THE EFFECTS OF CURRENT ACCOUNT DEFICIT ON ECONOMIC GROWTH IN KENYA

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DECLARATION

This research paper is my original work, which has not been undertaken elsewhere in any university for the award of a degree.

Sign…….. Date……

Peter Lomulen

APPROVAL

This research paper has been submitted for examination with my approval as the university supervisor.

Sign:…….. Date:……

Dr. Kennedy Osoro.

DEDICATION

This thesis is dedicated to my family for constant love and unwavering support

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LIST OF ACRONYMS AND ABBREVIATIONS

BOP: Balance of Payments

CAB: Current Account Balance

CAD: Current Account Deficit(s)

COMESA: Common Market of Eastern and Central Africa

EAC: East African Community

ECM: Error Correction Model

EU: European Union

FDI: Foreign Direct Investment

GDP: Gross Domestic Product

IMF: International Monetary Fund

IS: Import Substitution Strategy

Md: Money Demand

ML: Marshal-Lerner conditions

Ms: Money Supply

REER: Real Effective Exchange Rate

WB: World Bank

UNCTAD: United Nations Conference on Trade and Development

WTO: World Trade Organization

ABSTRACT

The study explored effects of current account deficit on growth in Kenya by using series data between1975 and 2018. The long run effects between variables were investigated using co-integration test and the results confirmed such effects. The Vector Error Correction Model was applied which depicted that both current account deficit and growth were positively affected by fixed capital formation at one percent level of significance Short term connection showed foreign direct investment and fiscal balance positively impacted economic growth at ten and five percent levels of significance. Granger causality results failed to establish direct causality between the deficit and growth and vice versa. Key study recommendations included prescription of appropriate trade, monetary and fiscal policies which promote increased exports, depreciation of domestic exchange rate against foreign ones and fiscal consolidation.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

Current account deficits (CADS) and macroeconomic effects are not only of national concern but remain a global and regional phenomenon (Blanchard, and Ferretti, 2014). Policy makers use current account position often as one of the key symptoms of future economic behavior and performance (Calderon et al. 2000). Current account remains balance of payments major component as well as broadest indicator of the net international capital flows. Persistent current account deficit is characteristic to economic distortions, that could be corrected with exchange rate depreciation and / or competitiveness improvement in production, or can lead to potentially painful adjustment problems over time, or lead to potential systemic problems later on.

Although the link between growth and current account balance has been discussed for a long time, their empirical connection has often presented mixed results; some empirical analysis have proved the link to be weak, or have lacked evidence about the role of current account deficits (CAD) in economic growth and development, while strong and significant in some cases (Coskun, 2010).

Why should current account deficit be of our concern, does it matter for Kenyan? Under balanced growth, current account is assumed balanced so that domestic investment equal national saving. However, in reality this is a rare scenario, because many countries experience gaps in their production and capital flows leading to the gaps between saving and investment. Some countries produce more, export more and save more while majority of them experience huge gaps between absorption and national output resulting to high imports. Countries which import more commodities than they export experience current account deficits and assume debtor status in terms of the rest of the world, while the one with surplus becomes the lender.

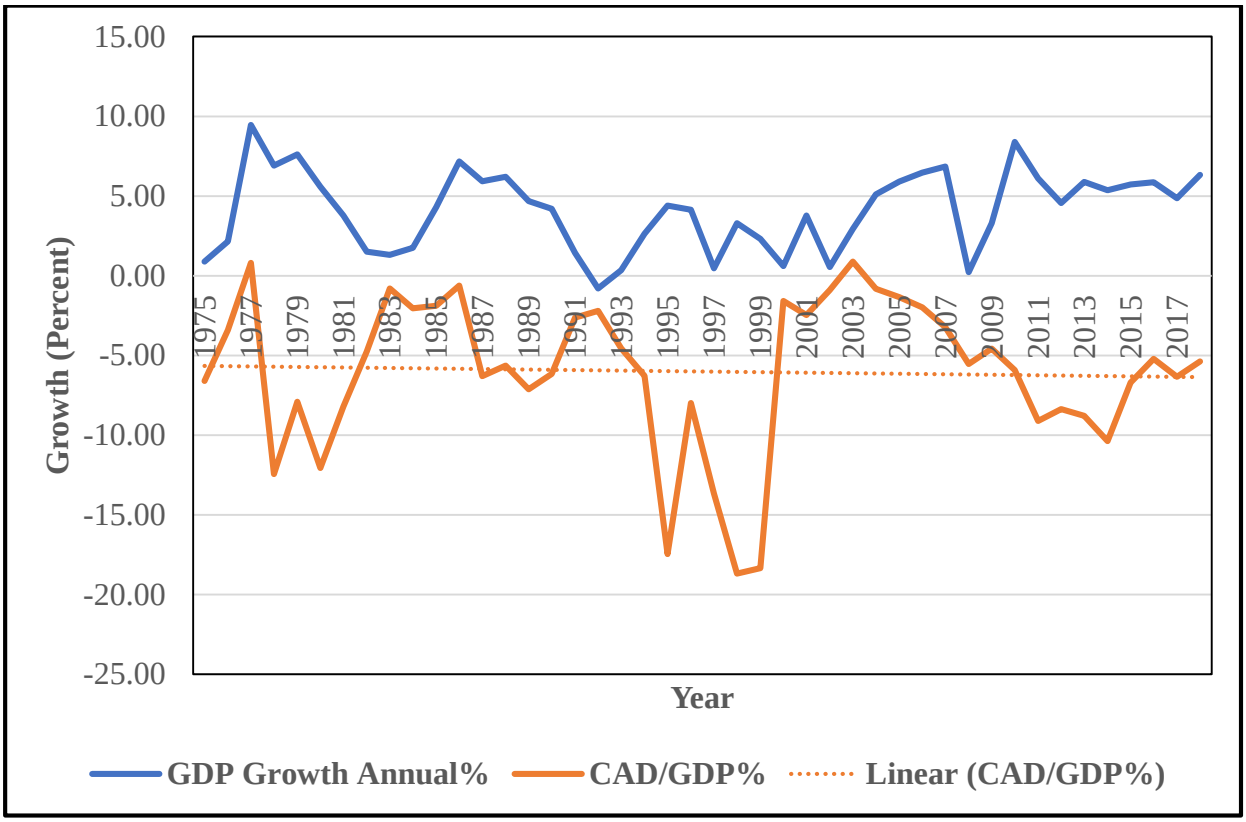
Current account deficits and their effects are endemic in many developing countries presenting structural deficits, mainly due to the insufficiency of export earnings to ensure the coverage of goods and services. Kenya fits the bill on this account.

1.1. Kenya Current Account Performance

Performance of the current account over the research period can be elaborated as summarized by Osoro, K. (2013) among others, and in the light of the recent medium term plans (MTPS). There was notable deterioration of the current account during the first MTP, 2008/12 period recording Ksh 136,851 Million (-6.4%) in 2008 and Ksh 359,463 (-8.4%) in 2012. However, there was notable improvement during the second MTP, 2013/17, which reflected an upward trend posting the highest rate in of Ksh 518.93 Billion (-6.34%) in 2017 compared to Ksh 375.3 Billion (-8.8%) recorded in 2013. It is worth noting that neither did the trend change because growth slowed as a result of adverse multiple shocks experienced in the period under review like post-election crisis, drought, global financial crisis (GFC), volatility in world oil and sluggish world economic activity.

Indeed, sluggish performance of trade sector is explained by poor performance in the export sector, which is associated with low levels in foreign trade volumes and export prices, and even overall directions of trade among multilateral and bilateral trading partners. In addition, the fiscal deficit expanded because government expenditure exceeded total revenue, during the sample period. The fiscal deficit widened from 6.2 percent in 2013/14 to 8.3 percent in 2014/15. Generally, the fiscal position continued to worsen especially due to increased investment in infrastructural projects.

Figure 1: Current Account Balance & GDP Annual Growth Rates (1975-2018



Source: Author (2019), WDI Data.

Figure 1.0 shows that during the sample period, Kenya attained astronomical economic growth in two phases 1977-1990 and 2007-2016, registering the highest real GDP of 9.5 percent in 1977, 7.2 percent in 1990 and 7% in 2007. The lowest point of growth was registered at 3.8 percent in 1981 and 4.9 percent in 2017. Between 1991-2000 it registered the poorest economic growth performance posting 4.4 percent in 1995 as the highest and a paltry -0.8 percent the lowest in 1992. In the subsequent years, the economy has remained robust in the last decade between 2013 and 2018, growing at an average 5.5 percent between 2013 and 2017, and 4.7 percent per year in the period 2008-2012. This scenario reflects the fact that upward trends of CADs are associated with linked to high economic performance while declining trends indicate poor performance.

