	94.15
1	53	-367.4241	0.82345	96.7217	68.52
2	62	-349.34194	0.67701	60.5573	47.21
3	69	-337.71677	0.51644	37.3070	29.68
4	74	-327.01028	0.48786	15.8940	15.41
5	77	-319.79095	0.36314	1.4554*	3.76
6	78	-319.06327	0.04446		
Maximum Rank	Parms	LL	Eigenvalue	Max Statistic	5% Critical Value
0	42	-395.17088		55.4936	39.37
1	53	-367.4241	0.82345	36.1643	33.46
2	62	-349.34194	0.67701	23.2504	27.07
3	69	-337.71677	0.51644	21.4130	20.97
4	74	-327.01028	0.48786	14.4387	14.07
5	77	-319.79095	0.36314	1.4554*	3.76
6	78	-319.06327	0.04446		

Source: Author's Computations

According to Johansen (1995), a sequence of trace tests at a given significance level produces an estimate of the number of cointegrating equations. Upon conducting Johansen test for cointegration, the study found out that the estimator had five cointegrating equations corresponding to the row of the table. As shown in Table 2.5, the study revealed that variables

including primary budget deficit were cointegrated[7] implying that in the end these variables move together.

2.4.5 Model Stability Tests

The study examined if the model satisfies the eigenvalue stability conditions. As may be inferred from the Figure 2.3, all Eigen values are actually inside the unit circle and less than one and others equal to one. The composition is exactly the one necessary for cointegration between the variables to exist. As a benchmark, in case of two-variable model with one lag $\Delta Y_t + \alpha + (Z_1 - 1)Y_t + \varepsilon_t$ stability conditions imposed on eigen-values of matrix Z_1 are such that one eigenvalue is equal to one while another is always smaller than one in absolute terms. The result reported here is exactly generalization of this condition to the model employed in the analysis.
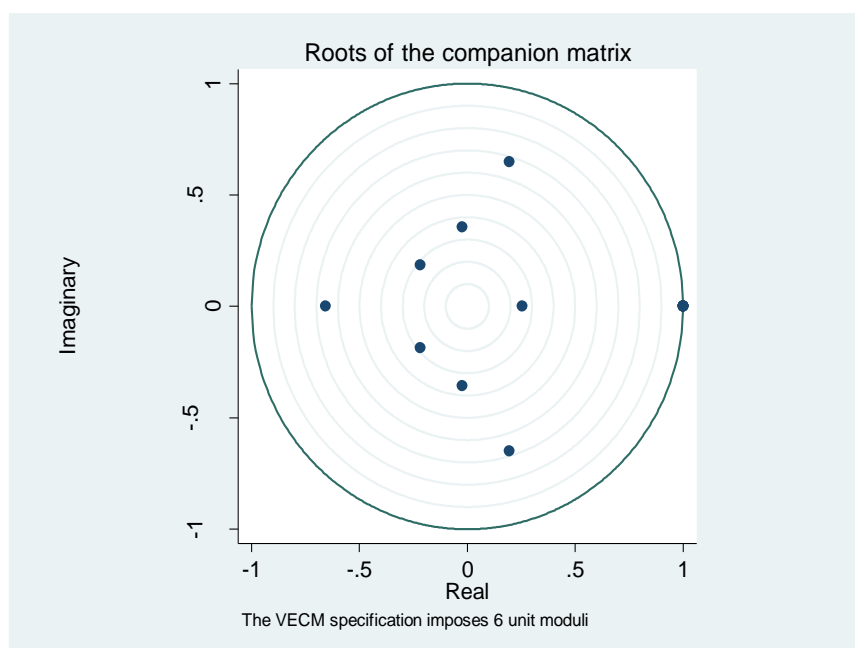
Figure 2.3 VECM Model Stability Test
Source: Author's Computations

The stability test presents the characteristic AR polynomial inverse roots. If the modulus for all roots is equal to or less than one and lies inside the unit circle, the estimated VEC model is stable. Since there was cointegration, estimation of unrestricted VAR was not appropriate. In the

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[7] Variables cease to be cointegrated if the test statistic is less than the critical value.

type[8] of equation(s) the study estimates, cointegration was present and thus long-run causality existed running from either growth of GDP per capita to primary budget deficit, vice versa or both. Therefore, a VEC model was appriopriate to examine the long-run and short-run relationships.

2.4.6 VECM Model Results

The study aimed at estimatimating the system of equations through VEC model representation, which allows for dynamic contemporaneous and lagged interconnection between the variables of interest to exist and also determine both the short-run and long-run effects of explanatory variables on the dependent variable. This is in an effort to provide more qualitative and efficient estimates. Since there was cointegration amongst the variables a vector error, correction model was necessary to determine the short-run and long-run relationship in accordance with the objectives of the study.

a) Lag - Order Selection Criteria

Prior to estimation, the study determined potential number of lags to be included in the model. Table 2.6 reports the lag-order selection statistics and shows that the likelihood ratio (LR), final prediction error (FPE) and Akaike's information criteria (AIC) prefer two lags whereas Hannan and Quinn information criteria (HQIC) and Swartz Bayesian information criteria (SBIC) prefer only one lag. The results are as displayed in Table 2.6.

Table 2.6: Lag Selection Criteria

Lag selection-order criteria								
Sample: 1984 to 2016				Number of Observations = 33				
Lag	LL	LR	Df	P	FPE	AIC	HQIC	SBIC
0	-555.757				1.5e+06	34.1065	34.2133	34.4239
1	-440.574	230.37	49	0.000	29708.7	30.0954	30.9499*	32.6349*
2	-381.071	119.01*	49	0.000	24242.3*	29.4588*	31.061	32.2204
	* Indicates lag order selected by the criterion							

Source: Author's Computations

Having considered and established that the final model has passed all necessary tests, the study estimated the VEC model to elucidate the economic effects of primary budget deficits and extent

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[8] There are three types of VAR models i.e., VAR in levels, VAR in first difference or VECM and whenever a decision is made, it depends on pre-test for unit roots and cointegration.

to which primary budget deficits contribute to growth or decline of growth of GDP per capita in both the short-run and long-run. Under-estimating the number of lags could lead to auto-correlated error terms in the model while over-estimating of the lags could lead to errors with high means implying an over-fitted model. It was very necessary to determine empirically the optimal lag lengths. The results for lag length criteria revealed a lag length of either one or two. A graph of the AR root at lag lenth of two indicated that the VEC model was stable and the results obtained were valid as all roots were within the unit circle. Confirmation of the model stability was important since instability may lead to misspecification and inability to use the model for forecasting and policy analysis. Equally, the LM test for autocorrelation established that at the second lag, the model suffered no autocorrelation.

b) VECM Model Estimation

Having established cointegration, the study applied the VEC model. The study therefore estimated the VEC model at the second lag and the results for long-run and short-run are presented in Table 2.7 and 2.8 respectively.

Table 2.7: VECM Long-run Relationship

Dependent Variable – Growth of GDP per capita				
Variable	Coefficient	Std Error	t-statistic	p-value
Constant	4.52652			
Primary Budget Deficit	0.3009452**	0.1031473	2.92	0.00
Gross Fixed Capital Formation	-0.6293719**	0.1311379	-4.80	0.00
Real Interest Rate	0.1939812**	0.0301921	6.42	0.00
Terms of Trade	0.032698	0.0179231	1.82	0.07
Inflation Growth	0.151625**	0.0245427	6.18	0.00
Financial Innovation	-1.072003	0.6619184	-1.62	0.10
** Indicate significance at 5% significance level				

Source: Author's Computations

Table 2.7 shows the results for the long-run association between variables. Primary budget deficit, real interest rate, terms of trade and inflation rate were negatively related to growth of GDP per capita where by primary budget deficit, real interest rate and growth of inflation were statistically significant at 5% significance level. On the other hand, gross fixed capital formation and financial innovation were positively associated with growth of GDP per capita whereby grosss fixed capital formation and financial innovation were statistically significant at 5% and 10% significance level, respectively. The estimates suggest that a one percentage point rise in

the primary budget deficit leads to about 0.286 percentage decline in the growth of GDP per capita in the long-run, ceteris paribus. The implication is that the rising and perenial primary budget deficit induces increased debt levels to the Kenyan economy in the long run. From macroeconomic theory, high debt evels have adverse effects on economic growth.

Moreover, Fischer (1993) affirmed that large budget deficits signal general macroeconomic instability due to macroeconomic volatility shocks and the interest rate channel through which higher borrowing costs due to investors increased perception of credit risks when the stimulus is implemented from a weak fiscal position. Secondly, the adverse effect is through the crowding-out of private investments fuelled by continued large internal borrowings. However, in long run, the estimates further suggest that primary budget deficit positively affects growth of GDP per capita indirectly through gross fixed capital formation variable. Evidence shows that a one percentage point rise in gross fixed capital formation leads to about 0.6 percentage rise in the growth of GDP per capita in the long-run, implying that the authorities should apply the glden rule of public finance, whereby borrowed funds should be used for public investments only (and not for recurrent spending).

The real interest rate is negatively and significantly associated with growth of GDP per capita. Economic theory suggests that higher real interest rates increases incentive to save and less consumption. The implication is that future consumption is cheaper relative to current consumption (substitution effect). However, people with savings will get more income from the higher returns and their spending may increase (income effect). The annual percentange change in the rate of inflation and the terms of trade variables was also negatively associated to growth of GDP per capita. This was in line with apriori expectations. The estimates suggest that a one percentage point rise in real interest rate leads to about 0.18 percentage decline in the growth of GDP per capita in the long-run.

Interms of the inflation variable, the estimates revealed that growth of GDP per capita was negatively associated with inflation growth. This was in line with apriori expectations. The estimates suggest that one percentage point rise in growth rate of inflation leads to about 0.14 percentage decline in the growth of GDP per capita in the long-run.

Lastly, evidence for the financial innovation variable show positive association with growth of GDP per capita and is statistically significant (at 10 % level). This was also in line with the apriori expectations. The results establish that a one percentage point rise in financial innovation has the potential to lead to about 1.02 percentage increase in the growth of GDP per capita in the long-run.

The analysis of short-run relationship is executed with differenced variables. The results are presented in Table 2.8.

Table 2.8: VECM Short-run Relationship

Dependent Variable – Growth of GDP per capita				
Variable	**Coefficient**	**Std Error**	**t-statistic**	**p-value**
Constant	0.5738097	0.308339	1.86	0.063
D.Primary Budget Deficit	0.5732248 ∗∗	0.2471195	2.32	0.020
D.Gross Fixed Capital Formation	-0.02202157	0.2329484	0.09	0.931
D.Real Interest Rate	0.183078 ∗∗	0.0528359	3.47	0.001
D.Terms of Trade	0.0449231	0.042387	1.06	0.289
D.Inflation Rate	0.1505866∗∗	0.0549989	2.74	0.006
D.Financial Innovation	-9.577926∗∗	1.88016	-5.09	0.000
Error Correction Term [U (-1)]	-0.9500526∗∗	0.2639438	-3.60	0.000
∗∗ Indicates significance at 5% significance level				

Source*: Author's Computations*

Table 2.8 shows the VEC model short-run results whereby D. represents the first difference. Since there was co-integration amongst the variables; a lagged error correction term is normally fitted in the short-run model as one of the explanatory variables in order to establish the speed of adjustment towards the long-run equilibrium. From econometric theory, the essense of VEC model short-run relationship is to establish the speed of adjustment of the error correction term (the amount of disequilibrium transmitted each year). The negative coefficient of the error correction term confirms that the growth of GDP per capita and the explanatory variables have a long-run relationship. The result shows that the coefficient of error correction term [U (-1)] is -0.9500526 which is less than one and significant at 1%. The significance implies that whenever there are deviations in the growth of GDP per capita from an equilibrium path, the model corrects at the rate of 95% per year.

In the short-run, the primary budget deficit has statistically significant (at 5% significance level) positive effect on economic growth. The gross fixed capital formation and financial innovation

variable have negative effects on economic growth in the short-run. However, the effect of financial innovation is statistically significant while that of financial innovation is insignificant (at % significance level). The effects of other explanatory variables on growth of GDP per capita in the short-run is as highlighted in Table 2.8.

2.4.7 Granger Causality Results

Establishing presence of long-run relationship implies existence of long-run causality. In this case, the study specifically determined whether one-time series predicts another. That is whether primary budget deficit causes growth of GDP per capita or it was growth of GDP per capita that causes primary deficit or else if both propelled each other. The Toda-Yamamoto (1995) Granger-causality results reveal that primary budget deficit causes growth of GDP per capita. On the other hand, growth of GDP per capita does not Granger-cause primary budget deficit in the period 1980 to 2016. The result is highlighted in Table 2.9.

Table 2.9: Toda and Yamamoto (1995) Granger Causality Test

Equation	Excluded	Chi2	Df	Prob
Growth of GDP per capita	Primary Budget Deficit	101.49	3	0.000
Growth of GDP per capita	Gross Fixed Capital Formation	4.6881	3	0.196
Growth of GDP per capita	Real Interest Rate	108.53	3	0.000
Growth of GDP per capita	Terms of Trade	56.098	3	0.000
Growth of GDP per capita	Inflation Rate Growth	128.84	3	0.000
Growt of GDP per capita	Financial Innovation	137.5	3	0.000
Growth of GDP per capita	ALL	426.45	18	0.000
Primary Budget Deficit	Growth of GDP per capita	0.14189	3	0.986
Primary Budget Deficit	Gross Fixed Capital Formation	8.9305	3	0.030
Primary Budget Deficit	Real Interest Rate	4.0299	3	0.258
Primary Budge Deficit	Terms of Trade	2.3703	3	0.499
Primary Budget Deficit	Inflation Rate Growth	0.04098	3	0.998
Primary Budget Deficit	Financial Innovation	1.194	3	0.754
Primary Budget Deficit	ALL	41.563	18	0.001
H_0: Implies Rejection of Granger non-causality				

Source: *Author's Computations*

The first row of Table 2.9 shows that lagged values of primary budget deficit cause growth of GDP per capita. This is because the p-value is equal to 0.0000. However, because of the p value (0.986 > 0.05), lagged values of growth of GDP per capita do not cause primary budget deficit and therefore, the null cannot be rejected. Table 2.9 shows the direction of causality amongst the

other variables. The direction of causality is therefore from primary budget deficit to growth of GDP per capita. This implies that from the estimated growth model, there exist a unidirectional causality, running from the primary budget deficit to growth of GDP per capita, ceteris paribus. The direction of causality of other variables is as highlighted in Table 2.9.

2.4.8 Post-Estimation Tests

a) Test for Normality of Data and Residuals

Non-normality of residuals violates the assumptions of the classical linear regression model. As part of time series properties (in post estimation test analysis) the study applied Shapiro Wilk tests to determine normal distribution of data and the random error terms with the null hypothesis (H_0) that residuals are normally distributed. The findings are as presented in Table 2.10.

Table 2.10: Shapiro-Wilk Test

Equation	Chi2	Degree of freedom	Prob > chi2
Growth of GDP Per Capita	1.130	2	0.56825
Primary Budget Deficit	6.898	2	0.03178
Gross Fixed Capital Formation	2.320	2	0.31350
Real Interest Rates	1.317	2	0.51755
Terms of Trade	3.312	2	0.19090
Financial Innovation	19.451	2	0.00006
ALL	34.428	12	0.00058
Shapiro Residuals (Obs = 33)	-	-	0.76143

Source: Author's Computations

The findings show that almost all the study variables had normal distribution except financial innovation. Since the p-value of 76.1 percent, was greater than the significant level of 5 percent as shown in Table 2.10, the study therefore fails to reject the null hypothesis.

b) Test for Serial Correlation

In time series data, the study anticipates the correlation between the stochastic random error terms of the succeeding time periods. Its presence is also associated with biasness that can result to spurious estimates. From the LM test in Table 2.11, shows absence of autocorrelation as both first and second lags had a p value that was more than 5 percent.

Table 2.11: Langrage-Multiplier (L M) Test for Autocorrelation

Lag	chi2	Df	Prob
1	31.0995	36	0.70071
2	43.5336	36	0.18144
H_0: No Serial Correlation			

Source: *Author's Computations*

2.5 Conclusion

The relation between budget deficits and economic growth is one of the most debated issues in developing countries. The objective of this paper was therefore to examine the effect of primary budget deficits on economic growth and also determine the direction of causality between the primary budget deficit and growth of GDP per capita in Kenya. The dependent variable was growth of GDP per capita while the key explanatory variable was the primary budget deficit, gross fixed capital formation, real interest rate, terms of trade, rate of inflation and a dummy on financial innovations in the growth equation.

The study applied the VEC model estimation technique in the determination of the study objectives. The findings reveal that primary budget deficit had a positive and significant association with growth of GDP per capita in the short-run. However, in the long-run there was negative and significant relationship with undirectional causality running from primary budget deficit to growth of GDP per capita, ceteris peribus.

First, is the correlation between economic growth and real interest rate is negative which strengthens our findings. Further, the terms of trade reveal a negative correlation with growth of the economy. Nevertheless, unfavourable terms of trade combined with higher interest payment resulting from higher long-run interest rate will reinforce the negative impact to the economy in the long-run. This imply that it is extremely important to curb both the interest payments and high primary budget deficits, both in short-run and long-run.

Second, is the interaction effects between persistent and large budget deficits and and debt stocks that exacerbate the adverse consequences of high deficits in the long-run. The presence of a large government debt to export ratio, in economic theory, negatively affect private investments in the long-run by decreasing the funds available to invest, given that the return from new investment will beze cessively taxed to allow the government repay the accumulated debt.

Third, the findings may also be justified by crowding-out effects due to high domestic borrowing that leads to crowding-out of the private investments. This has adverse effect on the growth of the economy.

Johansen test for cointegration revealed that primary budget deficit and other variables in the study were cointegrated implying that in the end they moved together. Results on Toda Yamamoto (1995) causality test revealed that primary budget deficit granger-causes growth of GDP per capita, ceteris peribus. The results indeed highlighted the short-run and long-run growth effects and the causal nexus between primary budget deficit on economic growth in Kenya which had been ignored in the identified past studies.

Moreover, when compared with evidence from the existing literature, the findings of this paper are consistent with the findings of Ilzetzki et al. (2010), World Bank (2010) and Walaa (2016), for Kenya. The Government of Kenya, therefore, should strive to keep the primary budget deficit under control, design a suitable structural public finance reforms to reduce the root causes of perennial primary deficits, enhance private investments by strategically reducing the public domestic borrowings, and foster a monitoring and evaluation fiscal team, in order not to hamper the long-run economic growth and development in Kenya. Other transmission mechanisms including real interest rate, terms of trade and foreign exchange rate can also be employed strategically to mimimize the adverse effects of budget deficits in the long-run.

In conclusion, anlysts have to be cautious with econometric results as affirmed by Alexander and King (1998). It is not easy to objectively guarantee strategies to achieve persistently high economic growth in the long-run. This study, affirms that achieving sustainable and stable economic growth that is inclusive depends on strategies that relate to institutional and technological policies.

2.6 Policy Implications

The findings suggest promotion of policies that reduce high primary budget deficit and interest payments for sustained economic growth in Kenya. Transformative revenue mobilization strategies, reduction of non-priority government recurrent expenditure, and rationalization of overall budgetary expenditure can improve public finances for macroeconomic stability and long-

term economic growth in Kenya. As a golden rule, the government should utilize the finances from public borrowings only for public investment and not for consumption purposes. The government should also pursue the strategies that promote implementation of a prudent fiscal policy in Kenya. This implies that the discretionary fiscal policy in Kenya should be anchored on a supportive monetary policy response with a close monitoring of any deviation of fiscal policy from long-run sustainability path. Further, in order to minimize the adverse economic effects of crowding-out of the private sector, there is need for the authorities to strategically reduce on the continued high domestic borrowings by the authorities in order to promote sustained economic growth for shared prosperity. Lastly, other key policy implications would be promotion of policies that incentivize on financial innovations (like Mpesa) and enhance price stability by the Central Bank of Kenya for sustained economic growth.

2.7 Contribution of the Study to Knowledge

The study makes the following key contributions. First, it provides evidence from Kenya on the dynamic interdependencies between primary budget deficits and economic growth. The dynamic analysis approach applied was instrumental for robustness in the analysis and also offered an apportunity to fine tune policy suggestions. Second, the study aimed at determining the effects of budget deficit on economic growth by considering primary budget deficit which had been ignored in Kenya. This deepened the originality of research providing further some key policy insights and knowledge. Third, the study employed other important transmission channels like real interest rates and gross fixed capital formation that had not been considered yielding fresh evidence that complements the research database. The study also considered financial innovations driven by digital revolution (Ndung'u, 2018) introduced by the mobile (M-Pesa) technology in Kenya. Moreover, the study took into account the dynamism of macroeconomy by considering changes induced during the 2014 rebasing of GDP in Kenya. Importantly, the study also took into account the volatility of output brought about by over reliance on export of primary commodities as well as other structural shocks present in the Kenyan macroeconomy. Last but not the least, the study further contributes to the existing knowledge and research database for current and future researchers in Kenya and beyond.

CHAPTER THREE

EFFECTS OF CURRENT ACCOUNT DEFICITS ON ECONOMIC GROWTH IN KENYA

3.1 Introduction

Since 1980s, the World Bank and the International Monetary Fund have been encouraging many countries to abandon capital controls and pursue financial liberalization. This led to the opening of many economies to global financial flows of various degrees. However, restrictions on international financial transactions, breaks in capital flows and induced imbalances in the external accounts continue to generate interest world over whilst capital controls continue to be deployed. It has been documented that removing controls does not guarantee rapid economic growth (Collier and O'Connell 2008). However, there is no consensus yet on policymakers' global views on the desirability and impact of deficits in the current account on economic performance. External imbalances world over, have therefore received substantial attention over the years with two broad viewpoints on the value of the current account imbalances for macroeconomic policy and growth (Corden, 1991; Obstfeld, 2012).

The first view opines that the current account balance is not important for policy, whilst the other suggests that the current account is certainly relevant for policy and has macroeconomic implications. This view posits that the current account does not matter from policy perspectives as current account imbalances are temporary and self-correcting, even though the elements that determine the current account and lead to imbalance are certainly important for policy. This first view argues that imbalances in the current account simply reflects the very optimizing decisions by households and firms, which are a direct result of the increased integration of global financial markets. The view advocates that when countries share risk equally, forward looking and optimizing households generate balances on the current account that are consistent with efficient resource allocation, provided that the deficit is not excessive. Over time, as firms exhaust their most productive investment projects, households reduce consumption due to reduced wealth and the current account balance adjusts or self corrects (Obstfeld, 2012).

However, the view that current account balance is not important for policy, has been critiqued on ground that it is based on the assumption that countries share risk equally (complete assets

markets). This has been disputed in economic literature. The second weakness of this view is on the basis that it holds that the high degree of integration of global financial markets poses the risk of financial market instability, but the current account is not. However, if systematic (undiversifiable) risk from financial markets causes economic stability, then the current account balance which is a direct result of these capital flows should also be a concern as a sharp increase or decrease in capital flows will deteriorate or improve the nation's current account balance and may have economic implications (Obstfeld and Rogoff, 1995b).

The second view on the importance of current account to macroeconomy asserts that whilst current account imbalance may be justified by macroeconomic fundamentals, current account deficits cannot be sustained indefinitely, particularly when the deficits are not consistent with macroeconomic fundamentals. This view holds that the persistent and large current account imbalances are a symptom of related macroeconomic problems and views the external deficit as an accumulation of liabilities to the rest of the world. These liabilities are financed by inflows into the capital account and need to be repaid at a later date by borrowing further or depleting foreign exchange reserves. However, the depletion of foreign exchange reserves associated with financing the deficit could lead to a foreign exchange crisis and increase in external debt liabilities that may impact on economic growth of the recipient countries (Hume and Sentance, 2009; Gourinchas and Obstfeld, 2011; Catao and MilesiFerretti, 2014).

This viewpoint implies that deficits in the current account warrant policy intervention as they could have economic destabilizing implications. The implications however may vary depending on the sources of the imbalance. For instance, whilst an investment driven current account may not be a problem as it reflects a productive and growing economy, a consumption driven imbalance reduces the nation's ability to repay debts. Likewise, a deficit driven by an excess of imports over exports may reflect competitiveness problems and a deficit caused by low savings rather than high investment may be a sign of weak fiscal policy or a consumption binge and reflects a country living beyond its means (Obstfeld, 2012).

On a global perspective, the high and growing external imbalances especially in United States (US) have continued to generate debates on whether these imbalances are sustainable, given the current structure of the US economy and the prevailing economic and international environment. It has also led to concerns about the impact of a disorderly correction of these imbalances on the

global economy and on poor countries that have trade and investment relations with the US. In developing countries like Kenya there are general concerns about whether or not the external imbalances observed are sustainable and their implications on economic performance. There is also a concern that the likelihood of easy reversibility of capital inflows may increase the risk of a 'sudden stop' or a reversal as a shift in market sentiments creates flight away from domestic assets (O'Connell et al., 2010). This could lead to depletion of reserves, sharp currency depreciations and a decline in stock prices, as happened during the 2008 global financial crises (Mwega 2010).

As pointed by Mwega (2014), under the episodes of undesirable current account deficits, consequences of the deficits could range from foreign exchange crisis to a sudden stop of capital flows as the country's liabilities increase. A sudden stop of capital flows may lead to an abrupt current account reversal which could suddenly lead to adjustment of relative prices, currency depreciation and an increase in the real value of foreign liabilities that may impact on the country's macroeconomy. The effects of 2008 global financial crisis and the financial and economic status of many developing countries have rekindled the debate on the effects of current account imbalances on economic growth and their causal linkages.

Three main theories on the dynamics of current account imbalances in the literature include elasticity, absorption (savings-investment balance) and monetary approaches. Elasticity approach features the price elasticity of demand for imports and exports by allowing exchange rate variations. The approach is widely applied to evaluate the impact of currency and the role of exchange rate and trade flows on current account balances. The absorption (saving-investment balance) approach is also termed as the macroeconomics-oriented approach. The approach opines that an economy with current account deficit should import from other countries to cover her excess consumption and spending. The absorption approach compliments the elasticity approach (Hung and Gamber, 2010).

The third approach is the monetary approach to Balance of Payments (BOP). It regards money as a stock and argues that money stock can be changed through international reserve flows. It states that a fixed exchange rate system could work without having to resort to devaluation provided a country has a sound monetary policy and therefore devaluation is trigerred by failure of monetary policy (Umer, et al., 2010).

The argument stems from the fact that disequilibrium in the BOP is a temporary situation that will be corrected if the money market is in equilibrium (Du Plessis et al., 1998). From the theoretical perspective the debate on the effects of current account deficits on economic development is so far, inconclusive.

There are a myriad of existing studies on the interaction between the current account and macroeconomic variables (e.g., Sachs, 1981; Abbas et al., (2011), Lau et al., (2006), Gruber and Kamin, 2005; Kumar, 2012; Pancaro, 2013; Agarwal and Gangal, 2013). Most of these studies focus on cross country data sets and are mainly concentrated on industrialized economies. From the literature, it is also crystal clear that panel results are generalized and tend to find conflicting results on the interaction of the current account with macroeconomic aggregates particularly in countries of different income levels (Caldern et al., (2007), and Chinn & Prasad 2003). As affirmed by O'Connell (2008), the scope for untangling the effects of a large number of potentially relevant determinants is limited in a country case study. This further affirms the need for studies that analyze the relations at country specific levels.

On the other hand, the country case studies that do exist however mostly focus on developed countries and either attempt to determine current account sustainability (e.g., Lu 2009, Lu 2012), or try to determine the best monetary rule that can be implemented for smooth current account adjustment (Ferrero et al., 2008; Herz and Hohberger, 2013; and Di Giorgio and Nistico, 2013). These studies are based on developed countries and may not necessarily have structural and policy relevance for lower income countries (Caldern et al. 2007, Chinn & Prasad 2003; Makanza and Dunne, 2016). Moreover, existing evidence is relatively more conflicting on the effects of current account deficits on economic growth and development.

Recently, these discussions have been rapidly increasing and have yielded conflicting evidence in developing countries. The findings show that current account deficit varies from country to country and is connected with the fragility and crisis susceptibility of the economy. The study identifies several attempts by authors to determine the extent by which current account deficit is influential to economic crises. A key important factor on the movements on the current account is the concept of economic growth. However, in developing countries, there exist a great economic heterogeneity and great variations in key factors causing movement in current accounts. The current account imbalances behave differently depending on macroeconomic circumstances

in countries and therefore approaches to managing the deficits in the current accounts should be country tailored (Makanza and Dunne, 2016).

Despite the assertion, there exists no comprehensive investigation on the effects of current account imbalances on economic growth in Kenya. Osoro (2013) also affirms that literature on BOP related studies in Kenya is very scanty. Moreover, there exist scanty literature on the effect of external imbalances on economic growth for specific economies in Sub-Saharan Africa and Kenya in particular. A detailed empirical investigation will be very useful not only for formulation of evidence-based policy but also for a health macroeconomic policy feedback in Sub-Saharan African economies.

3.1.1 Balance of Payments (BOP)

According to the International Monetary Fund, BOP and International Investment Position Manual, 6th edition of 2009 (BPM6), BOP is a statistical statement that summarizes transactions between residents and non-residents during a specified period. It consists of goods and services account, the primary income account, the secondary income account, the capital account, and the financial account. Under the double-entry accounting system that underlies the BOP, each transaction is recorded as consisting of two entries and the sum of the credit entries and the sum of the debit entries is the same.

Balance of Payments statistics is important for monetary and financial monitoring and policy deliberations in different areas in both local and international contexts. In analysing the BOP account, the first glance is often at the overall balance of payments (or overall BOP balance). The overall BOP balance represents the sum of balances of the current account and the non-reserve portion of the capital and financial account, plus net errors and omissions. In other words, the overall BOP balance is the mirror image of transaction changes in reserve assets. Hence, the analysis and interpretation of the overall BOP balance and that of the net transactions of reserve assets should be taken together. BOP data also provide an objective basis for gauging the economic situation and in assessing the financial soundness of an economy. Not only are BOP data crucial elements for many businesses and investment decisions, but they also facilitate macroeconomic analysis of different aspects of an economy.

In the analyses of the BOP account, the first glimpse is mostly at the overall balance of payments that represents the sum of balances of the current account and the non-reserve portion of the capital and financial account, plus net errors and omissions (NEO). In other words, it is the mirror image of transaction changes in reserve assets. Hence, the analysis and interpretation of the overall BOP balance and that of the net transactions of reserve assets should be taken together.

a) Concept of the Overall BOP Balance

A BOP account is an integrated statistical statement that systematically summarises, for a specific time period, the economic transactions of an economy with the rest of the world. A complete BOP account comprises two broad accounts: (i) the current account; and (ii) the capital and financial account. Based on the double-entry accounting system, every transaction is represented by two entries, a credit (+) and a debit (-), with equal value but opposite sign. In principle, the sum of all credit entries should always equal to the sum of all debit entries. In other words, the net sum of all credit and debit entries should always add up to zero. That implies that the values of all payments and receipts in the BOP account should always be in balance. In practice, however, the credit and debit entries do not balance exactly. This is because data is from different sources and methods. This statistical discrepancy is thus reflected by NEO, which is the amount needed to bring the credit and the debit sides of the statement back to equality.

In analysing the BOP account, a net balance of international transactions may be obtained by drawing a line horizontally to divide the BOP statement into two groups of items that include: (i) above the line; and (ii) below the line. This enables the analysis of linkages and interrelationship of different groups of items in the BOP account. The lower the line is drawn, the more inclusive the net balance above the line becomes. The net balance of the items above the line will always be numerically equal, but opposite in sign, to the net balance of the items below the line, due to the double-entry accounting principle described earlier. A net credit of these balances is conventionally termed a "surplus" while a net debit a "deficit". Thus, the statement that an economy has a deficit or surplus in its "balance of payments" must refer to some specified group of transactions.

It is common to refer to a surplus or deficit in any of the following net balances: current account balance, visible trade (trade in goods) balance, invisible trade (trade in services) balance, or any

combination of these or other international transactions. For example, a surplus (or a deficit) in the current account balance should correspond to an equivalent deficit (or surplus) in the capital and financial account balance, plus NEO.

Similarly, by drawing a line just above reserve assets, the net balance above the line would represent the sum of all entries of the current account and the non-reserve portion of the capital and financial account plus NEO, which is the overall BOP balance. The balance below the line, which is reserve assets, would be equal in value but in opposite sign to that above the line. The overall BOP balance is thus the mirror image of transaction changes in reserve assets. For instance, if there is a surplus in the overall BOP balance of USD one Billion (credit), it means that reserve assets have been increased by USD one Billion (debit). Hence, the analysis and interpretation of the overall BOP balance and that of the net transactions of reserve assets should be taken together.

The overall BOP balance summarises the flow of funds from, or to a country for a reference period. For instance, an overall BOP surplus implies that Kenya receives more foreign currencies than it pays in external transactions in goods, services, income and assets, as well as in external transfers. In other words, a BOP surplus reflects an overall net inflow of funds from the rest of the world during the period. Conversely, an overall BOP deficit means that Kenya pays more foreign currencies than it receives in external transactions, and reflects an overall net outflow of funds to the rest of the world during the period. Nevertheless, since the overall BOP covers a wide range of transactions, it is necessary to study its contents (the above-the-line components) thoroughly as well as when interpreting the BOP account.

