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Analysis of Budget Imbalance Dynamics in Kenya

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Abstract

Kenya needs substantial and sustained fiscal consolidation to create fiscal space for financing the government's election pledges, the Vision 2030 development projects, and sustainable development goals. However, the government has found it hard to sustain its fiscal consolidation attempts. This study investigates the fiscal consolidation constraints that act through the budget imbalance dynamics in Kenya using the Olivera-Tanzi effect approach. The study covers the period 2000-2015 using time series data and employs three Auto-regressive Distributed Lag (ARDL) error correction models in the analysis. The study showed that a rise in the general price levels in the economy, adjustment of minimum wages, rise in perceived levels of corruption in the public sector and the political budget cycles (occurrence of a general election) worsen the budget imbalances (deficits) thus constrain fiscal consolidation efforts in Kenya. The study also demonstrated that budget imbalance dynamics in Kenya could partly be explained by the Olivera-Tanzi proposition. The study recommends measures to reduce the fiscal imbalance gap in Kenya, which include controlling both supply and demand side inflationary pressure and dealing with rent seeking behavior in the public sector.

Keywords

Budget imbalance dynamics, fiscal consolidation, government expenditure, government revenue, Olivera-Tanzi proposition

1. Introduction

1.1 Background

Since Kenya attained its independence, its fiscal policy stance has been largely expansionary. Kenya's Economic survey data show that the total government expenditure as a percentage share of the GDP at

current market prices has averaged at 33.7 percent annually from fiscal year (FY) 1999/2000 to FY 2017/2018, registering a low of 27.6 percent in 2012/2013 and an estimated high of 35.9 percent in 2017/2018. The Economic survey data also show that total nominal government expenditure rose tenfold from KSh 225.7 billion (about $2.2 billion) in 1999/2000 to Ksh 2,330.0 billion (approximately $23.1 billion) in FY 2017/2018. Kenya's Budget Statement for 2018/2019 shows that total government spending increased to Ksh 2,556.6 billion (approximately $25.3 billion) in FY 2018/2019.

Expansionary budgets lead to increased pressure for government borrowing, thus contributes to the fiscal consolidation challenges in a country. According to the African Development Bank (AfDB), Organization for Economic Co-operation and Development (OECD) and United Nations Development Program (UNDP) (2016), the overall budget deficit for Africa (including grants) worsened from -4.8 percent of GDP in 2014 to -6.6 percent of GDP in 2015. The African Development Bank (2018) shows that the budget deficit in Africa further worsened to 7.0 percent in 2016 but estimates it to have declined to 5.7 percent in 2017. AfDB et al. (2016) and AfDB (2018) show that the overall budget deficits (including grants) as a percentage of GDP for the entire East Africa region has deteriorated from -4 percent in 2013 to -4.6 percent in 2015, then registered a slight improvement to -4.2 percent in 2016 and is estimated to be at -3.9 percent in 2017. A closer look at the averages of the budget deficit to GDP ratios reported by AfDB et al. (2016) and AfDB (2018) over the last five years (since 2013) indicates that, apart from South Sudan that faces internal instability, Kenya is the next worse performing nation in the region. Kenya's budget deficit as a percentage of the GDP averaged at 7.2 percent for the period 2013-2017 which is above the EAC region's average of 4.1 percent and Africa's average of 5.5 percent. From the estimated 7.2 percent of GDP in the FY 2017/18, Kenya's Budget Statement for financial year 2018/2019 noted that the government projects the fiscal deficit to narrow to 5.7 percent of GDP in the FY 2018/19 and to 3.0 percent of GDP by FY 2021/2022 under the fiscal consolidation plan.

