Original Paper

The Effects of Current Account Deficits on Economic Growth:

Evidence from Kenya

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Abstract

The study examines the effects of current account deficits on economic growth. It also evaluates the direction of causality between the current account deficits and economic growth. These have in the recent past been analyzed in developed and developing economies. In contributing to this ongoing debate, the study applied unit root tests, cointegration analysis, a dynamic vector error correction model and Toda-Yamamoto Granger-causality representation using annual time series data for Kenya from 1980 to 2016. There is evidence that in the long run, current account deficit has significant positive effect on economic growth in Kenya. The evidence suggests a bidirectional causality running from current account deficit to economic growth with feedback effects. The study underscores the need for the authorities to utilize current account deficits to strictly finance public investment to foster gross fixed capital formation, for shared prosperity in Kenya. The evidence underscores the need for more country specific studies in sub-Saharan Africa.

Keywords

current account deficit, economic growth, cointegration, VECM, causality

1. Introduction

Globally, the Bretton woods institutions have motivated several nations to back down from capital controls and undertake financial liberalization. This has opened many economies to global financial flows. However, curtailments on international financial transactions, breaks in capital flows and coaxed current account deficits have continued to yield interest worldwide. It has been observed that removing controls is not an assurance for economic growth (Collier & O'Connell, 2008). As such, the debate on

the effectiveness of current account deficits on macroeconomy remains unsettled with two broad views (Obstfeld, 2012). The first view opines that these deficits are not significant for policy, while the other suggests that they are very important and have macroeconomic effects. This former view posits that the imbalances in the current account are not relevant because they are temporary and they self-correct.

On a global perspective, the high and expanding current account imbalances in the United States of America (USA) have yielded great concerns about whether they are sustainable, given the design of the economy and the prevailing international and financial circumstances. This has continued to generate debates on their global effects and the specific impact on developing economies in the event of an abrupt correction particularly for the economies that trade with the USA. In developing countries like Kenya, there are recent debates on whether or not the deficits observed in the current account are sustainable and their implications on macroeconomy and economic growth. There are also concerns about the likelihood of easy reversibility of the inflows of capital which may increase the likelihood of a reversal or an "abrupt break" (O'Connell et al., 2010). In reference to Mwega (2014), the risk could trigger depletion of reserves and abrupt currency depreciations. The impact could also trigger the relative prices to adjustment suddenly and aggravate the expansion of foreign liabilities. This was the case during the 2008 global financial crises. The effects of this global financial crisis and the macroeconomic status of many developing countries like Kenya have continued to generate interests and motivate empirical studies on the subject.

Osoro (2013) observed that, little is known about the macroeconomic variables that drives the balance of payments in Kenya. Perpetual deficits in the current account imply that government will always increase her stock of external debt. Moreover, these imbalances cannot not be supported indefinitely especially when they are not in line with macroeconomic fundamentals. Intuitively, unsustainable deficits in the current account imply that the government will increase the external debt which may adversely impact on macroeconomic stability, overburden the current and future generation, impacting on the overall welfare of the citizens. Arising from the increase in external public debt in Kenya, the rating agencies such as Standard and Poor's; and the Moody's Investors Service and have in the recent past (2017 to 2021) downgraded Kenya's credit rating (IMF, 2018). The implication is that the Kenyan Government will have to pay more for foreign borrowings. Additionally, combined with the existing state of foreign debt levels in the country, the impact of continued deficits in the current account may trigger significant deficits in future or heavy tax burden to the current and future generations. This could signal a looming increase in external debt servicing obligations, including interests and principal payments, whose ultimate effect is to increase recurrent expenditure and squeeze on development spending.

Moreover, development needs in most developing economies including Kenya have exerted more burden resulting from the increase in population g which has continued to fuel more demand to invest in health, education and infrastructure. For this reason many developing countries have been addicted to external deficits in the current account. The difficulty of timely policy adjustment in public

expenditure levels to changes in the government's resource envelop poses a serious problem and a risk to sound macroeconomic policy planning and management in Kenya. The need for adequate public expenditure management has recently become paramount particularly at this period when the national government, the 47 county governments and the private sector are experiencing severe financial constraints. As such, many developing economies like Kenya are currently facing the "fiscal trilemma" in an effort to balance between increased spending, containment of public debt and resistance to tax increments. Importantly, whereas an expanding deficit in the current account may not essentially be a source of concern for an advancing economy like Kenya, external deficits combined with rising public debt could further de-escalate the country's sovereign ratings and precipitate a capital flight, nostalgic of the Asian crisis, or the recent turmoil in the euro-area. Moreover, persistent deficits in the current account may trigger disequilibrium in the balance of payments, among others several chaos. To this end, the questions that remain unresolved are:

(i)   Whether there could be a relationship between current account deficit and economic growth, for shared prosperity, in Kenya?

(ii)   What is the direction of causality between current account deficit and economic growth in Kenya?