Reserve assets consist of external assets that are readily available to and effectively controlled by the monetary authorities of an economy for directly financing payment imbalances and for indirectly regulating the magnitude of such imbalances through intervention in the foreign exchange markets to affect the currency exchange rate of that economy. Transactions in reserve assets are traditionally considered to be accommodating transactions, conducted by using foreign currencies to finance the net effect of all autonomous transactions in the current account and the capital and financial (non-reserve assets) account. These transactions also reflect official intervention in foreign exchange markets to stabilise the exchange rate of domestic currency when excess supply (demand) of foreign currencies (traded against domestic currency) arises

together with an overall BOP surplus (deficit). Nevertheless, net changes of reserve assets in a modern economy may also reflect active management of reserve assets and other autonomous transactions for achieving various policy objectives. Nevertheless, net changes of reserve assets in a modern economy may also reflect active management of reserve assets and other autonomous transactions for achieving various policy objectives. For instance, the conversion of fiscal surpluses into foreign assets is one of the factors influencing movements of reserve assets in Hong Kong.

In reference to BOP and International Investment Position Manual, 6th edition (2009), different accounts within the BOP are distinguished according to the nature of the economic resources provided and received. For instance, the current account shows flows of goods, services, primary income, and secondary income between residents and non-residents. The current account is thus an important grouping of accounts within the BOP. As per the BPM6, the components of current account includes:

(i)   The goods and services account that indicates transactions in goods and services.

(ii)   The primary income account that indicates amounts payable and receivable in return for providing temporary use to another entity of labor, financial resources, or non-produced non-financial assets.

(iii)   The secondary income account that indicates redistribution of income.

Specifically, the balance on these three accounts is termed as the current account balance.

b) Current Account Balance (CAB)

The CAB shows the difference between the sum of exports and income receivable and the sum of imports and income payable (exports and imports refer to both goods and services, while income refers to both primary and secondary income). As per the BPM6 (2009), the value of the CAB is equal to the saving-investment gap in the economy. Thus, CAB is a macroeconomic variable that is related to understanding domestic transactions.

c) Capital Account

The capital account indicates credit and debit entries for non-produced non-financial assets and capital transfers between residents and non-residents. It therefore records acquisitions

and disposals of non-produced non-financial assets like land sold to embassies and sales of leases and licenses, as well as capital transfers (the provision of resources for capital purposes by onexparty without anything of economic value supplied as a direct return to that party).

d) Financial Account

The financial account indicates net acquisition and disposal of financial assets and liabilities. Financial account transactions appear in BOP and, because of their effect on the stock of assets and liabilities in the integrated International Investment Position [9](IIP) statement.

The sum of the balances on the current and capital accounts represents net lending (surplus) or net borrowing (deficit) by the economy with rest of the world. This is conceptually equal to the net balance of the financial account. Precisely, the financial account measures how the net lending to or borrowing from non-residents is financed. The financial account plus the other changes in the account explain the change in the IIP between beginning and end periods (BPM6, 2009).

A deficit in the current account implies that a country accumulates external liabilities as it finances its deficit with foreign credit in the form of external debt, aid, foreign direct investment, portfolio investment, and other forms of capital flows, which make up the capital and financial account of the BOP equation. Deficits in the current account have been a persistent feature of many African economies including Kenya. Generally, current account deficits in Africa have worsened since 2000 (AEO, 2019) with the trade deficit being the main driver of the current account imbalances. This has been predominantly the case in Kenya (World Bank, 2017; IMF 2018).

3.1.2 Current Account and Trade Balances in Kenya

To begin with, statistics reveal that since 1980s the current account in Kenya has persistently been in deficit for almost the entire period with only a single surplus in 2003. The rest of the entire period under analysis has been marked by current account deficit bias. Similarly, balance of

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[9] The IIP is a statistical statement that shows (at a point in time) the value of financial assets of residents of an economy that are claims on non-residents or are gold bullion held as reserve assets; and the liabilities of residents of an economy to nonresidents. The difference between the assets and liabilities is the net position in the IIP and represents either a net claim on or a net liability to the rest of the world.

trade has been persistently in deficit for the period 1980-2016 with only two surpluses recorded in 1993 and 1994. The deficits in the current account in Kenya are due to negative trade balances that have persisted not only in Kenya but also in many developing economies (AEO, 2019; World Bank, 2017; IMF 2018; Republic of Kenya, 2017).

Equally, this negative bias is due to deteriorating terms of trade. That is, the value of imports has been growing at relatively higher rates relative to exports. This has been mainly due to increasing prices of oil and other intermediate imports goods. Secondly, Kenya's exports like many African nations are dominated by few primary commodities, which have low price and income elasticities (Kariuki, 2009; Republic of Kenya, 2017; World Bank; 2017).

Evidence further shows that by applying both the trade and current account deficits in policy analysis, policy analysts are able to highlight whether the presence of direct transfers of capital and investment incomes influence the estimated relationships. This has not ignored in the past studies in Kenya. The distinction enhances the decision to fine-tune any suggested policy interventions (Stiglitz et. al., 2006; Algieri, 2012) providing a more robust analysis.

On the other hand, the increase in trade deficits is attributed to increased value of imports largely due to increases in petroleum, oil lubricants, fertilizers and food grains among others. The turning point of trade balance in Kenya was in 2011. It recorded a negative balance of 17.2% of GDP. For the period 2012 to 2016 the trade balance recorded -13.3% in 2012, -13.28% in 2013, -14.7% in 2014, -11% in 2015 and -8.8% in 2016. The persistence of negative trade balance in Kenya largely contributes to the persistent negative current account balance.

Lastly, the external imbalances improved in the wake of economic integration between 2000 and 2004. Despite this trend, there was a sudden increase in the balance of trade that negatively impacted on the current account balances after 2004 eroding the benefits of policies of economic integration. Importantly, inspite of various policy measures taken to regulate international trade in Kenya, the current account has predominantly been in deficits (Republic of Kenya, 2016; World Bank, 2017; Republic of Kenya, 2018).

3.1.3 External Balances and Economic Growth in Kenya

This sub-section highlights Kenya's external balances and economic growth performance since 1980s. As documented by Mwega and Ndung'u (2008), the good economic performance in Kenya during 1960s and early 1970s was not sustained in 1980s and 1990s. The latter period was characterized by persistently low growth and limited economic transformation despite the fact that the country maintained a large measure of political stability and pursued a fairly consistent development strategy. In 1960s growth averaged 5.7 per cent and accelerated in 1970s to 7.2 per cent. It declined in 1980s to 4.2 per cent and in 1990s to 2.2 per cent. The growth rate of GDP per capita in Kenya averaged 0.5 per cent and declined to negative 3.9 per cent in 1992 and negative 2.1 in 2000. However, it recorded an impressive positive 4 percent in 2007 but after the 2007 post-election violence it declined to negative 2.5 percent in 2008 and then increased to a positive 3.2 percent in 2016 (World Bank 2017).

The current account recorded an average deficit of 8 per cent of GDP in 1981, 6 per cent in 1990, 2 per cent in 2006, and generally widened in the subsequent years. By 2012, the deficit had risen to an average of 8.4 per cent of GDP and by 2014 to 10.4 per cent of GDP, mainly due to increased imports in the context of a stagnant export sector. By 2016 the current, account recorded a deficit of 5.2 per cent of GDP (World Bank, 2017). Figure 3.1 shows the trends in current account deficit in relation to GDP, respectively.
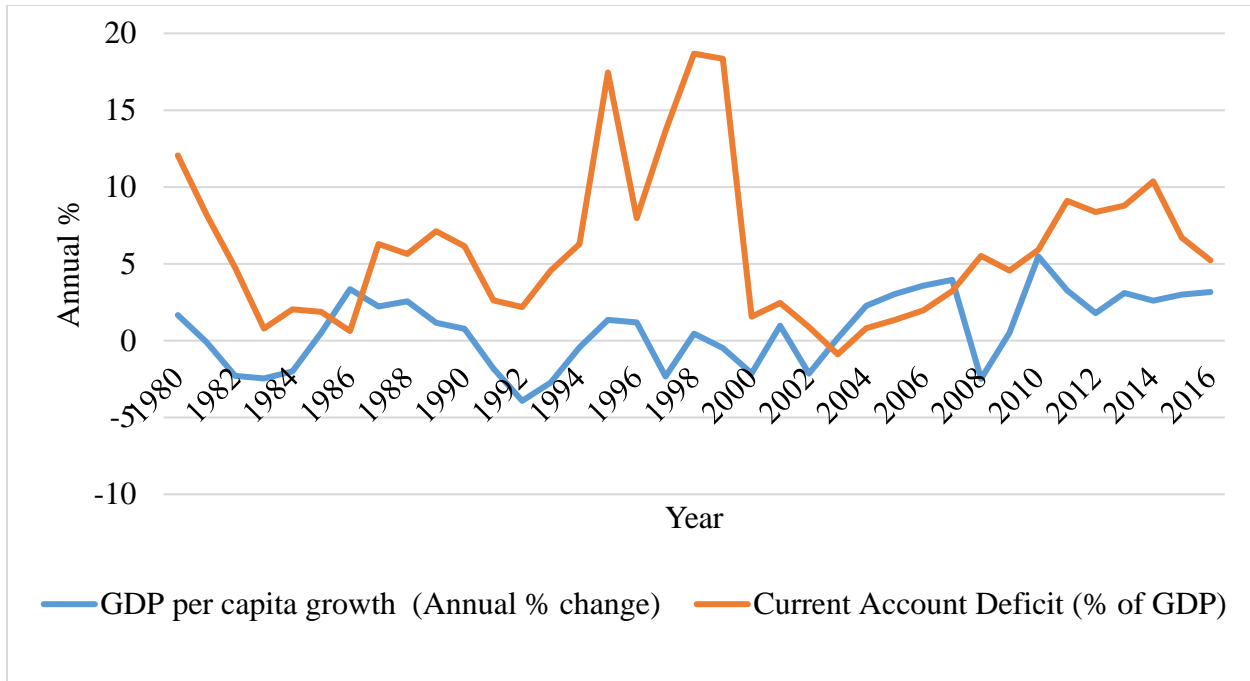
Figure 3.1: Kenya's Current Account Deficit and Growth of GDP Per Capita
Source: *Done by the Author*

Figure 3.1 depicts trend on current account balances and growth of GDP per capita from 1980 to 2016. From the literature, the high overall current account deficit in the country is mainly financed by short-term net capital inflows except in a few episodes when net long-term official flows dominate. Short-term capital flows have typically accounted for more than 50 per cent of total financial flows in Kenya. This constitutes a major source of vulnerability and for financial stability in Kenya (O'Connell et al. 2010; Mwega 2014; World Bank, 2016).

3.1.4 Statement of the Problem

The growth in the world economy has led to the need for integration as countries strive to promote trade and investments. This has resulted into economies such as Kenya removing capital controls to allow for free movement of capital and liberalising the stock markets. The result has been increased inflow of foreign capital in the economy. The financial sector in Kenya has continued to perform a major function in mobilization of savings for investments. To bridge the savings-investments gap and realize the desired level of economic growth, Kenya has sought external capital through foreign trade that has yielded deficits in the current account. Statistics reveal that Kenya's current account has been in deficit since 1980s with only a single surplus of 0.89 per cent of GDP in 2003 (World Bank, 2017).

The trend in current account indicates that Kenya had a deficit of 12.1 per cent of GDP in 1980, narrowing to 6.1 per cent of GDP in 1990, widening to 17.5 per cent in 1995 and 18.7 per cent of GDP in 1998. In 2000, current account deficit narrowed to 1.6 per cent of GDP. This was due to foreign aid in Kenya. The current account balance strengthened and recorded a surplus of 0.89 of GDP in 2003. This was due to a surplus in the balance of trade that was largely due to increased exports (Republic of Kenya, 2004) during that period. However, the current account worsened to a deficit of 9.1 per cent of the GDP in 2011, a deficit of 10.4 per cent of GDP in 2014 and the deficit averaged 6 per cent in 2015-2016 (World Bank, 2017).

In 1980-1990, growth rate of GDP per capita in Kenya averaged 0.5 per cent reducing to negative 3.9 per cent in 1992 and negative 2.1 in 2000. The growth of GDP per capita recorded an impressive positive 4 per cent in 2007 but after the 2007 post-election violence it worsened to negative 2.5 per cent in 2008 and then increased to positive 3.2 per cent in 2016 (World Bank, 2017). Considering the persistent deficits in the current account, the problem that remains unresolved is why the deficit financing through the current account has not culminated into higher economic growth and reduced poverty, inequality and unemployment rates in Kenya?

Additionally, Melesi-Ferreti and Razin (1996a) show three interrelated terms on the current account. They include: (i) an economy's solvency; (ii) current account sustainability; and (iii) current account deficit excessiveness. In relation to the first concept, an economy is solvent if the present discounted value of the future trade surplus is equal to the current external indebtedness. By focusing on the second concept, current account is sustainable if the continuation of the current government policy stance and (or) of the present private sector behaviour will not entail a need for a 'drastic' policy shift or a balance of payments (currency) crisis. Norrowing to the third concept, a deficit that is too large to be explained in terms of any given model of consumption, investment and production is described as unsustainable. The notion of 'excessive' current account deficit is based on deviations from an 'optimal' benchmark, which can be calculated under some strict assumptions such as perfect capital mobility and efficient financial markets.

In Kenya, Osoro (2013) observes that, little is known about the macroeconomic variables that drives BOP in Kenya. Perpetual external deficits normally imply that government will always increase her stock of external debt. Moreover, deficits in the current account cannot be

sustained indefinitely especially when they are inconsistent with macroeconomic fundamentals. Intuitively, unsustainable deficits in the current account imply increase on external debt that may adversely impact on macroeconomic stability, overburden the current and future generations, affect the rate of economic growth and negatively impact on the overall welfare of the citizens.

In fact, the available evidence on the subject is more conflicting and therefore inconclusive with many gaps for individual developing economies in Sub-Saharan Africa. There exists a number of research gaps for Kenya in particular. Due to unavailability of data for individual developing economies, many authors have focused on unsustainability of current account deficits, but again on cross-country perspectives. These heterogenous gaps need to be urgently addressed. This study, therefore, attempts to fill the identified gaps by focusing on a single country for a robust analysis on the effect of current account deficit on economic growth and provide econometrics time-series evidence from Kenya.

3.1.5 Research Questions

i) What are the effects of current account deficit on economic growth in Kenya?
ii) What is the direction of causality between current account deficits and economic growth in Kenya?

3.1.6 Objectives of the Study

The main objective was to analyze the effects of current account deficits on economic growth in Kenya.

Specifically, the research paper aimed at determining;

i) The effects of current account deficits on economic growth in Kenya.
ii) The direction of causality between current account deficits and economic growth in Kenya.

3.1.7 Significance of the Study

First, the study is crucial in several ways that include but not limited to policy relevance. As highlighted in the introduction part of this paper, current account deficits can trigger adjustment processes characterized by declines in economic growth when they are inconsistent with

macroeconomic fundamentals. Second, the study seeks fresh evidence that contributes to the already scanty evidence on the subject particularly in Kenya. There exists both theoretical and empirical (methodological) gaps. Most of the studies identified apply cross country (panel) analysis that do not exhaust country specific analysis. By the fact that individual economies are heterogeneous in nature, overtime, the study notes that different models, methodologies, data, approaches and sample periods may yield different and fresh insights particularly for country specific studies. In Kenya, the available evidence is not only sparse but also mixed and inconclusive. By applying novel estimation techniques, different data, approach and period, the study yields not only new but also robust analysis validating the parameter estimates and yielding key policy insights for Kenya.

Last but not the least, as documented in the financial year 2016/2017 Medium Term Debt Strategy (Republic of Kenya, 2017); Kenya like many developing countries needs to manage a number of risks if it is to achieve the targeted economic growth projections. This makes it important for policy makers to understand not only the dynamics but also quantitative and precise effects of current account deficit on economic growth in Kenya. A detailed empirical investigation is instrumental to not only aid formulation of evidence based and country specific case growth strategies but also guides on the design of fiscal, monetary and exchange rate policies in advancing economies, Kenya included. The study contributes further to new frontiers of knowledge and builds a crucial research data base for future researchers, academia and policy makers in Kenya and beyond.

3.2 Literature Review

3.2.1 Theoretical Literature

Balance of Payment theories are mainly concerned with identifying possible determinants of BOP and specifically the analysis of policies for preserving BOP equilibrium. Generally, the BOP analysis is a post-war phenomenon. Prior to the revolution of the Keynesians, issues of international disequilibrium were analysed within the classical conceptual framework of the mechanism of adjustment, actions of monetary and other policy making authorities being sub-sumed in the system. Keynesian revolution introduced persistent disequilibrium issues into the

analysis of international monetary system (Johnson, 1977a). Johnson (1977a) documents the following approaches to BOP:

(i)   Elasticity approach

(ii)   Keynesian multiplier approach

(iii)   Absorption approach

(iv)   Keynesian policy analysis approach

(v)   Monetary approach to Balance of Payments (BOP)

However, the five approaches have been broadly collapsed into two based on whether BOP is treated as a real or a monetary phenomenon in the economic literature. Moreover, it is also worthy noting that out of the five historical (or traditional) approaches, literature largely identifies three main approaches to BOP that include elasticity, absorption and the monetary approaches.

i)   Elasticity Approach

Robinson (1937) made the first move to view BOP as a real phenomenon. As a response to the need for a theory of BOP adjustment under flexible exchange rate, the author formulated the elasticity theory. The Elasticity and Keynesian multiplier approaches are both concerned with addressing the following questions:

i)   What are the conditions for currency devaluation to improve a country is BOP on current account.

ii)   What will be the effect of currency devaluation on the level of domestic activity and how will this affect BOP?

iii)   What are the conditions for devaluation to be successful?

iv)   What will be the effect of devaluation on terms of trade of the devaluing country?

Elasticity theory finds solutions to the enumerated questions in terms of the Marshall-Lerner condition. The Marshall-Lerner condition is derived in a two country, two commodity context based on the assumption that under-employment exists in each country and that domestic price of each country's export goods is given. Equation 3.1 gives the basic equation of the Marshall-Lerner condition.

$$\frac{d_B}{d_e} = -X\left(1 + n_x + n_f\right) \qquad\qquad 3.1$$

Where d_B is the change in home country's trade balance and is measured in units of domestic currency, d_e is the change in exchange rate, X is exports, x and f are suffixes representing exports and imports respectively (both are measured in units of domestic currency) and n_i is elasticity of demand for i^{th} good, $i = x, f$. From equation (3.1),

$$\frac{d_B}{d_e} > 0 \; if \quad |n_x + n_f| > 1 \qquad\qquad 3.2$$

As affirmed by Robinson (1937), equation 3.2 implies that devaluation of a currency will improve BOP position if the sum of domestic elasticity of demand for imports and foreign elasticity of demand for exports exceeds unity. The Marshall-Lerner condition holds relevance only in the medium and long term and therefore, the J-curve also forms in the medium to long term. According to the J-curve effect, following devaluation of a currency, the current account balance will first decline for some time prior to rising beyond the initial point as predicted. The approach has been critiqued on the basis that it employs partial equilibrium analysis, besides ignoring the cross-correlations among the prices of relative goods, as well as demand and supply.

(ii)　Keynesian Multiplier Approach

The approach is a modified version of the elasticity analysis in the sense that it takes care of the limitations of the elasticity approach. The theory is premised on a mixture of Hicks-Mosak general equilibrium analysis with Keynesian income-multiplier analysis which finds its development in the works of Laursen and Metzler (1950); Harberger (1950); and Meade (1951).

In Keneysian sense, elasticity analysis ignores the net multiplier effects of changes both in export proceeds and in spending on home and exportable goods associated with changes in import expenditure changes in the balance of trade. The assumptions behind Marshall-Lerner's condition imply that changes in terms of trade are the only initial effect of devaluation. This approach does not take into account the effect of any change in exchange rate on real output and money variables of the economy. It explicitly assumes that any improvement in balance of trade following devaluation is matched by saving in the form of

accumulation of foreign exchange reserves and that the resulting accumulation of hordes of foreign exchange has no feedback on the real economy.

The focus of foreign trade multiplier analysis focuses on the automatic adjustment that would take place if a shift in a country's payments position occurred. Assuming that a country, initially in equilibrium, experiences a downward shift in demand for its exports, with a consequent initial deficit, the reduction in exports would lead to a decline in home country income which in turn would reduce expenditures through the multiplier. With a positive marginal propensity to import and to save, imports would decline by some fraction of the initial adverse shift in trade balance. This could partially offset the initial shift in equilibrium position. The approach makes good the deficiency of the simple elasticity approach by recognizing and allowing for the implications of changes in expenditure on output, income, expenditure, and output on BOP equilibrium. The analysis is based on the following key assumptions:

a) Existence of unemployed resources whose rate of utilization can vary without ulterior consequences resulting from devaluation.
b) Infinite elasticities of supplies, making changes in exchange rate and terms of trade.
c) Exchange rate is merely a control device over terms of trade.

In line with the multiplier model, the effect of devaluation on balance of trade may be obtained from the following equation:

$$\frac{1}{M} \frac{d(B_h/r)}{d_r} = \frac{s_h \, s_f \left(n_h + n_f - 1 \right)}{s_h \, m_f + s_f \, m_h + s_f \, s_h} \tag{3.3}$$

Where M is imports, r is price of foreign currency in domestic currency, subscript h and f indicates home and foreign countries, s and m represent to marginal propensities to save and to import, and n represents elasticity of imports. The formula in 3.3 suggests that Keynesian general equilibrium model is similar to elasticity model, since both depend on Marshall-Lerner condition.

(iii)   Absorption Approach

It was developed by Alexander (1952), though Meade (1951) and Tinbergen (1952) contributed. The approach is considered as first step towards development of a BOP model within a

macroeconomic framework. The approach portrays a country's deficit in foreign trade as an excess of absorption over income (investment over saving). According to Johnson (1977b), devaluation can remedy the over absorption. Upon devaluation, domestic prices of imports would rise, so that to restore real cash balances to the desired level, it becomes necessary to hoard money, thereby reducing absorption (Alexander, 1952). The approach considers BOP not simply as excess of residents' receipts from foreigners over residents' payments to foreigners but as excess of residents' total receipts over total payments as depicted in 3.4:

$$B \; = R_f - P_f \qquad\qquad 3.4$$

Where R_f is the excess of receipts of residents from foreigners, and P_f is payments by residents to foreigners. Considering all payments by residents to residents (R_f) are simultaneously receipts by residents from residents (P), equation (3.4) can be rewritten as;

$$B \; = \; R_f + R_r - (P_f + P_r) \qquad\qquad 3.5$$

Equation 3.5 implies that;

$$B \; = \; R - P \qquad\qquad 3.6$$

Where R is total receipts by residents, and P is total payments by residents. At the core of, the absorption approach is the accounting identity:

$$B \; \equiv \; X - M \quad \equiv \; Y - A \qquad\qquad 3.7$$

Where B is trade balance, X is exports, M is imports, Y is income and A is absorption. The identity 3.7 may be expressed in first differences (Δ) as:

$$\Delta B \; = \; \Delta Y - \Delta A \qquad\qquad 3.8$$

Equation (3.8) reflects change in B as a difference of changes in Y and A. Moreover, a change in A resulting from devaluation may be decomposed further into a direct and an indirect change, the latter being the result of a change in Y due to devaluation. The indirect change in absorption depends on the propensity to absorb. Devaluation may directly alter the amount of real absorption associated with any given level of income. The change in A is also expressed as in 3.9:

$$\Delta A \;=\; c\Delta Y + \Delta D \qquad\qquad 3.9$$

Where c depicts the sum of marginal propensities to consume and invest, and ΔD indicates the direct effect of devaluation on absorption. By substituting equation (3.9) in (3.8), we get 3.10:

$$\Delta B \;=\; (1-c)\Delta Y - \Delta D \qquad\qquad 3.10$$

Equation 3.10 states that the effect of devaluation on trade balance depends on:

i) Effect of devaluation on real income;

ii) Magnitude of marginal propensity to absorb (c) and,

iii) How devaluation directly affects absorption at any given level of income (how large is ΔD).

Further, Alexander (1952) subsequently makes analyses on two parts: indirect effect and direct effect. The income effects of devaluation include the idle resource effect and the terms of trade effect. Under direct effects, Alexander recognizes cash balance effect, income redistribution effect, money illusion effect and other miscellaneous effects.

Incase there is presence of unemployed resources, increase in exports following devaluation results to an increase in income via foreign multiplier. Devaluation leads to deterioration in terms of trade and thus a reduction in the real income of the country. Therefore, the "idle resource" and "terms of trade" income effects are in opposite directions, so that ΔY can have either sign. Consequently, the effect of devaluation on ΔY is ambiguous. On the other hand, the effect of devaluation on income and consequent income effect on absorption, and trade balance will improve only if c is less than unity.

Whilst marginal propensity to consume is normally less than unity (c), the combined marginal propensity (to consume, invest, and spend publicly) may well be greater than unity. If so $(1-c)\Delta Y$ will be negative and trade balance will deteriorate. To the extent that c is less than unity, any increase in income would increase absorption by less than the increase in income, and therefore trade balance will improve. If c is greater than unity, devaluation would have a negative effect on trade balance, since induced effects on absorption will be greater than original effects on production.

The absorption approach suggests that elimination of BOP deficits would normally require simultaneous adoption of both on expenditure switching as well expenditure reducing strategies. An expenditure switching strategy implies that devaluation reduces imports and encourages exports in a deficit country and switches demand in surplus countries for imports. In case Marshall-Lerner condition is fulfilled, these effects tend to improve the trade balance in a deficit facing country while simultinously increasing the level of aggregate demand in the deficit country through increased net exports. During instances when resources in the country are near full capacity use, then a domestic expenditure reducing strategy, such as a policy on tax increase, would be necessary to avoid inflation.

The absorption approach popularity is related to theory's close linkage with monetary sector of the economy in a manner that real expenditure can exceed real income if supply of real money exceeds demand for real money balances. This implies that, a deficit (surplus) in BOP may be due to excess supply (excess demand) in money market.

Machlup (1955) analyzed not only the validity of the underlying framework of analysis but also on the approach's concentration on aggregate magnitudes and neglect of relative prices. The absorption approach also recognizes the need to rebuild real balances in presence of price increases after devaluation, but ignores reduction in money supply.

(iv)   Keynesian Policy Analysis (Meade Tinbergen Model)

The issue of attaining external balance in foreign trade and BOP and internal balance in price stability in home country and full employment simultaneously finds its expression in the Keynesian policy analysis approach. The model in an open economy was authored by Meade (1951) and Tinbergen (1952). The approach assumes that the country under analysis has a policy authority that utilizes financial (fiscal and monetary) and exchange rate policies to enhance the execution of objectives regarding the full employment (internal balance) as well as the BOP (external balance).

The heart of this approach for policy is that, if a country seeks to attain a BOP surplus while maintaining full employment, the solution is to combine a devaluation with a deflation in exactly the right proportions to maintain full employment total demand for output (foreign plus domestic) while reducing total domestic demand for foreign and domestic goods below

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the level of total domestic output by fiscal or monetary restraint. Equally, the non devaluer must inflate expenditure. Links of improvement in trade balance following devaluation depends not only on attainment of the elasticity criterion (sum of elasticities of import demand being greater than unity) but also on the classical transfer criterion (sum of marginal propensities to import out of expenditure being less than unity).

Additionally, Johnson (1976) observed that the Keynesian policy approach ignores the stock-flow adjustment consequences of the reserve flow associated with a deficit or surplus of the BOP. The adjustment process implies that the combined policies of devaluation and deflation cannot produce a flow equilibrium BOP surplus. However, period by period expansion of cash balances consequent on BOP surplus will gradually raise the level of expenditure with an increase in domestic price level sufficient to reduce exports and increase imports sufficiently to allow additional domestic demand. Such an increase is equivalent to an appreciation of foreign exchange rate, that partially offsets initial devaluation, and in long-run the economy must go back to equilibrium position. This implies that inflation of domestic prices oftenly offsets nominal devaluation.

In general, the absorption approach is superior to elasticity approach. The neglect of the merits of elasticities and relative prices is however not justifiable since price effects and income effects cannot be dichotomized. Changes in relative prices combined with elasticities, affect income, and income changes affect relative prices and elasticities.

(v)   Monetary Approach to Balance of Payments

In the literature, the monetary approach was first outlined by Hahn (1959) and further developed by Mundell (1968), Johnson (1972), Swoboda (1973), Dornbusch (1973), and Mussa (1974). The approach asserts that reserve flows are essentially a monetary phenomenon and thus, can be analyzed in relation to money market of a 'small economy'. The approach opines that any disequilibrium in BOP is a reflection of disequilibrium in money markets.

The approach emphasizes on the monetary aspects of BOP adjustments under fixed exchange rates system rather than relative price and income effects that were the preoccupation of elasticities approach and formed a major part of the absorption approach. Monetary approach recognizes that real variables affect BOP and exchange rates but operate only through

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monetary channels. The approach can be analysed with an aid of a model which comprises of five equations. The first element of the model is demand for money. This is a stable function of real income (Y), rate of interest (i) and price level (P).

$$M_d \; = \; L(Y, i, P) \hspace{3cm} 3.11$$

Where $L'(Y) > 0, \quad L'(P) > 0)$; $\quad L'(i) < 0$. The second element is supply of money and is equal to the sum of domestic assets of the banking system (domestic credit, D) and country's foreign exchange reserves (R).

$$M_s \; = \; D + R \hspace{3cm} 3.12$$

Abstracting from the short-run adjustment process, there is equilibrium in money market in the end. This implies that,

$$L(Y, i, P) = \; D + R \hspace{3cm} 3.13$$

Expressing equation (3.13) as,

$$\Delta R \; = \; \Delta L(Y, i, P) - \Delta D \hspace{3cm} 3.14$$

Taking $\Delta D = DCE$ (Domestic Credit Expansion), it follows that;

$$\Delta R = \Delta L(Y, i, P) - DCE \hspace{3cm} 3.15$$

Equation 3.15 indicates the summarized basic contention of the monetary approach to balance of payments. It therefore follows that any deficit or surplus is equal to the difference between change in demand for money and change in domestic credit. A continuous BOP deficit can thus prevail only if authorities allow domestic credit to expand faster than demand for money. It is important to note that monetary approach is premised on the Walras' law where by the sum of excess demands for goods and services, bonds and securities and money is zero as in equation 3.16.

$$ED_g + \; ED_b + \; ED_m = 0 \hspace{3cm} 3.16$$

Where g, b and m depict goods, bonds and money respectively. In a fully employed economy closed to international trade in goods and assets, excess demand will be eliminated by changes

in prices. However, in open economies such excess demand will be reflected in different net international flows in BOP accounts.

The BOP is constrained by:

$$(X_g - M_g) + (X_B - M_b) + (X_m - M_m) = 0 \qquad 3.17$$

Where X and M represent exports and imports. Therefore, the three accounts: current, capital and money accounts must sum to zero. The budget constraint shows that if two markets are in equilibrium, likewise the third market must be in equilibrium. BOP analysis could therefore concentrate on current and capital accounts and thus ignore the money account.

Despite discussions that the monetary approach to BOP emerges as the most celebrated BOP model in international monetary theory, the model suffers from some internal contradictions. The validity of fundamental propositions of the monetary approach in the sense that a surplus or deficit in BOP indicates stock disequilibrium between demand for and supply of money has been doubted by many economists. Moreover, direct link between BOP and excess demand for money is of questionable validity. For instance, Rabin (1979) demonstrates that a BOP surplus may be accompanied by an excess supply of money, whilst a deficit in BOP may be accompanied by an excess demand for money when considering equilibrium in the market for traded and non-traded goods. Rabin (1979) observes that a change in tastes in the home country away from traded goods to non-traded goods creates an excess supply of money through a surplus in the current account. The excess supply enhances the generation of upward pressure on price of non-traded goods.

Moreover, the proponents of the monetary approach to BOP contradict themselves in relation to specification of money demand function. We apply different versions of demand for money function for either exposition of the theory or for application of the theory to particular problems. Tsiang (1977) notes that there are two basic types of demand function for money in the monetary theory of BOP. Either the nominal money balances are described as a function of real income, price level, interest rate or nominal money balances as a function of money value of total real wealth and interest rate.

Lastly, anothercritique of monetary approach is ignoring fiscal aspects of creating domestic credit. In the literature, Kreinin and Officer (1978) have recognized the need to analyse government budget constraint as one of the sources of domestic credit. As such, the budget deficit may be financed by sales of government securities to the private sector. The implications of government budget constraint are however, ignored by the monetary approach. There is no specified means therefore through which the money supply is expanded (Kreinin and Officer, 1978).