Moreover, growth in government revenue has been stagnant over the period, oscillating between a low of 9.3 percent in 2011/2012 and a high of 21.8 percent in 2012/2013. Kenya's narrow tax base which largely relies on income taxes (about 40 percent of total revenue and 8 percent of GDP), and Value - Added Tax (VAT) which constitutes about 25 percent of total revenue (World Bank, 2015) makes it difficult for the government to pursue tax-based fiscal consolidations. Additionally, there has been limited revenue raising efforts by the local county governments, with the counties collecting only 43 percent of the targeted own-source revenue, hence increasing the pressure for more national government transfers (World Bank, 2015). Consequently, the persistent budget deficits have led to increased government borrowing, which has remained on an expansionary path since 2004.

Budget deficits have been the focus of fiscal and macroeconomic adjustments in view of the economic ills associated with them. The economic ills mainly derive from the ways of financing budget deficits, especially when excessively employed. For instance, financing the budget deficits through domestic borrowing may crowd out private investment and consumption (Mashakada, 2013; Easterly &

Schmidt-Hebbel, 1991) whereas financing through foreign borrowing may lead to current account deficits (Easterly & Schmidt-Hebbel, 1991). These macroeconomic imbalances may further limit the fiscal consolidation efforts in a country. Figure 1 shows how Kenya financed its budget deficit between the FY 2010/2011 and 2017/2018.

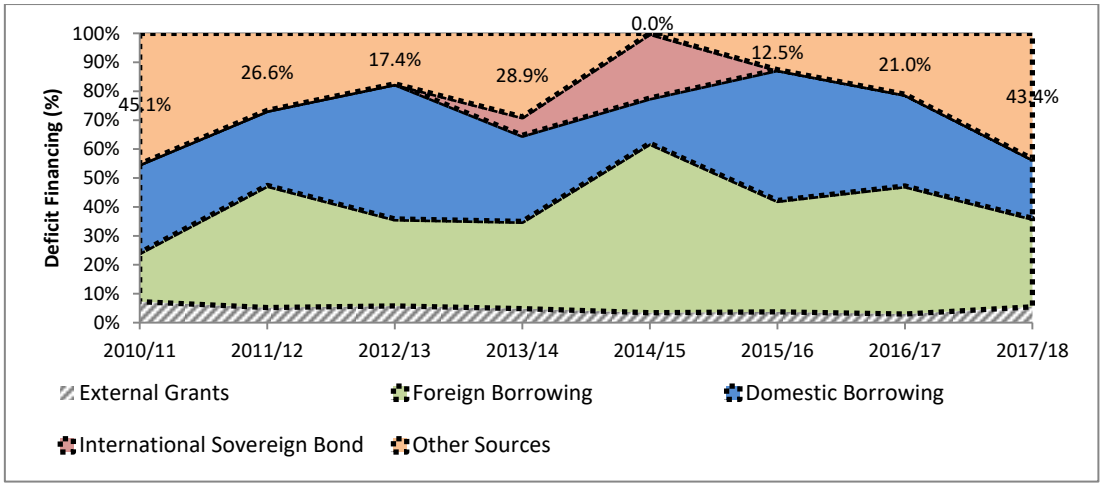

Figure 1. Budget Deficit Financing in Kenya

Data Source: Republic of Kenya (2014, 2016, 2017, 2018).

The figure shows that the main sources of deficit financing in Kenya are domestic borrowing (with an annual average of 30.8 percent financing over the period) and external/foreign loans (with an annual average of 36.5 percent financing over the same period). In the financial year 2013/2014 and 2014/2015, Kenya financed 6.4 percent and 22.4 percent of its deficit respectively using international sovereign bond. In the reviewed period, the external grants have financed an annual average of 4.8 percent of the deficit. Key to note is that a substantial proportion of the deficit (about 24.4 percent annual average over the reviewed period) is financed through other sources, which is not clearly documented in the data source used. These other sources could include monetization of the budget deficit and/or drawing down on foreign exchange reserves. Monetization (money creation) of the budget deficit may increase the base money in an economy, which further generates inflationary pressure (Mashakada, 2013; Easterly & Schmidt-Hebbel, 1991). Possible monetization of the deficit means that part of the deficit financing is through seigniorage (viewed as an inflation tax on the public). This informs use of the Olivera-Tanzi effect theory in analysis of the budget imbalance dynamics in the country. Olivera (1967) modeled an increase in size of budget deficits that results from inflation when public expenditure is related to current price level, but government revenues are related to the previous price level, as a result of lags in tax collections. Tanzi (1978) noted that it is always not possible for tax payments to be made to the tax authorities at the same time that the taxable activity occurs. Therefore, there will always be time lags before the tax is paid.