1.2. Problem Statement

Kenya continuous to witness perpetual external macroeconomic imbalance in most of the period under review, characterized by a high current account and which poses risks. The current account deficit has been driven mainly by two major factors; fiscal deficit and low net exports.

Effects of current deficits differ between positive and negative ones. Positively, the current account deficits lead to foreign capital inflow and overall increase of aggregate demand for private consumption and investment, and even leading to transfer of technology and innovation into the national economy. On the contrary, large current account imbalances have born negative economic and financial distortions in the national economy, sometimes leading to potentially painful adjustment problems over time, or potential systemic problems later on. Specifically, it weakens export competitiveness, causes a currency crisis, increases external debt and reduces international reserves. In fact, significant CADs raise the risk of an abrupt cut in the flow of capital into an economy (current account reversals), which accelerate debt accumulation (Blanchard et al. 2011). The current account reversals are quite distortionary to economic and financial stability. Similarly, they are linked to key growth determinants and may also affect fiscal consolidation efforts. In addition, a rising current account deficits result to overheating of an economy and ultimately, drive to exchange rate regime change or tight macroeconomic policies.

Kenya has continued to operate a high current account deficit characterized by low level of exports and expanding imports of capital equipment and machines, which are financed by colossal amounts of foreign debts currently estimated to be standing at Kenya Shillings 5.4 Trillion. The main drivers of the import growth were machinery; motor vehicles, petroleum products; steel, iron; cooking oils; and sugar.

1.4 Study Research Questions

i. What would be the effects of current account deficit on economic growth in Kenya?
ii. What would the path of causality between current account deficit and economic growth?
iii. What policy options should be recommended?

1.5. Study Objectives

1.5.1 General Objective

Overall aim of this research was to trace current account deficit effects on Kenya;s economic growth.

1.5.2 Specific Objectives

Specific objectives of study were to:

i. Find out effects of the current account deficit on economic growth
ii. Determine direction of causality between current account deficit and economic growth
iii. Suggest relevant policy recommendations

1.6.Justification for the Study

Persistent CADS pose both economic and financial instability to both industrialized and developing countries like Kenya. The study is expected to benefit various groups in the society. First, it will inform the financial actors and other stakeholders to understand negative effects associated with persistent CADS. Causes of current account deficits are well researched and interrogated internationally and even nationally in Kenya, but research related to the connection between CADS and growth per se are limited.

The study will close the existing literature gap on how CADs affect economic growth, since few if any studies have attempted to measure sustainability of the CADs in Kenya. This calls for efforts to further understand the role that, during boom/bust periods or recession, optimal saving and investing decisions may play for the current account dynamics and external stability in Kenya.

Last but not least, the study will analyze the CAD-growth nexus using growth rate to measure effect of the shock on national economic performance, and is expected to generate debate in regard to sustainability of current deficit.

1.7.Scope of the Study

The choice period between 1975 and 2018 was motivated by various reasons. First, the duration was long enough to determine the dynamics between current account and growth. Furthermore, data covering this period is available.

The paper has five chapters. The first contains the introduction, while second one outlines theoretical foundations and empirical literature. Followed by three wat presents the data and empirical methodology to estimate the relationship between repressors and the dependent variable. Chapter four then follows, which discusses research results. Finally, chapter five highlights future research opportunities, empirical findings, conclusions and appropriate recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

There are two sections in this part. The first one consists of theoretical literature regarding CAD and balance of payments (BOPs), while the second section presents a synthesis of past empirical studies related to the effects of current account deficit.

2.2 Theoretical literature Review

The review is based on four models widely accepted and used in analyzing current account movements: Absorption, monetary, elasticity and Inter-temporal optimization (ICA) model approaches These models highlight the channels through which the drivers of current account dynamics affect the BOP position specifically, and economic growth in general. It is noted that current account determination theories on their own are limited in capturing the effects of CADS are therefore linked to economic growth theories and policies.

2.2.1 Monetary Approach and Current Account Deficit

According to Harry, J. (1976) revolutionary model, "a BOP deficit is always and everywhere a monetary phenomenon" and investment is given priority. The monetary approach is basically founded on money demand and supply. It posits that BOP overall balance is determined by the transmission mechanism between money demand and supply such that if monetary supply is faster than its demand, such a country has an excess money supply and vice versa. In such a case, equilibrium in the money market will be stored by channeling surplus monies to increase consumption of both foreign and domestic commodities.

The implication is emergence of money demand and supply as critical determinants of balance of payments, as they adjust. The BOP equilibrium is achieved when there is equilibrium in the money market. Therefore, any discrepancies can only be corrected through monetary measures.

2.2.2 Inter-temporal Approach and Current Account Deficit

This is a microeconomics-based approach. It is considered an outcome of the inter-temporal choices made by households, firms and governments (Sachs, 1981)) based on the saving-investment inter-temporal nature. According to Edwards, 2001: "the macroeconomic factors that determine and affect saving and investment end up influencing the current account balance".

The inter-temporal theory consists of some critical assumptions which include, consumer rationale, perfect information and seamless capital mobility. Consequently, lending and borrowing are expected to be optimal, so that production and consumption choices are made and executed at different points in time.

This theory expresses current account to be acting as a shock absorber for temporary shocks, which enables economic agents to undertake consumption smoothing, because both saving and investment are affected by prevalent productivity shocks. Therefore it follows that response of external accounts to productivity shocks is related to depends different strength of the saving and investment effects.

2.2.3 The Elasticities Approach and Current Account Deficit

This approach emphasizes value of greater openness in foreign trade, which is expected to drive economic growth and promote development (Tsegaye, D., 2015, Anderson and Babulla,2008).

According to this approach, foreign trade affects economic growth directly through imports and exports of consumer and capital commodities leading to the dynamics in the balance of payments (BOPs). These changes can be examined based on export and import elasticities and exchange rate effect on BOP adjustment to currency devaluation. The Marshall-Lerner condition describes how the trade balance and currency depreciation improve the current account. Consequently, import and export elasticities determine the adjustment process of the BOPS toward equilibrium.

All countries strive to transition into an export-driven economy and trade liberalization. Chang and Grabel, (2004) identify some of the major benefits of openness that include competition,

comparative advantage, efficient allocation of resources, higher foreign Direct Investment (FDI) flow and positive externalities.

2.2.4 Absorption Approach and Current Account Deficit

Surplus difference between domestic expenditure over available production determines current account balance. It is normally presented in terms of national income accounting identities in eq. 2.1.

$C + I + G + X – M = Y$ ……2.1

In this case, Y is aggregate income, C represents private consumption, private investment is I and G is government spending, exports are represented by X and the imports by M.

Given equation 2.1, C + I + G which is domestic demand is technically represent as A, and symbolically represented as follows

$C + I + G = A$ ……2.2

Eq. 2,2 is presented so that by definition

$X - M = CA$ ……2.3

Substituting eq. 2.2 in 2.1, it can be seen that

$X - M = Y - A = CA$ ……2.4

According to the identity Y is national production and A is domestic demand (consumption and investment), while CA is the gap between production and demand. In this case, expenditure regulatory policies are used to improve balance of payments. Expenditure switching policies aim to increase national output and while restricting the rise in domestic demand e.g. devaluation and tariffs. On the other hand, expenditure reducing policies reduce domestic demand and restrict output not to fall below existing level.

2.2.5 Portfolio Approach

According to this approach, the interaction of the money market, the capital market and commodity market determines current account and exchange rate position. Stability of the three markets is established by equilibrium in the money market.

In the short run, dynamics in capital market determine exchange rate volatility. According to this view, the relationship between monetary supply and demand determines exchange rate. Economic agents are assumed to be rational and forward looking.

2.2.6 Economic Growth and Current Account

By definition, growth refers to an increase in production i.e. a continuous process by which productivity of an economy is augmented in order to increase national output and income (Enu et al., 2013). Given a production function, output growth is determined by the rate at which various factors of production are accumulated and how fast technical progress is adopted. Furthermore, accumulation of the factors of production depends on other variables like demand, political, social and demographic factors. Economic growth and current account deficits respond to dynamics of one another differently. High economic growth in the sovereign county worsens the CAD and vice versa.