3.2.2 Empirical Literature

Empirical analysis and discussions on BOP disequilibrium as reflected by current account, mostly center on its determinants, sustainability and dynamics in industrialized economies. These discussions and analyses have rapidly increased recently but also a number of analyses provide scanty information on the linkages between external deficits and economic growth in developing countries. Literature provides that current account deficits were sustainable in the listed countries: Czech Republic and Slovenia (Konya, 2008), New Zealand (Kunhong et al, 2001), 15 economies in the Euro zone (Holmes and Walrath, 2007), Zambia, Seychelles, Mali, Lesotho, Mozambique and Gambia (Osakwe and Verick, 2009), (Heidari et al, 2012). There mixed evidence for India (Tiwari et al., 2012).

On the other hand, unsustainable deficits in the current account are indicated by Husted (1992) for United States of America, Konya (2008) for Hungary, Dulger and Ozdemir (2005) for Germany, UK, US and Japan, Osakwe and Verick (2009) for Burundi, Burkina Faso, Rwanda and Togo, Perera and Varma (2008) for Sri Lanka confirming that problems in the current account and BOP in general affect all countries (both developed or developing).

Further, Freund and Warnock (2005) divided the period into 25 episodes and examined if there is any threshold of current account in developed economies. The findings show the status of deficit in the current account dynamics in these episodes. The author argues that when the current account deficit to GDP ratio reaches 5%, adjustment process starts and after this point it reverses and tends to decline. Moreover, the author points out that the situation results to slow growth in income and real exchange rate depreciation in 3 to 4 years. Key to note is that the author emphasizes that there are serious differences between specific countries.

Moreover, Freund and Warnock (2007) examined the current account balance and economic growth nexus for developed economies and classified the study period (1980-2003) into 26 episodes. The author concludes that increases in current account deficit has a negative effect on economic growth. Cakmak and Varlik (2007) conducted a related analysis for Turkey's economy and classified increases in the current account deficit as an important indicator of risks to the economy. The author analysed the sustainable current account threshold in medium and long-term and established a threshold of 3.6% (for moderate scenario) and as 5.5 to 6% (for good scenario). The author concludes that if the thresholds were exceeded for Turkey, fragility against financial turbulences fueled by negative shocks may amplify and undermine growth.

In Kenya, Bigstein and Ndung'u (1992), observe that ten years after Kenya's independence (in 1963), the first budget and current account deficits were recorded. The deficits trigerred the BOP challenges fueled by the deteriorating terms of trade and expansionary public budgets.

Moreover, from a sample of both industrial and developing economies (Kenya included), Chinn and Prasad (2003) examined medium-term determinants of current accounts. They applied cross-section and panel regression estimation techniques. Their findings show that both government budget balances and initial stocks of net foreign assets are positively correlated with current account balances. Findings also reveal that measures of financial deepening and terms of trade are positively associated with current account surpluses (or smaller deficits) while indicators of openness to international trade are associated with larger current account deficits in developing countries.

In the literature, Ozmen (2004) applied both Generalized Instrumental Variable Estimation (GIVE) method and OLS and examined the effects of institutional and macroeconomic policy stance variables on current account deficits. The author analysed cross-section data for a broad number of industrialised and developing economies including Kenya. The evidence strongly suggested that better governance increases (but the presence of original sin decreases) the ability of an economy to sustain external deficits.

Further, Abmann (2007) applied panel data from 1975 to 1997 for 67 countries, Kenya included. The author investigated the dynamic effect of macroeconomic crises as currency crises and current account reversals on economic growth. Both specifications of the influence of the crises

were analysed and within each specification, both types of crises had an impact on economic growth. The findings established that impact of a currency crisis is significantly persistent over time, unlike the effect of a reversal. Equally, evidence pointed out that significant heterogeneity prevails in the growth equation. The findings suggest differences in the estimated costs of both types on economic growth.

Additionally, Osakwe and Verick (2009) examined the determinants of short and medium-term current account deficits in Africa, Kenya included. They argue that economies are likely to have a deficit of over 5% if the economy is small, less open and diverse, and experiences macroeconomic instability. Moreover, governments that are less democratic also have a higher chance of running a deficit in the current account. The study concludes that while most African economies are characterized by current account deficits, only a few have real concerns regarding the sustainability of this imbalance. As long as these countries can finance their deficits through aid and debt accumulation, they face no immediate crisis.

However, they pointed out that a no immediate crisis status allows the economies to continue with the status quo rather than addressing the structural causes of the deficit such as export supply constraints. This is due to poor infrastructure. African leaders and policymakers should therefore focus on removing such impediments thereby providing a boost to long-term growth and development prospects.

It has also been noted that Liesenfeld et al., (2010) applied panel data specifications to examine both the dynamics and causes of current account reversals in both low and middle-income economies, Kenya included. The findings established that current account balance, foreign reserves, terms of trade and concessional debt are key determinants of reversals in the current account. They also found strong evidence for serial dependence in the occurrence of reversals. Moreover, whilst the likelihood criterion shows that state dependence and serially correlated errors are observationally equivalent, predictive performance measures augment the hypothesis that the serial dependence is mainly due to serially correlated country-specific shocks.

From the studies focusing on Kenya, Mwega et al., (1994) applied a three-gap framework to determine if it was fiscal, savings and foreign exchange gaps that was the binding constraint on Kenya's economic growth. The study also focused on the macroeconomic constraints and medium-

term growth in Kenya. The findings established that foreign exchange was a major resource constraint to potential growth in Kenya.

Further, Gichuki and Moyi (2013) analysed the sustainability of Kenya's current account deficits and applied the inter-temporal optimal approach. The findings suggest that current account deficits in Kenya are unsustainable in the long-run. The study however concludes that current account trend in Kenya violates the intertemporal budget constraint and the trade balance is therefore unsustainable.

Last but not the least, Osoro (2013) determined the long-run determinants of BOP dynamics for Kenya from 1963 to 2012. The author applied cointegraton analysis, error correction model and Granger-causality approach. The study reveals how determinants of BOP lead to adjustments in removing disequilibrium in BOP. Evidence shows that variables exhibiting non-stationarity are insignificant in determining the BOP in the long-run. Further, the study suggested that BOP was cointegrated and thus BOP fluctuations could be caused by the level of trade balance, volatility in exchange rate and foreign direct investment inflow. The findings established that the positive effect of foreign direct investments leads to the generation of new products and services that in-turn causes an improvement in the BOP through exports' expansion. The study concludes that BOP is both a monetary and real phenomenon.

To sum up, it is evident that current account deficits and economic growth links are scanty in developing countries. Evidence is still inconclusive on the precise and quantitative effects as well as their causal links in Sub-Saharan Africa. Although Kenya has been included in a number of generalised studies, there exists very scanty evidence on the effects of current account deficits on growth of GDP per capita in Kenya. This paper seeks to determine the effect of current account deficit on growth of GDP per capita, test the causal links and therefore draw evidence-based policy related responses for Kenya. Table 3.0 details a summary of the empirical literature.

Table 3.0: Summary of Empirical Literature

Author & Year	Country of Study	Data Used	Methodology	Main Finding
Hakim & Sriyana (2020)	Indonesia	Annual time series data for 1985 to 2020	ARDL & EGARCH techniques	Exchange rate, growth of GDP, total reserves, inflation and rate of unemployment are vital in resolving the behaviour and variability of current account balance
Fasanya & Olayemi (2018)	Nigeria	Time series annual data for 1980 to 2012	ARDL Cointegration	Thirwall's law of actual growth rate, being equal to the predicted growth rate by BOP current account equilibrium holds
Nyoni and Musisinyani (2017)	Zimbambwe	Time series annual data for 1980 to 2013	OLS estimation approach	Current account deficit had statistically negative effect on economic growth
Olayemi et al (2017)	Nigeria	A combination of annual time series data for (1981 to 2016) and quarterly data from (1981Q1 to 2016Q4	ARDL Cointegration	Economic growth was found to be equal to growth rate of export divided by income elasticity of imports
Aydin and Esen (2016)	Turkey	Quarterly data for 1999Q2 to 2014Q2	Threshold Autoregressive (TAR) approach	There exists evidence of threshold effects related to current account deficit. The current account threshold established a 4% of GDP, above which it revealed a negative effect on economic growth.
Ibrahim & Mehmet (2014)	Turkey	Quarterly data for 2002Q1 to 2014Q1	Unit root ADF test & VAR framework	Current account deficit had statistically negative effect on economic growth
Gichuki & Moyi (2013)	Kenya	Annual time series data for 1975 to 2010	ADF & PP unit root Cointegration Intertemporal optimization	External deficit in Kenya is not sustainable in the long-run.
Osoro (2013)	Kenya	Annual time series data for 1963 to 2012	Unit root test Cointegration VAR/VECM Granger-causality.	FDI has a positive effect on trade balance. The results also reveal that the exchange rate depreciations improve the trade balances

Source: Author's Compilations

3.2.3 Overview of Literature

In theoretical literature, the main approaches to BOP include the elasticity, absorption and monetary approaches. We establish that the three alternative approaches are distinct since each of them employs own distinct concepts and therefore respond to the issue of correcting the BOP disequilibrium from unique perspectives. The alternative approaches have own merit over the other in drawing implications from specific types of empirical facts. However, both theoretical

and empirical debates remain inconclusive on the BOP disequilibrium analyses as well as on the potential effects of BOP deficits on growth of the economy.

The elasticity approach attributes a deficit in the current account to wrong prices, including exchange rates, and centers attention on how sensitively imports and exports respond to price changes. The absorption approach views a deficit specifically on current account as an excess of country's total absorption of goods and services over its total production. The absorption approach is also known as the saving-investment balance or macroeconomics oriented approach. This approach opines that economies with current account deficit should import from other countries to cover its excess consumption and spending. It is predicted that the current account is in surplus when absorption is smaller than income. It is in deficit when absorption is larger than income. The monetrary approach attributes a current account deficit to excess supply of money. The monetary approach analyses implications for stock equilibrium of continuing flow of financial assets required to finance a continuing BOP surplus or deficits. Monetary approach formulates the BOP difficulties as a monetary phenomenon to be analyzed with the tools of monetary theory, whereby elasticity and absorption approaches formulate it as a residual difference between real flows determined by other flows and relative prices.

This study affirms Hung and Gamber (2010) assertion that the BOP and the current account are macroeconomic variables and therefore the absorption approach provides a macro-oriented approach and is a more inclusive framework of analysis in developing countries like Kenya. Under the absorption approach to BOP, the current account is the difference between monetary values of domestic production and aggregate demand. Government expenditure has impacts on imports and BOP is considered as a real and monetary phenomenon. This paper adopts the absorption approach to BOP and extends McCombie and Thirlwall (2004) growth model by introducing capital flows and structural shocks in the growth analysis.

3.3 Methodology

3.3.1 Theoretical Framework

As McCombie and Thirlwall (2004) observed, "if a country gets into BOP constraints as its expands demand before the short-term capacity growth rate is reached, then demand must be curtailed; supply is never fully utilized; investment is discouraged; technological progress

becomes less desirable and worsens the BOP further, and a vicious circle is started." Demand pull approach to growth affirms that increasing returns is a key element of economic growth. Thirlwall's growth model is distinct from the models of new endogenous growth in that the former shows that aggregate demand and financial constraints are essential candidates of long-run economic growth.

McCombie & Thirlwall (2004) model shows that productive resources are not always fully utilized and that their supply tends to respond to demand which is an approriate case in many lower middle income countries, Kenya being one. A key assumption upon which many neoclassical theories are pemised is Say's law that states that supply creates its own demand and the perfect working of the economy will always ensure what is produced is consumed (Braudel, 1979).

The limitations of the neoclassical supply constrained economy that assumes economic growth resulting from changes in factors of production and technical progress led to the emergence of the Keynesian effective demand driven economy (Keynes, 1936; Thirlwall, 1979; McCombie & Thirlwall, 2004; and Aricioglu et al., 2013). Besides their tenets, the aggregate demand in an economy is influenced by the international market forces with an implication that its demand can be constrained by BOP. Noteably, it may not be prudent to appreciate the long-run growth effects without disecting the BOP of the economy (McCombie & Thirlwall, 2004; Olayemi et al., 2017). This paper therefore adopts the absorption approach to BOP jointly with the extension of McCombie & Thirlwall (2004) growth model.

The mainstream economic growth models neglect not only the demand side of the economy, but also external constraints. Moreover, the new economic growth theories are supply-oriented and closed growth models. Keynesian models along Kaldorian lines, link trade to growth and exports pull demand (McCombie & Thirlwall, 2004).

The McCombie & Thirlwall (2004) growth model asserts that trade is an important constraint to economic growth when there are BOP challenges. Static trade models show that trade openness can increase rate of growth temporarily due to short-run gains from the reallocation of resources, which would imply a positive relationship between changes in openness and economic growth. The new growth literature identifies a number of avenues through which

trade openness affects long-run growth of the economy. They include technological change and technological gaps. The idea behind these new growth models is that countries, which are more backward, provide more opportunities to absorb new ideas and converge on international norms more quickly, allowing them to benefit from technological change. Noteably, the open new endogenous growth models, like Grossman and Helpman (1990, 1991), focus only on trade and growth and neglect BOP constraints.

In the McCombie & Thirlwall (2004) growth model, neither trade nor financial liberalization necessarily lead to better growth performance. The Keynesian and structuralist traditions take into consideration both current account and capital account equilibrium. Therefore, it is important to consider not only exports of goods and services, but the income elasticity of demand for imports. Performance of exports and income elasticity of demand for imports imply that trade and capital account liberalization do not necessarily lead to economic growth through technological gains or through an increase in total factor productivity. To this end, Thirlwall's (1979) growth model is presented in the following three equations:

$$x = \theta(p_d - p_f) + \rho z \qquad\qquad 3.18$$

$$m = \alpha(p_d - p_f) + \pi y \qquad\qquad 3.19$$

$$x + p_d = m + p_f \qquad\qquad 3.20$$

where ρ, π, and $\alpha > 0$ and $\theta < 0$. Income elasticity of exports and imports are ρ and π respectively, price elasticity of exports and imports are, respectively, θ and α. x is the growth of real exports, m is the growth of real imports, z is the growth rate real income from the rest of the world, y is the growth rate of real domestic income, $p_d - p_f$ is the rate of growth of relative prices (growth rate of domestic prices less growth rate of foreign prices). Equations (3.18) and (3.19) are, respectively export and import demand functions, whereas equation (3.20) is current account equilibrium.

Solving equation (3.20) for the growth of real income:

$$y^* = [(1 + \theta - \alpha)/\pi]\ (p_d - p_f)z \qquad\qquad 3.21$$

Substituting for growth rate of world real income (z), from equation (3.18) yields:

$$y^* = [(1/\pi)(1 - \alpha)](p_d - p_f) + (1/\pi)x \qquad 3.22$$

Assuming Marshall-Lerner condition holds or that relative prices are constant when measured in common currency, then $(p_d - p_f = 0$, and equation 3.22 becomes 3.23 as follows;

$$y^* = (1/\pi)x \qquad 3.23$$

Equation 3.23 is the BOP constrained growth equation, a version of the Harrod's foreign trade multiplier. It is the Thirlwall's law and states that the higher the income elasticity of demand for imports (π) the lower the BOP equilibrium growth rate.

3.3.1.1 Application in Developing Countries

Evidence suggests that the economic growth model discussed in sub-section 3.3.1 is an efficient framework applied to many economies (Olayemi and Fasanya, 2018). However, the model considers only the current account position. Although in the long term, current account equilibrium is extremely important, many developing countries are affected by capital flows as argued by Mwega (2014) for the case of Kenya. It is necessary to review the model to introduce capital flows, in countries in which capital inflows are important for BOP equilibrium. Capital flows affect the simple version of Thirlwall's model leading to differences between the growth predicted by the model and the effective growth of a country. In order to include capital flows in the model, the paper reviews equation 3.20. Assuming that BOP is in initial current account disequilibrium, we show equation 3.24 as,

$$P_d X + F = P_f M E \qquad 3.24$$

Where X is the volume of exports, P_d is the domestic price of exports, M is the volume of imports, P_f is the foreign price of imports, E is the exchange rate, and F is the value of nominal capital flows measured in domestic currency. $F > 0$, are capital inflows while $F < 0$, capital outflows. Taking rates of change, it follows that:

$$\delta(P_d + x_f) + (1 - \delta)f = m + p_f + e \qquad 3.25$$

Where the subscripts show the rates of growth of the variables, δ and $(1 - \delta)$ are the shares of export and capital flows as a proportion of total receipts. Substituting equation 3.25 into

equations 3.18 and 3.19 and assuming again that Marshall-Lerner condition holds or that relative prices are constant if measured in common currency, equation 3.25 becomes:

$$y^* = [\delta_x + (1 - \delta)(f - p_d)] \ /\pi \qquad\qquad 3.26$$

The BOP constrained economic growth rate, starting from initial current account imbalance, is the weighted sum of the growth of exports due to exogenous income growth outside the country, and the growth or real capital flows, divided by the income elasticity of demand for imports.

3.3.2 Empirical Model

The objective of the study is to determine the effect of current account deficits on economic growth in Kenya. The study also examines the nexus between current account deficit and growth of GDP per capita in Kenya. The dependent variable is growth of GDP per capita while the key explanatory variable was current account deficit. The paper combines the absorption approach to BOP and extends the general framework applied by McCombie and Thirlwall (2004) in specifying the empirical model. In line with the study carried out by Osoro (2013) in Kenya, little is known about the macroeconomic variables that influence BOP in Kenya and therefore McCombie and Thirlwall (2004) growth model provides deep insights in the attempt to specify the macroeconomic growth model for Kenya. Moreover, we consider control variables based on adopted theoretical framework in the specified growth equation. Excluding control variables from the model could lead to estimates bias in the direction of causality (Akinlo and Egbetude, 2010).

The specified augmented econometric growth model is;

$$Y_t = \alpha_0 + \alpha_1 K_t \ + \ \alpha_2 (CAD)_t \ + \alpha_3 FX_t \ + \ \alpha_4 Z_t + \vartheta_t \qquad\qquad 3.30$$

Where Y_t depicts growth of per capita GDP, K_t represents the share of gross fixed capital formation to GDP, $(CAD)_t$ is the current account deficit as a share of GDP, FX_t denotes Kenya official foreign exchange rate based on Kenya shillings per USD dollars and Z_t depicts the identified control variables that include, percentage change in terms of trade, trade openness and percentage change in consumer price index (CPI) index as provided by micro and macro foundatations of BOP constrained growth theory and ϑ_t is the error term.

3.3.3 Definition and Measurement of Variables

Variable	Definition and Measurement	Expected Sign	Data Source
Growth of GDP per capita (Y)	The percentage change of GDP per capita expressed in annual percentage. It is considered a proxy for economic growth.		WDI, 2017
Gross Fixed Capital Formation (K_t)	The acquisition (including purchases of new or second-hand assets) and creation of assets by producers for their own use, minus disposals of produced fixed assets.	Positive	WDI, 2017
Current Account Deficit (CAD)	Current account is all transactions other than those in financial and capital items. The major classifications include goods and services, income and current transfers. It shows the saving-investment resource gap of the domestic economy. Values greater than zero indicate a deficit while those less than zero indicate a surplus.	Positive	WDI, 2017
Foreign Exchange Rate (FX)	The Kenya official exchange rate in Kenya shillings per USA dollar	Negative	WDI, 2017
Trade Openness (TO)	Sum of exports and imports of goods and services as a percentage of GDP. The index measures country's openness to trade or integration in the world economy.	Positive	WDI, 2017
Terms of Trade (ToT)	The ratio of export price index (or unit value index) of goods and services to import price index (or unit value index) of goods and services. It is measured in annual percentage change. The base year is 2009.	Negative	IMF, WEO, 2018
Inflation Growth Rate (CPI)	The annual percentages of average consumer prices based on year to year changes. It is in annual percentage change.	Negative	IMF, WEO, 2018

Source: *Author's Compilations*

3.3.4 Econometrics Approach

a) Descriptive Statistics

Descriptive statistics for all the variables in the model were conducted to determine the statistical properties of the model prior to running any estimation. The process involved application of the tests of skewness, kurtosis and normality of the variables and the spread of the data by determining the mean and the first movement from the mean.

b) Unit Root Tests

Unit root tests were applied to determine the stationarity properties of the variables in order to eliminate the possibility of spurious estimates. In determining the properties of stationarity, Phillip-Perron (PP, 1988) unit root tests were applied. The null hypothesis is that there is a unit root. Phillip-Perron (PP) unit root test is preffered to ADF unit root test because even though the two yield consistent results, the PP test has higher abilities to detect unit root (Baliamoune-Lutz, 2008). Additionally, ignoring the presence of structural (shocks) breaks (present in the macroeconomy) could lead to rejection of null hypothesis (there is unit root) thus yielding

erroneous order of integration of variables. The study therefore conducted Zivot and Andrews (1992) unit root tests to validate the order of integration of the model variables.

c) Cointegration Analysis

Macroeconomic variables are likely to have a stable long-run relationship and a cointegration technique is crucial for realistic results. However, cointegration analysis is conditional on variables having a unit root. The intuition is that variables that are cointegrated will not move far away from each other and therefore their deviations are stationary in the end. A linear or many linear combinations of non-stationary variables make them stationary. The paper applied Johansen cointegration test based on Johansen (1988) and Johansen and Juselius (1990).

Johansen cointegration test has two statistics that include trace and maximum eigen statistics. It indicates whether there is cointegration or lack of it in the variables. The statistic is from observations of the rank of a long-run coefficient matrix, which comprises of a combination of the cointegrating vectors as well as the amount of each equation of the model.

d) Vector Autoregressive (VAR) Model

VAR model introduced by Sims (1980) side-steps the need for structural modeling by treating every endogenous variable in the system as a function of the lagged value of all endogenous variables in the system. The technique on the characteristics of the data is commonly used for forecasting systems of interrelated time series and for analyzing dynamic effects of random disturbances on the system variance. Ordinary Least Squares (OLS) technique would give spurious estimates when variables are not stationary.

An extension of VAR model is the vector error correction model which allows the VAR model to determine relationships when variables are cointegrated (have a long-run relationship). VEC model allows correction of errors in long run by incorporating an error correction parameter in the short-run model (Engle and Granger, 1987; Camilo, 2015).

The VAR model to be estimated is given as;

$$X_t \;=\; \sum_{i=1}^{k} A_i \, X_{t-i} \;+\; \vartheta_t \qquad\qquad 3.31$$

Where X_t is a vector of endogenous variables, which include growth of GDP per capita, gross fixed capital formation, current account deficits, foreign exchange rate and control variables that include trade openness, annual percentage change in terms of trade and annual percentage change in inflation rate. Depending on the results, if unit root and cointegration exist in the variables, the estimated VEC model is as in equation 3.32:

$$\Delta \; X_t \; = \sum_{i=1}^{k} \Delta A_i \; X_{t-i} \; + \; \Pi ECM_{t-1} + \; \vartheta_t \qquad\qquad 3.32$$

Where Π is the error correction parameter and indicates the speed of adjustments of deviations from short-run to long-run equilibrium. In the literature, macroeconomic variables are likely to have a stable long-run relationship and a cointegration technique is crucial as it yields more realistic results (Camilo, 2015). It was therefore necessary to conduct a cointegration analysis to avoid misspecification of estimated growth model.

e) Johansen test for Cointegration

Upon conducting cointegration analysis, variables were cointegrated and therefore the vector error correction model was appropriate to determine the short-run and long-run relationships. Upon conducting post diagnosis tests, results of the VEC model model passed the Jarque Bera normality test, the model stability test and the multivariate LM autocorrelation test and consequently were reliable for policy implications in line with the study objectives.

f) Granger - Causality Test

The study applied the Toda and Yamamoto (1995) causality test to determine the direction of causality between variables.

g) Post - Estimation Diagnostic Tests

Further, normality of residuals test, model stability test and autocorrelation tests were all conducted based on cointegration and VEC model technique of estimation. The post estimation diagnostic tests were necessary to validate the estimates prior to interpretation and further discussions.

3.3.5 Data Type and Sources

Annual time series data on growth of GDP per capita, gross fixed capital formation, current account deficit, foreign exchange rate and trade openness for Kenya was obtained from World

Development Indicators (WDI, 2017) published by World Bank while data on annual percentage change in terms of trade and annual percentage change in inflation was obtained from International Monetary Fund, (WEO, 2018). Other data sources include the Central Bank of Kenya, and the National Treasury official statistics.

3.4 Empirical Results and Discussion

3.4.1 Descriptive Statistics

Table 3.1 presents the salient data characteristics with descriptive statistics that only show the most important information from 1980 to 2016. The statistics include the means, standard deviations from the mean, the minimum and maximum values. Table 3.1 shows that all variables had information for the entire period. Growth of GDP per capita averaged 0.72546 percent. On the other hand, the minimum value for growth of GDP per capita recorded was below zero by 3.9163 percent with the maximum being 5.48461 percent. The current account deficit had a mean of 6.0343 percent with the minimum being below zero by 0.88845 percent and a maximum of 18.6798 percent. Other variables are as appended in Table 3.1.

Table 3.1: Summary Statistics

VARIABLE	OBS	MEAN	STD. DEV.	MIN	MAX
Growth of GDP Per Capita	37	0.7254615	2.344224	-3.91632	5.484607
Current Account Deficit	37	6.034267	4.976387	-0.88845	18.6798
Gross Fixed Capital Formation	37	18.58817	1.915688	15.3879	22.88066
Foreign Exchange rate	37	54.42169	29.90224	7.420187	101.5
Trade Openness	37	55.96497	7.216515	36.75138	72.85848
Terms of Trade	37	-0.9272703	6.870742	-12.882	20.129
Inflation Rate	37	11.30384	8.61778	1.554	45.979

Source: *Author's Computations*

3.4.2 Correlation Matrix

The study also subjected the data to various tests such as multicollinearity tests to determine the degree of correlation. Incase the correlation among the coefficients of the variables is greater than |0.7| then it shall be an indicative of Multicollinearity. Table 3.2 shows the result for the pairwise correlations matrix. Multicollinearity in the variables escalates the variance of parameter estimates leading to biased estimates. Table 3.2 had correlation coefficients that were less than the threshold, an implication of absence of multicollinearity.

Table 3.2: Correlation Matrix

Variables	Growth of GDP Per Capita	Current Account Deficit	Gross Fixed Capital Formation	Foreign Exchange Rate	Trade Openness	Terms of Trade	Inflation Rate
Growth of GDP per Capita	1.0000						
Current Account Deficit	0.0640	1.0000					
Gross Fixed Capital Formation	0.5850	0.0670	1.0000				
Foreign Exchange Rate	0.0896	0.0723	0.0538	1.0000			
Trade Openness	-0.1643	0.0227	0.0453	-0.2411	1.0000		
Terms of Trade	-0.1488	0.0248	0.0463	0.0372	-0.1917	1.0000	
Inflation Rate	-0.4634	-0.1205	-0.1373	-0.2960	0.4547	-0.0267	1.0000

Source: Author's Computations

3.4.3 Unit Root Tests

Phillips-Perron (PP) unit-root test examines the order of integration of the series. It determines the presence or absence of the unit root (nature of stationality).

Table 3.3: Phillips-Perron Tests Results

Variables		Unit Root Tests			Order of integration
		Phillips-Perron			
		Statistic	Critical value (5%)	P- value	
Growth of GDP Per Capita	Levels	-3.208 (-7.006)	-3.675(-3.682)	0.0195 (0.000)	I (1)
Current Account Deficit	Levels	-3.195 (-6.839)	-3.675 (-2.972)	0.0203 (0.000)	I (1)
Gross Fixed Capital Formation	Levels	-2.788 (-5.016)	-2.969 (-2.972)	0.0600 (0.000)	I (1)
Foreign Exchange Rate	Levels	-0.536 (-5.607)	-2.969 (-2.972)	0.8848 (0.000)	I (1)
Trade Openness	Levels	-2.335 (-5.695)	-2.969 (-2.972)	0.1608 (0.000)	I (1)
Terms of Trade	Levels	-2.969 (-10.023)	-3.522 (-2.972)	0.0302 (0.000)	I (1)
Inflation Rate	Levels	-2.994 (-6.516)	-3.675 (-2.972)	0.0355 (0.000)	I (1)
**Values in parenthesis are after first differencing *These variables have a unit root. H_o: Variable is non-stationary[10]					

Source: Author's Computations

We applied time-series annual data spanning from 1980 to 2016. The first thing to note is that macroeconomic data series employed in this paper are likely to be I (1) processes. Accordingly, prior to empirical investigation was to analyse the properties of the time series annual data. In all

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[10] Condition: If the test statistic is more than critical value at 5% we reject the null.

cases, we reject the hypothesis of stationarity. The PP unit-root tests results established that the variables had an integration of order one implying that the series turns stationary after first difference.

The PP unit root tests (which yielded similar results); the study conducted further tests on stationarity in order to establish the presense or absence of structural shocks in the data as opined by Ndirangu and Gitau (2014). Ndirangu and Gitau (2014) conducted a study in Kenya and established that structural breaks of most macroeconomic variables in Kenya coincide with shocks in terms of trade, economic policy changes and political shocks in the economy. This study conducted structural breaks analysis based on Zivot and Andrews (1992) analysis. The findings are indicated in Table 3.4

Table 3.4: Zivot-Andrews Unit-Root Test Results

Variables	Year of structural break	Level		First difference (Second difference)		Order of integration
		t-statistics	5% critical value	t-statistics	5% critical value	
Growth of GDP Per Capita	1998	-4.078	-4.80	-5.914	-4.80	I (1)
Current Account Deficit	2000	-3.968	-4.80	-7.672	-4.80	I (1)
Gross Fixed Capital Formation	1999	-3.515	-4.42	-4.755	-4.42	I (1)
Foreign Exchange Rate	1993	-4.284	-4.80	-6.118	-4.80	I (1)
Trade Openness	1993	-3.299	-4.80	-5.959	-4.80	I (1)
Terms of Trade	1992	-3.214	-4.80	-7.806	-4.80	I (1)
Inflation	1995	-4.530	-4.80	-8.696	-4.80	I (1)

Source: Author's Computations

Results of Zivot-Andrews unit roots test show that all variables were non-stationary but transformed to stationary at first difference, further confirming the PP unit-root tests. After this confirmation, we ignored I (2) tests for these variables.

The next stage required that we subject the data further to Johansen test for cointegration in order to determine if the variables were cointegrated or not. The procedure was important in order to enhance the selection of the econometric technique of estimation.

3.4.4 Cointegration Test Results

Prior to performing Johansen test, it was necessary to determine the number of lags to be included in the model. The likelihood ratio (LR), final prediction error (FPE), Akaike's information criteria (AIC), Hannan and Quinn information criteria (HQIC) and Swartz Bayesian

information criteria (SBIC) were applied in the analysis (Nielsen, 2001; Lukkepohl, 2005; Abdulnasser and Scott, 2011). Table 3.5 results show both LR, FPE and AIC prefer two lags whereas HQIC and SBIC prefer only one lag. The results are highlighted in Table 3.5.

Table 3.5: Lag Selection Criteria

Lag selection-order criteria								
Sample: 1982-2016				Number of Observations = 35				
Lag	LL	LR	Df	P	FPE	AIC	HQIC	SBIC
0	-762.588				3.0e+10	43.9765	44.0838	44.2875
1	-614.62	295.94	49	0.000	1.1e+08	38.3211	39.1802*	40.8097*
2	-559.181	110.88*	49	0.000	1.1e+08*	37.9532*	39.5639	42.6193
	* Indicates lag order selected by the criterion							

Source: Author's Computations

The study confirmed that two lags were optimal because the model was stable and free from autocorrelation. Upon conducting Johansen (1995) test for cointegration, the trace and the maximum statistic established that the variables were indeed cointegrated. The trace statistic revealed three while the maximum statistic established two cointegrating equations corresponding to the row of the table as indicated in Table 3.6.

Table 3.6: Johansen Test for Cointegration Results

Johansen Tests for Cointegration					
Trend – constant, Sample: 1982-2016				Number of Observations = 35, Lags = 2	
Maximum Rank	Parms	LL	Eigenvalue	Trace Statistic	5% Critical Value
0	56	-649.4918		180.6212	124.24
1	69	-617.18742	0.84213	116.0125	94.15
2	80	-594.86858	0.72067	71.3748	68.52
3	89	-581.86715	0.52429	45.3719*	47.21
4	96	-571.60044	0.44382	24.8385	29.68
5	101	-564.97368	0.31523	11.5850	15.41
6	104	-559.19777	0.28111	0.0332	3.76
7	105	-559.18119	0.00095		
Maximum Rank	Parms	LL	Eigenvalue	Max Statistic	5% Critical Value
0	56	-649.4918		64.6088	45.28
1	69	-617.18742	0.84213	44.6377	39.37
2	80	-594.86858	0.72067	26.0029*	33.46
3	89	-581.86715	0.52429	20.5334	27.07
4	96	-571.60044	0.44382	13.2535	20.97
5	101	-564.97368	0.31523	11.5518	14.07
6	104	-559.19777	0.28111	0.0332	3.76
7	105	-649.4918	0.00095		

Source: Author's Computations

The VECM model was deemed fit to examine the effects of current account deficits on growth of GDP per capita in Kenya and determine the causal relationships both in short-run and long-run for the period 1980-2016 in consistent with the objectives of the study.