The available evidence on the subject is more conflicting and inconclusive for Kenya. There exists very scanty evidence on country specific studies on the subject in sub-Saharan Africa and Kenya in particular. This is a research gap that has been ignored and needs to be urgently filled. This study attempts to fill this gap for Kenya. The novelties of this paper originates from the application of novel estimation techniques that include cointegration, application of structural breaks in the analysis and a deeper analysis that appreciates the study objectives more exhaustively in terms of a developing country specific time series variations. The estimates establish not only stable but also robust causal relationships that validate the parameter estimates. The evidence provides useful fiscal, monetary, exchange rate and balance of payments policy insights that can be employed to recalibrate policy adjustment measures for macroeconomic stability and long term inclusive growth in Kenya.

In addition to providing the evidence on growth effects of current account deficits, this paper also establishes the direction of causation between current account deficit and economic growth for Kenya. The additional evidence further contributes to formulation of evidence based and country specific case growth strategies for shared prosperity in the nation. The study also takes into account the dynamism of country's macro-economy and considers changes induced by the recent rebasing of GDP in Kenya in 2014. Lastly, the evidence builds upon crucial research data base for policy makers and academia in Kenya. Due to inadequacy of data in many developing countries like Kenya, scholars have shied away from country specific studies on the subject. This study was instrumental in filling these research gaps for Kenya.

2. Literature Review

2.1 Theoretical Literature

Balance of Payment (BOP) theories have mainly examined possible determinants of BOP. Specifically, they have analyzed policies aimed at preserving BOP equilibrium. This paper identifies three broad approaches to BOP as highlighted by Johnson (1977). They include: elasticity, absorption and the monetary approaches.

2.1.1 Elasticity Approach

In the literature, Robinson (1937) is acknowledged for pioneering the work of viewing BOP as a real phenomenon. The greater demand for BOP adjustment theory under flexible exchange motivated him to devise the theory. The theory address the following; (i) circumstances for devaluation of currency to boost a nation's BOP; (ii) consequences of devaluing the currency on domestic activities; the terms for devaluation to be rewarding; and (iv) impact of devaluation on domestic country's terms of trade. This theory finds answers to these concerns in the Marshall-Lerner (M-L) condition which is inferred in a two country, two commodity conditions. The M-L condition assumes that there exists under-employment in these two countries. It also assumes that the home price of individual state's export goods is given. The cardinal equality of the M-L condition is expressed as,

$$d_B/d_{ei} = -X\,(1 + n_x + n_f) \qquad (1)$$

where d_B shows the change in trade balance of domestic country, d_e displays the exchange rate change, X stands for exports, while x together with f stands for exports and imports, and n_i show the elasticity of demand for i^{th} good, $i = x, f$.

It therefore follows that,

$$d_B/d_e > 0 \quad if \quad |n_x + n_f| > 1 \qquad (2)$$

Equation (2) implies that currency devaluation will lead to a BOP improvement if the foreign elasticity of demand for exports plus the domestic elasticity of demand for imports exceed unity. However, this theory has been critiqued on the grounds that it employs partial equilibrium analysis.

2.1.2 Absorption Approach

It is credited to Alexander (1952) with contributions of Meade (1951), Tinbergen (1952) and Johnson (1958). It is associated with the foundation to develop a BOP model within a macroeconomic framework. Consequently, it is considered relatively popular to the other approaches. This popularity originates from its close association with monetary sector of the economy. The approach views BOP not solely as surplus of receipts of residents from foreigners over payments of residents to foreigners. As such it considers BOP as surplus of total receipts over total payments of residents as displayed in equation (3):

$$B = R_f - P_f \qquad (3)$$

where R_f represents the surplus of receipts of residents from foreigners, and P_f stands for the

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payments by residents to foreigners. Assuming that all payments by residents to residents (R_f) are receipts by residents from residents (P), equation (3) can be rewritten as;

$$B = R_f + R_r - (P_f + P_r) \tag{4}$$

Equation (4) implies that;

$$B = R - P \tag{5}$$

where R displays the aggregate residents' receipts, and P shows the aggregate residents' payments. Central to this macroeconomic approach, is the accounting identity highlighted in equation 6:

$$B \equiv X - M \equiv Y - A \tag{6}$$

where B depicts the trade balance, X represents exports, M shows the imports, Y represents the income and A displays absorption. The identity (6) may be expressed in first differences (Δ) as:

$$\Delta B = \Delta Y - \Delta A \tag{7}$$

Equation (7) is the variation in B as a difference of variations in Y and A. Moreover, a change in A resulting from devaluation may be broken down further to capture the direct and indirect variations. The change in A may be expressed in equation (8):

$$\Delta A = c\Delta Y + \Delta D \tag{8}$$

where c depicts the marginal propensity to consume plus the marginal propensity to invest, and ΔD indicates the direct effect of devaluation on absorption. By substituting equation (8) in (7), equation (9) results:

$$\Delta B = (1 - c)\Delta Y - \Delta D \tag{9}$$

Equation (9) implies that the balance of trade effects of devaluation depends on: (i) the real income effects of devaluation; (ii) the magnitude of marginal propensity to absorb (c); and (iii) the size of ΔD. Whilst this approach is popular, Machlup (1955) critiqued not only the validity of the underlying framework of analysis but also its centralization on total sizes and disregard of relative prices. It has also been critiqued on the basis that it disregards decreases in money supply.