Economists have applied three major categories of economic models to explain the cause and the differences in growth that exist among world economies. Namely, neoclassical growth (NCGM), new endogenous growth models (NGM) and the augmented neoclassical growth model (ANCGM). These models differ in terms of assumptions and explanatory variables subsequently building upon the weakness of one another. First, the neoclassical conventional model (NCGM). These long-run equilibrium growth models were mainly based on availability of exogenous variables like population and technology, and not on endogenous factors (Barro, R. & Sala-i-Martin, X. 1995). These models were characterized by diminishing returns to factor inputs and constant returns to scale

Second, the NGM based on demand-determined growth equilibrium pioneered by Romer (1986), Lucas and Svensson, (1988), led to improved growth models that incorporated an expanded range of factors to explain long run growth rate. Specifically**,** technologies, capital accumulation, government policies like in education and health were identified as major variables to promote productivity. They proposed that innovation and imitation, driven by international trade and globalization to be considered in the model. Consequently, a variety of

research was conducted to investigate association between international trade, technological advancement and growth.

Finally, Mankiw, Romer and Weil (MRW, 1992) argued endogenous models were not reliable in explaining growth differences among nations. They proposed augmented Solow growth model, in which they challenged the assumption of diminishing factor productivity in the NCGM, and incorporated human capital to the model besides physical capital. They presented the assertion that considering transitional dynamics during steady state, the production function could exhibit increasing factor productivity and explain the different growth rates across countries. They show that the equilibrium income per capita is directly related to an augmented variable, which is closely linked to the level at which human capital is accumulated ceteris paribus.

2.3 Empirical Literature

This section reviews previous studies related to the study.

Özer, M.et al. (2018) investigated current account deficit association with Montenegro growth, between 2011 and 2016 period. He used ARDL bounds co-integration test. Results showed two major findings: First, the variables of interest were bound together. Second, there was bi-directional association between the two variables of interest.

Honsou, R. (2017) undertook comprehensive empirical study between 1990 and 2015, purposely compared the impact of economic and financial variables and the nature of deficit between Franc zone and some non-Franc zone countries in southern Sahara. Using panel data models, the results revealed the two zones were not different from each other in terms of both behavior and competitiveness. It emerged that gross domestic saving had similar effect in both zones. Finally, the change in the terms of trade better explained current account deficit variance among countries in Franc zone. Those countries in the non-Franc Zone were majorly impacted by net foreign transfers besides the savings.

Musisinyani B. et al. (2017) utilized data from 1980-2013, used the OLS estimation technique to examine effect of deficit in Zimbabwe. The econometric results obtained indicated positive association between the target elements, and control variables applied to mitigate a deficit like external aid, foreign debt and investment were positively linked to the economy's performance.

In another study Guschanski, A. and Stockhammer, E. (2017) undertook a comparative analysis of current account imbalances emanating from trade flows and financial flows, due to variance in literature that tends to view the two factors separately. They Used a reduced model for 28 OECD countries between 1971-2014. The results indicated that cost competitiveness and asset prices play a role in the determination of external balance. Consequently, they proposed a simplified model that gives equal emphasis to trade flows, determined by price competitiveness, and financial flows, determined by asset prices.

Aydın, C. and Esen, Ö. (2016) investigated the existence of threshold effects on current account deficits in Turkey between 1999 (Q2) and 2014 (Q2). They used threshold autoregressive (TAR) models, and found evidence of threshold effects, which was four percent. Which meant that any ratio above this threshold negatively impacted economic growth while that below the threshold value had positive effects. Similar studies were conducted in Turkey. First Yurdakul, F. and Ucar, B., (2015) deployed Granger causality and VAR analyses using quarterly data between 1999 (Q1) and 2014 (Q2). Unidirectional connection was established between current deficit and growth. Second, Kostakoglu and Dibo (2011) also applied the same methodology, and obtained reverse causality results. These studies imply bidirectional causality between growth and current account imbalances.

Rossitsa, R. (2014) examined the effect of current-account imbalances on growth during the 2008-2009 global financial crisis. A sample of 179 countries covered by IMF data and 27 countries within the European Union (EU) was selected, and divided into four lots, which included low-income, lower middle-income, upper middle-income and high-income by GDP per capita. He used descriptive statistics and regression for estimation. In terms of data, average GDP growth rates for the duration before he crisis (2003–2007) and 2008 and 2009, current

account GDP ratio and average inflation levels. The results showed high- and upper middle-income countries were more affected than the poorer ones. Similarly, among the EU-27 sample, crisis seemed to have affected lower income compared to higher income countries.

Belke, A.and Dreger, C.(2011) analyzed current account dynamics in European region in terms of catching up and competitiveness. Using panel econometric techniques, they found out that countries with low income were characterized by deficits while those considered rich tended to experience surpluses, which corresponds to inter-temporal theory. Some studies (Debelle and Faruqee, 1996 and Calderon et al. 2000) showed that fast growing countries indicated high prevalence of current account deficits, and that there was reverse and significant causality between rise in GDP growth rate and decline in current deficit GDP ratio.

2.4 Summary of Literature

The literature shows different opinions widely held on empirical findings. Most of the studies focused on the determination, financing and or sustainability. Specific implications from the critical review of literature revealed observations that follow.

First, the four approaches to the BOPs and determinants of current account balances reviewed bear respective weaknesses. The elasticities approach has the weakness of considering partial-equilibrium analysis (trade only), instead of general equilibrium analysis, which looks at all markets. ICA model basically assumes that all economic agents are rational and have perfect information, which may be unrealistic. Hence, this assumption is unrealistic because often, people and or even the government is not rational in decision – making.

Second, the literature suggests that the internal and external factors that influence an economy's current account balance vary across time and regions. A full account of such factors requires a detailed country analysis, which may not be economically feasible. In fact, a wide range of research were undertaken among states mostly experiencing trade deficits such as; European Monetary Union, Malaysia, U.S, most of which are high income compared to Kenya.

Third, empirical work shows that different studies have employed diverse econometric methods and estimation techniques, which have sometimes resulted to inconsistencies and contradictory results. It is observed that most of studies tend towards VAR and VEC models approach.

Finally, there appears to be a consensus on the part of many researchers that the variables under consideration (fiscal balance, fixed capital formation, real exchange rate and money supply influence growth and are transmitted through the deficits.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

Theoretical analysis based on inter-temporal approach applied on augmented Cobb-Douglas production function, while empirical analysis will be based on association and correlation of the dependent variable and the repressors. We shall be more concerned with the correctness of the signs than actual precision of the estimates.

3.2 Theoretical Framework

The inter-temporal (ICA) approach is preferred in this case because of its merits over other current account approaches. First, it is centered on dynamic saving-investment decisions by forward-looking representative agents. Second, it has been argued (Nieminen, M. 2017) that it is dynamic and rich in theoretical analysis. For example, the model acknowledges private saving-investment decisions among others. Third, the model accounts for price-effects on saving and investment, thereby emerging as a product of elasticities and absorption models.

Many authors have commended the model foundation on the national accounting identity as a strong basis for open-economy policy analysis (Genberg and Swoboda, 1992, and Obstfeld and Rogoff, 1994). Essentially, saving-investment level and output growth are useful in explaining a country's status. Current account balance is obtained from domestic saving minus investment as shown in equation 3.1.

CAB = S - I ……(3.1)

Where, CAB=Current Account Balance S=saving; I=Investments. Savings and investment are inter-temporal as indicated in equation 3.2.

$CA\ (REER, Y\ WO, XCA) = S\ (NFA, Y, r, XS) - I(Y, r, XI\ )$ ……(3.2)

where:

S is domestic saving; I equal domestic investment; · CA stands for current account; NFA is the initial net position of foreign assets; · r represents real interest rate; Y equal domestic output gap and $Y\ WO$ represents world output gap; XS stands for saving factors, XI stands for investment factors, $REER$ is real effective exchange rate while XCA represents world terms of trade (TOT)

We then adopt Inter-temporal Current Account approaches by Drissi and Ghassan (2015) aa pioneered by (Obstfeld and Rogoff, 1994). Real output growth is expressed as an identity in equation 3.3.

Y= C (yd, r) + I (r)+ G + [EX(ry*)- r IM (ry)] ……(3.3)

where m= L (y, r), r= r* and that yd =yt. The first three components represent absorption or domestic demand which can be denoted as A. The last component represents current account which can be denoted as CA. Equation 3.4 can thus be represented as:

Y=A+CA ……... (3.4)

Finally, theoretical model is expressed as follows

Y = f (CAD, GFCF, TOT, FB, FDI, REER, MS) ……. ….(3.5)

Where Y is economic growth that is a function of current account deficit (CAD/GDP) ratio and gross fixed capital formation (GFCF.). Control variables included terms of trade (TOT), foreign direct investment (FDI), real effective exchange rate (REER), fiscal balance (BD) and money supply (MS).

3.3 Empirical Model

The effect of current account shock on aggregate output is captured using augmented production function widely applied (Mercado and Cicowiez, 2013, Acemoglu, 2011& Mankiw, Awokuse 2008, 2007, Romer and Weil, 1992)).