3.4.5 VECM Regression Results

The study estimated a vector error correction model at two lags and one cointegration equation. The results show that in the long-run, all the variables considered in the estimated growth model had significant effect (at 5% significant level) on growth of GDP per capita. The results for the long-run relationship are presented in Table 3.7.

Table 3.7: VECM Long-run Relationship

Dependent Variable – Growth of GDP per capita				
Variable	Coefficient	Std Error	t-statistic	p-value
Constant	-4.05667			
Current Account Deficit	-0.2023674**	0.0726912	-2.78	0.01
Gross Fixed Capital Formation	-0.2956186**	0.1500644	-1.97	0.05
Foreign Exchange Rate	-0.0526924**	0.0096977	-5.43	0.00
Trade Openess	0.291333**	0.0677921	4.30	0.00
Growth of Terms of Trade	-0.1093857	0.0853664	-1.28	0.20
Inflation Rate	-0.4137104**	0.0518985	-7.97	0.00
** Indicate significance at 5% significance level				

Source: Author's Computations

Table 3.7 presents the long-run model effects of current account deficit on economic growth in Kenya. After factoring the error correction term, all the variables applied in the estimated model except trade opnenness had positive long-run effects on growth of GDP per capita. However, the effect of terms of trade on growth of GDP per capita was not significant (at 5% significant level). The rest of the explanatory variables had statistically significant coefficients at 5% significant level.

The current account deficit and gross fixed capital formation variables had positive association with growth of GDP per capita in the end. This was revealed after factoring in the error correction parameter. Their coefficients were largely significant as shown in Table 3.7. This conforms to the a priori expectations of positive long-run effects on growth of GDP per capita in the estimated VECM model. In terms of empirical underpinnings of the estimates, the findings of positive impact of current account deficits on economic growth are in support of the findings of Calderon et al.,

(2017) for developing economies. Equally, Makoto and Nyoni (2017) also confirmed a positive impact of current account deficits on growth of the economy, among other authors. On the other hand, trade openness and inflation rate had asymmetric association with growth of GDP per capita, in the long-run, whereby trade openness had negative while inflation rate had positive effects. This was contrally to the a priori expectations of the study. This is noted when the error correction parameter is considered in accordance with the VEC model technique of estimation. Moreover, the foreign exchange rate variable was positively related to growth of GDP per capita, in the long-run. This was also against the a priori expectations. The coefficients of foreign exchange rate, trade openness and and inflation rate were largely significant at 1% significant level.

The findings suggest that a one percentage point rise in the current account deficit leads to about 0.058 percentage increase in the growth of GDP per capita in the long run, ceteris paribus. Moreover, results indicate that a one percentage point rise in the gross fixed capital formation variable leads to about 0.085 percentage rise in the growth of GDP per capita in the long-run. On the other hand, and based on the estimates, a one percent increase in trade openenness lead to 0.084 percent decline in growth of GDP per capita. The results also suggest that a depreciation of the Kenya shilling against the US dollar by one Kenya shilling has the potential to increase the long-run growth of GDP per capita by 0.015%, ceteris paribus. Lastly, long-run estimates suggest that a one percentage point rise in the rate of inflation in Kenya has the potential to lead to about 0.12 percentage increase in the growth of GDP per capita in the long-run. This was contrally to the a priori expectations. The coefficients for rest of explanatory variables is as indicated in Table 3.7. The result on the short-run relationship on the effects of the explanatory variables on the growth of GDP per capita is indicated in Table 3.8.

Table 3.8: VECM Short-run Relationship

Dependent Variable – GDP per capita growth rate				
Variable	**Coefficient**	**Std Error**	**t-statistic**	**p-value**
Constant	-0.0286708	0.5150763	-0.06	0.956
D.Current Account Deficit (-1)	-0.0287446	0.1024565	-0.28	0.779
D.Gross Fixed Capital Formation (-1)	-0.0071142	0.3834564	-0.02	0.985
D.Foreign Exchange Rate (-1)	-0.0837549	0.1301337	-0.64	0.520
D.Trade Openness (-1)	0.0520024	0.993376	0.52	0.601
D. Growth of Terms of Trade (-1)	-0.007752	0.0365253	-0.21	0.832
D.Inflation (-1)	-0.0344578	0.0739186	-0.47	0.641
Speed of Adjustment of the Error Correction Term [U (-1)]	-0.28898∗∗	0.1445208	-2.00	0.046
∗∗ Indicate significance at 5% significance level				

Source: Author's Computations

The estimates for the short-run relationship are in differenced variables, whereby D. represents the first difference. A lagged error correction term is fitted in the short-run model as one of the explanatory variables in order to establish the speed of adjustment towards the long-run equilibrium. The motivation of VEC model Short-run is to establish the speed of adjustment of the error correction term (the amount of disequilibrium transmitted each year). The negative coefficient of the error correction term confirms that growth of GDP per capita and the explanatory variables have a long-run relationship. The result shows that the coefficient of error correction term [U (-1)] is - 0.28898 which is less than one and significant at 5 %. The significance implies that whenever there are deviations in the growth of GDP per capita from an equilibrium path, the model corrects at the rate of 28.9% annually, ceteris paribus. In short-run, all the explanatory variables except trade openness had negative effects on economic growth albeit non-significant (at 5 % level of significance). Whereas, trade openness had positive effect on economic growth in the short-run, this effect was also insignificant.

3.4.6 Granger Causality Results

The study determined the nature and direction of causality between the variables of interest. The study applied the Toda and Yamamoto (1995) Granger - causality representation as indicated in Table 3.9.

Table 3.9: Toda and Yamamoto (1995) Granger Causality Tests Results

Equation	Excluded	Chi2	Df	Prob
Growth of GDP per capita	Current Account Deficit	30.323	3	0.000
Growth of GDP per capita	Gross Fixed Capital Formation	23.952	3	0.000
Growth of GDP per capita	Foreign Exchange Rate	26.628	3	0.000
Growth of GDP per capita	Trade Openness	16.633	3	0.001
Growth of GDP per capita	Terms of Trade	7.7886	3	0.051
Growth of GDP per capita	Inflation Rate	24.566	3	0.000
Growth of GDP per capita	ALL	71.256	18	0.000
Current Account Deficit	Growth of GDP per capita	17.136	3	0.001
Current Account Deficit	Gross Fixed Capital Formation	17.484	3	0.001
Current Account Deficit	Foreign Exchange Rate	12.758	3	0.005
Current Account Deficit	Trade Openness	6.5772	3	0.087
Current Account Deficit	Terms of Trade	1.6771	3	0.642
Current Account Deficit	Inflation Rate	1.538	3	0.674
Current Account Deficit	ALL	76.755	18	0.000
H₀: Implies Rejection of Granger non-causality				

Source: Author's Computations

The first row of Table 3.9 shows that lagged values of current account deficit cause growth of GDP per capita as p-value is equal to 0.0000 which is less than 5%, therefore rejecting the null hypothesis of Granger non-causality. Equally, since the p value is equal to 0.001 which is less than 5%, lagged values of growth of GDP per capita also cause current account deficit. Therefore, the null hypothesis is rejected. Results indicates that there is a bidirectional Granger-causality running from growth of GDP per capita jointly with all other moderating variables to current account deficit and the vice versa confirming existence of feedback linkage for Kenya, ceteris paribus.

3.4.7 Post Estimation Tests Results

Non-normality of residuals violates the assumptions of the classical linear regression model. Autocorrelation is a situation where disturbances in various periods are correlated. This leads to biased standard errors and t-statistics. The autocorrelation test was done using the multivariate LM test statistics for residual serial correlation up to 2 lags. Under the null assumption of no serial correlation of order "h", the LM statistic follows an asymptotic distribution x^2 with k^2 degrees of freedom, where k is the number of endogenous variables. The LM test results are as indicated in Table 3.10 confirming absence of autocorrelation at both lag one and two.

Table 3.10: LM Tests for Autocorrelation

Lag	LM Stat	Df	Prob
1	55.5017	49	0.24306
2	58.0159	49	0.17706
H_0: No autocorrelation at lag order			

Source: Author's Computations

The residual LM test for serial correlation indicated that there was no serial correlation in the residuals at both lags 1 and 2 since the p-value was greater than 5 % as shown in Table 3.10. Moreover, Figure 3.2 indicates the model stability test and satisfies the stability conditions since all the inverse roots of AR characteristic polynomial lie in the unit circle.
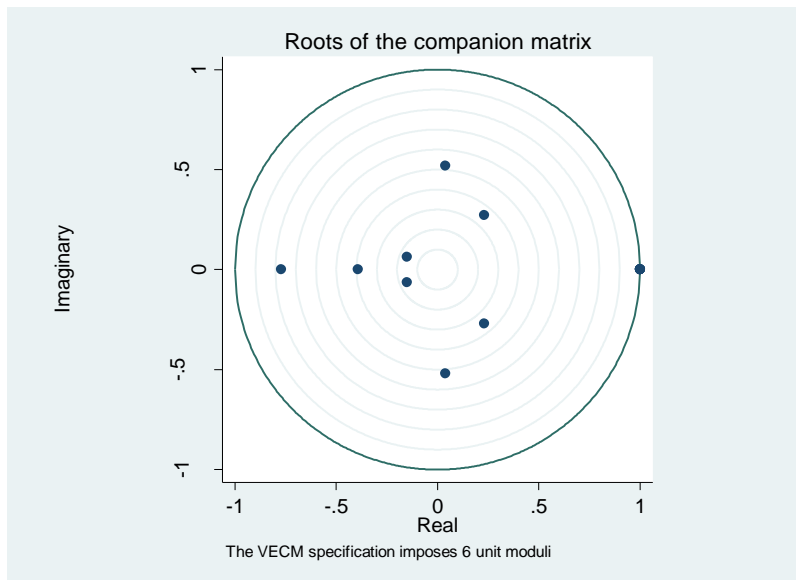
Figure 3.2: VECM Model Stability Test
Source: Author's Computations

3.5 Conclusion

The objective of the paper was to examine the effect of current account deficit on economic growth. The paper also examined the nexus between current account deficit and growth of GDP per capita using annual time series data from 1980 to 2016, for Kenya. The determination of the effect of current account deficit on economic growth was analysed using cointegration technique and a VECM representation. The long-run results indicate that current account deficit has a positive effect on growth of GDP per capita. The Toda and Yamamoto causality test revealed that there is a bidirectional causality, running from growth of GDP per capita to current account deficits or vice versa.

3.6 Policy Implications

The findings from this paper suggest that the authorities should up-scale on fiscal discipline and strictly apply the golden rule of public finances by utilizing external deficits in the current account only to finance public investment and not for consumption for sustained economic growth in Kenya. That the capital financing through this account should be prudently invested in viable and productive public investments in order not to hamper the growth of the economy. The government should also up-scale on strategies to address the structural competitiveness challenges to minimize the deficit in the current account and foster its sustainability. Equally, other strategies to minimize the adverse effects of perrenial deficits in the current account would be by promotion of policies that augument the shares of domestic savings to GDP and foreign direct investments to GDP, in Kenya. The findings also suggest the need to continuously purse strategies aimed at promotion of sustained economic growth since it will affect positively on long-run sustainability of the current account and general welfare of the populace. The findings also imply that the Central Bank of Kenya should continuously promote strategies that maintain price stability, exchange rate stability and augument the growth of the economy. These will include inflation tagerting, maintence of adequate foreign exchange reserve baffers, among others.

3.7 Contribution of the Study to Knowledge

First, this study contributes to the existing knowledge and research database on the effects of current account deficits on economic growth. Second, it also fills an important research gap on the effects of current account deficits on economic growth in Kenya that had not been addressed in Kenya. Importantly, the study takes into account the dynamism of Kenya's macro-economy and considers changes induced by the recent rebasing of GDP in Kenya in 2014. By employing a data series spanning from 1980 to 2016, the study provides new evidence that takes into consideration the lower middle-income status for Kenya in sub-Saharan Africa.

Moreover, this paper employed GDP per capita growth in the analysis, which from economic theory perspectives is preferred when making comparisons between economies. This is justified by the fact that it is able to reveal the relative performance of individual economies besides the growth accounting for the population variables. Growth of GDP per capita is justified by the fact that individual economies like Kenya do not have similar aggregate production functions.

Lastly, due to inadequacy of data in many developing countries, scholars have shied away from country specific studies on the subject. Consequently, this paper applies relatively novel estimation techniques that include cointegration with allowance for structural breaks, Zivot and Andrews (1992) structural break test, Toda & Yamamoto (1995) Granger causality representation (1995) in a deeper country specific time series analysis that establish stable and robust causal relationships that validate the parameter estimates. This study was important in filling the research gap for Kenya.

CHAPTER FOUR

EFFECTS OF FISCAL AND EXTERNAL DEFICITS ON ECONOMIC GROWTH IN KENYA

4.1 Introduction

Advancement of economies the world over, coupled with globalization of the financial systems has led to financial integration, mainly focused on meeting the financing gaps of different economies as well as facilitating trade, investment and development[11]. All countries, developed and developing alike, seek to achieve high levels of economic development to raise the welfare of their nationals. They allocate enormous resources and enact relevant economic policies to achieve this objective. According to the growth theory, besides labor and technological progress, the other key input is capital, which could be either internal or external. Governments normally generate internal capital through budget deficits while external capital is financed by foreign trade that yields external deficits either in balance of trade or current account or both (Algieri, 2012).

Africa's rising public debt continues to attract great attention both regionally and internationally. The narrative seems to have gradually shifted from "Africa rising" to "rising debt in Africa". At times, an expansionary fiscal policy respose aimed at inducing economic growth and employment creation is not successful always. The ineffectiveness may be demonstrated in a scenerio where fiscal deficits, financed by borrowings, increases public debt ratios, interest rates and crowd-out private investments and impact negatively on growth. The desirability of budget and external deficits on the basis if public borrowing is intended to finance public consumption, investments or if the deficits are sustainable and their mode of financing (Pelagidis and Desli, 2004).

Many policy makers in Africa and other economies have more reluctantly relied on fiscal policy strategies to rebalance their public finances because of persistence of low growth and higher deficit vicious cycle due to inadequate tax revenues and perennial trade deficits. The austerity programs

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[11] Financial sector globalisation started in different periods for both the developed and developing economies, starting much earlier for the developed economies, and the process of globalisation also varied among economies. In developing economies, globalisation of the financial sector began in late 1970s with the syndicated bank loans (Frankel, 2011).

implemented recently in some Euro-Zone countries appear to confirm the argument [12]. Understanding the nexus between fiscal and external deficits is therefore important in aiding appropriate policy evidence that is much-needed to comprehend if a reduction in budget deficit is sufficient to solve external imbalances in both the balance of trade and current accounts. For instance, if the twin deficit hypothesis holds, a government could improve the country's external balance through tightened fiscal manoeuvres (Algieri, 2012).

4.1.2 Fiscal Deficits, External Deficits and Real GDP Growth in Kenya

In 1980s and 1990s, Kenya's economic growth was not impressive. The economy witnessed multiple shocks arising from severe drought in 1983-1984, 1992-1993 and 2000, El Nino in 1997-1998, increase in international oil prices in 1991 due to Gulf crisis, and political instabilities following 1992 and 1997 elections. The world coffee prices fell in 1990 and the terms of trade worsened. Drought experienced during the end of the decade led to power rationing in 2000, which increased the costs of production. Uncertainties regarding general elections coupled with low domestic credit, poor infrastructure and low output and prices of major agricultural exports fueled the decline in real GDP to 0.6 per cent with a deficit of 2.2 and 5.4 in fiscal and trade balances respectively in 2002 (Mwega and Ndung'u, 2008).

The Economic Recovery Strategy for wealth and employment creation (ERS) which provided a framework for development plan that mainly focused on improvement in investment and savings, infrastructure development, judicial and regulatory reforms led to the rebound in growth between 2003 and 2007. The ERS also implemented reforms and enhancements in the financial sector, which ensured stability in exchange rates (Republic of Kenya, 2008). The implementation of ERS improved the investment climate and led to increased private sector investment. Hence, the achievement of the projected economic growth rate of 7 per cent in the fifth year of the plan (2003-2007). During the plan period, the Government implemented a fiscal consolidation strategy that saw the fiscal deficit narrow to 0.8 per cent while the trade deficit recorded 10.1 per cent of GDP. The high trade deficit was attributed to rise in imports (World Bank, 2014).

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[12] The recent experience of some countries of peripheral Euro-Zone falling into a public debt trap (Greece, Ireland, Portugal, Spain, Italy and Cyprus) confirms the hypothesis.

The economic growth could however not be sustained following the outcome of 2007 elections which disrupted food supply and increased political risk levels. This led to a dismal growth of 1.6 per cent in 2008 compared to 7 per cent recorded in 2007. In 2008, the global financial crisis that started in developed countries in 2007 affected the Kenyan economy, hence partly contributing to low levels of growth recorded in 2008. These factors may also have resulted in inflation rising to 26.2 per cent in 2008 from 9.8 per cent in 2007. The economic recovery experienced up to 2010 changed in 2011, with growth declining from 5.6 per cent to 4.5 per cent. Fiscal and trade balances worsened in 2008 recording a deficit of 3.4 and 12.2 respectively (International Monetary Fund, 2018).

The improvement in growth in real GDP witnessed in 2010 was not sustained in subsequent years and real GDP fell down to between 4 and 5 percent in 2012 and 2013 respectively (World Bank, 2017). In 2014, real GDP growth rate was 5.4 percent while 2015 and 2016 was 5.7 and 5.8 percent respectively. Figure 4.1 shows the trends in fiscal, external deficits and growth of real GDP in Kenya for the period 1980 to 2016.
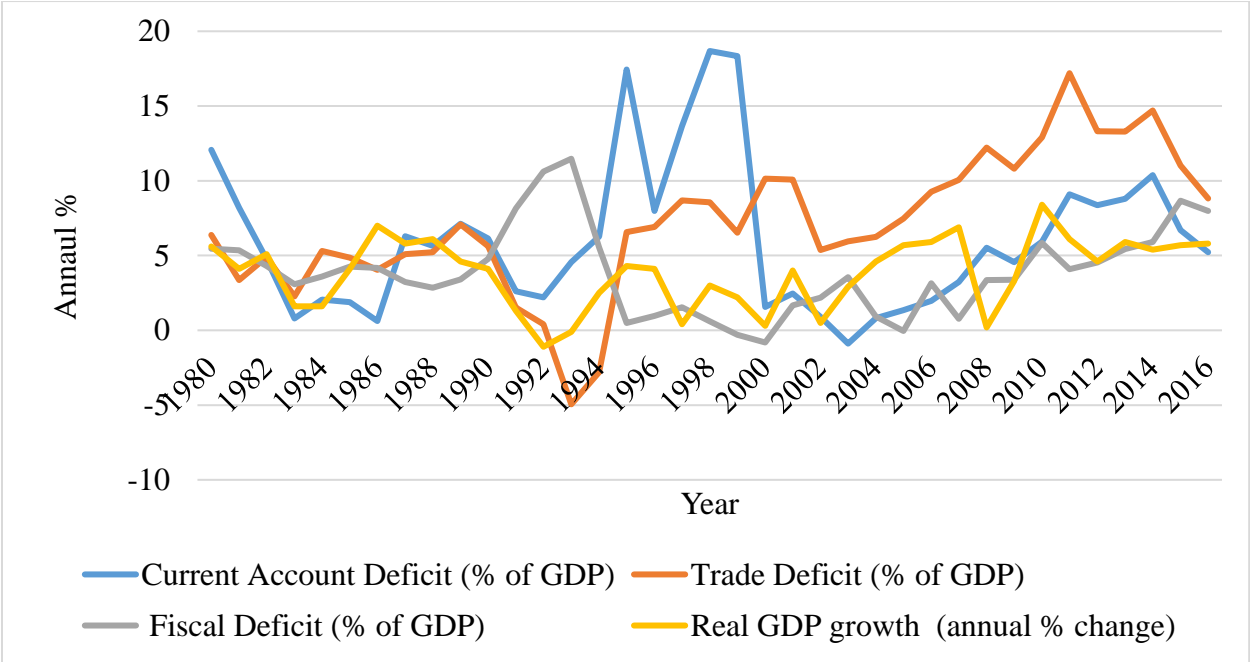
Figure 4.1: Kenya's Fiscal Deficit, Trade Deficit, Current Account Deficit and Real GDP Growth
Source: *Done by the Author*

In spite of the persistent public sector deficits, many economic challenges persist. Key among them include high poverty levels, high unemployment rates, persistent corruption, burgeoning

public debt, public expenditure pressures, infrastructural deficiencies, inequality and uneven service delivery. Equally, economic and fiscal risks associated with exposure of key macroeconomics variables like foreign exchange rate, inflation, interest rates and contigent liabilities exist (Republic of Kenya, 2019). For instance, the foreign exchange risk (exposure) to the Kenya widening public debt is high since 50.9 per cent of the total debt is denominated in foreign currency. Net Present Value (NPV)[13] of debt to GDP net of deposits was 48.2 per cent as at the end of financial year 2017/18 as indicated in Table 4.0.

Table 4.0: Kenya's Cost and Risk Indicators of Existing Public Debt (as at end FY 2017/18)

Risk Indicators		External Debt	Domestic Debt	Total Debt
Amount (in millions of KSH)		2,568,398.70	2,478,835	5,047,233.70
Amount (in millions of USD)		25,417	24,531	49,948
Nominal debt as % GDP		29.0	28.0	57.1
PV as % of GDP		24.3	28.0	52.3
Government Deposits			368,707	368,707
Government Deposits as % GDP			4.1	4.1
NPV of debt as a % of GDP net of Deposits				48.2
Cost of debt	Interest payment as % GDP	1.2	2.9	4.1
	Interest payment as % Total Revenue	4.1	17.1	23.9
	Weighted Av. IR (%)	4.5	11.5	7.9
Foreign exchange risk	Foreign exchange debt (% of total debt)			50.9

Source: IMF Country Report No. 18/295, October 2018

As at the end of financial year 2017/18, the Kenya's external debt stock comprised the United States Dollar (USD), Chinese Yuan, Euro, the Sterling Pounds (GBP) and the Japanese Yen in proportins shown in Figure 4.2, whereby the currency mix reflects the source of funding. The diversification of the currency mix aimed at hedging against exchange rate risks on external debt is illustrated in Figure 4.2.

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[13] NPV of debt is the nominal amount outstanding minus the sum of all future debt-service obligations (interest and principal) on existing debt discounted at an interest rate different from a contracted rate.
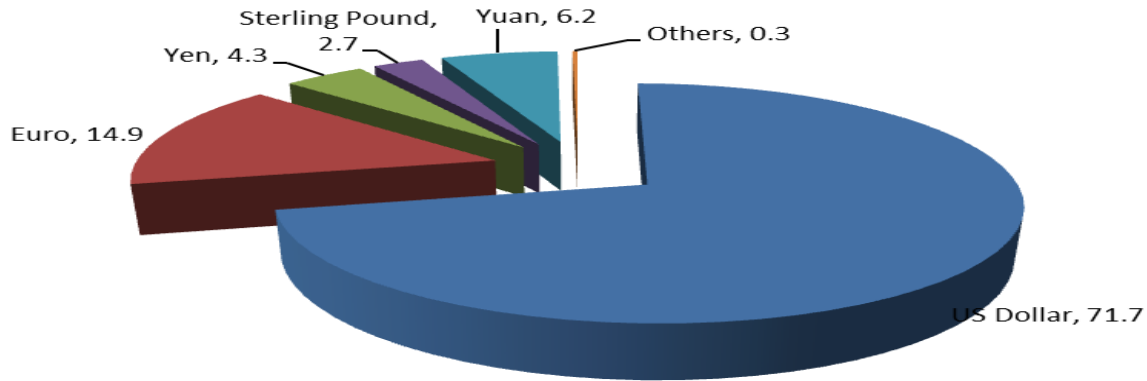
Figure 4.2: Currency Composition of External Debt
Source: Republic of Kenya, 2019

Kenya's lenders including China, World Bank (IDA) and Commercial Banks were the main sources of debt at 22, 20 and 33 per cent respectively. Japan is a major bilateral creditor to Kenya. The USA, Denmark, Saudi Arabia, Spain, Kuwait, France, Belgium, Switzerland, Germany, Poland, Austria, Finland, UK, Sweden, Netherlands, Italy, Korea, India, Canada, and Supplier's Credit are also bitateral creditors to Kenya as in Figure 4.3.
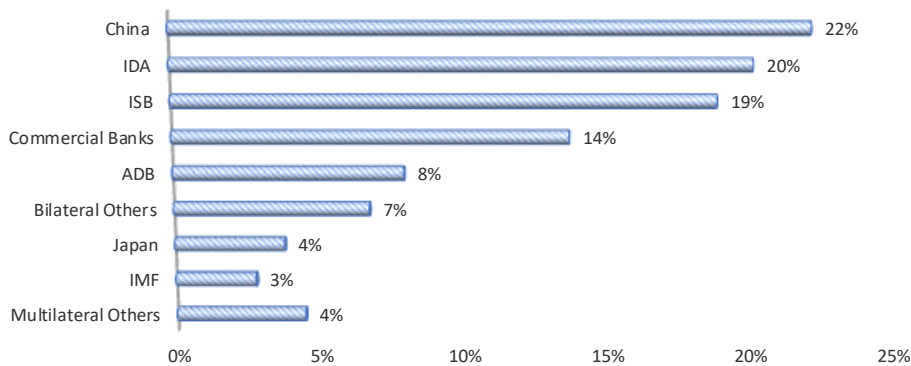
Figure 4.3: Major Creditors to Kenya
Source: Republic of Kenya, 2019

The analysis of sustainability of external debt in the context of medium term scenarios takes into account the expectations of the reaction of economic variables and other key factors in the determination of the conditions under which debt and other measures would stabilize at reasonable levels. It also considers major economic risks, the need and scope for policy

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adjustment. In the analysis, macroeconomic uncertanities that include the outlook for the current account and policy uncertanities (like fiscal policy) tend to dominate the medium outlook. Indicators of debt sustainability reveal that Kenya is currently facing a moderate risk of external debt distress due to the recent breach of at least one of the three external debt indicators as shown in Table 4.1.

Table 4.1: Kenya's External Debt Sustainability

Indicators	Thresholds	2017	2018	2019
Present Value of Debt–to-GDP Ratio	**55**	25.9	31.4	32.3
Present Value of Debt-to-Exports Ratio	**240**	165.4	191.1	191.4
Public and Puplicly Guaranteed Debt Service-to-Exports Ratio	**21**	16.5	19.9	26.2*
Public and Puplicly Guaranteed Debt Service-to-Revenue Ratio	**23**	13.3	16.2	21.6
* Indicates breach of external debt indicator				

Source: Republic of Kenya, 2019

Despite the breach of one of the key indicators of external debt sustainability, the total existing public debt in Kenya remains below the public debt benchmark of 70 per cent in present value (PV) terms as set out in the World Bank's Country Policy and Institutional Assessment report (Republic of Kenya, 2019). In general, inspite of the induced internal and external financing over the years, Kenya has recorded uneven real GDP growth as highlighted in chapter one of this study.

4.1.3 Statement of the Problem

The role of fiscal discipline and external balances close to equilibrium for macroeconomic stability and sustained economic growth of countries cannot be overemphasized (Lau et al., 2010; Fatima et al., 2011; Udoh, 2011). Statistics reveal that since 1980s, Kenya's fiscal position has persistently been in deficits recording only two surpluses (0.29 percent of GDP in the 1999 and 0.81 percent of GDP in 2000).

Despite the continued internal and external financing, economic growth has had a low fluctuating growth and poverty and unemployment rates have remained rampantly high (World Bank, 2017). In 1980, the growth rate of real GDP in Kenya was 5.6 percent reducing to negative 0.1 percent in 1993 and positive 0.3 percent in 2000. Economic growth recorded an impressive positive 7 percent in 2007 but after the 2007 post-election violence, it declined to 0.2 percent in 2008. In 2010, real GDP growth was at 8.4 percent narrowing to 5.8 percent in 2016 (IMF, 2018). Considering the good performance of the financial sector and the internal and externally financed capital as

reflected by the deficits in the fiscal, trade and current accounts, the issue that remains unresolved is why this financing has not culminated into higher economic growth?

There exists very scanty evidence on the subject particularly in Sub-Saharan Africa. Further, the available scanty evidence is more conflicting and therefore appear to be inconclusive as to whether budget deficits lead to current account deficits or otherwise. It is also not clear whether trade deficits lead to budget deficits or budget deficits lead to trade deficits or they spur each other. For instance, Egwaikhide et al., (2002) established that current account deficits led to budget deficits in Kenya. Further, Osoro et al., (2014) on Kenyan case study found that budget deficits led to current account deficits. Kosimbei (2002) found no causality between budget and current account deficits. It is evident that both theoretical and empirical literature yields inconclusive evidence for Kenya.

Moreover, none of the studies identified in Kenya considered the three (trade, current account and fiscal) deficits in the analysis. The distinction of trade and current account deficits can signal if the presence of direct transfers of capital and investment incomes influence the relationship between budget and external balances, and therefore enhances the decision to fine-tune key policy interventions. As highlighted by Soni (2014), alternative measures of deficits are important for macroeconomic policy analysis. Consequently, this study notes that in order to arrive at appropriate policy responses, the correct measurement of the deficit is a vital prerequisite. The available evidence is scanty, where there is need to address the identified gads for Kenya.

4.1.4 Research Questions

(i)   What are the effects of fiscal and trade deficits on economic growth in Kenya?
(ii)   What is the impact of fiscal and current account deficits on economic growth in Kenya?
(iii)   What is the nexus between the fiscal and trade deficits in Kenya?
(iv)   What is the nexus between fiscal and current account deficits in Kenya?

4.1.5 Objectives of the Study

The general objective of this paper was to determine the effects of fiscal and external (trade and current account) deficits on economic growth in Kenya.

Specifically, the study aimed at determining;

a) The effects of fiscal and trade deficits on economic growth in Kenya.
b) The impact of fiscal and current account deficits on economic growth in Kenya.
c) The nexus between fiscal and trade deficits in Kenya.
d) The nexus between the fiscal and current account deficits in Kenya.

4.1.6 Significance of the Study

Firstly, it is clear that there exists both theoretical and methodological gaps from the existing body of literature. Most of the studies identified on the subject matter apply cross country (panel) analysis that do not exhaust country specific analysis. By the fact that individual economies like Kenya are heterogeneous in nature, overtime, this paper appreciates that different models, methodologies, data, approaches and sample periods may yield different and fresh insights particularly for country specific studies. In Kenya, the available evidence is not only sparse but also mixed and inconclusive. Evidence points out that by employing novel estimation techniques, different data, approach and period, the study may yield not only new but also robust analysis validating the parameter estimates and yielding key policy insights for Kenya.

Secondly, this paper aims to provide new evidence on the economic effects of fiscal and external deficits and establish the causal linkages of the examined variables. It contributes to the already scarce literature by offering a case study of Kenya. Understanding these linkages is important for formulation of appropriate economic policy responses for Kenya. The study also offers an important comparison between the two relations on trade deficits and fiscal deficits on one side, and current account deficits and fiscal deficits on the other. The distinction is of value and is very instrumental in highlighting whether the presence of direct transfers of capital and investment incomes influence the relationship. This enhances the decision to fine-tune any policy interventions based on empirical evidence. This paper deepens the originality of research and contributes to the research database and public policy debates for the current and future researchers in Kenya and Sub-Saharan Africa.

4.2 Literature Review

4.2.1 Theoretical Literature

The effect of budget and external deficits on economic growth has drawn controversy in economic theory, empirical research and general economic policy making. There has been varied viewpoints on the desirability of government deficits among economists both in theoretical and empirical dimensions. An attempt is made to review the literature in this paper based on the following broad theories:

a)   Theories on effects of budget deficits on economic growth

b)   Main approaches to Balance of Payments (BOP)

c)   Models of small, open economy

d)   Theories on causal links between budget deficits and external deficits

a) Theories on Effects of Budget Deficits on Economic Growth

Three main theories in the literature include:

i)   Neoclassical Theory

ii)   Keynesian Theory

iii)   Ricardian Equivalence Hypothesis

In the literature, the differences between alternative theories are due to factors like time dimensions, nature of economy, technique of analysis and the assumptions drawn on specific behavioral responses in the identified cases as highlighted in chapter two of this thesis including various channels through which budget deficits impact growth of the economy. Equally, chapter two has also analyzed the literature and the major econometric models employed by different researchers and therefore this paper details a brief summary of the analysis. This sub-section adopts the Rangarajan and Srivastava, (2005) summary of the main differences in the identified alternative theories as follows:

	Neoclassical	Keynesian	Ricardian
Consumers	Finite, Life-time horizon	Myopic, Liquidity constrained	Infinite time, Perspective via altruistic transfer
Effect of a deficit based tax cut on private saving	Private saving would fall	Aggregate demand increases	Private saving remains unaffected
Employment Of resources	Full employment	Resources not fully employed	Full employment
Effect on interest rate	Interest Rate increases	Interest rate increases	No effect
Contention	Budget deficits detrimental	Budget Deficits beneficial	Budget deficits irrelevant

Source: Rangarajan and Srivastava, (2005)

b) Main Approaches to BOP

Three theories to BOP (and the associated effects of external deficts on growth) in the literature include:

i)   Elasticity Theory

ii)   Absorption Theory

iii)   Monetary Theory

From the literature, Robinson (1937) is associated with the formulation of the three theories. These three theories can further be classified into two-based on if BOP is a real or a monetary phenomenon. In chapter three, we show a detailed literature review on the idiosyncrasies of the three approaches and major econometric models applied by researchers, their merits and demerits of each of the alternative approach. In this section therefore, the paper details a brief summary of the identified three theories to BOP:

i)   The Elasticity Theory

Firstly, Robinson (1937) formulated this theory. This was as a response to the need for a theory of BOP adjustment under the flexible exchange rate that made an attempt to view BOP as a real phenomenon. The theory focuses on the following main questions: First, what are the conditions for currency devaluation to improve a country's BOP on the current account. Second, what will be the effect of currency devaluation on the level of domestic activity and how will this affect the BOP. Third, what are the conditions for devaluation to be successful? Lastly, is what will be the effect of devaluation on terms of trade of the devaluing country?