2.1.3 Monetary Approach to Balance of Payments

This approach is traced back to Mussa (1974) among other prominent scholars. It asserts that reserve flows are purely a monetary phenomenon. The theory opines that real variables impact BOP and exchange rates via the monetary channels. The paper attempts to analyze the monetary theory through the following equations. The first equation is money demand expressed as a function of real income (Y), interest rate (i) and price level (P).

$$M_d = L(Y, i, P) \tag{10}$$

where $L'(Y) > 0, \quad L'(P) > 0)$; $\quad L'(i) < 0$

The second equation show the supply of money which is equal to the sum of domestic assets of the banking system (domestic credit, D) and foreign exchange reserves of the country (R).

$$M_s = D + R \tag{11}$$

Generalizing the short run adjustment process and assuming that there is equilibrium in money market in the long run, it implies that;

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$$L(Y, i, P) = D + R \tag{12}$$

When equation (12) is expressed as,

$$\Delta R = \Delta L(Y, i, P) - \Delta D \tag{13}$$

While, $\Delta D = DCE$ (Domestic Credit Expansion). Substituting ΔD for DCE, equation 14 is derived as,

$$\Delta R = \Delta L(Y, i, P) - DCE \tag{14}$$

Equation (14) displays the summarized main claim of this approach. Thus, any surplus or deficit as expressed by the variation in a foreign exchange reserves of a nation is equal to the difference between variation in demand for money and variation in domestic credit. A continuous deficit in the BOP can occur only if authorities permit domestic credit to increase faster than money demand. Importantly, this approach is premised on the Walras' law in that the sum of excess demands for goods and services; bonds and securities; and money is zero, as illustrated in equation 15;

$$ED_g + xED_b + ED_m = 0 \tag{15}$$

Where g, b and m depict goods, bonds and money respectively. In an economy with full employment but closed to international trade in goods and assets, surplus demand is eliminated by price changes. However, economies that are open, the surplus demand is reflected in different net international flows in the accounts of BOP. Therefore, the constrained BOP equation is expressed as,

$$\left(X_g - M_g\right) + (X_B - M_b) + (X_m - M_m) = 0 \tag{16}$$

where X and M are exports and imports, respectively. The three accounts: current, capital and money accounts must sum to zero. Equation 16 implies that if two markets are in equilibrium, then the third one must also be in equilibrium. Thus, the analysis of BOP could focus on current and capital accounts while ignoring the money account.

This approach has been critiqued based on the validity of fundamental assumptions of the model. The direct connection between BOP and excess demand for money has also been doubted. In addition, the proponents of this approach have been accused of contradicting themselves in relation to modelling of money demand function among others (Tsiang, 1977; Kreinin & Officer, 1978).

2.2 Empirical Literature

Generally, empirical analysis on BOP disequilibrium mostly focus on its determinants, sustainability and dynamics in industrialized economies. These discussions and analyses have rapidly increased recently and a number of analyses have been conducted but provide scanty information on the subject particularly in developing economies. This study observes that Freund (2005) classified the time interval into 25 occurrences and examined the threshold effects of these deficits in industrialized economies. The study shows when the deficit gets to 5% of GDP, the adjustment process begins. He provides evidence that beyond this point, the adjustment process reverses. He pointed out that the situation results to slow economic growth in 3 to 4 years relative to specific countries in question. In reference to Freund and Warnock (2005), increases in current account deficits in developed economies also revealed a negative effects on growth of the economy.

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In Kenya, Bigstein and Ndung'u (1992), observed that about ten years after Kenya got independence (in 1963), the country experienced the first budget and current account deficits that led to the BOP problems that were attributed to deteriorating terms of trade and expansionary government spending. By sampling both developed and developing economies including Kenya, Chinn and Prasad (2003) conducted panel regression and provide evidence that budget deficits and net foreign assets have positive association with current account deficits. By applying panel data from 1975 to 1997 for 67 countries (Kenya included), Abmann (2007) examined the dynamic effect of macroeconomic crises and current account reversals on economic growth. 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. Additionally, Osakwe and Verick (2009) studied the short and medium-term determinants of current account deficits in Africa. This included Kenya in the study and shows that economies are likely to have a deficit of over 5% if the economy is small, less open, and experiences macroeconomic challenges.

Equally, Liesenfeld, Guilherme and Jean-Francois (2010) examined the dynamics of current account reversals in both low and middle-income economies, Kenya included. They show that current account balance, foreign reserves, terms of trade and concessional debt are key predictors of current account reversals. Narrowing to studies focusing on Kenya, Mwega, Mwangi, and Ochilo (1994) used a three gap model to determine if it was fiscal, savings and foreign exchange gap that was the constraint on economic growth in Kenya. They provide evidence that foreign exchange was a significant constraint to potential growth in Kenya.