$\boldsymbol{Y_t = AF(K_t), N_t}$ **……**…….(3.6)

This production function has the following properties.

(a) increasing in both arguments (:FK > 0, FN > 0)

(b) decreasing marginal returns to physical and human capital (FKK < 0, FNN < 0)

(c) increasing returns to scale (AF (λK, λN) = AF^{λ} (K, N))

(d) and satisfies the Inada condition

These properties fit the Augmented Cobb-Douglas production (Solow-Swan. 1956). The model contains the key variables of economic growth as explained in eq. (3.7)

$Y_t = A_t K_t^{\alpha} N_t^{1-\alpha}$ ……(3.7)

where Y(t) represents total output of country at time *t*;

A stands for total factor productivity - consists business organization and efficiency, how factors of production are utilized.

N represents human capital,

K stands for physical capital stock,

α and 1−α represented capital and labor output elasticities. The model is then linearized in eq. 3.8.

$GDP_{growtht} = B_0 + (B1\ CAD)\ /\ GDP_{growtht} + B_2X_t + U_t$……..(3.8)

Where GDP_{growth} is GDP growth rate, $^{CAD}/_{GDP}$ current account deficit to GDP, X_t represents control variables and U_t is error term.

To capture effect of capital and its productivity equation (3.8) is extended to include private capital formation as follows.

$GDP_t = B_0 + B_1\ CAD/GDP + B_2GFCF_t + B_3X_t + U_t$……(3.9)

Where $GFCF_t$, indicates private capital formation-GDP ratio as at *t* time, indicator of physical capital (proxy of technological innovation in the augmented Cobb-Douglas production function). Control variables are included in equation 3.10 as defined in eq. 3.5 previously.

$GDP_t = B_0 + B_1\ ^{CAD}/_{GDP} + B_2\ ^{GFCF}/_{GDP} + B_3\text{TO}T_t + B_4\ ^{FDI}/_{GDP} + B_5\ ^{FB}/_{GDP} + B_6\text{REER} +$

$B_7\ ^{MS}/_{GDP} + U_t$……(3.10)

Where, t a proxy of time, and $\boldsymbol{B_1 \ldots B_7}$ are coefficients that are to be estimated. Other variables remain as defined in equations 3.8 and 3.9.

3.4 Description of Variables

The variables of interest are highlighted as follows.

Table 1: Research Variables

Key Variable	Denotation	Variable Description	Measurement (Units)	Expected Direction	Data Source
Economic growth rate	GDP	Annual growth rate of real gross domestic product	Percentage	Dependent Variable	IMF (2013)
Current account deficit	CAD/GDP	The target explanatory variable.	Percentage of GDP.	Negative (-)	IMF (2013)
Gross fixed capital formation	GFCF	Annual growth rate of private dross domestic fixed capital formation	Percentage of real GDP.	Negative (-)	IMF (2013)
Terms of trade	TOT	Ration of export unit price index and import unit price index	Index	Positive (Favourable) (+)	IMF (2013)
Foreign direct investment	FDI	Investment by foreign firms locally. It may affect CAB positively or negatively depending on time lag		Positive (+)	IMF (2018)
Fiscal Deficit	FD/GDP	fiscal balance measured in national currency. Accounts for Ricardian Equivalence and/or Twin Deficit hypothesis.	Percentage of GDP	Positive (+)	Ciocyte o & Rojas-Romagosa (2015)
Real exchange rate	REER	The price level of one currency in terms another	Kenya shilling per US dollar	Positive (+)	Ciocyte o & Rojas-Romagosa (2015)
Money supply	MS	Broad money in the national economy	Percentage of GDP	Positive (+)	IMF (2013)

Source: Author 2019

3.5 Estimation Techniques

Vector autoregressive (VAR) models which explicitly take into account the concept of co-integration structure of the variables were considered, as developed by Granger (1981), Engle & Granger (1987), Johansen (1995) and employed by LÄutkepohl (2005) among others. As a

result, co-integration test was carried out on the variables, to establish if long run equilibrium exists between the variables purposely to decide whether VECM or ARDL model was appropriate for estimation.

Co-integration was investigated using ARDL bounds test. As a result, a VECM was selected as the appropriate estimation technique. This decision is consistent with some of the advantages of a VECM over other VAR models. First it is a dynamic model that allows variables of interest to interact among themselves and with it as well. Second, it occurs as a convenient method of investigating the impact of a given variable on itself as well as all others (Lahor Osasohan, 2014).

We adopt a generalized reduced form of Vector Error Correction Model in equation 3.11:

$\Delta Y_t = A_1 + A_2 ec_{t-1} + A_3 \Delta Y_{t-1} + A_4 \Delta X_{t-1} + \varepsilon_t$ .....(3.11)

Where Yi: (Y1t, Y2t…Ynt) represents endogenous variables while Yt is the lag term for order I, as Ai stands for Autoregressive coefficients

ec_{t-1}: Error correction term

(ΔX): Represent exogenous variables

εt: A vector white noise process

Equation 3.11 is then applied to the study as in equation 3.12.

$\Delta GDP_{growtht} = B_0 + B_1 \Delta \, {CAD}/{GDPt - 1} + \gamma ECM_{t.1} + U_t$ ..... (3.12)

where *t* is the year, *d* captures first difference computation, ECM*it* contains errors of long-term equilibrium. When $\lambda = 0$, hypothesis is rejected and ECM exists, and establish long-run causality is dependable, or otherwise undependable. When $\beta 1 = 0$ is again rejected, and it means short-term relationship does not exist.

3.6 Pre-estimation Tests

A number of diagnostic tests were used to ensure that properties of the data were not violated in the process of estimation.

3.6.1 Testing for Stationarity

presence of stationarity was verified using the Augmented Dickey Fuller (ADF) test, which has an advantage over other methods because it maintains validity of the test by ensuring that the error terms are white noise. The ADF test equation is given by equation 3.12.

$$\Delta Yt = \alpha + \beta t + \rho Yt - 1 + \sum_{i=1}^{m} \text{б}i\Delta Yt - 1 + \mu t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3.12)$$

where; α- constant term, m-maximum number of lags specified, β_t– the trend, and μ_t-error term

3.6.2 Co-integration Test

The Bounds test discovered by pesaran et al. (2001) was used to investigate for co-integration. In this case factors were found to be mutually integrated and co-integrated of order one. Prior to carrying out co-integration test, lag selection criterion was carried out.

3.6.3 Serial Correlation Test

The joint hypothesis that there was no autocorrelation in the residuals was investigated using Breusch-Godfrey test for serial correlation. A small p-value indicates that there is significant autocorrelation remaining in the residuals.

3.6.4 Multi-Collinearity Test

Variance Inflation Factor (VIF) was used to test for linear correlation in the model. Because it is an econometric issue of concern, especially in small samples.

3.6.5 Heteroscedasticity Test

Under OLS assumptions, the variance of the errors across the variables is constant i.e. homoscedastic. The study opted to use the Breusch-Pagan-Godfrey rest for heteroscedasticity.

Accordingly, decision rule is that all residual diagnostic tests are satisfactory and assert that the model is acceptable and well treated, hence the estimation model is stable and statistically sound.

3.6.6 Normality Test

The test is used to verify distribution of the data using Jarque Bera test.

3.6.7 The Model Stability Test

Model stability was verified using CUSUM test.

3.7 Data Type and Source

The relationship has been estimated for the period 1975- 2018. All the data sources are of secondary type. The Secondary Data was collected through publications of the Government of Kenya (GOK) statistical abstracts and Economic Surveys, and IMF and the WB website, journals, magazines books and newspapers.

CHAPTER FOUR
DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

Descriptive statistics, inferential statistics and explanation of the results.

4.2 Summary of Descriptive statistics

Summary of statistics using means and standard deviations have been summarized in table 2 as follows.

Table 2: Summary Statistics

Variable(s)	1. N	2. Mean	3. Sd. deviation	4. Minimum	5. Maximum
Economic growth	43	4.103	2.486	-0.799	9.454
Current account deficit	43	-6.011	4.800	-18.68	0.888
Money supply	43	35.00	4.720	26.68	43.25
Foreign direct investment	43	0.790	0.793	0.00472	3.457
Gross capital formation	43	18.83	2.068	15.39	25.08
Exchange rate	43	51.31	33.14	7.343	103.4
Terms of trade	43	87.41	12.97	68	122
Fiscal balance	43	-2.912	3.837	-11.42	7.570

Author (2019)

The average GDP growth rate for the periods 1975 and 2018 was 4.103% with a standard deviation of 2.486%. Kenya registered highest economic growth of 9.45% and worst economic performance of negative 0.799% for the periods under study. Lumps in economic performance were attributed to external shocks in oil prices, poor climate conditions, and unpredictable political environments. On the average, CAD to GDP ratio stood at -6.011 with a standard deviation of 4.800A maximum of broad money was recorded at 43.25% with minimum at 26.68%. Domestic saving as a percentage of GDP averaged 12.88% with a standard deviation of 6.795%.