The theory finds solutions to the four questions on the basis of Marshall-Lerner condition that is derived in a two-country two-commodity context premised on the assumption that there is under-employment in each country and domestic price of each country's export goods is given (Robinson (1937).

ii)   Absorption Theory

This theory is considered as the first stride in the development of a BOP macroeconomic model. It treats a country's deficit in foreign trade as an excess of absorption over income (investment over saving). Devaluation can therefore be a remedy over absorption. Upon devaluation, domestic prices of imports would rise, in order to restore real cash balances to the desired level; it becomes necessary to hoard money, thereby reducing absorption (Alexander, 1952).

The theory suggests that in order to eliminate the BOP deficits, one would require a simultaneous adoption of expenditure switching and expenditure reducing policies. An expenditure-switching policy implies that devaluation will reduce imports and encourage exports in a deficit country and therefore switches demand for imports in surplus countries. If Marshall-Lerner condition is met, the effects improve the deficit country's trade balance, but simultaneously increase the level of aggregate demand in the deficit country (through increases in net exports). If resources in the country are near full employment capacity, then a domestic expenditure reducing policy, (like an increase in tax) would be required to arrest inflation. The theory is popular in economic policy due to its close links with monetary sector of the economy.

iii)   Monetary Theory of Balance of Payments (BOP)

The theory advocates that reserve flows are essentially a monetary phenomenon. Thus, this theory can be analysed in line with a small country's money market. It details that any disequilibrium in BOP is a reflection of disequilibrium in money markets. The approach focuses on the monetary aspects of BOP adjustments under fixed exchange rates rather than relative price and income effects. This is unlike elasticities and absorption approaches. It recognizes that real variables affect BOP and exchange rates but operate only through monetary channels.

Additionally, although celebrated as a model of BOP in international monetary theory, it is argued that the model suffers from some contradictions. Many economists have also doubted the validity of fundamental assumption of the theory that a surplus or deficit in BOP is a stock disequilibrium between demand for and supply of money. Rabin (1979) demonstrated that a surplus in the BOP may be accompanied by an excess supply of money and a deficit in the BOP may be accompanied by an excess demand for money by considering equilibrium in market for non-traded goods.

Lastly, it is important to point out that monetary theory is critiqued for ignoring fiscal aspects of creating domestic credit. Importantly, Kreinin and Officer (1978) support the need to handle government budget constraint as one of the sources of domestic credit. They argued that government deficit may be financed by sales of government securities to private sector, contrally to the premise of monetary theory.

c) Models of Small Open Economy

The study identifies three models of small, open economy that are instrumental for macroeconomic policy analysis. They include:

(i)   Keynesian model
(ii)   Australian model
(iii)   Inter-temporal approach to current account

(i)   Keynesian Model for an Open Economy

The model is associated with Keynes (1936). The fixed-price, Keynesian model begins with the identity (highlighted in 4.1) and adds behavioral equations that link consumption demand, and import demand to income, Y. In the Keynesian tradition, consumption demand is a linear function of income:

$$Y = A + CA \qquad\qquad 4.1$$

Where Y is the total production or income, A is absorption, and CA is is the current account balance. By ignoring the net factor payment and transfers, the current account balance is the same as trade balance. CA is positive when there is a surplus and negative when there is a deficit. A current account deficit can then be interpreted as an excess of absorption over income (the

amount an economy earns from its production exceeds the amount it wishes to demand or "absorb"). In this case, reducing a current account deficit can be achieved either by increasing income (Y), or reducing absorption, (A). In order to determine how to do this, it is necessary to specify a model that links Y and A to various policy instruments (Keynes, 1936).

The model adds behavioural equations that links consumption demand (C^P) and import demand (IM) to income (Y). In the Keynesian tradition, consumption demand is a linear function of income. Equally, imports are a linear function of income. In a realistic manner, when imports are taken to be intermediate goods, they depend on the scale of production, rather than consumer goods, in which case they may be better modelled as a function of A. the model takes investment (I), government expenditure (C^g), and exports(X), to be predetermined, or exogenous.

Lastly, the model assumes that production (Y) expands at constant marginal costs (the fixed-price assumption). However, we note that most production systems are subject to increasing marginal cost. Thus, there are no capacity constraints in the short-run. If the cost of producing an additional unit of output is fixed, then the price of the final product is fixed. In order for this to be true, the cost of hiring additional labor (wages) must be constant. This is generally true in conditions of unemployment. Assuming that the assumptions hold, it implies that equation 4.2 is a fully specified model of the macroeconomy.

$$Y = \{A + CA\} - \quad IM \qquad \qquad 4.2$$

By solving equation 4.2, we can derive the multipliers of the response of income and the external balance to changes in the exogenous variables. The solutions for Y and CA are:

$$Y = \left\{\frac{1}{1 - c + z}\right\}(C_0 + I + C^g + X - IM_0) \qquad \qquad 4.3$$

$$\text{And,} \quad CA = X - IM_0 - \left\{\frac{z}{1-c+z}\right\}(C_0 + I + C^g + X - IM_0) \qquad \qquad 4.4$$

This implies that, a one unit increase in government consumption (C^g), will increase income by $\left\{\frac{1}{1-c+z}\right\}$, and will reduce the current account balance by $\left\{\frac{z}{1-c+z}\right\}$. From the model, by introducing the foreign trade sector, the traditional Keynesian multiplier, which is equal to, $\left\{\frac{1}{1-c}\right\}$

is reduced. This is because imports represent an additional "leakage" from the system, which does not exist in the closed economy.

The impact on the current account balance of an increase in government spending is unambiguously negative. The multiplier is $\left\{\frac{-z}{1-c+z}\right\}$. This is presumably part of the rationale behind the almost universal call to cut government spending in countries with large current account deficits. Further, by attempting to address the question "what will be the effect on the current account balance of an increase in exports?" On the one hand, it should improve the balance, since exports are a source of foreign exchange. On the other hand, through the multiplier effects, they increase incomes which in turn implies an increase in imports. The total effect is equal to:

$$1 - \left\{\frac{z}{1-c+z}\right\} > 0 \quad\quad 4.5$$

From this model, although the increased imports dampen the effect of export expansion, it is clear that the net effect is unambiqously positive.

(ii)   Australian Model.

To begin with, the model is credited to Salter (1959) and Swan (1960, 1963a). As cited by Metaxas and Weber (2013), the model is also referred to as the depedent economy model. It integrates income effects and price effects, which are the main determinants of the level and composition of production and consumption. As compared to the Keynesian model for an open economy, this model provides a more complete understanding of macroeconomic relationships and thus it is commonly used for economic policy analysis and the analysis of external shocks to the economy.

Secondly, the main feature of this model is the division of the economy's output and consumption into two broad categories of goods and services (tradables that are outputs that either earn or cost foreign exchange and non-tradables that are domestically produced and consumed but do not directly earn or cost foreign exchange). Dividing all economic activity into these two categories suggests that the two types of outputs compete with each other for the economy's scarce resources. If the economy is fully employing its resources (labor and capital), then a net increase in the production of tradable outputs must divert resources away from the production of non-tradables.

Thirdly, the issue of economic efficiency for an economy is how to allocate domestic resources. Either one indication that the economy may be under or over-producing tradables, is the existence of a BOP deficit or surplus. Correction of this imbalance in the tradable sector will necessarily require adjustment in the non-tradable sector. This is a key idea in structural adjustment (a BOP deficit is the reflection of a low output of tradable relative to the output of non-tradables). The difference between the mechanisms of price formation for tradable compared with non-tradables is critical to the understanding of the role of the real exchange rate and the workings of macroeconomic adjustment in developing economies.

Moreover, this model highlights the major insight of Alexander's absorption approach in the Swan diagram. That is any point on the internal balance line to the right of the external balance line is a situation of full employment and BOP deficit. A depreciation, which increases the external price level, is a vertical movement away from the internal balance line. If, the full employment level of output cannot be surpassed, then the increase the cost ratio must be accompanied by a reduction in real expenditure that takes the position of the economy back onto the internal balance line. As such, real expenditure must fall if a depreciation is to restore external balance at full employment.

Lastly, the correction of any disequilibrium situation needs a combination of financial policy and price adjustments. In Salter's (1959) model, the effect of a change in financial policy (e.g., change in government spending) is a parallel shift of expenditure. Higher public spending increases domestic expenditure and shifts the spending line outward while lower government spending shifts it inward. Adjustments of prices impact on the price of traded goods relative to non-traded goods and are reflected by a change in the slope of the income and expenditure lines.

(iii) Inter-temporal Approach to Current Account

This paper notes that analysises of the current account follows two paradigms. Firstly, the intertemporal solvency approach, which seeks to address whether all the debts incurred will ultimately be repaid. This implys that large trade deficits today will be offset by equally large trade surpluses in future. That a country can remain technically solvent so long as it makes the necessary policy adjustments needed in future to bring the requisite, surpluses that facilitates repayments of debts. However, it is a weak approach, which has been, analyzed for imposing too

few restrictions on the current account based on only solvency. On the other hand, is a sustainability criterion which adds over and above solvency, the requirement that policies remain constant in future? This would imply that under the assumption that policies do not change, a country does not violate its intertemporal budget constraint (Camarero et al. 2009).

Importantly, current account deficit resulting from the trade deficit often signals challenges on structural competitiveness while low domestic savings to GDP ratios imply that the deficit is not financing future economic growth. Foreign domestic investment is a more sustainable way of financing current account deficit than other forms of capital flows such as portfolio investment so that low foreign direct investment denotes unsustainable repayments. Low economic growth rates imply that future prospects for paying off debt are not strong. If debt levels are high and unsustainable, it is difficult for an economy to continue to maintain a current account deficit. Moreover, poor governance leads countries to implement poor macroeconomic policies, which are crucial to correct imbalances (Gichuki, 2013).

From an economic theory perspective, the intertemporal approach views the current account as a change in the net foreign asset position of a country. It is grounded on utility maximizing decisions by economic agents. It asserts that large deficits can be optimal and sustainable and, therefore, not a cause of concern for policy makers. It also proposes that saving and investment decisions result from forward looking behaviour based on the expected values of various macroeconomic factors. It achieves a synthesis between the trade and financial flow perspectives by recognizing how macroeconomic factors influence future relative prices and how relative prices affect saving and investment decisions (Obstfeld and Rogoff, 1995b)**.**

d) Theories on Budget Deficits and External Deficits Causal Links

According to Kim and Kim (2006), there are four streams of literature that explain the nexus between budget deficits and current account deficits (Algieri (2013). They include:

i)   Twin deficit hypothesis
ii) Current account targeting hypothesis
iii) The feedback linkage (Bidirectional causality)
iv) The Ricardian equivalence.

i) Twin Deficits Hypothesis

Firstly, the Feldstein chain's argument, that an increase in the government deficit pushes the interest rates up, which in turn attracts foreign capital and strengthens the domestic currency driving the current account balance into deficits, appears to have been the most important demonstration of the twin-deficits phenomenon (Feldstein, 1986). This paper identifies two approaches to the transmission mechanism behind the twin-deficits hypothesis. These approaches are explained through the Keynesian income-expenditure approach and the Mundell-Fleming (FM) model that is founded on open-economy and high capital mobility (Mundell, 1963). Focusing on the perspective of the income-expenditure approach, an increase in budget deficits will increase domestic absorption $(C + I + G)$ and, in turn the domestic income. Additionally, this approach posits that the increase in income will induce imports and eventually will reduce the surplus or increase the deficit in the trade balance which is a component of current account and thus makes the public sector and external sector deficits act as twins. As highlighted by the Keynesian open economy models with high capital mobility, an additional linkage can explain the deterioration in the trade balance due to a higher budget deficit.

Secondly, a rise in the budget deficit will result in an increase in the aggregate demand and domestic real interest rates. The high interest rates lead to net capital inflow from abroad and cause appreciation of the domestic currency. The strong currency will make imports cheap and domestic exportable less competitive in the global market and adversely affect net exports deteriorating the current account. Although these channels may differ slightly, the conclusion is valid both under fixed and flexible exchange rate regimes (Elif and Gul, 2002). However, while acknowledging the adverse economic and social effects of large budget deficits, critics of F-M approach are doubtful of the causal sequence.

Thus, some researchers have cited the Ricardian equivalence hypothesis (REH) to argue that whether budget deficit is financed through public debt or with increases in tax rates, the effect on real interest rates, aggregate demand, private spending, the exchange rate or the external accounts is unaltered. The proponents of the REH posit that while tax cuts reduce public saving and enlarges the budget deficit, private saving rises by an amount equal to the expected increase in the burden of tax in the future years (Nozar and Loretta, 2006).

On the other hand, Giancarlo and Muller (2006) emphasize on two different fiscal transmission mechanisms of the twin-deficits. The first mechanism underline relative price movements, while the other is on the intertemporal decisions. This paper notes that the first transmission mechanism centres on the Mundell-Fleming model. To highlight, an expansionary fiscal shock augments disposable income and internal demand whereby a proportion of the higher consumption demand 'leaks abroad' in form of higher import demand, worsening the trade balance.

In addition, with flexible exchange rates, a stronger domestic demand appreciates the exchange rate and crowds-out the foreign demand. Due to the differences in the multiplier, the effect is stronger for spending hikes than for tax cuts. The rise in the external deficit is mitigated to the extent that the rise in domestic demand increases the domestic interest rate, thereby crowding-out domestic investment.

Generally, the prominence is on the static transmission mechanism that links fiscal deficits to excess demand and relative price movements. Other scholars are in support of the twin-deficit hypothesis, that higher budget deficit lead to higher current account deficits. For instance, based on the analysis of the data from the United States, Normadin (1994) established that a tax increase decreases the fiscal deficit directly and inturn decreases the external deficit. This is because of the reduced imports resulting from the decline of private incomes (after-tax).

Similarly, Kasa (1994) presents a significant connection between trade and budget deficits for the post war era for the United States, Japan and Germany after controlling for the effects of fiscal spending on Gross National Product. Last but not the least; Keynesian economic models assume that a shift from tax to debt financing, increases private consumption as private consumption depends on disposable income. Thus, budget deficits aggravates private consumption and the deficit in the current account. Researchers including Zietiz and Pemberton (1990), Vamvoukas (1999), Miller and Russek (1989) and Islam (1990), among others are in support of the twin-deficit hypothesis.

ii)   Current Account Targeting Hypothesis

To begin with, despite the plethora of studies in favour of the twin deficits hypothesis, there is evidence of reversed causation. The causality runs from current account deficit tobudget deficit. According to Poterba & Summers (1986), this causality is the current account targeting hypothesis. Examples of the studies in support of this hypothesis include Anorua and Ramchander (1998), Ahmed & Teo (1999) and Alkswani (2000), among others.

According to Summers (1988), the worsening of the external balances potentially leads to a slower pattern of growth resulting to increases in the fiscal deficits. Government mainly sets a fiscal stimulus policy that is aimed at minimizing the negative financial and economic effects of large external imbalances but contrally, economic slowdowns resulting from large external deficits not only enlarge government spending, but also shrink tax revenues, leading to fiscal deficits.

This reversal relationship is termed ''current account targeting'' as described by Summers (1988). Many economists and analysts including Anoruo and Ramchander (1998), Khalid and Guan (1999), Egwaikhide (2002), Kim and Kim (2006), Marinheiro (2008) and Stiglitz (2010) affirmed the reverse relationship in their papers implying that external deficits in either trade account, current account (or both) tend to cause fiscal deficits. Lastly, policy implications of drawn from this mode of causation is ambiguous and impracticable (Ogbonna, 2014).

iii)   The Feedback Linkage (Bidirectional Causality)

Another causality between the budget and external deficits is by Kim and Kim (2006). According to Prasad (2013), the bidirectional causality, reveal some key evidence from Latin American countries that was conducted during the financial crisis. The view contends that in as much as budget deficits cause external deficits, equally external deficits can cause budget deficits. Moreover, Feldstein and Horioka (1980) also established that savings and investments are highly correlated, and the linkage causes bidirectional causality between budget and external deficits amlplifying the need to consider the channel in this paper.

iv)   The Ricardian Equivalence (Neutrality View)

To start with, the proponents of this hypothesis deny any connection between the budget deficit and the current account deficit. Thus, the concept is of the view that since people are rational, they know that the reduction in taxes, because of the government expansionary fiscal policy of tax cut, is temporaly and so they will therefore save the extra disposable income to pay for the future higher taxes. It posits that the national savings will not be affected because the decrease in government savings represented by increased fiscal deepening will be compensated by the additional precautionary private savings for expected future increase in taxes.

According to Elif and Gul (2001), this hypothesis opines that the equilibrium levels of interest rates, investment, current account and consumption will not be affected by the changes in the level of budget deficit. This assertion can be termed as an extension of the Permanent Income Life-Cycle Hypothesis including government expenditure, taxes and debt, which reveals that a change in the level of budget deficit will not change the lifetime budget constraint and real wealth of the consumer.

This theory therefore, shows that as a consequence of intertemporal consumption behavior, according to the REH, temporary changes in the level of government expenditures and marginal tax rates are much more important than the means of financing it. The theory posits that in order to explain the BOP deficit, productivity differentials, interest rate and temporary increases in the public sector spending as alternative explanatory variables besides budget deficits.

 Similarly, the "equivalence theory" as illustrated by the classical economist, David Ricardo in 1817, suggests that government budget deficits should not alter capital formation and economic growth or the level of aggregate demand including demand for imports due to the fact that far-sighted individuals fully capitalize the implied future taxes associated with budget deficits. As stated, the theory implies that there is no apparent correlation between the two deficits. Ricardo's neutrality hypothesis posits that the private sector views budget deficits as public investment and treats public and private investment as perfect substitutes. Thus, fiscal measures designed to influence aggregate demand will have no effect as individual's reduce consumption in anticipation of future tax liabilities.

Moreover, the REH suggests that a tax-cut has no effect on consumption since rational individual, aware of the intertemporal government budget constraint, base their consumption decision on permanent income and therefore anticipates an increase in future tax-liability by saving amount equal to the tax-cut. Thus, the hypothesis is premised on relatively strong assumptions such as rational and forward-looking individuals, lump-sum taxes, perfect capital market and infinite lives of consumers. This renders the REH's practical relevance questionable (Gerhard and Jesus, 2004).

These discussions generally suggest that the link between budget and external (current account and trade) deficits is indeed an empirical issue.

4.2.2 Empirical Literature

Empirical studies that deal with the effects of budget and external deficits on economic growth are scanty and inconclusive. This is precisely the case in developing countries, like Kenya. In the industrialised economies, Bahmani-Oskooee (2004) examined the three alternative approaches to a country's BOP. The study employed two measures of external balances, the trade balance and the current account, both in real terms for the USA. The study applied real full employment budget as a measure of fiscal tool, while as a measure of monetary policy, the study used real M1 and real M2 aggregates. To determine if elasticity approach receives any long-term support, the author utilized three different measures of exchange rate. Quarterly data over the 1971: Q1-1989: Q2 period was applied in the analysis. A cointegration technique was used and the findings reveal that while full-employment budget was cointegrated with the current account and the trade balance, the M2 monetary aggregate was marginally cointegrated only with the trade balance.

In the literature, Bahmani-Oskooee (1992) and Ki-Ho Kim (1995) applied the same data as Mohsen Bahmani-Oskooee (1992) and established that the results of Mohsen Bahmani-Oskooee (1992) were not valid. They attributed the invalidity of the results to the methodology employed. Precisely, Bahmani-Oskooee (1992) and Ki-Ho Kim (1995) argued that out of twelve time series that Bahmani-Oskooee concluded to be unit roots using Augmented Dickey-Fuller (ADF) technique, three of them had no unit root when Kwiatkowski-Phillips-Schmidt-Shin (KPSS) procedure was employed. Kim (1995) however, employed Johansen's approach

in estimating the cointegration relationship, in contrast to Engle-Granger tests employed in Bahmani-Oskooee (1992). The author verifies that the trade balance is not cointegrated with the full employment budget and that both the current account and trade balances have a long-run relationship with the M2 aggregate and the terms of trade, respectively.

Further, Bahmani-Oskooee (1995) extended his previous work and Kim's multivariate models using Johansen-Juselius cointegration technique. By applying the Perron's test, he examined the stationarity of time series variables and emphasized that cointegration results obtained by the Johansen-Juselius technique were sensitive to the number of lags and stated that Kim (1995) had arbitrarily included only four lags without testing. The analysis revealed that although all three-policy variables belong to the cointegrating vector, fiscal policy variable was relatively more important as a long-run determinant of the U.S. current account.

Additionally, Bachman (1992) considered four variables (Federal government surplus, gross domestic investment, U.S. relative to foreign productivity, and the estimated risk premium) to represent the causal agent for each of the four hypotheses introduced by Darrat (1998). The findings revealed that only the fiscal deficit explained the evolution of the current account. Feldstein's twin deficit hypothesis proved to be superior in the VAR analysis (Bachman, 1992).

Estimates by Roel Beetsma, Massimo Giuliodori, and Franc Klaassen (2007) suggest that the government spending increase in the selected EU countries (Austria, Belgium, Denmark, Finland, France, Ireland, Italy, Germany, Greece, the Netherlands, Portugal, Spain, Sweden, and the U.K.) produces a 0.7 per cent of GDP impact budget deficit, thereby pointing to the potential relevance of the twin deficits hypothesis on the GDP (Beetsma, Giuliodori, and Klaassen 2007)

Moreover, Abbas et al. (2011) analyzed the sample of more than 100 countries, and concluded that an improvement in the fiscal balance of one per cent of GDP improves the current account balance by 0.2 percentage. Effects gradually disappear, becoming insignificant after 2 to 4 years. The impact was longer-lasting in emerging than in advanced countries. Kosteletou (2013) confirmed the twin deficit hypothesis for EU countries. The author emphasized that an expansionary fiscal policy worsens the current account deficits in Eurozone countries (Greece, Portugal, Spain, Italy, France, Cyprus and Slovenia). The findinds also revealed that the opposite

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direction effects also hold. The result confirmed existence of reverse causality that ran from current account to the budget deficit.

Equally, Gurgul and Lach (2012) conducted a study on the nature of causal dependencies between economic growth and budget and trade deficits of ten new European Union (EU) members in transition from Central and Eastern Europe (CEE) region. The study applied annual data from 2000-2009 using panel datasets method developed by Granger and Huang (1997). To confirm the stability of the results they performed empirical investigations on two specific sub-groups chosen on the basis of differences in the levels of budget balances of sample countries. The results provide support that budget deficits were significantly slowing down the GDP growth rates in the case of new EU Members in transition from CEE region. The results established a unidirectional Granger causality running from budget deficits to trade deficits that confirmed existence of twin deficits hypothesis.

It has also been noted that Daly and Siddiki (2009) applied cointegration analysis along with regime shifts and established a long-run relationship between budget deficits, real interest rates and current account deficits in 13 out of 23 OECD countries examined. However, the number of countries with apparent long-run relationships was significantly reduced when regime shifts were not permitted. The findings also demonstrated that, when structural breaks were applied in the analysis; it seemed that twin deficits were less likely to be conjoined in the case of countries with a more extensive financial infrastructure confirming the importance of application of structural breaks in the analysis.

From a mixed of countries, Khalid and Guan (1999) applied cointegration to determine the causal relationship between current account and budget deficits. The Study employed annual time series data from five developed and five developing countries. The results suggest that the links between the two deficits in the end are more likely to occur in the developing countries than the developed ones. Results on the Granger-causality test support the existence of a causal relationship between external deficit and the budget deficit in mixed direction for developing countries.

Narrowing to Africa, Egwaikhide et al., (2002) studied several African countries using annual data for 1970-1999. He employed OLS method to examine the correlation between the twin deficits.

The findings revealed that there exists a positive relationship between the two deficits for all nations under study except for Cameroon, Cote d'Ivoire, Gambia, Guinea-Bisau and Mali. Granger causality test confirmed twin deficit hypothesis for Benin, Burkina Faso, Ghana, Nigeria and South Africa and bi-lateral causality for Togo. The result established unilateral causality running from current account to budget deficits for Kenya.

In Kenya, Kosimbei (2002) used annual time series data for 1964 to 2000 to examine the relationship between budget and current account deficit for Kenya. The study carried out Granger-causality tests which revealed that there was no causality between budget and current account deficits. The study concluded that Ricardian equivalence is valid with both short-run and long-run dynamics being the same for Kenya.

Further, Osoro et al., (2014) examined the relationship between current account balance and budget deficit while including other variables such as growth, interest rates, money supply (M3) in Kenya from 1963 to 2012. The study was based on cointegration and error correction model. The findings established that the Keynesian view fits well for Kenya since the causality runs from budget deficit to current account deficit.

An integral component in analysing the relationship between budget and external deficits is how budget deficits feed into the external deficits. There are various identified conduits through which budget deficits can feed into external deficits. As highlighted by Abbas et al. (2010) in Opeyemi (2012), three main channels that include the real exchange rate, real interest rates, and the real income. The overall impact of each channel on the budget and external deficits nexus hinges mainly on the features of each economy (Opeyemi 2012). For instance, the exchange rate is crucial in an economy where it is a floating rather than fixed regime. Equally, Prasad et. al., (2013) justifies inclusion of exchange rate in the analysis because of its role in international trade. The real exchange rate is important because its oscillations have a direct bearing on price, which in turn affects consumption decisions in the economy.

The study also Fleming (1962), Mundell (1963), Volcker (1987), Kearney and Monadjeni (1990), and Haug (1990). The authors emphasize the importance of interest rates and exchange rates as transmission mechanisms. For instance, they argue that if there is an increase in fiscal deficits, the increase forces interest rates to increase, thus causing capital inflows. This results in an

appreciation of the exchange rate through an increased demand of domestic financial assets, further deteriorating trade and current accounts.

Lastly, Kim and Kim (2006) highlight four possible causation linkages that may be present between budget and external deficits:

(i)   The twin-deficit Keynesian (or conventional) view, based on Mundell (1968) and Fleming (1962) model, with a persistent budget deficit that induces an external deficit;

(ii)   The Neo-classical view, if, in contrast to the previous case, chronic and excessive current account deficits may in turn lead to budget deficits;

(iii)   The Ricardian (or neutrality) view, which assumes the absence of any causal relationship between external deficits and budget deficits;

(iv)   The bi-directional hypothesis, whereby, budget deficits may cause external deficits, and vice-versa. There exist significant feedback effects that may induce causality between the two variables to flow in both directions.

Table 4.2: Summary of the Empirical Literature

Author & Year	Country of Study	Data Used	Methodology	Main Finding
Anisha & Tri (2017)	Indonesia	Quarterly data 2000: Q1 to 2012: Q2	Granger, Cointegration & ARDL-ECM	Twin deficit hypothesis & Feldstein-Horioka hypothesis hold for Indonesia
Nikiforos et al., (2015)	Greece	Annual data 1980 to 2010	Granger, Cointegration & VECM	Unidirectional causality running from CAD to BD
Magazzino (2012)	Greece	Annual data 1970 to 2010	Panel with bootstrap Critical value & Granger	Unidirectional causality running from CAD to BD
Epaphra (2012)	Tanzania	Annual data 1966 to 2015	Granger, Cointegration & VECM	Unidirectional causality running from BD to CAD
Algieri (2013)	GIIPS Countries: Greece, Ireland, Italy, Portugal, And Spain	Quarterly data 1980: Q2 to 2012: Q2	VAR & Granger plus Toda–Yamamoto	Homogeneity in using both Granger and Toda–Yamamoto approaches. No causality between BD and TD. No causality between BD and CAD.
Gurgul & Lach (2012)	10 Countries of CEE Region	Annual data 2000 to 2009	Panel & Granger	Budget deficits slowed down the GDP growth. Unidirectional causality running from BD to TD
Magazzino (2012)	Spain	Annual data 1970 to 2010	Panel & Granger	Unidirectional causality running from CAD to BD
Merza et al., (2012)	Kuwait	Quarterly data 1993: Q4 to 2010: Q4	Granger, Cointegration & VAR	Unidirectional causality running from CAD to BD

Author & Year	Country of Study	Data Used	Methodology	Main Finding
Rault & Afonso (2009)	Italy	Annual data 1970 to 2007	Panel with bootstrap Critical value & Granger	Unidirectional causality running from BD to CAD (for a 3 variable model: BD, CAD & RER). Unidirectional causality running from CAD to BD (for a 2 variable model: BD & CAD)
Rault & Afonso (2009)	Ireland	Annual data 1970 to 2007	Panel with bootstrap Critical value & Granger	Unidirectional causality running from CAD to BD
Osoro et al., (2014)	Kenya	Annual data 1963 to 2012	Granger, Cointegration & VECM	Unidirectional causality running from BD to CAD
Kosimbei (2002)	Kenya	Annual data 1964 to 2000	Granger, Cointegration & VAR	No causality between BD and CAD
Egwaikhide et al., (2002)	Kenya	Annual data 1970 to 1999	OLS & Granger	Unidirectional causality running from CAD to BD

Source: *Author's Compilations*

4.2.3 Overview of Literature

In this study, we review the literature based on theories related to effects of budget deficits and economic growth, approaches to BOP and on associated causal linkages and on transmission mechanisms of budget and external deficits. Both theoretical and empirical literature have yielded mixed results and inconclusive evidence particularly in developing countries.

Existing evidence from Sub-Saharan Africa in particular seem to be very scanty on the subject. Generally, in most of the identified literature, authors explore only the relationship between current account deficit and fiscal balance (e.g., Kosteletou, 2012; Bussie re et al., 2010; Daly and Siddiki, 2009; Kumhof and Laxton, 2009; Baharumshah et al., 2006; Salvatore, 2006; Njoroge et al., 2014). Soni (2014) and Algieri (2013) established that alternative measures of public deficits are crucial for macroeconomic policy and suggest that in order to arrive at appropriate policy suggestions; the correct measurement of the deficit is a vital prerequisite. Algieri (2013) suggests that in order to fine-tune any policy suggestion, there is need to consider both the trade and current account in the analysis. This is crucial for quantitative macroeconomic policy analysis, particularly in developing economies.

Empirical evidence also suggests that results may be different when we apply different methodologies and model specifications for the same economy or group of economies (Algieri, 2013; Osoro et al., 2014; Soukiazias et. al., 2015; Civcir. and Yucel, 2020). In Kenya, there exists scanty empirical evidence on the subject. Equally, non of the identified previous studies in Kenya

(Egwaikhide et al., 2002); Kosimbei, 2002; Njoroge et al., 2014; Osoro et al., 2014) considered the application of structural shocks in the determination of causal linkages. The effects on trade deficits and debt service on growth linkages have also been side-steped by the identified authors. This could have led to estimates bias in the nature and direction of causal linkages. Due to unavailability of country specific data for most of the developing countries, many researchers have shied away from country specific studies. This is a research gap on the subject for the developing countries and Kenya in particular. This study, therefore, attempts to fill the gap for Kenya.

4.3 Methodology

4.3.1 Conceptual Framework

The link between the effects of fiscal deficits, external deficits and economic growth can be shown in a diagram highlighted in figure 4.4 (Sadoulet and Janvry, 1995).