Moreover, Gichuki, and Moyi (2013) analyzed the sustainability of current account deficits in Kenya. They show that in Kenya, current account deficits are unsustainable in the long run and suggested that the deficits in the current account violates the intertemporal budget constraint. Osoro (2013) applied cointegration analysis and error correction model to examine the long run predictors of BOP dynamics in Kenya from 1963 to 2012. The results suggest that BOP was cointegrated and fluctuations in the BOP account could be triggered by the level of trade balance among other variables. Lastly, Ng'ang'a et al., (2019) investigated the nature of fiscal and monetary policy coordination and its impact on long-run sustainability in Kenya. Their study shows that there is a tendency for monetary policy to respond to unsustainable fiscal policy, in Kenya.

The above analysis establishes a view that current account deficits may be effective in stimulating economic growth in some cases and may prove impotent in others. This may be due to the fact that the effectiveness of these deficits differ depending on various economic characteristics including the size of deficit, among others. This could explain why the available evidence is mixed-up with positive, negative and neutral effects in some of the identified studies. To sum up, literature provides great insights in terms of absorption approach modelling in developing economies. This study notes that there exists very scanty evidence particularly for country specific studies and specifically for Kenya. It

is also clear that there exist country heterogeneities across the globe. By applying a different analytical model, methodology and sample period, the study may yield fresh economic policy insights for Kenya. Although Kenya has been included in a number of generalized studies, there exists very scanty evidence on the subject for Kenya. This paper seeks to determine the effect of current account deficit on economic growth for shared prosperity, test the causal linkages and draw evidence based policy responses for Kenya.

3. Methodology

3.1 Theoretical Framework

This paper applies absorption approach to BOP and adopts the McCombie and Thirlwall (2004) growth model. The model asserts that when there are BOP issues, trade is a significant restriction to growth of the economy. The Keynesian and structuralist models consider both equilibrium in current account and capital account. Notably, it is important to take into account not only exports of goods and services, but also the income elasticity of demand for imports. To this end, the Thirlwall's (1979) growth model is presented in the following equations (17, 18 and 19):

$$x = \theta(p_d - p_f) + \rho z \tag{17}$$

$$m = \alpha(p_d - p_f) + \pi y \tag{18}$$

$$x + p_d = m + p_f \tag{19}$$

Where ρ, π, and $\alpha > 0$ and $\theta < 0$

ρ and π show the income elasticity of exports and imports, respectively. The price elasticity of exports and imports are displayed θ and α, respectively. x shows the real exports growth, m stands for the real imports growth, z shows real income growth from the rest of the world, y depicts the real domestic income growth, and $p_d - p_f$ shows the relative prices growth. Equations (17) and (18) are export and import demand functions, respectively. Equation (19) is the current account equilibrium. Abstracting from (19), the real income growth is,

$$y^* = [(1 + \theta - \alpha)/\pi](p_d - p_f)z \tag{20}$$

After substituting for world real income growth (z), from (17), it follows that:

$$y^* = [(1/\pi)(1 - \alpha)](p_d - p_f) + (1/\pi)x \tag{21}$$

Taking Marshall-Lerner condition to hold, then $(p_d - p_f) = 0$, and equation (21) becomes,

$$y^* = (1/\pi)x \tag{22}$$

This (22) shows the BOP constrained growth equation. It is a sort of the foreign trade multiplier associated with Harrod. It shows the Thirlwall's (1979) law which is an efficient framework that can be applied in developing economies (Olayemi & Fasanya, 2018). This law advocates that the more the income elasticity of demand for imports (π), the smaller the BOP equilibrium growth rate. However, this law considers only the state of the current account. Whilst the equilibrium in the current account is paramount in the long run, capital flows have continued to impact several developing countries as argued by Mwega (2014) for the case of Kenya. So as to include capital flows in the model, equation

(19) is modified. By assuming that BOP is in current account disequilibrium initially, it follows that;

$$P_d X + F = P_f M E \tag{23}$$

where X shows the exports' volume, P_d depicts the home price of exports, M stands for the imports' volume, P_f displays the foreign price of imports, E stands for the exchange rate, and F shows the value of nominal capital flows (in domestic currency). $F > 0,$ depicts capital inflows while $F < 0,$ capital outflows. When the rates of change is assumed, it then implies that,

$$\delta(P_d + x_f) + (1 - \delta)f = m + p_f + e \tag{24}$$

where the subscripts reflect the rates of growth of the variables, δ and $(1 - \delta)$ are the shares of export and capital flows as a share of total receipts. Substituting (24) into (17) and (18) and assuming that Marshall-Lerner condition holds, (24) becomes:

$$y^* = [\delta_x + (1 - \delta)(f - p_d)] / \pi \tag{25}$$

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

4. Results

4.1 Descriptive Statistics

This paper applied annual time series data from 1980 to 2016 for Kenya. The study period also coincides with the time when many countries in sub-Saharan Africa, Kenya included experienced persistent deficits in the current account and volatile economic performance. The data was sourced from the Government of Kenya, World Bank (2017) and IMF (2018). GDP per capita growth was applied as a proxy for economic growth while independent variables comprised of current account deficit as a share of GDP, gross fixed capital formation as percentage of GDP, foreign exchange rate, percentage change in terms of trade, trade openness and percentage change in consumer price index. 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, 2014). The study applied Stata econometrics software to analyze the data. Table 1 indicates that all variables had complete observations for the entire period. Economic growth variable was found to be on average 0.73% with the minimum value being below zero by 3.9% with the maximum being 5.5%. The current account deficit had a mean of 6% with the minimum being below zero by 0.8% and a maximum of 18.7%. The rest of the variables were as indicated in Table 1.