The average foreign direct investment and the standard deviation between 1975 and 2018 were 0.790% and 0.793% of GDP respectively. The mean and standard deviation for gross fixed capital formation were 18.83% and 2.068% respectively. Terms of trade index averaged 87.41 percent while the standard deviation was estimated as 12.97 percent. Kenya exchange rate, on the average, between 1975 and 2018 stood at 51.31 with a standard deviation of 33.14. The mean for Fiscal balance was estimated at -2.912 percent and a standard deviation of 3.83 percent.

4.3 Stationarity Test

The study utilized Augmented Dickey Fuller test to determine unit root prevalence among individual variables. Procedure is necessary for time series analysis to mitigate spurious regression and to identify appropriate econometric technique. The decision rule for ADF test is based on t-statistic such a that a variable is considered stationary whenever the t-calculated value is smaller than the t-critical statistic.

Table 3: Augmented Dickey-Fuller (ADF) Unit Root Test Results

Variable	Levels			Order of Differencing	Difference			
	t-statistic	p-statistic	Remark		t-statistic	p-statistic	Lag	Remark
GDP	-3.842	0.0025	Stationary	0	-3.842	0.0025	1	Stationary
CAD	-3.592	0.0059	Non-stationary	1	-8.279	0.0000	0	Stationary
M3	-2.074	0.2552	Non-stationary	1	-6.872	0.0000	0	Stationary
FDI	-4.624	0.0001	Stationary	0	-4.624	0.0001	1	Stationary
GFCF	-3.376	0.0118	Non-stationary	1	-7.212	0.0000	0	Stationary
REER	-0.244	0.9330	Non-stationary	1	-5.972	0.0000	0	Stationary
TOT	-2.635	0.0860	Non-stationary	1	-8.666	0.0000	0	Stationary
FB	-2.017	0.2793	Non-stationary	1	-6.062	0.0000	1	Stationary

Author (2019)

According to table 3 economic growth, current account deficit, foreign direct investment and fixed capital formation are all stationary at levels. But others like real exchange rate and money supply were initially not stationary. All none stationary variables were differenced once to ensure they assumed stationarity.

4.4 Lag Selection Criterion

Prior to carrying out co-integration test, maximum lag length was determined. The study used the Akaike Information Criterion (AIC) in determining optimal lag-length. Output is summarized in table 4 as follows.

Table 4: Lag-length Selection Criterion

Variable	lag	Criterion
GDP	1	AIC
CAD	0	AIC
M3	0	AIC
FDI	1	AIC
GFCF	0	AIC
REER	0	AIC
TOT	0	AIC
FB	1	AIC

Author (2019)

The optimal lag length was determined as 1, as per Akaike Information Criterion (AIC). Consequently, we proceeded to carry out the co-integration test.

4.5 Autoregressive Distributed Lag Model

Co-integration was investigated using ARDL Bounds test. Decision rule is that if the F-statistic is found to be greater than the lower bound critical values, then the null hypothesis of none co-integration was rejected. This implies along run connection in the model An ECM model is therefore fitted, and the findings illustrated in table 5.

Table 5: ARDL Long Run Bounds Test Results

		H0: No Co=integration			
	Test Statistic	**Value**	**Significance level**	**I (0) Lower bound**	**I (1) Upper bound**
	F-statistic	**3.567**	**1%**	**2.96**	**4.26**
			5%	2.32	3.5
			10%	2.03	3.13

Author (2019)

Since the F-statistic was found to be greater than the lower bound critical values, then the null hypothesis of no co-integration was rejected, which implied appropriateness of estimating ECM model.

VECM Estimation model results

Upon carrying out the stationarity test and lag selection criterion, it was established that the VECM approach was more relevant for analysis. The results for VECM estimates wee summarized in table 6 as follows.

Table 6: Vector Error Correction Model Estimates

GDP			
Variables	**ADJ**	**Long Run (LR)**	**Short Run (SR)**
L.GDP	-0.573***		
	(0.149)		
CADGDP		0.163	
		(0.134)	
M3		-0.128	
		(0.222)	
FDI		-1.060	
		(1.073)	
GFCF		1.103***	
		(0.344)	
REER		0.0613	
		(0.0405)	
TOT		0.0766	
		(0.0713)	
FB		0.171	
		(0.157)	
D.FDI			0.766*
			(0.422)
D.FB			0.360**
			(0.143)

Constant			-11.15**
			(5.453)
Observations	43	43	43
R Squared	0.619	0.619	0.619

Standard errors: *** p<0.01, ** p<0.05, * p<0.1

Author (2019)

Table 6 specifies the model of the study follows:

$$GDP_t = --11.15 + 0.163\,{CAD}/{GDP} + 1.103\,{GFCF}/{GDP} + 0.077TOT_t - 1.060\,{FDI}/{GDP} + 0.171\,{FB}/{GDP} + 0.0613REER - 0.128\,{MS}/{GDP} - 0.573ECT \quad \ldots\ldots(3.14)$$

Equation 3.14 represents an error correction model regression results. It can be seen that coefficient of the Error Correction-term is negative and statistically significant at 1 percent level (-0.573/0.001). This means there is along run relationship between current account deficit, gross fixed capital formation, terms of trade, foreign direct investment, fiscal balance, the exchange rate, money supply and economic growth rate. In fact, although majority of the variables show insignificant results, gross fixed factor formation the proxy for investment means that one percent rise in GFCF would result to 110.3 percent rise in long term growth ceteris paribus. However, current account deficit, gross fixed capital formation, terms of trade, foreign direct investment, real exchange rate and money supply were positive and insignificant as per short term effects. But foreign direct investment and fiscal balance had positive and significant effect on economic growth at 10 percent and 5 percent levels respectively. Holding other factors constant, a unit increase in foreign direct investment would lead to 77.6 percentage increase in economic growth while increase while a unit change in fiscal balance will result to 36 percentage increase economic growth in the short term.

Most importantly, error correction-term in the model has a convergence speed to equilibrium of 57.3 percent. Therefore, in the short-run whenever the actual value of economic growth varies from the long run equilibrium position, there will be a rapid adjustment in the current account and other predictor variables by 57.3 percent will restore economic growth to its equilibrium, ceteris paribus. In addition, the model has R-squared of 0.619 and an Adjusted R-squared of 0.500. This implies that current account deficit, gross fixed capital formation, terms of trade, foreign direct investment, fiscal balance, exchange rate and money supply explain 50.0 percent of the variations in economic growth.

In terms of discussion of the results, the coefficient of current account deficit is positive although statistically insignificant. This is consistent with the results obtained by Aydın Celil and Esen Ömer (2016) where a current account deficit of 4% had positive effect on economic growth, but contradicts studies by Özer Mustafa et al. (2018) and (Calderon, Chong, and Loazya, 2000).

The coefficient of capital formation (GFCF) was positive and statistically significant in the long term. Hence was found consistent with studies related to investment and productivity (Enu et al., 2013) but is contradictory to Ifeyinwa et al (2017), which found the impact of capital formation to be positive but insignificant. This finding has economic policy implications in terms of physical capital accumulation and financing of private investments. The estimated coefficients of terms of trade (TOT) was positive and insignificant, which confirms previous studies (Adeleye T. 2015., Wai San et al. 2019) indicating the positive association between trade and growth.

The coefficients of foreign direct investment (FDI) is positive and significant. Specifically, the finding on foreign direct investment aligns well with that carried out by Ansari Mohammed (2004) where foreign capital was confirmed to cause strong efficiency impact on national investment. This implies that foreign direct investment would be effective in boosting growth in Kenya.

The coefficient for fiscal balance was found to be positive and significant with short run relationship, which was consistent with a number of studies (Kosimbei George, 2009, Umut

Umar study (2011) among others. This finding means that the more government runs a balanced budget, the more economic activity is expected to accelerate. It implies that fiscal policy is an important component in terms of taxation, government spending and financing of budget deficits.

The estimated coefficients for real effective exchange rate and money supply are positive and negative respectively, although both are statistically insignificant. Specifically, the finding on exchange rate was found to be consistent with other studies (Usman et al. 2009., Loganathan et al. 2012). While findings on money supply are inconsistent with the Olubunkola et al. (2013) in which case monetary policy had positive effect on all the variables except exchange rate that was negative.