The symbol $\neq \bigcirc p$ represents a market mechanism with equilibrium price p
σ_q are elasticities of substitution between factors of production
σ_M are elasticities of substitution between imports and domestic goods
σ_E are elasticities of transformation between exports and domestic goods
η and E are income and price elasticities of household consumption
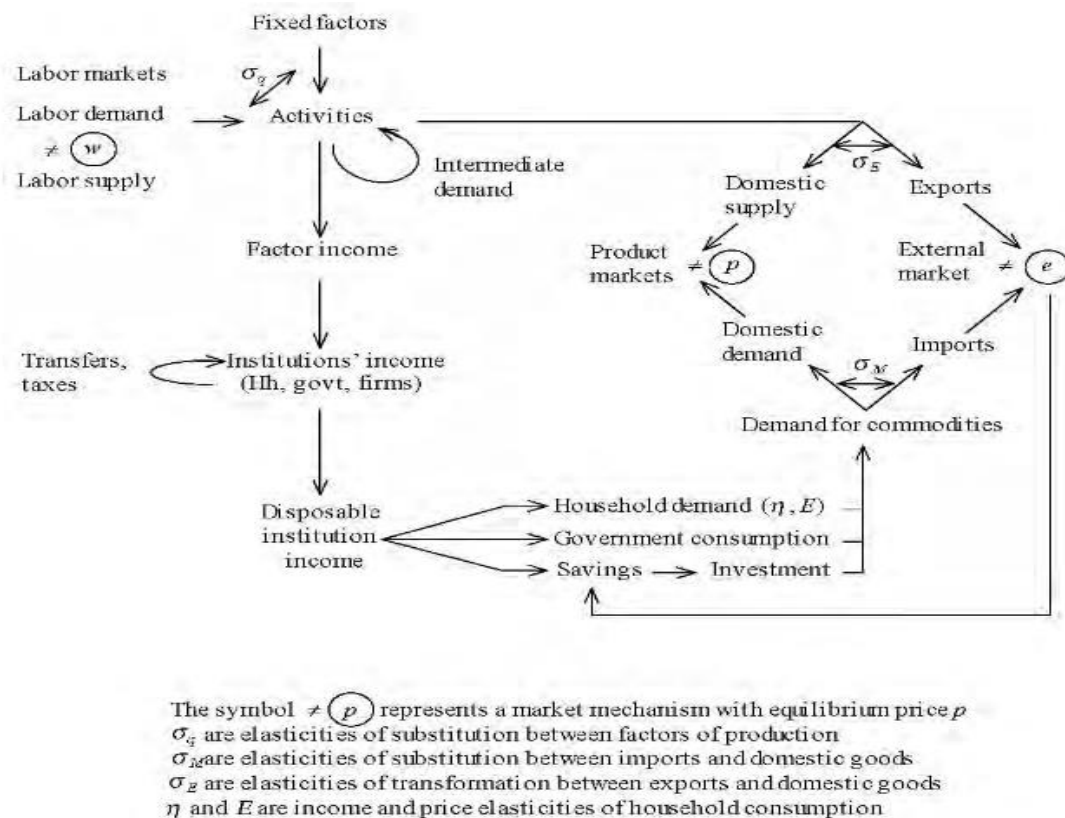
Figure 4.4: Conceptual Framework
Source: Sadoulet and Janvry (1995)

The link is not only important to analyze the effects of fiscal and external deficits on economic growth but can also help understand their causal interdependencies. The World Bank (2014) report for Kenya notes that the Kenyan economy has been experiencing exogenous shocks and therefore measures to reduce Kenya's susceptibility to macroeconomic shocks are necessary for improved economic growth. This link is therefore important especially to policy makers and acadamecians in Sub-Saharan Africa and Kenya in particular.

4.3.2 Theoretical Framework

The paper adopts the twin deficits hypothesis approach and adopts the work of Algieri, (2013). We derive the link between budget and external deficits from the national accounts identity.

$$Y = C + I + G + TB + NFI + NCT \qquad 4.6$$

Where Y is gross domestic product (GDP), C is private consumption, I is investment, G is government consumption, TB is trade balance, NFI is net factor income (from abroad), and NCT is net current transfers.

The sum of $TB + NFI + NCT$ describes the current account balance (CAB):

$$CAB = TB + NFI + NCT \qquad 4.7$$

Abstracting from 4.7, trade balance is a component of current account balance. Since the difference, between income (Y) and total consumption $(C + G)$ depict national saving (S), identity 4.7, is transformed as,

$$S - I = CAB \qquad 4.8$$

From equation 4.8 and excluding the net foreign income from abroad and transfers from equation 4.7 in a narrow definition transforms to: $\quad S - I = TB \qquad 4.9$

National saving results from two components which include the government or public saving and private saving, illustrated respectively by equation 4.10 and 4.11 where, T depicts taxes by the government.

$$S_{Public} = T - G \qquad 4.10$$

$$S_{Private} = Y - T - C \qquad 4.11$$

Rearranging equation 4.8 yields:

$$(T - G) + S_{Private} - I = CAB \qquad\qquad 4.12$$

Where $(T - G)$ shows the government balance (GB). It is a surplus if T is larger than G. . Similarly, if $CAB > 0$, the nation experiences a surplus in current account. If taxes are less than government spending, a country records a budget deficit. If $CAB < 0$, there is a current account deficit (Algieri, 2013).

$S - I$ shows the savings-investments balance of the private sector. In case the difference between private saving and investment is stable, then budget balance and current account will move together and be the same amount implying that they are ''twins''. However, if changes in the budget deficit are fully offset by changes in savings according to the Ricardian equivalence hypothesis, then budget and current account movement become unrelated (Algieri, 2012).

Lastly, it is important to differentiate the nature of deficits in the current account. For instance, if the deficit is financed from long-term capital inflows, then it can be beneficial to the economy. Inward investment can increase the productive capacity of the economy. This is because the current account can be expressed as the difference between national savings and investment. A current account deficit may reflect a low level of national savings relative to investment or a high rate of investment. Thus, a short-term deficit is not a problem (Ghosh and Ramakrishnan, 2006).

Mwega (2014) observes that, if an external (current accout and trade) deficit becomes too large and persistent, it can be dangerous as it becomes a sign of structural weakness and an uncompetitive tradable sector, and could lead to sharp reversals. Reversals could become disruptive because private consumption, investment and government spending have to be suddenly cut once foreign financing is no longer accessible and a country is required to run significant surpluses to quickly reimburse its past borrowings. Therefore, independently from the causes of a current account deficit, there is need to take great care when running large and persistent external deficits, in case the country registers sudden breaks or reversals of financing.

The study further adopts Soukiazis et al. (2014) growth model that incorporates the trade and current account deficits in the analysis.

$$\text{Growth rate of the domestic income } (\acute{Y}) \quad = \quad {A}/{B} \qquad\qquad 4.13$$

Where equation 4.13 is a more inclusive form of a vast number of determinants that affect economic growth. where A is decomposed into various parts which include: the measures of the impact of foreign demand on domestic growth, measures of the effect of relative prices on growth, measures on the volume effect of the balance of trade as well as current account balances, and finally measures on the impact of budget deficits on domestic growth, as shown in the conceptual framework. On the other hand, B takes care of the effects of the disaggregated import elasticities of the components of demand on domestic growth of the economy.

4.3.3 Empirical Models

This study specifies two economic growth models as per the objectives of the study. The first augmented economic growth model as measured by fiscal deficits and trade deficits is;

$$\dot{Y}_t = \alpha_0 + \alpha_1 FD_t + \alpha_2 TD_t + \alpha_3 DS_t + \alpha_4 CPI_t + \vartheta_t \qquad\qquad 4.14$$

In order to fine-tune any necessary economic policy decisions in line with economic theory, this study also considered fiscal deficits and current account deficits as a second measure and the model is as in 4.15;

$$\dot{Y}_t = \alpha_0 + \alpha_1 FD_t + \alpha_2 CAD_t + \alpha_3 DS_t + \alpha_4 RER_t + \vartheta_t \qquad\qquad 4.15$$

where $\dot{Y}_t$ depicts growth of real GDP in time t, FD_t represents the fiscal deficit as a share of GDP, TD_t is trade deficit, DS_t denotes total debt service in Kenya expressed as a share of exports and primary income while CPI_t denotes the percentage change in consumer price index (CPI) index as a key control variable based on macroeconomic theory. ϑ_t is the error term. On the other hand, CAD_t is the current account deficit expressed as ashare of GDP while RER_t is the real exchange rate as depicted by Kenya official exchange rate in Kenya shillings per US dollar.

Economic theory posits that debt service has implications for macroeconomic stability that has an impact on economic growth. Moreover, as observerd by Ndung'u (2018), the number of countries already unable to service their debts doubled in 2018 to eight and the IMF is strongly

urging African countries to raise taxes and to provide more scope for paying interest. Countries like Chad, Republic of Congo, South Sudan and Mozambique have moved to "debt distress" while the case for Kenya's risk of external debt distress has increased from low to moderate "debt distress" (World Bank, 2019).

Lastly, in the studies done in Kenya, there was no consideration of structural breaks (shocks) in variables employed in the estimated models (Osoro et al., (2014) Egwaikhide et al., (2002), Njoroge et al., (2012). Non-consideration of structural breaks may lead to distortions of the models results. This may lead to spurious estimates and bias in the determination of the nature and direction of causal linkages. This study therefore employs both Zivot and Andrews (1992) unit root test in the analysis.

4.3.4 Definition and Measurement of Variables

Variable	Definition and Measurement	Expected Sign	Data Source
Growth of Real GDP ($\dot{Y}_t$)	The annual percentage change in real GDP. Real GDP measures the value of all goods and services produced in a country in a year expressed in 2009 prices considering inflation.		WDI, 2017
Fiscal deficit (FD_t)	This is the general government net lending/borrowing in national currency expressed as as share of GDP.The fiscal balance has peredominantly been in deficit for almost the entire 1980-2016 period except in 1999 and 2000. Positive values indicate a deficit while negative values indicate a surplus.	Positive	IMF, WEO, 2018
Trade deficit as a share of GDP (TD_t)	External deficit on goods and services. Balance of trade is equal to exports of goods and services minus imports of goods and services. The balance of trade account has peredominantly been in deficit for almost the entire 1980-2016 period except in 1993 and 1994. Positive values indicate a deficit while negative values indicate a surplus.	Positive	WDI, 2017
Current Account Deficit (CAD)	The saving-investment resource gap of the domestic economy. Values greater than zero indicate a deficit while those less than zero indicate a surplus.	Positive	WDI, 2017
Debt service (DS_t)	The total debt service as a percentage of exports of goods, services and primary income in Kenya.	Negative	WDI, 2017
Inflation rate (CPI_t)	The annual percentages change of average consumer prices based on year-to-year changes. It is in annual percentage change.	Negative	IMF, WEO, 2018
Real Exchange Rate (RER)	The Kenya official exchange rate in Kenya shillings per US dollar	Negative	WDI, 2017

Source: *Author's Compilations*

4.3.5 Econometrics Approach

a) Descriptive Statistics

Descriptive statistics were conducted to determine statistical properties of the model before running any estimation. This involved testing for the normality of the variables and the spread of the data by determining the mean and first movement from the mean.

b) Unit Root Tests

The study conducted unit root tests to eliminate possibility of spurious regressions. It applied the usual Philip Perron (PP) test (1988) to determine presence ofxunit root. Phillip Perron test results are preferred to ADF unit root test results because even though the two tests give consistent results, the PP test has higher unit root detection abilities (Baliamoune-Lutz, 2008).

In addition, ignoring the presence of structural breaks could lead to rejection of null hypothesis (there is unit root) thus giving erroneous order of integration of variables. Thus, the study went ahead to test for unit root using tests that endogenously take into account the presence of structural breaks. It used Zivot- Andrews test (Zivot and Andrews, 1992) to test for unit root.

c) Cointegration Analysis

The study employed test based on Johansen (1988) and Johansen and Juselius (1990) Johansen (1995) test for cointegration in the analysis, based on VAR model. From the literature, many macroeconomic variables are likely to have a stable long-run relationship (Camillo, 2015). The intuition is that variables that are cointegrated will not move far away from each other and thus their deviations are stationary in the long-run. This concept has been clearly brought out by Murray (1994) in studying the drunk and her dog that will not lose sight of each other. Variables which are non-stationary, a linear or linear combinations of these become stationary.

Johansen test has two statistics, trace and maximum eigen statistics. These parameters indicate whether there is cointegration or not in the variables. The statistics are derived from observing the rank of a long-run coefficient matrix which comprises a combination of the cointegrating vectors as well as the amount of each cointegrating vector in each equation of the model. The trace statistic is a joint test based on the null hypothesis that there is a number of cointegrating equations equal to or less than the rank against an alternative hypothesis that the number of

cointegrating equations is more than the rank. The maximum-eigen statistic is based on a null hypothesis that the number of cointegrating equations is equal to the rank against an alternative hypothesis that the number of cointegrating equations is greater than the rank.

Johansen test for cointegration results is important to determine whether the variables employed in the study are cointegrated or not. If cointegration exists, then VECM model can be the appropriate estimation technique that yields both short-run and long-run relationships for policy implications.

d) VAR Model

In order to realize objectives of the study and draw some policy implications the study estimated the VAR model introduced by Sims (1980). The VAR model is advantageous because it does not require strong restrictions on the parameters to be imposed. It usually tests for joint behavior of variables which are treated as endogenous from theory. An extension and variation of the VAR model is the Vector Error Correction (VEC) Model. The VEC model is fit for the econometrics analysis in instances where the variables are cointegrated or have a long-run relationship. This is because the technique is able to provision for the errors in short-run to be corrected in long-run. It does this by incorporating an error correction term. The error correction term determines the speed of adjustment as an explanatory variable, in the long-run model.

The VEC model is given by:

$$\Delta Y_t \ = \sum_{i=1}^{k} \Delta A_i \ Y_{t-i} \ + \ \Pi ECM_{t-1} + \ \vartheta_t \qquad\qquad 4.16$$

Where Y_t denotes a vector of variables which include growth of real GDP, fiscal deficit, trade deficit, current account deficit and debt service in Kenya. In order not to run the risk of misspecification of the model growth of inflation and real exchange rate were considered as control variables in the estimated models. ECM_{t-1} is error correction term, where Π is the coefficient of the error correction term and it gives the speed of adjustment (of deviations) from short-run to long-run equilibrium.

e) Granger Causality Tests

One of the key objectives of the study was to determine the dynamic causal linkages between the identified macroeconomic variables. This study applied the Toda Yamamoto (1995) Granger causality modified Wald tests to determine the direction of causality between the variables employed in the study. Further, normality of residuals tests as well as model stability test and autocorrelation tests were all conducted based on dynamicVEC model technique employed in the estimation of the model.

4.3.6 Data Type and Sources

Time series annual data on real GDP growth, trade deficit, debt service, current account deficit and real exchange rate was obtained from World Bank (WDI, 2017) while data on fiscal deficit and growth of inflation was obtained from IMF (WEO, 2018). The collected data was later subjected to various diagnostic and unit root tests in order to determine if it was credible for the analysis and policy implications based on the study objectives.

4.4 Empirical Results and Discussion

4.4.1 Descriptive Statistics

The mean, standard deviation, skewness and kurtosis are reported in Table 4.3. All the variables had complete data set of 37 observations that was considered adequate for model estimations.

Table 4.3: Summary Statistics

Variables	Obs	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis
Real GDP Growth	37	3.8514	2.3235	-1.1	8.4	0.2878	0.3397
Fiscal Deficit	37	3.8962	2.8930	-0.814	11.475	0.0640	0.3746
Trade Deficit	37	7.1466	4.5947	-4.9488	17.1967	0.3873	0.2876
Debt Service	37	19.6917	11.9007	4.3194	39.7661	0.4087	0.0008
Inflation	37	11.30384	8.61778	1.554	45.979	0.0000	0.0003
Current Account Deficit	37	6.034267	4.97639	-0.8885	18.6798	0.0071	0.2081
Real Exchange Rate	37	54.42169	29.90224	7.42019	101.5	0.3964	0.0001

Source: Author's Computations

Table 4.3 shows that the variables were closely dispersed from their mean as indicated by their standard deviations. The variables were not highly skewed since their skeweness values were

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close to zero. The kurtosis values were not far from three. All the variables were considered to be credible for further analysis.

4.4.2 Correlation Matrix

Correlation matrix shows the linear association between pairs of variables. Highly correlated variables could lead to invalid t-statistics and can lead to invalid inferences. The correlation matrix showed that the variables were not highly correlated and thus there was no problem on the variables employed. However, the positive and negative relationships between the variables were evident as expected. The results are indicated in Table 4.4a and 4.4b for model 1 and model 2 respectively.

Table 4.4a: Correlation Matrix (Model 1)

Variables	Real GDP Growth	Fiscal Deficit	Trade Deficit	Debt Service	Inflation Growth
Real GDP Growth	1.0000				
Fiscal Deficit	-0.0848	1.0000			
Trade Deficit	0.4469	-0.3075	1.0000		
Debt Service	-0.1630	0.0740	-0.6142	1.0000	
Inflation	-0.4634	0.6138	-0.6247	0.2322	1.0000

Source: *Author's Computations*

Table 4.4b: Correlation Matrix (Model 2)

Variables	Real GDP Growth	Fiscal Deficit	Current Account Deficit	Debt Service	Real Exchange Rate
Real GDP Growth	1.0000				
Fiscal Deficit	0.0674	1.0000			
Current Account Deficit	0.1423	0.0631	1.0000		
Debt Service	-0.1883	0.0386	-0.1705	1.0000	
Real Exchange Rate	0.1737	-0.0036	0.0695	-0.8061	1.0000

Source: *Author's Computations*

4.4.3 Unit Root Tests

Prior to the determination of the unit root of the variables, the study examined the optimal lag lengths of all the variables in the two models. Moreover, a graphical analysis of all the variables was conducted.

a) Optimal Lag Length and Graphical Analysis of the Variables

The study applied Akaike information criteria (AIC), Schwarz-Bayes information criterion (SBIC), Hannan-Quinn information criteria (HQIC) and final prediction error (FPE) techniques to determine the optimal lag length of both the variables in the model (Nielsen, 2001; Lukkepohl, 2005; Abdulnasser and Scott, 2011). It was important to determine the optimal lag length for all the variables in order to facilitate some further tests on unit roots. The lags selection-order criteria were examined up to the fourth lag. Real GDP growth, fiscal deficit, trade deficit, debt service, inflation, current account deficit and real exchange rate had 1, 1&2, 1, 1, 1&4, 1 and 1 optimal lag lengths respectively. This is indicated in Tables A2 in the appendix. The graphical trend analysis of the variables is also indicated in the appendix.

b) Results for Unit Root Tests

The study estimated Phillip Perron and Zivot-Andrews unit root tests with allowance for structural breaks. Table 4.5 shows the results for Phillip Perron test.

Table 4.5: Phillip Perron Unit Root Tests

Variables	Phillip Perron Unit Root Tests Results								
	Levels				First Difference				Order of Integration
	Constant		Trend & Intercept		Constant		Trend & Intercept		
	t-stat	5% Critical value	t-stat	5% Critical value	t-stat	5% Critical value	t-stat	5% Critical value	
Growth of Real GDP	-19.73	-12.852	-20.262	-18.736	-34.779	-12.820	-34.800	-18.660	I (1)
Fiscal Deficit	-9.943	-12.852	-9.402	-18.736	-27.257	-12.820	-27.675	-18.660	I (1)
Trade Deficit	-7.418	-12.852	-15.605	-18.736	-34.005	-12.820	-33.967	-18.660	I (1)
Debt Service	-1.776	-12.852	-12.635	-18.736	-34.971	-12.820	-35.197	-18.660	I (1)
Inflation	-15.06	-12.852	-17.082	-18.736	-30.632	-12.820	-30.646	-18.660	I (1)
Current Account Deficit	-16.49	-12.852	-16.475	-18.736	-37.645	-12.820	-37.752	-18.660	I (1)
Real Exchange Rate	-0.609	-12.852	-7.999	-18.736	-32.647	-12.820	-32.624	-18.660	I (1)

Source: Author's Computations

The Phillip Perrons unit root tests results confirmed that the variables were integrated of order one. In order to ascertain the order of integration amongst the variables employed in the model, the study further conducted the Zivot-Andrews unit root tests and the results did not show any

variation in terms of presence of unit root. The variables employed in the model were indeed integrated of order one. The results for Zivot-Andrews unit root test are shown in Table 4.6.

Table 4.6: Results for Zivot-Andrews Unit-Root Tests

Variables	Year of structural break	Level		First difference		Order of integration
		t-statistics	5% critical value	t-statistics	5% critical value	
Real GDP Growth	1991	-4.383	-4.80	-6.140	-4.80	I (1)
Fiscal Deficit	1994	-4.644	-4.80	-6.699	-4.80	I (1)
Trade Deficit	1990	-3.409	-4.80	-6.880	-4.80	I (1)
Debt Service	1993	-4.506	-4.80	-7.201	-4.80	I (1)
Inflation	1995	-4.530	-4.80	-8.696	-4.80	I (1)
Current Account Deficit	2000	-4.968	-4.80	-7.672	-4.80	I (1)
Real Exchange Rate	1993	-4.284	-4.80	-6.118	-4.80	I (1)

Source: Author's Computations

The results from the tests for structural breaks unit root tests showed that most of the variables were not stationary at levels but became stationary at first difference. Thus, they reinforced the results of the Phillip-Perron unit root test**s.**

4.4.4 Cointegration Test Results

The study conducted Johansen test to examine the presence of cointegration among the variables. This was very necessary because the variables were not stationary at levels and they were integrated of order one. It was therefore necessary to test for the long-run relationship of these variables. The results indicated that there was one, either two or three cointegrating equations in both the estimated models. The tests results established a long-run relationship among the variables. This was by both the trace and the max-eigen statistics that indicated the presence of up to three cointegrating equations. The study, therefore, went further to run the VEC model to correct for the errors in the long-run equilibrium.

Tables 4.7a and 4.7b for the 2 models indicating that the variables in both models had up to three cointegrating equations present the Johansen tests results. This implied that in the end, the variables in each model move together.

Table 4.7a: Johansen Test for Cointegration (Model 1)

Johansen Tests for Cointegration					
Trend – constant, Sample: 1984-2016				Number of Observations = 33, Lags = 4	
Maximum Rank	Parms	LL	Eigenvalue	Trace Statistic	5% Critical Value
0	80	-338.00253		127.7560	68.52
1	89	-306.8368	0.84875	65.4245	47.21
2	96	-291.61095	0.60259	34.9728	29.68
3	101	-279.20139	0.52862	10.1537*	15.41
4	104	-274.59249	0.24371	0.9359	3.76
5	105	-274.12456	0.02796		
Maximum Rank	Parms	LL	Eigenvalue	Maximum Statistic	5% Critical Value
0	80	-338.00253		62.3315	33.46
1	89	-306.8368	0.84875	30.4517	27.07
2	96	-291.61095	0.60259	24.8191	20.97
3	101	-279.20139	0.52862	9.2178*	14.07
4	104	-274.59249	0.24371	0.9359	3.76
5	105	-274.12456	0.02796		

Source: Author's Computations

Table 4.7b: Johansen Test for Cointegration (Model 2)

Johansen Tests for Cointegration					
Trend – constant, Sample: 1984-2016				Number of Observations = 33, Lags = 4	
Maximum Rank	Parms	LL	Eigenvalue	Trace Statistic	5% Critical Value
0	80	-368.96599		113.9683	68.52
1	89	-346.31997	0.74652	68.6763	47.21
2	96	-327.32613	0.68372	30.6886	29.68
3	101	-315.65722	0.50698	7.3507*	15.41
4	104	-312.32106	0.18306	0.6784	3.76
5	105	-311.98185	0.02035		
Maximum Rank	Parms	LL	Eigenvalue	Maximum Statistic	5% Critical Value
0	80	-368.96599		45.2920	33.46
1	89	-346.31997	0.74652	37.9877	27.07
2	96	-327.32613	0.68372	23.3378	20.97
3	101	-315.65722	0.50698	6.6723*	14.07
4	104	-312.32106	0.18306	0.6784	3.76
5	105	-311.98185	0.02035		

Source: Author's Computations

a) Optimal Lag Length of the Models

The study tested for the optimal lag lengths by applying the Likelihood Ratio (LR), Akaike information criteria (AIC), Schwarz-Bayes information criterion (SBIC), Hannan-Quinn information criteria (HQIC) and final prediction error (FPE) techniques in the analysis of the two models before running the estimations. Tables 4.8a and 4.8b present the results. The lag-order

selection statistics show both LR and AIC prefer three lags whereas FPE, HQIC and SBIC prefer only one lag for both models.

Table 4.8a: Lag Selection Criteria (Model 1)

Lag selection-order criteria								
Sample: 1983-2016				Number of Observations = 34				
Lag	LL	LR	Df	P	FPE	AIC	HQIC	SBIC
0	-493.112				3.7e+06	29.3007	29.3773	29.5252
1	-393.302	199.62	25	0.000	45679.7*	24.9001	25.3594*	26.2469*
2	-369.827	46.95	25	0.005	55325.8	24.9898	25.8319	27.4589
3	-340.683	58.288*	25	0.000	57471.4	24.7461*	25.9708	28.3375
* Indicates lag order selected by the criterion								

Source: Author's Computations

Table 4.8b: Lag Selection Criteria (Model 2)

Lag selection-order criteria								
Sample: 1983-2016				Number of Observations = 34				
Lag	LL	LR	Df	P	FPE	AIC	HQIC	SBIC
0	-524.38				2.3e+07	31.14	31.2166	31.3645
1	-411.445	225.87	25	0.000	132802*	25.9673	26.4266*	27.3141*
2	-385.847	51.194	25	0.002	141969	25.9322	26.7742	28.4013
3	-366.986	37.724*	25	0.049	270023	26.2933*	27.5181	29.8847
* Indicates lag order selected by the criterion								

Source: *Authour's Computations*

The stability test of the two models was conducted and results for the 3 lag and one Cointegration equation VECM are presented in Figures 4.5a and 4.5b respectively.
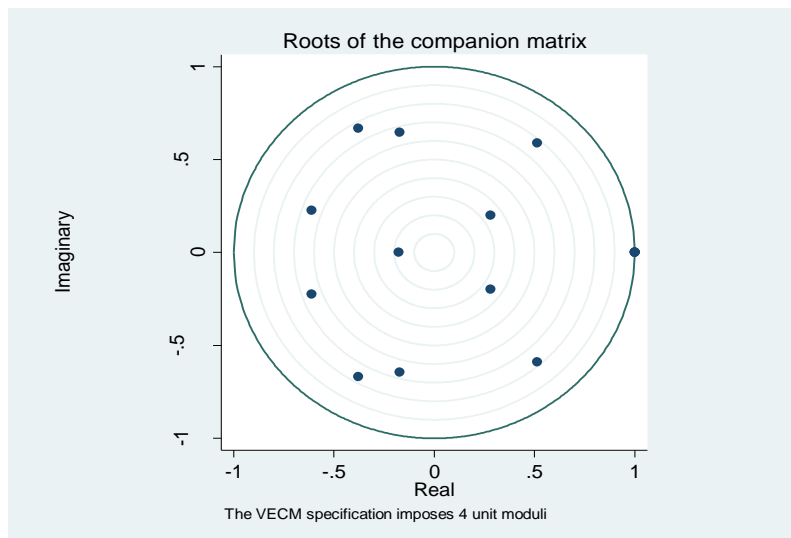
Figure 4.5a: VECM Stability Test (Model 1)
Source: Author's Computations
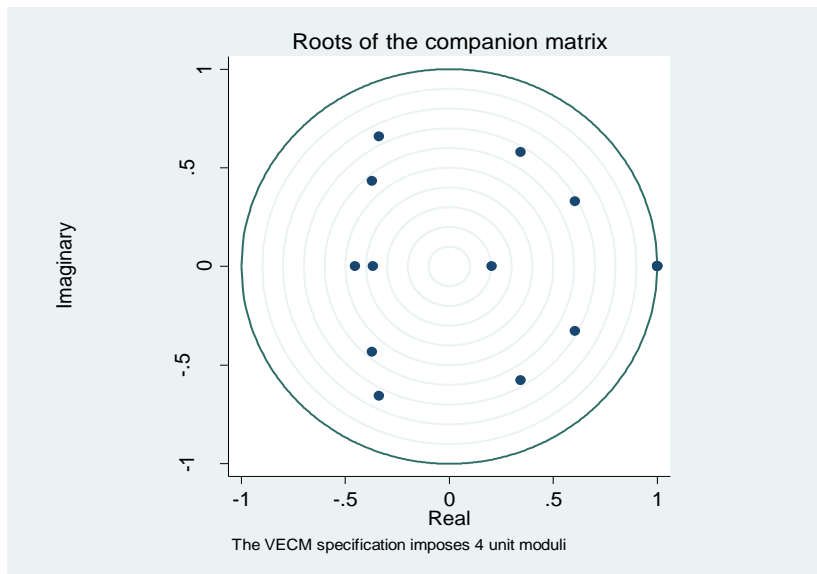
Figure 4.5b: VECM Stability Test (Model 2)
Source: Author's Computations

The results in Figures 4.6a and 4.6b reveal that all the roots lie inside the unit circle. This confirms that the 3 lags VEC model is stable for the two models. Additionally, the multivariate LM tests were utilized to examine the presence or absence of residual serial correlation in the estimated VEC models and the results are indicated in Table 4.9a and 4.9b.

Table 4.9a: LM Tests for Autocorrelation (Model 1)

Lag	LM Stat	Df	Prob
1	22.5229	25	0.60540
2	41.6552	25	0.01957
3	27.0229	25	0.35474
4	22.3519	25	0.61535
H_0: No autocorrelation at lag order			

Source: Author's Computations

Table 4.9b: LM Tests for Autocorrelation (Model 2)

Lag	LM Stat	Df	Prob
1	25.1990	25	0.45127
2	24.7490	25	0.47651
3	24.1067	25	0.51321
4	19.6712	25	0.76385
H_0: No autocorrelation at lag order			

Source: Author's Computations

The residual LM test for serial correlation indicated that there was no serial correlation for both models (since the p value was greater than 5 percent) at lag three in the residuals as shown in Tables 4.9a and 4.9b. The Jarque-Bera test also confirmed that all the disturbances were normally distributed as shown herein Table 4.9c

Table 4.9c: Jarque-Bera Normality test for disturbances

Equation	Chi2	Df	Prob > chi2
D. Real GDP Growth	0.080	2	0.96102
D. Fiscal Deficit	2.583	2	0.27485
D.Trade Deficit	0.935	2	0.26654
D.Debt Service	0.508	2	0.77556
D.Inflation Rate	1.987	2	0.37023
All	6.093	10	0.80737

Source: Author's Computations

Table 4.9c shows that there is normality in distribution of disturbances. The probability values for the six tests (0.96102), (0.27485), 0.26654, 0.77556, 0.37023 and (0.80737) are greater than 5 percent. Having established that both models had passed all necessary tests, the study applied the VEC model technique to estimate the effects of budget and external (trade and current account) deficits on growth of real GDP in both the short-run and long-run as well as determining the nature and direction of causality on the variables employed in the model.

4.4.5 VECM Regression Results

The study estimated the VECM model at three lags and one cointegration equation and the regression results for the effects of budget and external (trade and current account) deficits on growth of real GDP as depicted by fiscal deficits and trade deficits are presented in Table 4.10a

Table 4.10a: VECM Long-run Relationship (Model 1)

Dependent Variable – Growth of Real GDP				
Variable	Coefficient	Std Error	t-statistic	p-value
Constant	-8.680973			
Fiscal Deficit	-1.197490 ∗∗	0.1927764	-6.21	0.000
Trade Deficit	0. 3839721 ∗∗	0.1352404	2.84	0.005
Debt Service	0.0436986	0.0315625	1.38	0.166
Inflation Rate	0.4793849∗∗	0.884487	5.42	0.000
∗∗ Indicates significance at 5% significance level				

Source: Author's Computations

Table 4.10a shows the long-run regression results on the effects of fiscal and trade deficits on growth of real GDP in Kenya. All the variables in the model except debt service had statistically significant long-run relationship at 5% significance level. Fiscal and trade deficits had asymmetric effects on growth of real GDP and both exhibited statistically significant relation at 5% significance level. Specifically, and based on the estimates of VEC model, fiscal deficit had positive long-run effects on growth of real GDP while trade deficit had negative effects on real GDP growth in the long run, ceteris paribus. The estimates suggest that a one percentage point increase in fiscal deficit leads to about 1.031 percentage rise in the growth of real GDP in the long-run, ceteris paribus. On the other side, a one-percentage point rise in trade deficit leads to about 0.331 percentage decline in the growth of real GDP in the long run, ceteris paribus.

The inflation variable had also negative and statistically significant effects on real GDP growth. Lastly, debt service had negative effects on growth of real GDP. However, this adverse effect was not statistically significant. Inflation growth had a negative and statistically significant relationship on growth of real GDP, all else equal.

After estimating the VEC model, it was important to to highlight both the short-run and long-run relationships. This was executed taking into considerations the error correction model results. The short-run regression results show how the dependent variable is related with the other variables in the short-run by utilizing the differenced variables. The study reported the short-run relationships on all the model variables as indicated in Table 4.10b.