Table 1. Descriptive Statistics

VARIABLE	Obs	Mean	Std. Dev	Min	Max
GDP per Capita Growth	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 Growth	37	-0.927270	6.870742	-12.882	20.129
Inflation Growth	37	11.30384	8.61778	1.554	45.979

Source: Authors

4.2 Trend Analysis

The study examined the movement and behavior of the data series for all the variables overtime prior to proceeding to analyze the data as presented in Figures 1, 2, 3, 4, 5 and 6.
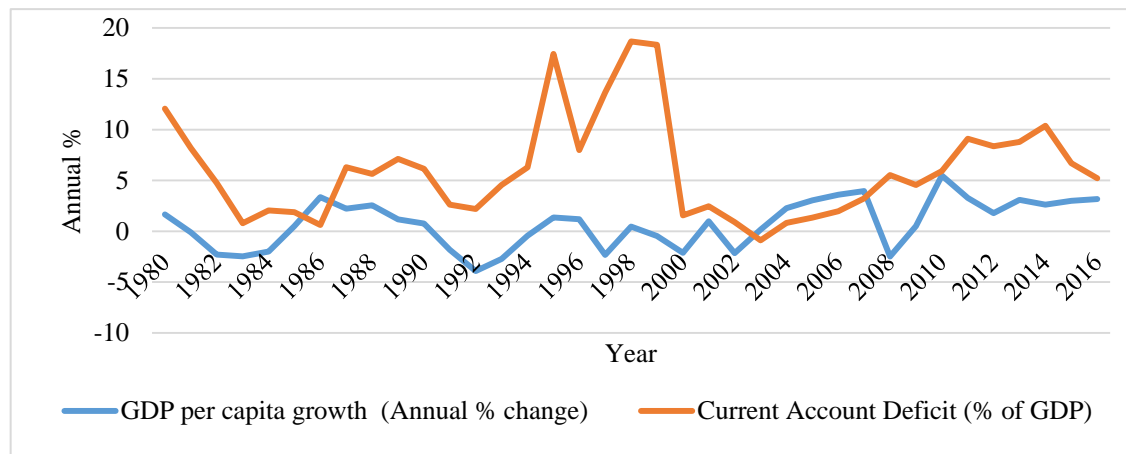

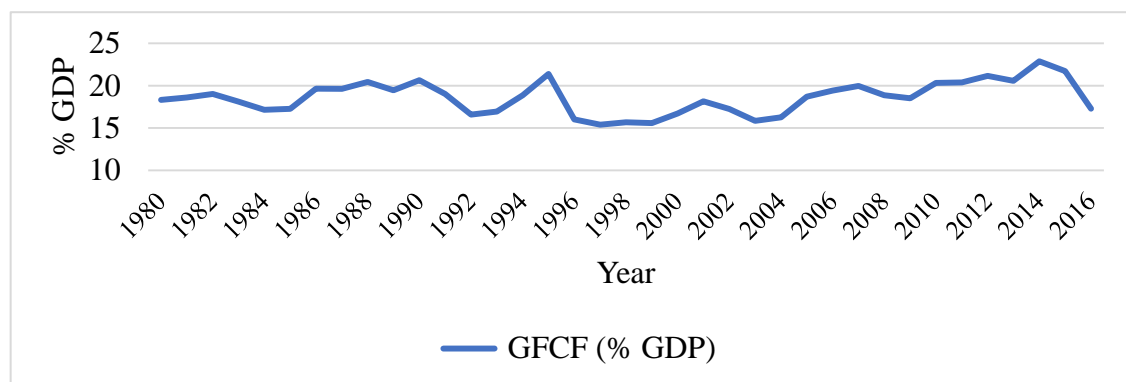**Figure 1. Kenya's Current Account Deficit and GDP Per Capita**
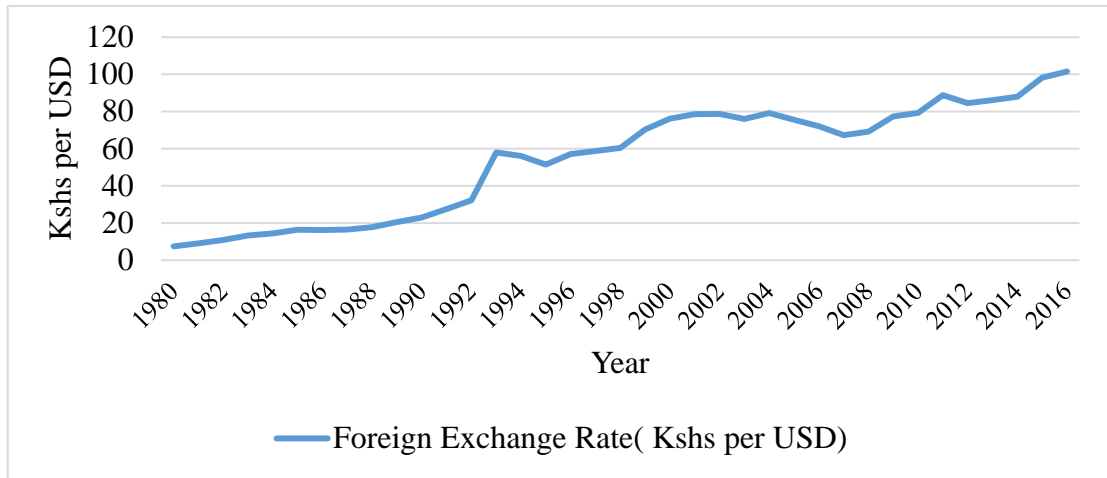