In conclusion the empirical results obtained have adequately addressed the aims of the study. First, long term and short term connection between current deficit and growth was established. Second, bounds test proclaimed long run effects between growth and the predictor factors. Because GFCF and fiscal balance bear significant influence on growth, we can conclude that investment level and the level of government spending directly affect economic activity in Kenya, which directly affect output and employment. Again, the second objective concerning direction of causality was satisfied.

4.7 Post-Estimation Tests

4.7.1 Normality Test of the Residuals:

Test on residuals was conducted using Jarque Bera test, where results were summarized as table 7 follows. Accordingly, the data series was found to be normally distributed. Hence, we failed to reject the null hypothesis based upon value of chi square (0.6095) that led to accepted probability as depicted in table 7 as follows.

Table 7: Jarque Bera Test Results

Chi-square	**Prob. at**(**5**%)
0.6095	0.05

Author (2019

4.7.2 Serial Autocorrelation Test

The Breusch-Godfrey test was used to test joint hypothesis that there is no serial autocorrelation in the residuals. The small p-value indicated there was no significant autocorrelation remaining in the residuals as shown in table 8 as follows.

Table 8: Breusch-Godfrey Autocorrelation Test Results

Chi-square	**Prob. at**(5%)
2.104	0.1469

Author (2019)

The LM test for autocorrelation was conducted., and the outcome shown in table 8 reveal the value of chi square (2.104) lead to excepted probability which was below the critical value. Therefore, we did not reject the null hypothesis that there was none serial correlation in the model.

4.7.3 Multi-collinearity Test

4.7.3.1 Pair-wise Correlation Matrix

Table 9: Pair-wise Correlation Matrix

Variable	**CADGDP**	**M3**	**FDI**	**GFCF**	**EXCH**	**TOT**	**FB**
CADGDP	1						
M3	-0.2422	1					
FDI	-0.1117	0.3284	1				
GFCF	-0.1111	0.0575	0.2565	1			
REER	-0.0574	0.829	0.2636	-0.1798	1		
TOT	-0.2033	-0.3617	-0.1094	-0.0139	-0.6152	1	
FB	-0.1561	-0.3035	-0.1561	0.0718	-0.4257	0.5122	1

Author (2019)

4.7.3.2 Variance Inflation Factor

After carrying out variable correlation test between the variables a more formal test of Variance information factor (VIF) was carried out. The result indicated VIF mean value of 3.10 which is

less than the maximum threshold of 10, which meant that there was no multi-collinearity in the model.

Table 10: Variance Inflation Factor Results

Variable(s)	VIF.	1/VIF.
REER	7.1	0.141
M3	4.75	0.210
FB	4.05	0.247
L1.	3.98	0.251
TOT	3.17	0.316
GFCF	2.02	0.496
GDP L1.	1.83	0.547
FDI L1	1.46	0.683
CADGDP	1.38	0.726
FDI	1.3	0.767851
Mean VIF	3.1	

Author (2019)

4.7.4 Heteroskedasticity

The Breusch-Pagan/Cook rest for heteroscedasticity was carried out and the findings are as illustrated in table 11.

Table 11: Breusch-Pagan/Cook Test for Heteroskedasticity

Chi-square	**Prob. at**(**5**%)
0.02	0.8801

Author (2019)

Results shown in table 11 confirm value of probability chi square (0.8801) lead to higher than the critical value. We fail to reject the null hypothesis that there was no heteroskedasticity in the model.

4.7.5 Stability Test

CUSUM was carried out as illustrated in appendix figure 3, to test stability of the long run parameters. plot test results show it to lie within the critical bounds at 5% level of significance. Thus, we conclude that long run model coefficients are structurally stable.

In conclusion according to the decision rules of post estimation tests, all residual diagnostic tests are satisfactory and assert that the model is acceptable and well treated, hence the estimation model is stable and statistically sound.

4.8 Granger causality test

In order to establish direction of causality between current account and growth, the Granger-Causality test that was undertaken showed findings summarized in table 12 as follows.

Table: 12: Granger Causality Test

Equation	chi2	df	Prob >chi2
H0: Lagged values of GDP does not granger cause CADGDP	5.66	2	0.059
H1: Lagged values of all variables granger cause CADGDP	5.66	2	0.059
H0: Lagged values of CADGDP does not granger cause GDP	3.11	2	0.212
H1: Lagged values of all variables granger cause GDP	3.11	14	0.212

Author (2019)

The results in table 12 show that the P-values in both equations one and two are greater than the critical value (5%), Thus, we fail to reject both null hypothesis, hence none granger causality was not found between current deficit and growth, which implied that current account does not granger-cause economic growth and vice versa.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND POLICY RECOMMENDATIONS

5.1 introduction

Research summary, conclusions, recommendations and limitations are addressed in this part. ‘

5.2Summary

The overall objective of this paper was to capture effects current account deficit growth in Kenya economic growth. Achievement of objective will contribute to macroeconomic stability which is a long-term goal of Kenya encapsulated in the Vision 2030. Annual time series data between 1975 and 2018 from the World Bank development indicators database (WDI 2019) was used. ARDL bounds test and ECM estimation techniques were applied in order to investigate long run and short-term effects between economic growth and current account deficit. Summary of the main conclusions is provided as follows.

The study indicated presence of long-run and short-term effects between predictor variables and growth. Long run results showed significant effect on growth among independent variables. Specifically, the effect of fixed capital formation on growth was positive and significant at 1 percent.

In the short run, the error correction-term was negative and significant at 1 percent level, which shows that over 57 percent of previous year’s shock is a feedback to the long-run equilibrium relationship presently. Foreign direct investment had positive and significant influence on growth at 10 percent, which was a similar position for fiscal balance at 5 percent level. Following findings, the study concluded as follows.

5.3 Conclusion

The results of the study have shown that current account and associated macroeconomic variables influence economic growth, hence important for the government to devise policy actions that mitigate such effects in the Kenyan economy.

First, current account deficit had positive but insignificant influence on growth. Policy makers should strive to undertake policy actions that increase saving and decrease fiscal deficit which are behind the rise of current account deficits, especially trade policies that promote increase of exports and competitiveness.

Second, gross fixed capital formation, foreign direct investment and fiscal balance seem important improving growth in Kenya. And policy implication is that policy makers should prescribe monetary and fiscal policies that promote investment, flow of foreign capital into the national economy, prevent capital flight and promote fiscal consolidation and prevent budget deficits

Finally, given that the exchange rate and money supply which are related through the monetarist approach to current account approach have negative association with growth in long term. However, two influence each other, the terms of trade through the Marshall Lerner condition, inflation and the level of net foreign assets as well. Therefore, this calls for prescription of such policies such as depreciation of the Kenya shilling to boost exports volume and well managed money supply to boost demand.

5.4 Policy Recommendation

Following empirical results, the following policy recommendations are prescribed to support the management of current account deficit in Kenya.

- For a developing country that is aiming to accelerate economic growth like Kenya, there is need to pursue trade policies that promote increase in export volume, improved terms of trade, and pursue external balance for overall economic stability

- Since money supply and exchange rate are critical elements in the growth of economy, the Central bank of Kenya should utilize these variables to improve the value of exports through depreciation of the shilling and increase the amount of net foreign assets (NFA) to finance current account deficit

- Finally, since fiscal balance and government spending have direct role on private enterprise as well as aggregate growth, government authorities should aim at balanced or surplus budgets, reduce fiscal deficit and promote fiscal consolidation.

5.5 Limitations of the Study

The first limitation is associated with the sources of data. Data was collected from the GOK (KNBS), the World Bank and UNCTAD databases which use different methods for data collection and collect data at different time periods. Second, study focused on the association between growth and the deficit, whereupon both variables are multidimensional and complex by nature. It means that there are many other variables affecting economic growth which have not been accounted for in this study.

5.6 Recommendation for Further Research

There are limited studies focused on current account deficit analysis in Kenya and Africa in general. Given the central focus of the study, other key aspects that need to be addressed in the case of Kenya include ways of ensuring sustainable current account deficit. Consequently, proposes future research be undertaken on sustainability approaches like solvency and liquidity.