Table 4.10b: VECM Short-run Relationship (Model 1)

Dependent Variable – Growth of Real GDP					
Variable	**Lag**	**Coefficient**	**Std Error**	**t-statistic**	**p-value**
Constant		-0.26355	0.390396	-0.68	0.500
D.Fiscal Deficit (-1)	LD	-0.33787	0.277074	-1.22	0.223
D.Fiscal Deficit (-2)	L2D	-0.45829	0.277605	-1.65	0.099
D. Trade Deficit (-1)	LD	0.61811	0.234637	2.63	0.008
D. Trade Deficit (- 2)	L2D	0.32877	0.209212	1.57	0.116
D.Debt Service (-1)	LD	0.16676	0.125667	1.33	0.185
D.Debt Service (-2)	L2D	-0.12779	0.114390	-1.12	0.264
D.Inflation Rate (-1)	LD	0.273263	0.102634	2.66	0.008
D.Inflation Rate (-2)	L2D	0.250086	0.084027	2.98	0.003
Speed of Adjustment of the Error Correction Term [U (-1)]		-0.8610462**	0.250634	-3.44	0.001
** Indicate significance at 5% significance level					

Source: Author's Computations

The short-run relationship results are in differenced variables as illustrated in Table 4.10b, whereby D. represents the first difference. The coefficient of the error correction term (ECT) was less than one and statistically significant (at 1 % level). The result reveals that the coefficient of error correction term [U (-1)] is -0.8610462 which is less than one and statistically significant at 1%, implying that the estimated model is stable and whenever there are deviations in real GDP growth from an equilibrium path, the model corrects at the rate of 86.1 % annually, ceteris paribus. Importantly, the negative coefficient of ECT confirms that the real GDP growth and the explanatory variables have indeed a long-run equilibrium relationship.

Fiscal deficit (at first and second lag) had negative but statistically insignificant effects on growth of real GDP in the short-run. Trade deficit had positive effects on economic growth at both the first and second lag but these effects were only statistically significant at first lag. The debt service variable had asymmetric effects on economic growth abeit non-significant. Lastly, the inflation variable revealed negative and statistically significant effects on economic growth in the short-run.

4.4.6 Granger-Causality Results

The study conducted the Toda-Yamamoto (1995) Granger-causality Wald tests to establish the direction of the dynamic causal relationship between the variables.
The first row of Table 4.10c shows that lagged values of trade deficit cause growth of real GDP as p-value is equal to 0.0000 which is less than 5%. Equally, because of the p value 0.000 is less than 5%, lagged values of growth of real GDP also cause trade deficit. Therefore, in both instances the null hypothesis is rejected, suggesting a bidirectional causality between trade deficit and growth of real GDP.
Moreover, in the second row of Table 4.10c, it is shown that lagged values of fiscal deficit cause growth of real GDP as p-value is equal to 0.0000 which is less than 5%. However, because of the p value 0.098 (in the eleventh row) is grater than 5%, lagged values of growth of real GDP do not cause fiscal deficit suggesting a unidirectional causality running from fiscal deficit to growth of real GDP. These results are shown in Table 4.10c.

Table 4.10c: Toda-Yamamoto Granger Causality Wald Tests (Model 1)

Toda-Yamamoto Granger Causality Wald Tests				
Equation	Excluded	Chi2	Df	Prob
Growth of real GDP	Trade Deficit	20.895	4	0.000
Growth of real GDP	Fiscal Deficit	39.525	4	0.000
Growth of real GDP	Debt service	19.014	4	0.001
Growth of real GDP	Inflation	46.626	4	0.000
Growth of real GDP	ALL	66.926	16	0.000
Trade Deficit	Growth of real GDP	83.731	4	0.000
Trade Deficit	Fiscal Deficit	44.436	4	0.000
Trade Deficit	Debt service	78.365	4	0.000
Trade Deficit	Inflation	33.02	4	0.000
Trade Deficit	ALL	293.35	16	0.000
Equation	Excluded	Chi2	Df	Prob
Fiscal Deficit	Growth of real GDP	7.826	4	0.098
Fiscal Deficit	Trade Deficit	7.1325	4	0.129
Fiscal Deficit	Debt service	9.6638	4	0.046
Fiscal Deficit	Inflation	4.4819	4	0.345
Fiscal Deficit	ALL	42.164	16	0.000
Debt service	Growth of real GDP	10.32	4	0.035
Debt service	Trade Deficit	18.406	4	0.001
Debt service	Fiscal Deficit	23.843	4	0.000
Debt service	Inflation	11.737	4	0.019
Debt service	ALL	56.195	16	0.000
Inflation	Growth of real GDP	13.508	4	0.000
Inflation	Trade Deficit	1.963	4	0.743
Inflation	Fiscal Deficit	13.079	4	0.011
Inflation	Debt Service	3.1817	4	0.528
Inflation	ALL	40.339	16	0.001
H0: Implies Rejection of Granger non-causality				

Source: Author's Computations

Lastly, in the seven row of Table 4.10c, it is shown that lagged values of fiscal deficit cause trade deficit as p-value is equal to 0.0000 which is less than 5%. However, since the p value 0.129 (in the twelveth low) is greater than 5%, lagged values of trade deficit do not cause fiscal deficit. The estimates suggest a unidirectional causality running from fiscal defict to trade deficit. These results confirm the presence of twin deficits hypothesis.

The study affirms that balance of payments is a macroeconomic variable and helps an economy understand how a country trades the shilling for that of another country as well as the flow of human capital across borders as indicated by net private non-official capital flows and flows of official reserves. Current account balance is thus a macroeconomic variable that is related to

understanding domestic transactions with the rest of the world. Applying the current account in the analysis may therefore offer a theoretically relevant and credible policy feedback for the country's macro-growth policy debates.

Current account deficits have been a persistent feature of many African economies including Kenya. Generally, current account deficits in Africa have worsened since 2000 have for the case of Kenya the deficit in the current account attributed to trade deficits whereby the imports have outpaced exports of goods and services (AEO, 2019). This study therefore went further to determine the effects of government deficits and external deficits on growth of real GDP as depicted by both the fiscal and current account deficits.

The study estimated the VEC model at three lags and one cointegration equation and the results for both the long run and short-run relationships are presented in Table 4.11a and 4.11b respectively.

Table 4.11a: VECM Long-run Relationship (Model 2)

Dependent Variable – Growth of Real GDP				
Variable	Coefficient	Std Error	t-statistic	p-value
Constant	24.70726			
Current Account Deficit	-1.695380 ∗∗	0.362420	-4.68	0.000
Fiscal Deficit	2.234128∗∗	0.701602	3.18	0.001
Real Exchange Rate	-0.4286162∗∗	0.120271	-3.56	0.000
Debt Service	0.7751052∗∗	0.269661	2.87	0.004
∗∗ Indicate significance at 5% significance level				

Source: Author's Computations

The results in Table 4.11a reveal the long-run relation on the effects of fiscal and current account deficits on growth of real GDP in Kenya. The two deficits as depicted by fiscal and current account deficits exhibited asymmetric long-run relationships with growth of real GDP where by both of them had statistically significant relationship at both 1% and 5% significance level. The error correction model results suggest that a one-percentage point rise in the current account deficit leads to about 0.338 percentage decline in the growth of real GDP in the long-run, ceteris peribus. Moreover, the estimates reveal that a percentage point rise in fiscal deficit leads to about 0.45 percentage decline in the growth of real GDP in the long-run, ceteris paribus.

Both the real exchange rate and debt service had a positive and statistically significant long-run relationship at 5% significance level on growth of real GDP. An increase (depreciation) of real

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exchange rate is associated with an increase in growth of real GDP, in the end. Lastly, debt service had a negative and statistically significant relationship on growth of real GDP, in the end, ceteris peribus. The study suggests not only promotion of debt reduction policies that includes upscaling of debt management strategies and mitigation of debt vulnerabilities but also promotion of policies that foster stability of macroeconomic and relative prices to drive long-term economic growth in Kenya. The result for the short-run relationship is indicated in Table 4.11b.

Table 4.11b: VECM Short-run Relationship (Model 2)

Dependent Variable – Growth of Real GDP					
Variable	**Lag**	**Coefficient**	**Std Error**	**t-statistic**	**p-value**
Constant		0.553824	0.515840	1.07	0.283
D.Current Account Deficit (-1)	LD	0.5022494**	0.1597794	3.14	0.002
D.Current Account Deficit (-2)	L2D	0.2268495	0.1304705	1.74	0.082
D. Fiscal Deficit (-1)	LD	0.2976300	0.2359869	1.26	0.207
D. Fiscal Deficit (- 2)	L2D	-0.0146271	0.2395602	-0.06	0.951
D. Real Exchange Rate (-1)	LD	0.2105914**	0.0916344	2.30	0.022
D. Real Exchange Rate (-2)	L2D	0.2277231**	0.1092504	2.08	0.037
D.Debt Service (-1)	LD	0.1948525	0.1267807	1.54	0.124
D.Debt Service (-2)	L2D	0.1090487	0.1677579	0.65	0.516
Speed of Adjustment of the Error Correction Term [U (-1)]		-0.1994**	0.054991	-3.63	0.000
** Indicate significance at 5% significance level					

Source: Author's Computations

The coefficient of the error correction term (ECT) was less than one and statistically significant (at 1 % level). The result reveals that the coefficient of error correction term [U (-1)] is **-0.1994** which is less than one and statistically significant at 1%. This implies that whenever there are deviations in real GDP growth from an equilibrium path, the model corrects at the rate of 19.9 % annually, ceteris paribus. Lastly, the negative coefficient of ECT confirms that the real GDP growth and the explanatory variables have indeed a long-run equilibrium relationship

The study applied the Toda and Yamamoto (1995) Granger causality analysis to examine the nature and direction of causality on the variables of interest. The results are indicated in Table 4.11c.

Table 4.11c: Toda-Yamamoto Granger Causality Wald Tests (Model 2)

Toda-Yamamoto Granger Causality Wald Tests				
Equation	**Excluded**	**Chi2**	**df**	**Prob**
Growth of real GDP	Current Account Deficit	29.465	4	0.000
Growth of real GDP	Fiscal Deficit	7.9095	4	0.095
Growth of real GDP	Real Exchange Rate	15.888	4	0.003
Growth of real GDP	Debt Service	21.899	4	0.000
Growth of real GDP	ALL	41.924	16	0.000
Current Account Deficit	Growth of real GDP	10.545	4	0.032
Current Account Deficit	Fiscal Deficit	15.626	4	0.004
Current Account Deficit	Real Exchange Rate	21.843	4	0.000
Current Account Deficit	Debt Service	32.185	4	0.000
Current Account Deficit	ALL	97.458	16	0.000
Fiscal Deficit	Growth of real GDP	9.0274	4	0.060
Fiscal Deficit	Current Account Deficit	3.5714	4	0.467
Fiscal Deficit	Real Exchange Rate	3.599	4	0.463
Fiscal Deficit	Debt Service	8.0469	4	0.090
Fiscal Deficit	ALL	35.83	16	0.003
Real Exchange Rate	Growth of real GDP	9.2996	4	0.054
Real Exchange Rate	Current Account Deficit	31.937	4	0.000
Real Exchange Rate	Fiscal Deficit	33.642	4	0.000
Real Exchange Rate	Debt Service	3.279	4	0.512
Real Exchange Rate	ALL	78.796	16	0.000
Debt Service	Growth of real GDP	7.824	4	0.098
Debt Service	Current Account Deficit	1.5121	4	0.824
Debt Service	Fiscal Deficit	8.1387	4	0.087
Debt Service	Real Exchange Rate	8.7753	4	0.067
Debt Service	ALL	31.948	16	0.010
H_0: Implie Rejection of Granger non-causality				

Source: Author's Computations

The first row of Table 4.11c indicates that lagged values of current account deficit cause growth of real GDP as p-value is equal to 0.0000 which is less than 5%. Similarly, since the p value 0.032 is less than 5% (in the sixth low), lagged values of growth of real GDP cause current account deficit. The estimates suggest that a bidirectional causality exists between current account deficit and growth of real GDP, ceteris paribus.

In the eleventh row, it is evident that lagged values of growth of real GDP do not cause fiscal deficit. This is because the p-value is 0.06, which is greater than 5%. Equally, the fact that the p value of 0.095 is greater than 5% (in the second row), lagged values of fiscal deficit do not cause growth of real GDP. Therefore, the null cannot be rejected. The estimates suggest no causality exists between fiscal deficit and growth of real GDP in estimated growth model.

Lastly, in the seventh row, the estimates show that lagged values of fiscal deficit cause current account deficit, as p-value is 0.004, which is less than 5%. However, because the p value 0.467 is greater than 5% (in the twelveth row), lagged values of current account deficit do not cause fiscal deficit. Therefore, the null cannot be rejected. The direction of causality is therefore, from fiscal deficit to current account deficit. This confirms existence of twin deficit hypothesis in the period 1980-21016, for Kenya.

The research findings in support of twin-deficits hypothesis established in this paper reinforce the studies done by Osoro et al., 2014 for Kenya, Anisha and Tri (2017) for Indonesia, Epaphra (2012) for Tanzania, and Gurgul and Lach (2012) for ten countries of Central and Eastern Europe (CEE) region. The findings suggest that a policy on expenditure rationalization to minimize the large and persistent fiscal deficits in Kenya, anchored on macroeconomic stability can help achieve growth enhancing external balances.

4.5 Conclusion

The main objective of this paper was to determine the effect of budget and external (trade and current account) deficits on economic growth and establish the nature of causality between the variables of interest. The study applied unit roots tests, VEC model econometric technique as well as Toda and Yamamoto (1995) causality representation to analyse this relationship and several diagnostic tests including tests for structural breaks were applied. Using Johansen (1995) cointegration technique and by estimating vector error correction model, the modelling findings revealed that fiscal and trade deficits had asymmetric long-run causal effects on economic growth whereby fiscal deficit had positive effects on growth of real GDP but trade deficit had negative effects on real GDP growth. On the other side, the second VEC model established that both fiscal and current account deficits had long-run negative causal effects on growth of real GDP in Kenya.

Results on Toda-Yamamoto causality Wald tests established a unidirectional causality running from fiscal deficit to trade deficit confirming existence of twin deficit hypothesis in Kenya. Equally, a unidirectional causality running from fiscal deficits to current account deficits in a multivariate analysis for the same period was confirmed reinforcing further the existence of twin deficit hypothesis for Kenya.

4.6 Policy Implications

The asymmetric VEC model causal effects on economic growth provide strong grounds to devise the policies adaptive and relevant to changing arenas in domestic and external sectors. In order to conduct a sound fiscal policy and reduce the high and persistent fiscal deficits, there is need to cut down on unproductive and non-priority public consumption and enhance revenue mobilizations strategies to minimize their adverse growth effects. The findings also imply that the authorities need to address the structural competitiveness challenges to reduce the persistence trade deficits and boost the growth of the economy. This can be achieved by devicing appropriate strategies on value addition and manufacturing under the Big "Four" Agenda. By focusing on the current account deficit other key strategies would be promotion of policies that augument the shares of domestic savings and foreign direct investment to GDP in Kenya.

Equally, evidence reveal also the need for the government to pay more attention to the debt service in Kenya. Strategies to minimize commercial loans and focus on concessional ones that have low interest payments and long maturity periods should be pursed to minize the adverse effects of debt service on the macroeconomy. From the estimates, the inflation variable has negative effects on growth of the economy implying the need to maintain inflation at the required thresholds by continously implementing inflation targegeting policies by the Central Bank of Kenya (CBK). Lastly, the findings suggest that there is need for the CBK to continue supporting the Kenyan foreign exchange rate to continue acting as a shock absorber to the external shocks and promote stability of the exchange rate for sustained economic growth in Kenya.

4.7 Contribution of the Study to Knowledge

The study contributes and fills a key research gap that has not been addressed in Kenya. First and based on the overall aim of the study, this thesis provides evidence from Kenya on the dynamic interdependencies between budget deficits and economic growth, external deficits and economic growth, and between budget and external deficits. The dynamic analysis approach applied based on the alternative measures of public sector deficits and economic growth was instrumental for robustness in the analysis and also offered an apportunity to fine tune policy suggestions.

Second, the study considered the primary budget deficit in the analysis. The study also offers an important comparison between the two relations on trade deficits and fiscal deficits on one side, and the current account deficits and fiscal deficits on the other. The distinction in the study highlights whether the presence of direct transfers of capital and cross boarder investments influence the relationship between budget and external deficits in Kenya.   This is important because it enhances the decision to fine-tune any policy responses, which had been ignored for not only Kenya but also many other identified countries in Sub-Saharan Africa.

Third, the consideration of triple balances as reflected by trade, current account and fiscal balances in the study was crucial as it enhances the decision to fine tune policy relevance suggestions based on evidence. By considering the triple deficits for Kenya, this paper further contributes to the limited research database on the subject and the findings provides a buffer for quantitative macroeconomic policy analysis that may be applied in formulation of sound policy responses on economic outlook for Kenya.

Lastly, the study also considered not only the application of structural breaks but also the testing of stability of causal relationships. Toda and Yamamoto (1995) Granger causality test have been also considered and applied to overcome limitations of standard Granger Wald tests in presence of cointegration. This was crucial as the relationships might not be stable due to the structural changes occurring in the global economic and political arenas. In the presence of instability, the findings could also suggest erroneous and unproductive policy strategies. Lastly, this study also contributes to the existing knowledge on the subject.

CHAPTER FIVE

SUMMARY, CONCLUSION AND POLICY IMPLICATIONS

5.1 Introduction

This chapter details thesis summary, conclusion and policy implications derived from the findings of the thesis. It also includes the contribution of the study to knowledge, limitations of the study and suggested areas for further research.

5.2 Summary of the Thesis

The study addresses the debate on the effects of budget and external deficits on economic growth in Kenya. It also focuses on the causal linkages between budget deficits, external deficits and economic growth and between budget and external deficits, which had been largely ignored in Kenya.

The study commences by determining the effects of primary budget deficit on economic growth in Kenya. The study incorporates financial innovations, which have taken place with respect to the introduction of Mpesa in Kenya in 2007 and its associated advancement up to year 2016. This study also considers the dynamism of country's macroeconomy and changes induced by the 2014 rebasing of GDP in Kenya. The main objectives of the study are to analyse the effects of budget deficit on economic growth, to determine the effect of current account deficit on economic growth, and to determine the effects of budget and external deficits on economic growth in Kenya. Policy implications derived from the respective empirical findings from the three papers are also suggested.

Chapter one introduces the study on the effects of budget and external deficits on economic growth in Kenya. The chapter lays an important basis for the three papers of the study. The first paper seeks to determine the effects of primary budget deficit on economic growth in Kenya using a VEC model and annual time series data for Kenya from 1980 to 2016. Specifically, the paper examines the effects of primary budget deficit on economic growth and determines the direction of causality between primary budget deficit and economic growth, in Kenya. Growth of GDP per capita is applied as the depedent variable while primary budget deficit, gross fixed capital

formation, real interest rate, terms of trade, inflation growth and a financial innovation dummy are considered as explanatory variables.

The findings reveal that the primary budget deficit has a positive and significant association with economic growth in the short-run. However, in the end there is a negative and significant relationship with a unidirectional causality running from primary budget deficit to economic growth, in Kenya. These findings are derived from the parameter estimates of the variables that were included in the estimated growth model.The results is also justified by crowding-out effects associated with sustained high domestic borrowing that has heightened debt servicing costs and constrained fiscal space for development spending and social welfare in the country.

The main objective of the second paper is to examine the effects of current account deficits on economic growth in Kenya. The paper utilizes cointegration analysis, VEC model, as well as Toda and Yamamoto (1995) granger-causality tests in the analysis. Growth of GDP per capita is the depedent variable while current account deficit, gross fixed capital formation, foreign exchange rate, trade openness, terms of trade growth and inflation growth are included as explanatory variables. Annual time series data on growth of GDP per capita, gross fixed capital formation, current account deficit, foreign exchange rate and trade openness for Kenya is obtained from WDI (2017) published by World Bank and data on annual percentage change in terms of trade and annual percentage change in inflation is obtained from IMF (2018) databases. Other sources of secondary data include the Central Bank of Kenya and the National Treasury (Republic of Kenya) publications.

The findings reveal a long-run bidirectional causality running from economic growth to current account deficits and vice-versa, confirming the feedback causal effect. An increase in economic growth has a significant effect of enlarging the current account deficit and the vice versa. The Keynesian approach to economic growth is in line with the econometric predictions to Kenya's growth story. This is important not only because it can help foster the design of long-run growth enhancing policies, but also can enhance evidence-based policy feedback particularly in sub-Saharan African countries where deficits in the current account and breaks in capital flows have been persistent. The paper suggests that the government should apply the golden rule of public finances and utilize the deficits in the current account only for investment purposes and not for consumption in order to boost the growth of the econmy. Moreover, more attention should be

focused on upscaling the efficiency and effectiveness of public investments to stimulate economic growth and enhance the sustainability of the current account in Kenya. Policies to boost exchange rate against depreciation, and price stability with a view to containing inflation rates within the desired thresholds are also suggested, among others.

The third paper seeks to investigate the effect of fiscal and external deficits on economic growth and to establish the direction of causality between trade deficits and fiscal deficits on one side, as well as current account and fiscal deficits on the other. The paper aims to contribute to the policy debate by using a more complete growth model that takes into account not only the external (trade and current account) deficits, but also internal imbalances that emerge from fiscal deficits in Kenya. Two growth models are estimated whereby both consider growth of real GDP as the dependent variable. Trade deficit, growth of inflation and debt service are employed as explanatory variables in the first model where as current account deficit, real exchange rate and debt service are the explanatory variables in the second model.

The VEC model results indicate the existence of a cointegrating relationship among the variables and the twin deficits hypothesis in the period 1980 to 2016 is confirmed. A variation in economic growth has a long-run effect on external (trade and current account) deficits in Kenya whereby, the Toda and Yamamoto (1995) causality tests results indicate that economic growth propels the long-run external deficits with feedback effects, ceteris paribus.

The study further incorporates a summary on the directions of causality of the key variables in the estimated economic growth models as revealed by the Toda and Yamamoto (1995) causality tests highlighted in Figure A9 in the appendix. There is evidence that among other growth enhancing policies, the government should device a strong fiscal policy to curb the high budget deficits for external stability and long-term economic growth in Kenya, among other policy suggestions.

5.3 Conclusion

The key objectives of this study are to determine the causal nexus between budget and external deficits on economic growth in Kenya. This is achieved using the unit root and structural break tests, cointegration analysis, vector error correction model as well as Toda and Yamamoto (1995) granger-causality representation. The study has three main conclusions. First, primary budget deficit has strong causal asymmetric effects on growth of GDP per capita in Kenya, whereby in

the short-run it has positive effect but negative effect in the long-run. The Toda and Yamamoto (1995) Granger-causality results establish a unidirectional causality running from primary budget deficit to growth of GDP per capita in Kenya.

In the second paper, variation in economic growth has significant effect of affecting he current account deficit and vice versa. The estimates reveal a bidirectional causality running from current account deficit to economic growth with feedback effects.

In the last paper, the estimates suggest the existence of a cointegrating relationship among the variables. The findings establish that budget deficit granger-cause trade and current account deficits, suggesting the existence of twin-deficits hypothesis in the period 1980 to 2016 for Kenya. Based on the estimates from the three papers, overall, this thesis concludes that in Kenya, budget deficit cause interest rates to rise which in turn surge in capital inflows, and lead to currency appreciation. The appreciation of the currency implies that imports get cheaper and exports dearer further deterorating the external balances, macroeconomic stability and long-term economic growth. Consequently, the research evidence necessitates derivation of associated policy implications based on empirical findings from the three papers as highlighted in the next sub-section.

5.4 Policy Implications

In the first paper, an increase in primary budget deficit is associated with a decline in economic growth in the end. However, in the short-run the relationship reveals that primary budget deficit has positive association with growth of the economy. The Toda and Yamamoto (1995) causality results establish a unidirectional causality running from primary budget deficit to economic growth, ceteris paribus. The evidence is in line with the Keynesian theory that budget deficit crowds-in private investment through its effect on macroeconomic variables leading to positive effect on economic growth in the short-run. However, in the end, there is evidence of negative effects underscoring the need for prudence in the management of the associated macroeconomic shocks including heightened and sustained budget deficits to the economy. The key policy implications derived from the first paper are:

(i)   The Government of Kenya should promote the policies that reduce high primary budget deficit and interest payments for long-term economic growth in Kenya.

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(ii)   There is need for promotion of strategies that augument gross fixed capital formation for sustained economic growth in Kenya.

(iii)   The Government of Kenya should up-scale on policies that incentivize private sector investments for economic growth and reduce on domestic borrowings to minimize crowding-out effects on macroeconomy.

(iv)   The authorities should up-scale on the value addition of our domestic exportables and purse policies that augument on favourable terms of trade in order to boost economic growth in Kenya.

(v)   There is need for the Central Bank of Kenya to continuously purse inflation targeting strategies for price stability and growth of macroeconomy.

(vi)   The authorities should continuously up-scale on policies that promote technological innovations (like Mpesa) in order to derive sustained economic growth in Kenya.

In the second paper, the findings suggest that an increase in current account deficit is associated with an increase in economic growth in the long-run, but a decrease in short-run, ceteris paribus. There is a bidirectional causality running from economic growth to current account deficit with feedback effects. The key policy implications from the second paper are:

(i)   The authorities should up-scale fiscal discipline and strictly apply the golden rule of public finance and utilize the deficit in the current account for investment purpose (and not for consumption) in order to foster sustained economic growth in Kenya.

(ii)   The government should continue to pursue policies that augument the efficiency of public investments to drive economic growth and improve social welfare of the people.

(iii)   Adequate policies aimed at supporting the exchange rate to function as a shock absorber to the economy should be continuously promoted.

(iv)   The authorities should put in place adequate policies aimed at offsetting the negative effects of exposing the economy to external shocks.

(v)   There is need for the government to up-scale on policies that urgument value addition and enhance favourable trade for sustained economic growth.

(vi)   The Central Bank of Kenya should promote policies such as inflation targeting that maintain inflation rate at the desired thresholds.

In the third paper, two economic growth models are estimated. In the first growth model, fiscal and trade deficits have asymmetric effects on economic growth and both exhibit statistically significant relations. Specifically, fiscal deficit has positive long-run effects on growth of real GDP whereas; trade deficit has negative effect on economic growth, in the long run. Results establish a bidirectional causality running from economic growth to trade deficit and from trade deficit to economic growth in Kenya. There is also a unidirectional causality running from fiscal deficit to trade deficit, confirming the existence of twin-deficit hypothesis for Kenya in the period 1980 to 2016. In the second growth model, the estimates establish a bidirectional causality running from growth of real GDP to current account deficit with feedback effects. There is also a unidirectional causality running from fiscal deficit to current account deficit, further confirming the existence of twin-deficit hypothesis for Kenya. The key policy implications derived from the third paper are:

(i)   The Government should device a strong fiscal policy to curb fiscal deficits with a view to improving external deficits for sustained economic growth in Kenya.

(ii)   The Central Bank of Kenya sould continuously promote policies aimed at supporting the exchange rate to function as a shock absorber to the economy.

(iii)   The authorities should promote prudent debt management strategies aimed at minimizing debt service vulnerabilities to boost growth of the economy.

(iv)   There is need for up-scaled price stability to contain inflation at the desired thresholds through continued inflation targeting by the Central Bank of Kenya.

(v)   There is also need for the promotion of policies that augment sustained economic growth, increase the share of domestic savings and foreign direct investments (to GDP) in order to enhance sustainability of the current account and economic growth.

Generally, the study findings provide evidence and further reinforce the thesis in this study that curbing high budget deficits is crucial for external stability and sustained economic growth in Kenya.

5.5 Contribution of the Study to Knowledge

The study contributes to new knowledge on the policy debates on effects of budget and external deficits on economic growth. It deviates from existing studies in Kenya by incorporating not only

the primary budget deficit, the structural break tests and Toda and Yamamoto (1995) causality, but also provides an important comparison between trade deficit and fiscal deficit on one side, and the current account deficit and fiscal deficit on the other. It also applies other alternative measures of budget deficits, external deficits and economic performance in the analysis. This had not been done previously in the identified studies for Kenya.

The application of both the trade and current account deficits in quantitative macroeconomic policy analysis highlights whether the presence of direct transfers of capital and investment incomes influence the estimated relationships. This has not been considered in the past studies in Kenya. The distinction enhances the decision to fine-tune any suggested policy interventions based on evidence providing a more original and robust analysis for Kenya.

The study also takes into account the dynamism of the country's macroeconomy and considers changes induced by the 2014 rebasing of GDP in Kenya thereby yielding not only new but also robust evidence for Kenya. In the methodological contribution, the study applies relatively new estimation techniques that include the test for structural breaks, which had been ignored in the previous studies. Lastly, the study provides a deeper analysis and further attempts to appreciate the study objectives more exhaustively in terms of country specific time series variations as compared to cross-country studies, yielding very important country specific evidence from Kenya.

In terms of relevance to economic policy, the study also contributes to the ongoing debate on the causal effects of budget and external deficits on economic growth in Kenya. As a country specific case, the study provides evidence from Kenya over the period 1980 to 2016. These findings are intended to provide useful fiscal, monetary, exchange rate and balance of payments policy insights that can be employed to re-orient public policy adjustment measures for macroeconomic stability and long-term inclusive growth in Kenya. The study also contributes to the existing knowledge on the causal interdependencies between primary budget deficit and economic growth, external deficits and economic growth and between fiscal deficit and economic growth, for shared prosperity in the country.

The study therefore contributes further to the existing scanty research database particularly for developing countries on both policy and academic perspectives. Most of the past studies explore only the relationship between fiscal, current account deficits and growth of real GDP ignoring the

trade, primary deficits and growth of GDP per capita. This study goes further to bridge these identified research gaps, among several others in the analysis. This indeed enriches this dissertation in terms of theory, methodolody, originality and puplic policy analysis.

5.6 Limitations of the Study

The main limitation is scarcity of data on some explanatory variables. Some of the data sets are not available for the analysis. For instance, data on financial innovations in the country and specifically M-Pesa volumes data dates back to 2007 (when M-Pesa was introduced in Kenya) and hence the reason for the use of a dummy variable in the first paper. Secondly, data on real effective exchange rate for Kenya is also not available. The study also could not capture financial openness due to scarcity of data. Equally, high frequency (quarterly) data is not available for a comparative analysis. By and large, from the analysis and based on the derived results of this thesis, the evidence provided is reliable as it is believed that the data used in the analysis certainly provided credible and verifiable findings that yielded valid policy responses in line with the broad study objectives.

5.7 Areas for Further Research

There is need to consider determination of threshold effects of budget and external deficits on economic growth in Kenya. Research on how innovations affect not just sustainability of economic growth but also employment creation and other macroeconomic and structural variables is also important. This is possible with availability of actual data. In addition, further research is suggested on the nexus between budget deficit on one side and international transfers and incomes of international investments on the other, since this literature is lacking. Moreover, with availability of high frequency (quarterly) data, it would be important to confirm the robustness of different measures of macroeconomic stability inrelation to economic growth in advancing economies. Other checks would include robustness to different estimation techniques and rationalization of the evidence of this thesis by application of dynamic stochastic general equilibrium framework of analysis for individual economies in sub-Saharan Africa.