Figure 2. Gross Fixed Capital Formation

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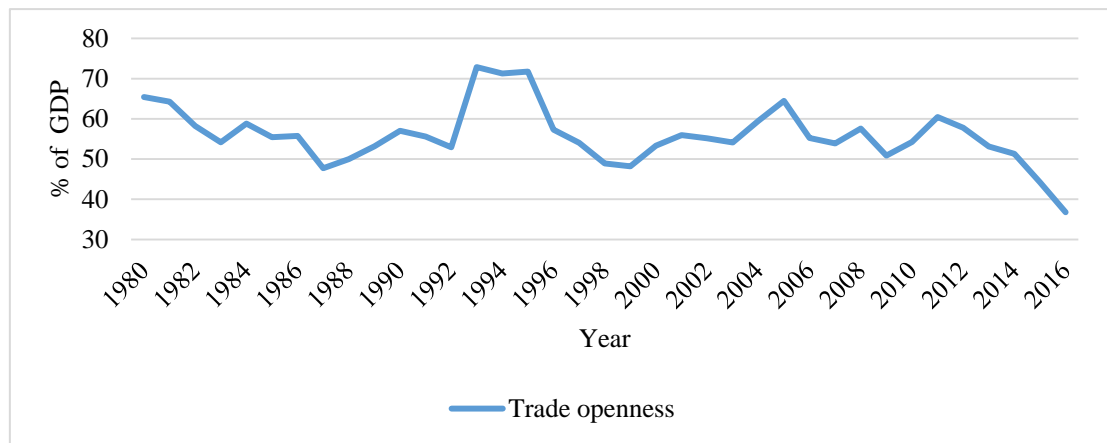**Figure 3. Foreign Exchange Rate**
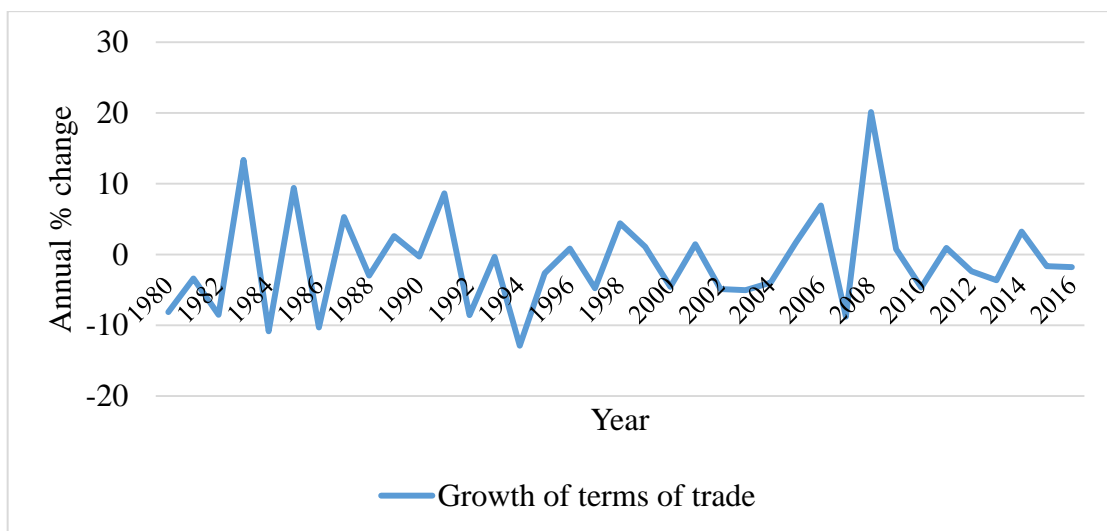