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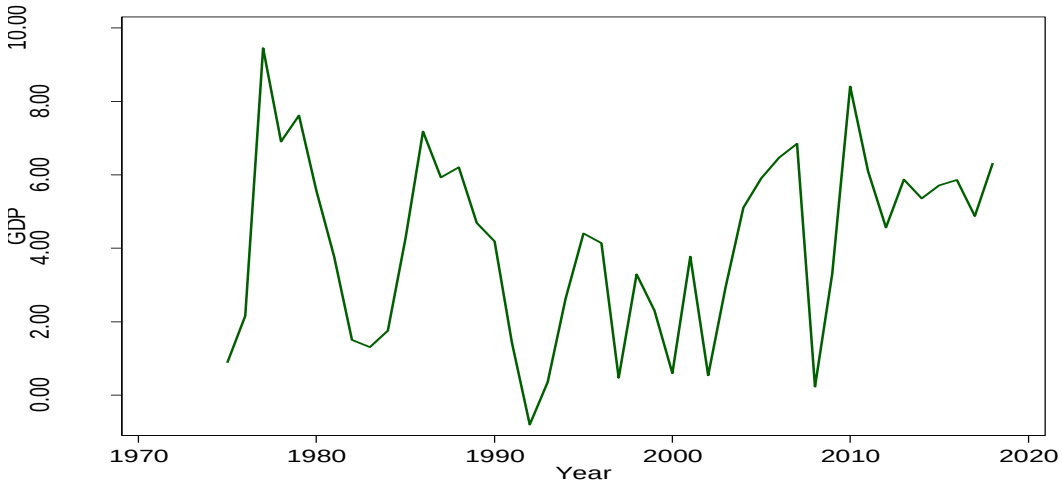
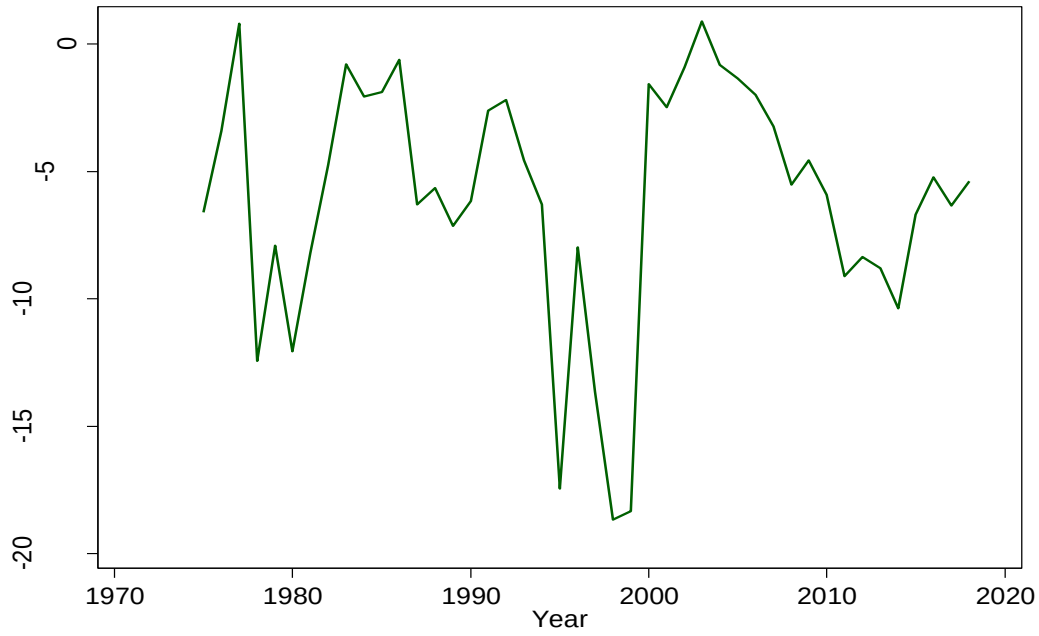
APPENDICES