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Table A1: Trends in Kenya's Macroeconomic Variables (1980-2016)

Variables	1980-1984	1985-1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Growth of Real GDP (annual % Δ)	3.6	5.5	4.1	1.3	-1.1	-0.1	2.5	4.3	4.1	0.4	3.0	2.2	0.3	4.0	0.5
Growth of GDP Per Capita (annual % Δ)	-1.0	2.0	0.766	-1.82	-3.92	-2.73	-0.44	1.360	1.182	-2.32	0.46	-0.47	-2.12	0.983	-2.16
Primay Budget Deficit (% of GDP)	0.9	-0.1	0.165	4.261	4.414	2.733	-1.72	-4.47	-3.08	-1.85	-2.04	-2.84	-2.43	-0.91	0.271
Fiscal Deficit (% of GDP)	4.4	3.6	4.771	8.152	10.62	11.48	5.544	0.486	0.959	1.551	0.591	-0.29	-0.81	1.669	2.176
Trade Deficit (% of GDP)	4.4	5.3	5.636	1.514	0.410	-4.95	-2.81	6.562	6.911	8.684	8.559	6.527	10.13	10.08	5.377
Current Account Deficit (% of GDP)	5.6	4.3	6.149	2.617	2.195	4.553	6.280	17.45	7.979	13.65	18.68	18.34	1.569	2.466	0.895
Gross Fixed Capital Formation (% of GDP)	18.2	19.3	20.65	19.03	16.58	16.94	18.87	21.39	16.01	15.39	15.68	15.59	16.71	18.15	17.24
Real Interest Rate (%)	2.5	6.6	7.333	5.746	1.825	3.413	16.43	15.80	-5.78	16.88	21.10	17.45	15.33	17.81	17.36
Growth of Terms of Trade (annual % Δ)	-3.5	0.8	-0.3	8.649	-8.57	-0.34	-12.9	-2.65	0.847	-4.77	4.419	1.086	-4.57	1.441	-4.89
Inflation Rate (annual % Δ)	13.6	10.0	17.78	20.08	27.33	45.98	28.81	1.554	8.864	12.10	5.612	4.984	7.77	5.824	2.156
Exchange Rate (Kshs per USD)	11.0	17.5	22.91	27.51	32.23	58.00	56.05	51.43	57.11	58.73	60.37	70.33	76.18	78.56	78.75
Trade Openness (% of GDP)	60.2	52.4	57.02	55.60	52.93	72.86	71.27	71.75	57.31	54.06	48.90	48.19	53.31	55.95	55.17
Debt Service (% of Exports & Primary Income)	29.4	37.9	35.41	32.61	31.14	17.06	20.56	25.26	22.39	15.56	14.85	15.83	21.02	15.88	16.35
Terms of Trade (Annual %)	126.8	117.1	117.8	117.5	127.6	116.7	116.3	101.3	98.62	99.48	94.74	98.93	100	95.43	96.8
Variables			**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Growth of Real GDP (annual % Δ)			2.9	4.6	5.7	5.9	6.9	0.2	3.3	8.4	6.1	4.6	5.9	5.4	5.7	5.8
Growth of GDP Per Capita (annual % Δ)			0.167	2.275	3.047	3.588	3.950	-2.49	0.512	5.485	3.273	1.785	3.092	2.611	3.001	3.172
Primay Budget Deficit (% of GDP)			-0.33	-1.46	-0.32	0.368	0.788	1.75	2.673	2.514	2.209	2.884	3.297	4.787	5.28	5.247
Fiscal Deficit (% of GDP)			3.554	0.916	-0.034	3.143	0.775	3.36	3.378	5.84	4.087	4.545	5.432	5.897	8.66	7.987
Trade Deficit (% of GDP)			5.959	6.256	7.461	9.267	10.06	12.23	10.80	12.91	17.20	13.31	13.28	14.70	11.03	8.809
Current Account Deficit (% of GDP)			-0.89	0.819	1.347	1.976	3.229	5.523	4.561	5.922	9.104	8.363	8.788	10.38	6.701	5.217
Gross Fixed Capital Formation (% of GDP)			15.84	16.26	18.7	19.42	19.96	18.86	18.51	20.32	20.39	21.15	20.57	22.88	21.73	17.28
Real Interest Rate (%)			9.771	5.045	7.610	-8.01	4.819	-0.99	2.837	12.03	3.841	9.457	11.55	7.816	5.896	7.899
Growth of Terms of Trade (annual % Δ)			-5.05	-3.97	1.665	6.929	-8.79	20.13	0.739	-4.65	0.935	-2.38	-3.63	3.241	-1.65	-1.80
Inflation Rate (annual % Δ)			5.983	8.381	7.823	6.041	4.265	15.10	10.55	4.309	14.02	9.378	5.717	6.878	6.582	6.318
Exchange Rate (Kshs per USD)			75.94	79.17	75.55	72.10	67.32	69.18	77.35	79.23	88.81	84.53	86.12	87.92	98.18	101.5
Trade Openness (% of GDP)			54.13	59.48	64.48	55.24	53.89	57.58	50.86	54.23	60.45	57.77	53.13	51.30	44.21	36.75
Debt Service (% of Exports & Primary Income)			15.84	8.282	9.984	7.128	6.324	4.880	5.136	4.401	4.319	5.257	5.911	11.07	8.792	10.62
Terms of Trade (Annual %)			92.07	87.43	83.96	85.35	91.27	83.24	100	100.7	96.05	96.95	94.64	91.2	94.16	92.61

Source: *Author's Compilation from World Development Indicators (2017) and International Monetary Fund (2018)*
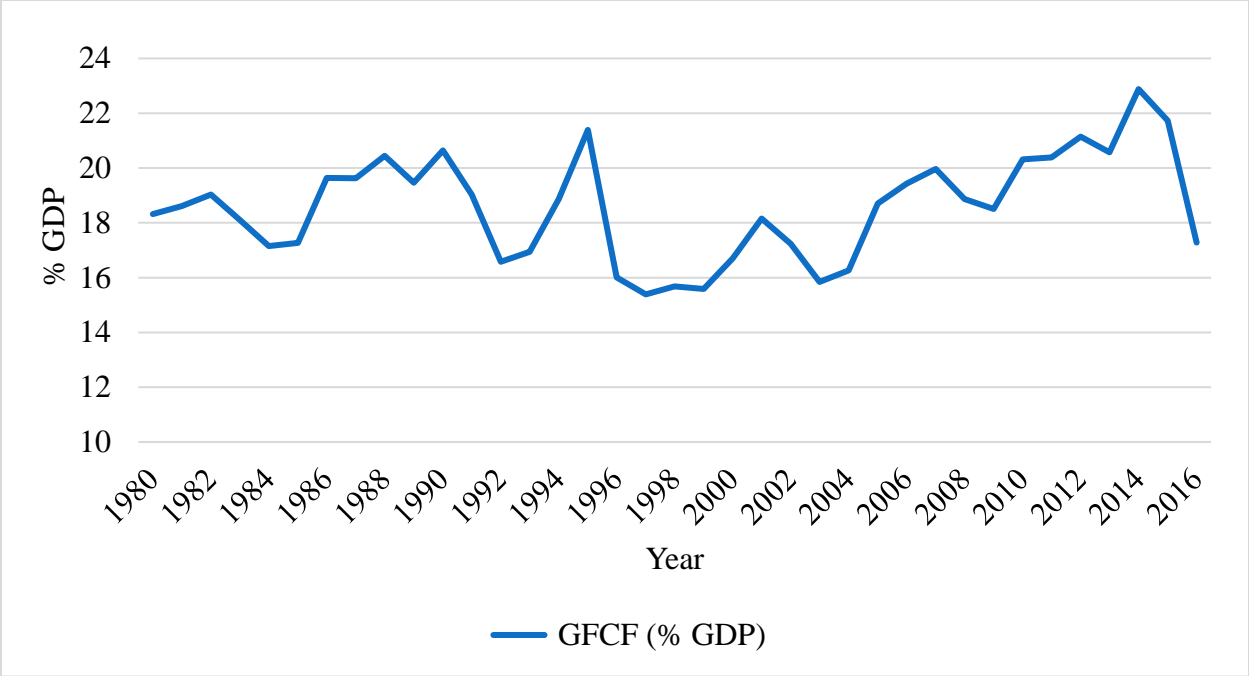
Figure A1: Gross Fixed Capital Formation (annual % of GDP)
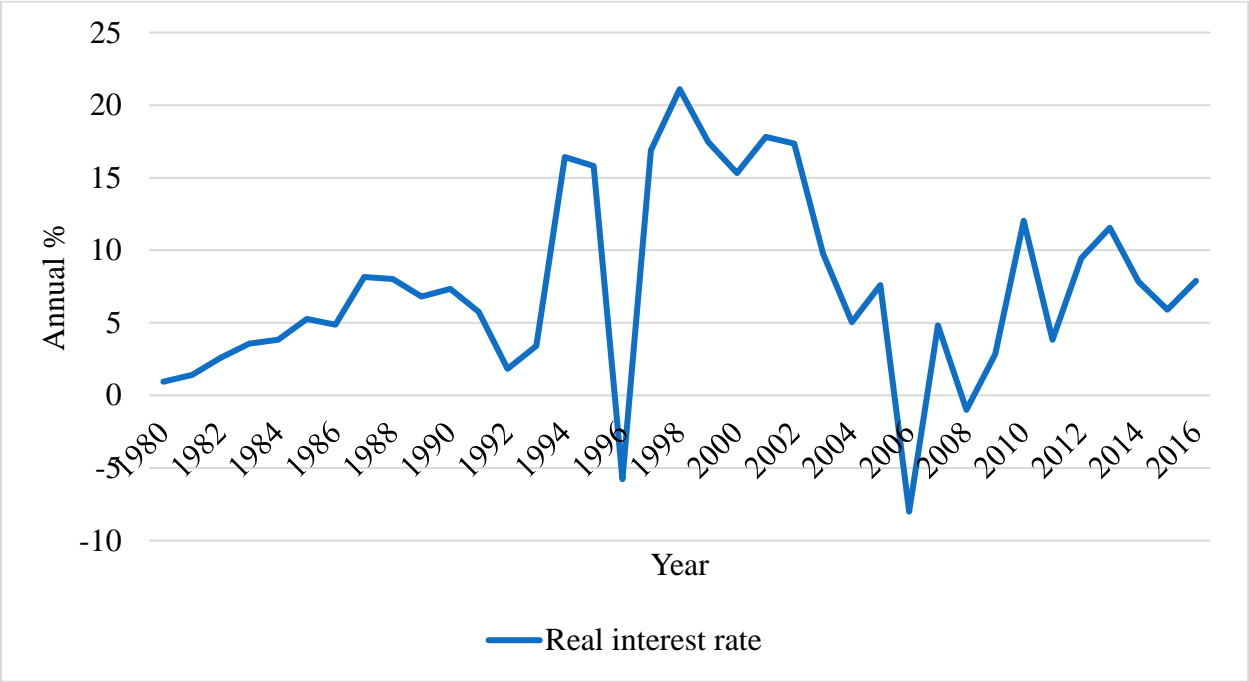*Source: Done by the Author*

Figure A2: Real Interest Rate (annual %)
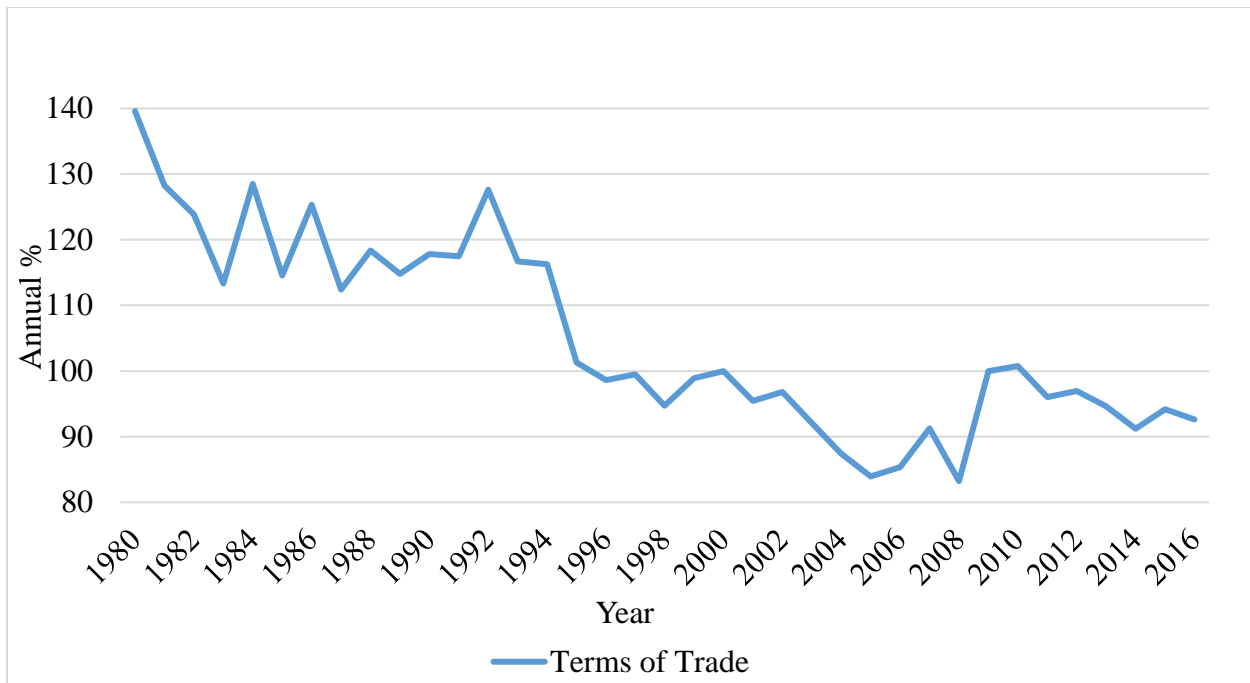*Source: Done by the Author*

Figure A3: Terms of Trade (annual %)
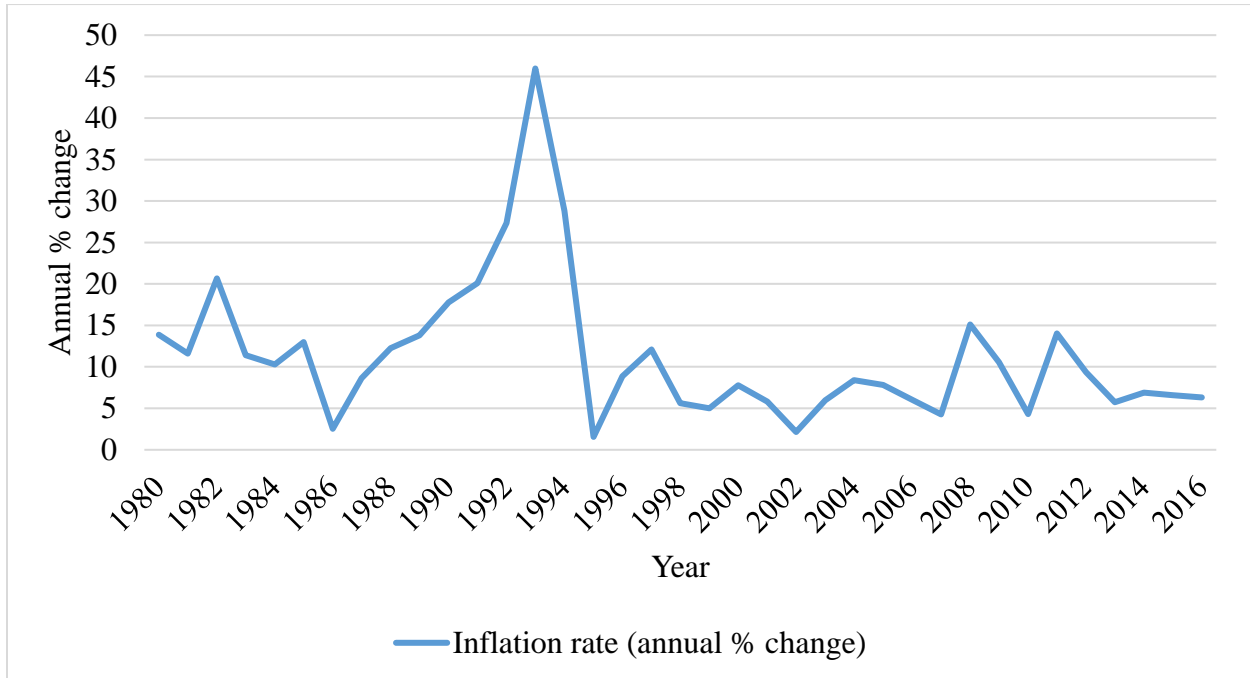*Source: Done by the Author*

Figure A4: Inflation Growth Rate (annual % change)
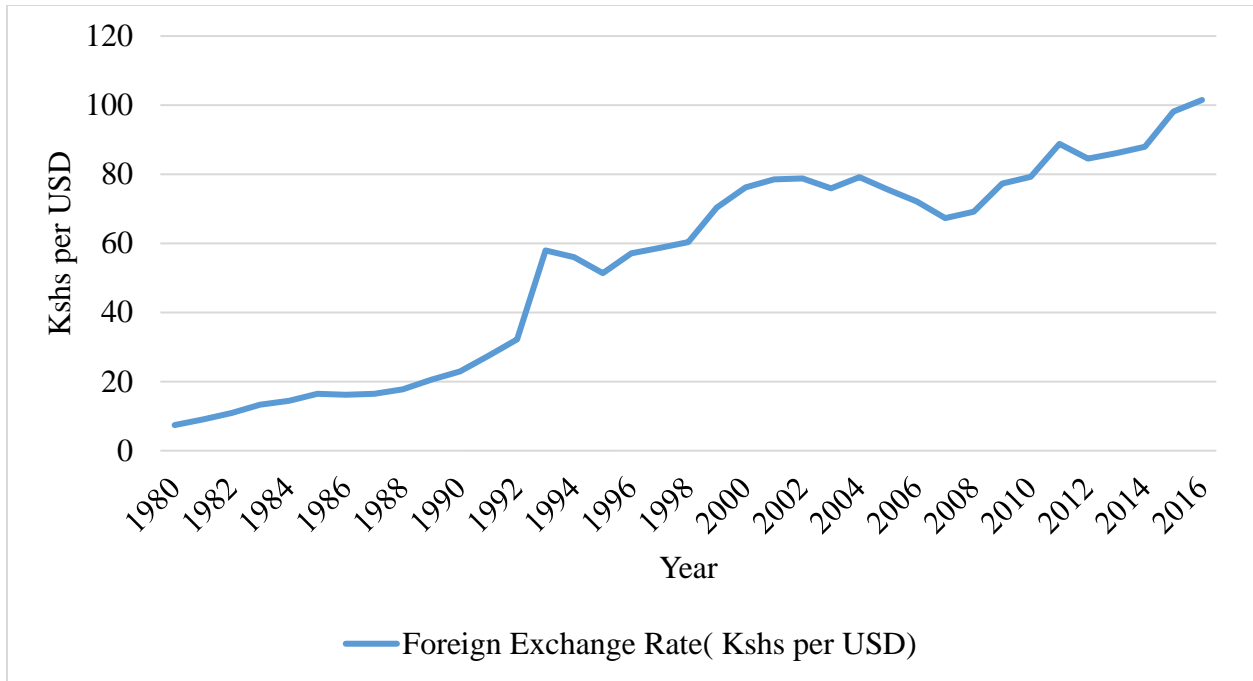 *Source: Done by the Author*

Figure A5: Foreign Exchange Rate (Kshs per US Dollar)
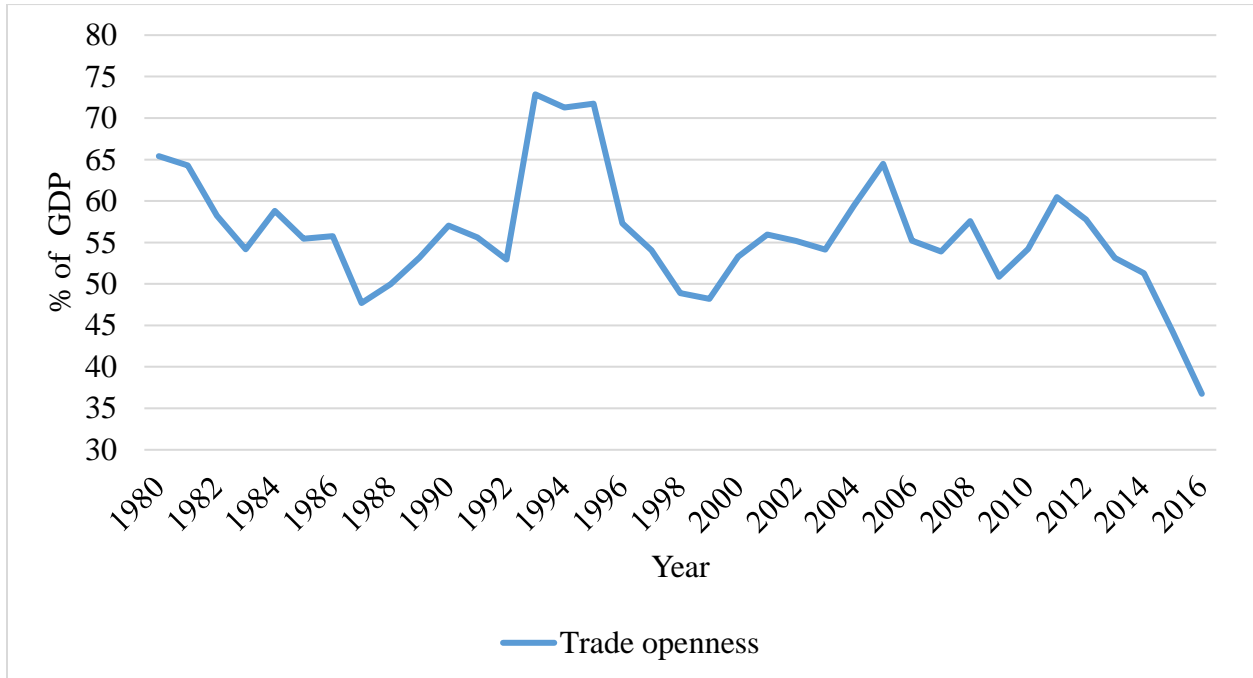*Source: Done by the Author*

Figure A6: Trade Openness (annual % of GDP)
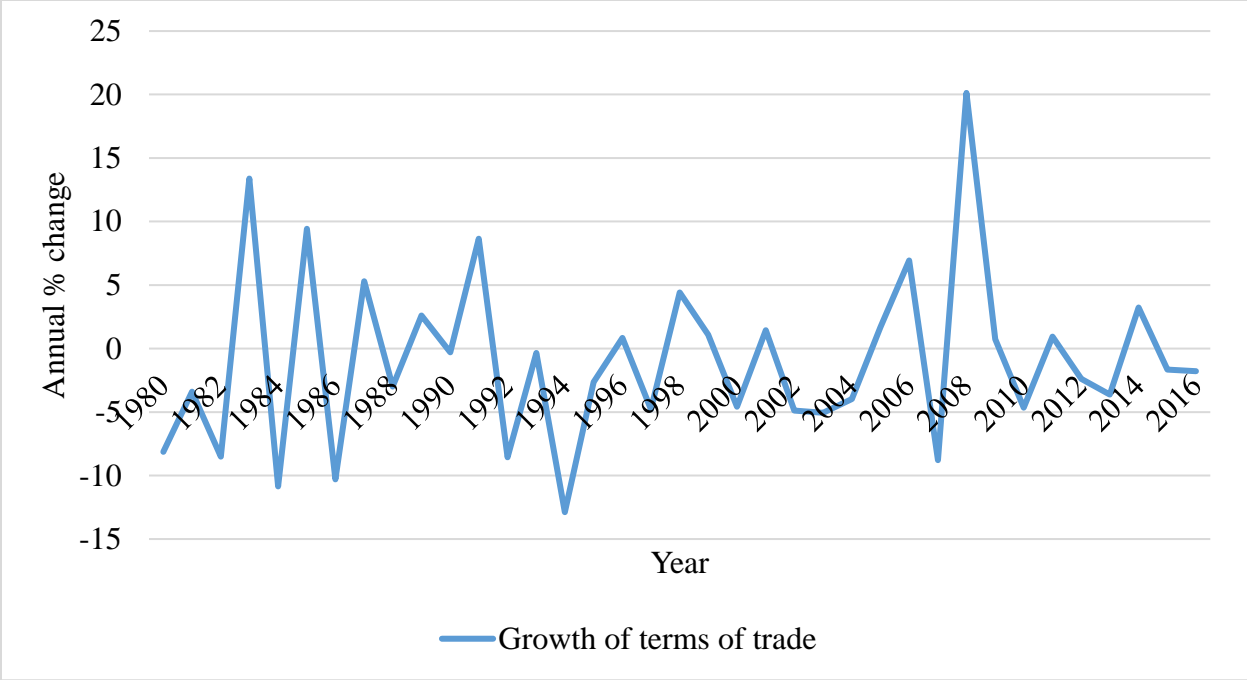*Source: Done by the Author*

Figure A7: Growth of Terms of Trade (annual % change)
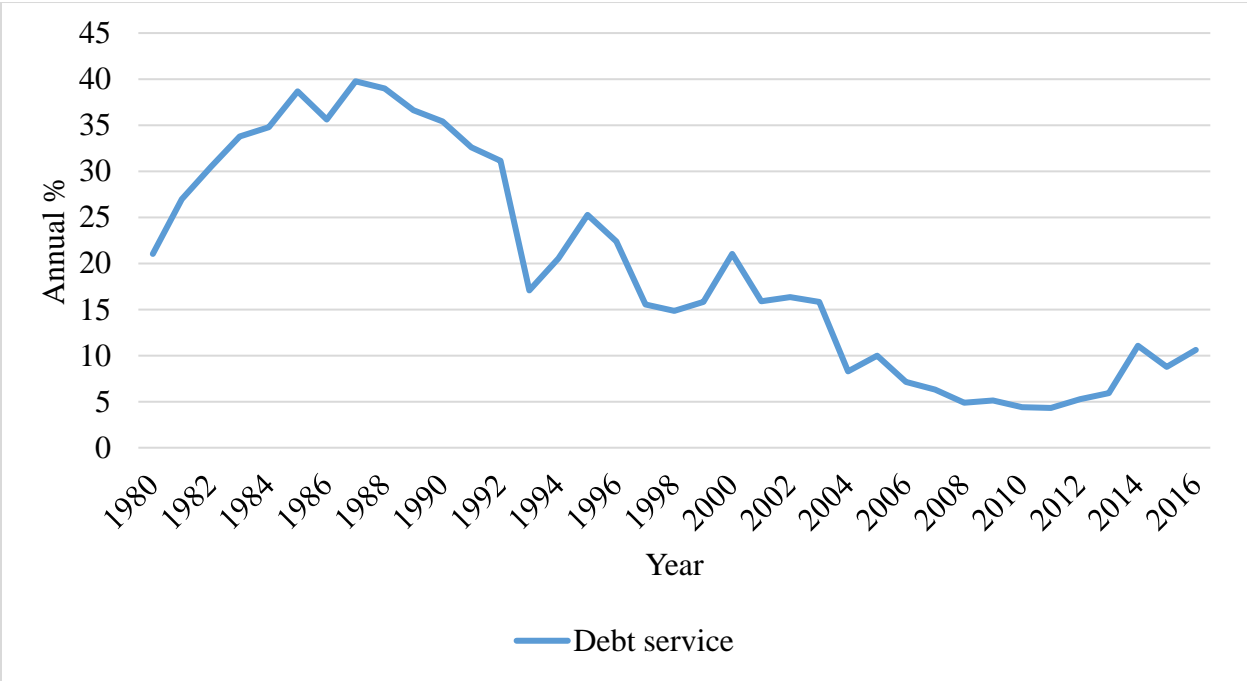*Source: Done by the Author*

Figure A8: Debt Service (annual % of exports and primary income)
Source: Done by the Author

Table A2: Lag Selection Criteria

| Lag selection-order criteria:				Sample: 1984-2016, Number of Observations = 33				
Growth of Real GDP								
Lag	LL	LR	Df	P	FPE	AIC	HQIC	SBIC
0	-75.2305				5.94276	4.62003	4.63529	4.66538
1	-71.0316	8.3979*	1	0.004	4.89605*	4.42616*	4.45667*	4.51685*
2	-70.7979	0.46734	1	0.494	5.13063	4.4726	4.51838	4.60865
3	-70.5775	0.44075	1	0.507	5.3826	4.58089	5.58089	4.70125
4	-70.4153	0.32446	1	0.569	5.66949	4.64692	4.64692	4.79737
Fiscal Deficit								
Lag	LL	LR	Df	P	FPE	AIC	HQIC	SBIC
0	-83.0078				9.52124	5.09138	5.10664	5.13673
1	-69.1749	27.666*	1	0.000	4.37498	4.31363	4.34415	4.40433*
2	-67.7367	2.8765	1	0.090	4.26182*	4.33285*	4.33285*	4.42312
3	-67.5901	0.29306	1	0.588	4.49118	4.39983	4.39983	4.52019
4	-67.2621	0.656	1	0.418	4.68327	4.45581	4.45581	4.60627
Trade Deficit								
Lag	LL	LR	Df	P	FPE	AIC	HQIC	SBIC
0	-97.5072				22.9261	5.97014	5.98539	6.01548
1	-79.5145	35.986*	1	0.000	8.18697*	4.94027*	4.97079*	5.03097*
2	-79.2837	0.46166	1	0.497	8.58069	4.98689	5.03266	5.12293
3	79.1529	0.2616	1	0.609	9.05111	5.03957	5.1006	5.22096
4	-78.3278	1.6501	1	0.199	9.15816	5.05017	5.12646	5.27691
Debt Service								
Lag	LL	LR	Df	P	FPE	AIC	HQIC	SBIC
0	-128.628				151.167	7.85624	7.8715	7.90159
1	-90.7768	75.703*	1	0.000	16.2015*	5.62283*	5.65335*	5.71353*
2	-90.5555	0.44249	1	0.506	16.9905	5.67003	5.71581	5.80608
3	-90.5223	0.06636	1	0.797	18.0284	5.72863	5.78966	5.91002
4	-90.3788	0.28702	1	0.592	19.0108	5.78053	5.85683	6.00728
Inflation								
Lag	LL	LR	Df	P	FPE	AIC	HQIC	SBIC
0	-118.715				82.8976	7.25546	7.27072	7.30081
1	-111.617	14.197*	1	0.000	57.2901	6.88586	6.91637	6.97655*
2	-110.883	1.4677	1	0.226	58.2423	6.90199	6.94776	7.03803
3	-109.231	3.3035	1	0.069	56.0255	6.86249	6.92352	7.04388
4	-107.415	3.6312	1	0.057	53.385*	6.81306*	6.88935*	7.0398
Current Account Deficit								
Lag	LL	LR	Df	P	FPE	AIC	HQIC	SBIC
0	-99.8623				26.4434	6.11287	6.12812	6.15821
1	-92.3879	14.949*	1	0.000	17.8633*	5.72048*	5.751*	5.81118*
2	-92.3862	0.00346	1	0.953	18.9842	5.78098	5.82676	5.91703
3	-92.2954	0.18146	1	0.670	20.0737	5.83609	5.89712	6.01748
4	-91.8383	0.91435	1	0.339	20.769	5.86899	5.94528	6.09573
Real Exchange Rate								
Lag	LL	LR	Df	P	FPE	AIC	HQIC	SBIC
0	-155.123				753.08	9.46203	9.47729	9.50738
1	-103.923	102.4*	1	0.000	35.9404*	6.41959*	6.45011*	6.51029*
2	-103.905	0.0364	1	0.849	38.1574	6.47909	6.52487	6.61514
3	-103.821	0.16824	1	0.682	40.3634	6.5346	6.59564	6.716
	* Indicates lag order selected by the criterion							
Source: Author's Computations								
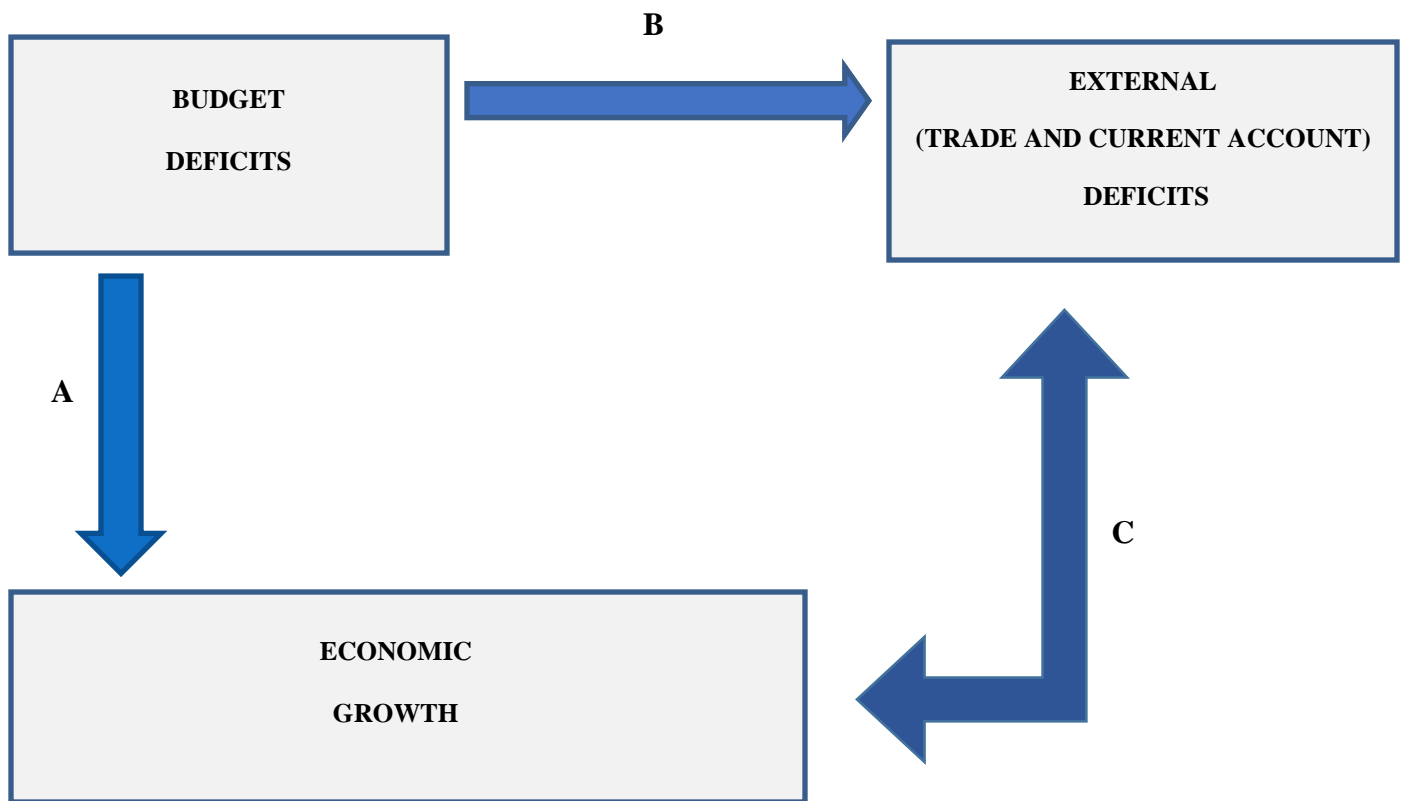
Figure A9: Summary of the Estabished Direction of Flow of Key Variables.

Source: *Author's Compilations*