Figure 4. Trade openness

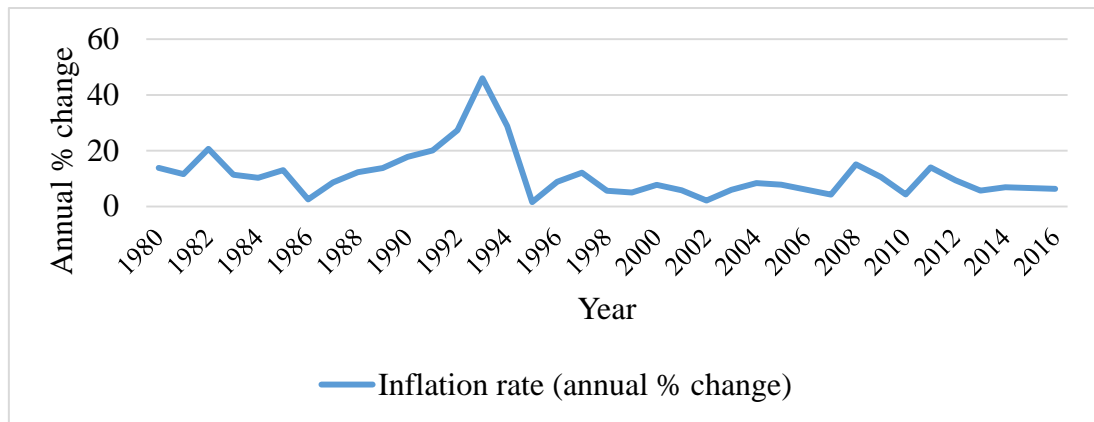**Figure 5. Growth of Terms of Trade**

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Figure 6. Inflation Growth Rate

Figure 1 highlights the current account deficit and economic growth variable from 1980 to 2016. In 1980s economic growth variable was at 4.2% while in 1990 it declined to 2.2% further declining to negative 3.9% in 1992 and negative 2.1% in 2000. However, it recorded an impressive positive 4% in 2007 but after the 2007 post-election violence it declined to negative 2.5% in 2008 and then increased to a positive 3.2% in 2016. On the other hand, the current account recorded an average deficit of 8% of GDP in 1981 and 6% in 1990. In 2000, it narrowed to 1.6% and was attributed to foreign aid in Kenya. Kenya's current account balance continued to improve recording a surplus of 0.89% of GDP in 2003 mainly due to improvement in trade balance. It reached a deficit of 9.1% in 2011, a deficit of 10.4% in 2014 and averaged 6% of GDP in 2015 and 2016. From the literature, the high overall current account deficit in the country is mainly financed by short-term net capital inflows. This is a major source of potential vulnerability for the Kenyan economy and for financial stability (O'Connell et al., 2010; Mwega, 2014; World Bank, 2016). There is also evidence of fluctuations in economic growth overtime which may also be attributed to political and economic shocks in the Kenya. The trend of the rest of the variables is as reflected in Figures 2 to 6.

4.3 Unit Root Tests

The motivation to apply the unit root tests in time-series data is to confirm non-stationarity in the variables. When the variables are found to be non-stationary, successful differencing is applied to the data series until the bias is eliminated. It was noted from the trend analysis that the data series was likely to be I (1) process. Thus the time series properties of the data were analyzed. Firstly, the study applied the Phillips-Perron (PP) unit-root test in the analysis. If the test statistic was more than the critical value (at 5%), the null was rejected. In all cases the null hypothesis of stationarity was rejected. The study established that the variables are integrated of order one and therefore the variables transformed to stationary after first difference. However, prior to drawing conclusions based only on the PP unit root tests' results, this study conducted further stationarity tests to establish the presence or absence of structural shocks in the data series. In reference to Ndirangu and Gitau (2014), structural

breaks for most of macroeconomic variables in Kenya coincide with shocks in terms of trade, economic policy changes and political shocks in the economy. The paper applied Zivot and Andrews (1992) tests for structural breaks. Table 2 displays the results.

Table 2. Results of the Zivot and Andrews Unit-Root Tests

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)
Growth of Terms of Trade	1992	-3.214	-4.80	-7.806	-4.80	I(1)
Inflation Growth	1995	-4.530	-4.80	-8.696	-4.80	I(1)

Source: Authors

The results of Zivot and Andrews tests show that all variables were non-stationary but transformed to stationary at first difference, further confirming the results of PP unit-root tests. The next stage of analysis required that the data be subjected to Johansen (1995) test for cointegration in order to determine if the variables were cointegrated or not. The procedure was deemed important in order to enhance the selection of the econometric technique of estimation.

4.4 Cointegration Analysis

The study applied Johansen (1995) test for cointegration, the trace and the maximum statistic established that the variables were indeed cointegrated implying that the vector error correction model (VECM) was appropriate to examine the effect of current account deficit on economic growth in Kenya. Consequently, the paper applied the VECM estimation technique and interpreted the short run and long run model parameter estimates.

4.5 VECM Regression Results

The residual LM test for serial correlation predicted no serial correlation in the residuals of the estimates. Equally, the model stability test satisfied all the stability conditions. Diagnostic tests suggest that the model correctly predicts the effects of current account deficits on economic growth in Kenya. The short-run and long-run results are shown in Tables 3 and 4, respectively.