APPENDIX 1: Time Series Trend Analysis at Levels

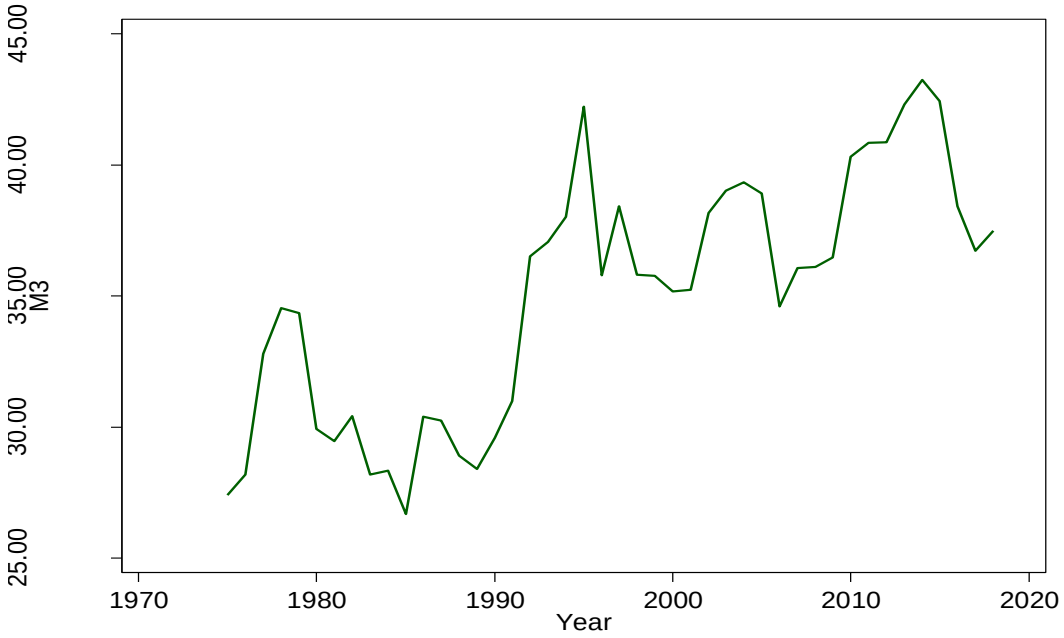
(a) Economic growth



(b) Current Account Deficit

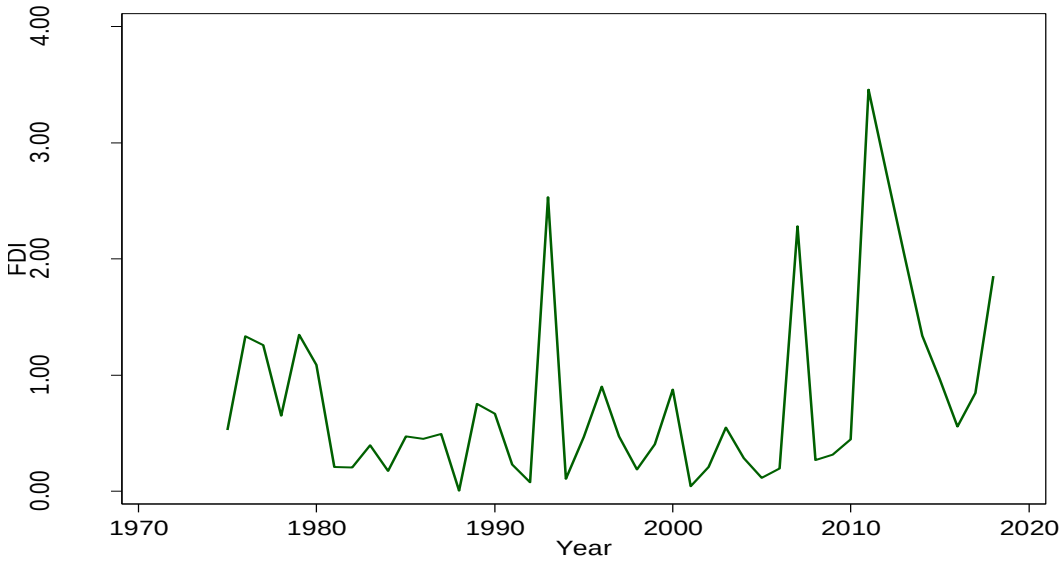


(c) Money Supply

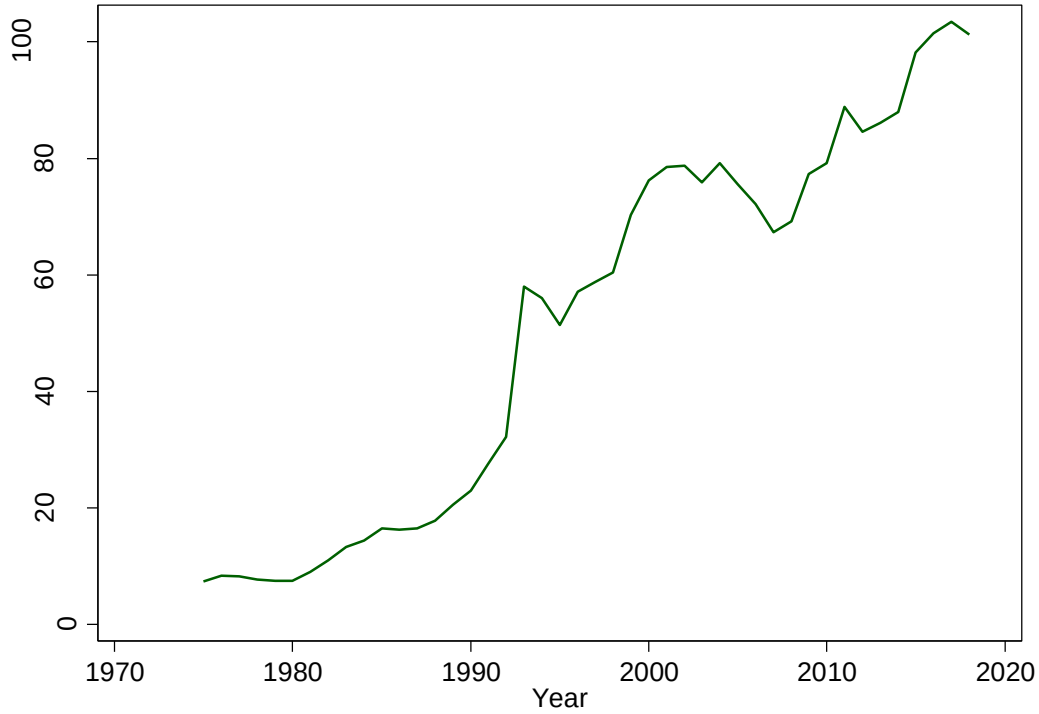


(d) Saving

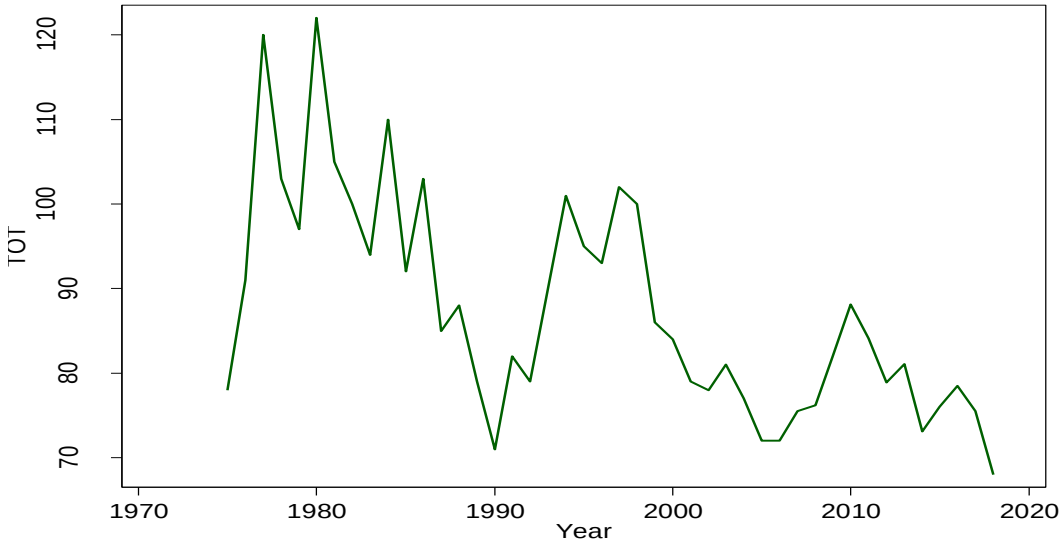
(e) Foreign Direct Investment



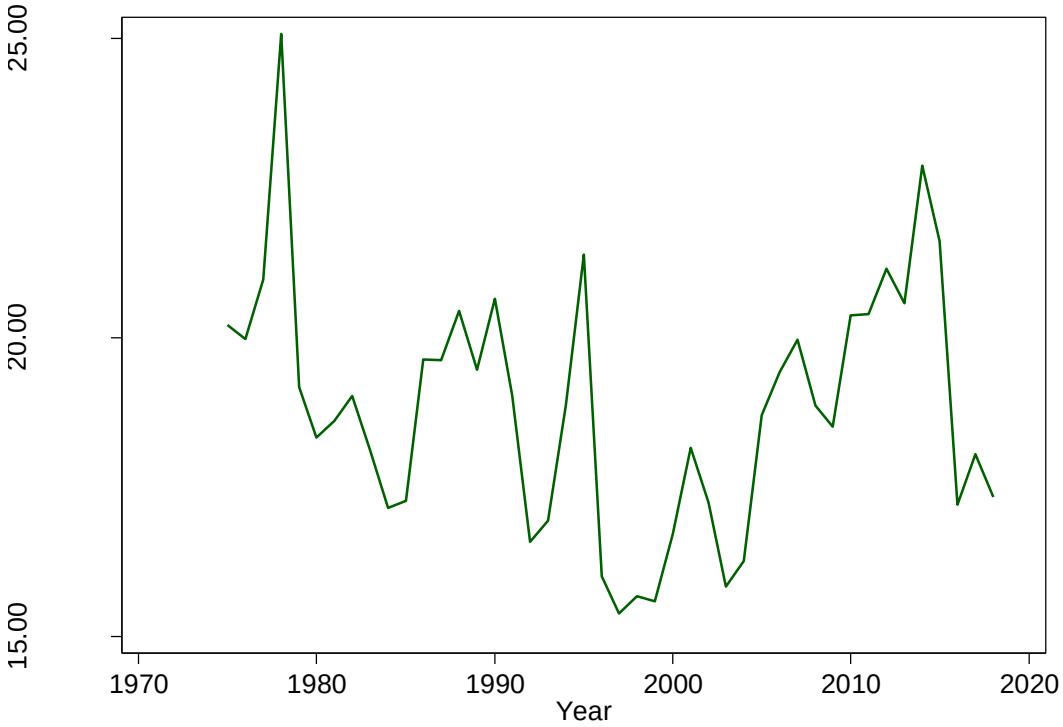
(f) Exchange Rate



(g) Terms of Trade

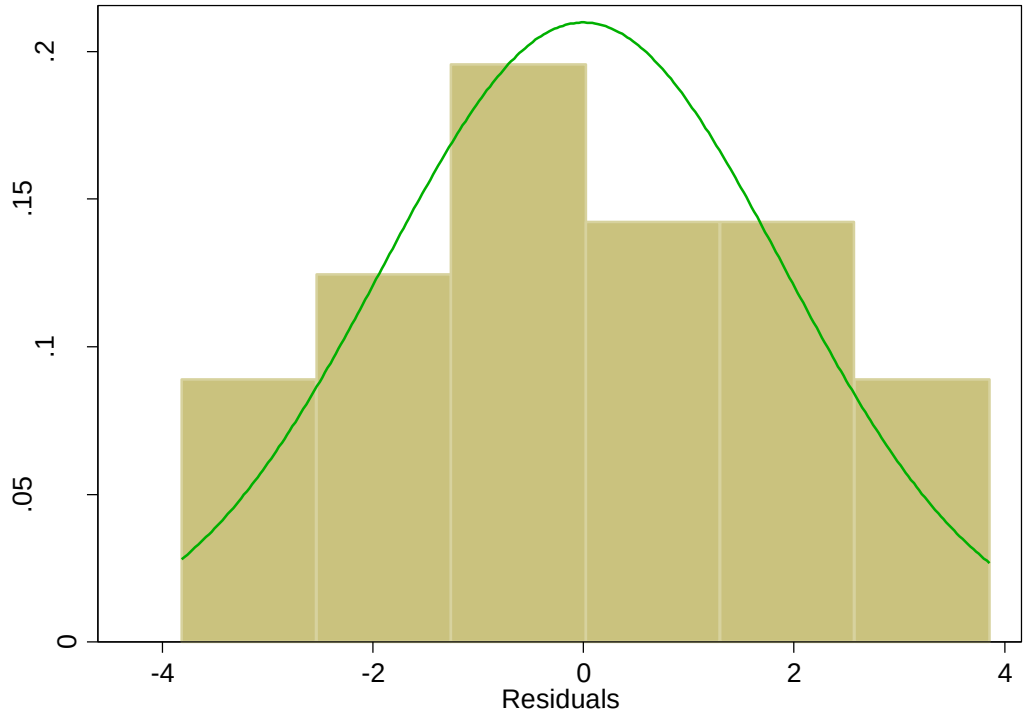


(h) Gross Fixed Capital Formation



(i) Fiscal Balance

Appendix 2: Jarque Bera Normality Test Results



Appendix figure 3: CUSUM Test Results