Table 3. 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.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: Authors

The estimates for the short-run relationship are in differenced variables and is illustrated in Table 3, whereby D. represents the first difference. The motivation of VECM 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 economic growth variable and the explanatory variables have a long-run relationship. It is shown that the coefficient of error correction term [U (-1)] is negative 0.28898 which is less than one and significant at 5% (p<0.05). The significance implies that *ceteris paribus*, whenever there are deviations in economic growth variable from an equilibrium path, the model corrects at the rate of 28.9% annually.

Table 4. 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 Openness	0.291333*	0.0677921	4.30	0.00
Growth of Terms of Trade	-0.1093857	0.0853664	-1.28	0.20
Inflation Growth	0.4137104*	0.0518985	7.97	0.00

* Indicate significance at 1% significance level

** Indicate significance at 5% significance level

Source: Authors

The long-run estimates reveal that current account deficit, gross fixed capital formation, foreign exchange rate, trade openness and inflation growth rate significantly predicts the effects of current account deficits on economic growth in Kenya. However, the effect of growth of terms of trade on economic growth was insignificant. The coefficients of current account deficit, foreign exchange rate, trade openness and inflation growth were largely significant at 1% significant level ($p<0.01$), while that of gross fixed capital formation was significant at 5% significant level ($p<0.01$).

This paper shows that in the long-run, current account deficit has positive and largely significant ($p<0.01$) effect on economic growth. *Ceteris paribus*, a 1% increase in the current account deficit is associated with 0.06 percent increase in the growth of GDP per capita. The effect of gross fixed capital formation on growth of the economy was also positively and statistically significant at 5% significant level. This illustrates that a 1% rise in gross fixed capital formation is associated with boosting economic growth by 0.085%, in the long-run.

The parameter estimate of trade openness is negatively and statistically significant ($p<0.01$) at 1% significant level suggesting a negative association with economic growth in Kenya. The evidence reveal that in the long-run, a 1% rise in trade openness is associated with 0.084% decline in economic growth, *ceteris paribus*. The parameter estimate for foreign exchange rate is also positively and significantly associated with economic growth variable ($p<0.01$). The estimates establish that all else equal, an appreciation of the Kenya shilling by 1 Kenya shilling per USD, is associated with expanding the growth of the economy by 0.015%, in the long-run. Lastly, the parameter estimate for inflation growth is negative and significant at 1% significance level ($p<0.01$). The estimate suggest that *ceteris paribus*, 1% increase in inflation growth is associated with 0.12% decline in economic growth, in the long-run. Lastly, there is evidence of positive effect of growth of terms of trade on growth of the economy albeit non-significant.

4.6 Toda-Yamamoto Granger-Causality Results

Additionally, the study applied the Toda-Yamamoto (1995) Granger-causality tests to determine the direction of causality between current account deficit and GDP per capita growth rate in Kenya. This was important in validating the suggested policy interventions. The results are displayed in Table 5.

Table 5. Results of Toda-Yamamoto (1995) Granger-Causality Wald Tests

Equations	Excluded	Chi2	Df	Prob
GDP per capita Growth	Current Account Deficit	30.323	3	0.000
GDP per capita Growth	Gross Fixed Capital Formation	23.952	3	0.000
GDP per capita Growth	Foreign Exchange Rate	26.628	3	0.000
GDP per capita Growth	Trade Openness	16.633	3	0.001
GDP per capita Growth	Terms of Trade	7.7886	3	0.051
GDP per capita Growth	Inflation Rate	24.566	3	0.000

GDP per capita Growth	ALL	71.256	18	0.000
Current Account Deficit	GDP per capita Growth	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
H_0: Implies Rejection of Granger non-causality				

Source: Authors

The first row of Table 5 shows that lagged values of current account deficit cause GDP per capita growth as p-value is equal to 0.0000 which is less than 5%, therefore rejecting the null hypothesis of Granger-non-causality. Equally, in the eighth row the p value is equal to 0.001 which is less than 5%, and therefore the lagged values of GDP per capita growth also cause current account deficit. Therefore, the null hypothesis is rejected. The results of the Toda-Yamamoto Granger-causality provide evidence of bidirectional causality running from GDP per capita growth to current account deficit with feedback effects for Kenya.

5. Conclusion

The study examined the effects of current account deficits on economic growth. It also reviewed the direction of causality between the current account deficit and economic growth in Kenya. From the estimates, the study shows that current account deficit, gross fixed capital formation, foreign exchange rate, inflation growth and trade openness significantly predict the effects of current account deficits on economic growth in Kenya. The current account deficit has a positive association with economic growth in Kenya, in the long run. The findings also suggest a bidirectional causality running from current account deficit to economic growth and vice-versa. Based on this evidence, the authorities should utilize current account deficits to strictly finance public investment to foster gross capital formation in order to continue boosting the growth of the economy. There is also evidence of positive association of exchange rate on economic growth in Kenya implying that the government should promote policies that are aimed at supporting the exchange rate to function as a shock absorber to the economy. Equally, the paper shows that the government should promote policies such as inflation targeting that maintain inflation rate at the desired thresholds, for long term inclusive growth in Kenya.

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