In view of the macroeconomic imbalances that may be generated by the budget deficits, it is important

to control their expansionary pressure in an economy. To this end, it is necessary to understand the factors behind the expansionary budget imbalance dynamics. The available literature shows that budget imbalances respond to various factors that can be categorized into: economic factors such as inflation (Olivera, 1967; Tanzi, 1977; Aghevli & Khan, 1978; Heller, 1980); political economy factors such as type of government (Alesina & Drazen, 1991) and strategic debt accumulation (Alesina & Tabellini, 1990a); structural factors such as the tax reforms (Muriithi & Moyi, 2003); tax revenue performance (Wawire, 1991, 2006, 2017); and demographic factors (Painter & Bae, 2001; Sanz & Velázquez, 2001; Wawire, 2006, 2017). Since budget imbalances seem to respond to various factors, it is of interest to investigate the factors that are majorly responsible for the budget imbalance dynamics in Kenya. It is against this backdrop that this paper sought to provide a broad analysis of budget imbalance dynamics in Kenya. The paper examines the factors that simultaneously influence rise in government spending while at the same time limiting growth in government revenue. Further, it looks at how these factors directly influence the budget imbalance dynamics in the country.

1.2 Statement of the Problem

In the Vision 2030 economic blueprint, Kenya aims at maintaining its budget deficit (including grants) to an average of about 3 percent of GDP over the period (Republic of Kenya, 2007). However, Kenya remains a perpetual casualty of expansionary budget deficits. Over the period under study (2000-2015), Kenya's persistent budget deficits (including grants) has increased from 3.86 percentage share of GDP in the year 2000 to 13.11 percentage share of the GDP in 2015, which is far from the target of 3 percent envisioned in the Vision 2030 blueprint. Since 2012, the budget deficits (including grants) have worsened from 6.48 percentage share of GDP to 9.73 percentage share of GDP in 2014 and finally to 13.11 percent in 2015. This is despite the government attempts to carry out fiscal adjustments and efforts to improve on domestic revenue mobilization.

The persistent growth in the budget deficits is worrying due to the pressure it is generating for additional government borrowing and the associated economic ills. For instance, fiscal deficits are responsible for an assortment of ills such as high inflation rates, over indebtedness and crowding out of the private sector investments (Gongera, Mindila, Nyakwara, & Ouma, 2013). These further constrain fiscal consolidation efforts in the country. The consequences of the persistent budget deficits call for an analysis of the factors behind the fiscal imbalance dynamics in the country. Identifying and coming up with control measures to reduce effects of these factors, some of which may be discretionary, would help to limit the associated economic ills and provide a supportive macroeconomic environment for successful and sustainable fiscal consolidation in the country.

1.3 Study Objectives

The main objective of this study was to examine the budget imbalance dynamics in Kenya. Specifically, the study sought to:

(i) Analyze the budget imbalance dynamics in Kenya

(ii) Examine the extent at which Olivera-Tanzi effect theory explains the budget imbalance dynamics

in Kenya

In pursuit of Kenya's development agenda, budget deficits may be unavoidable. However, there are factors that may lead to an increase in size of budget deficits, making it a challenge for policymakers to ensure fiscal discipline and macroeconomic stability thus yielding undesirable consequences in the economy. This study takes a broad perspective empirically to examine the underlying factors behind Kenya's budget imbalance dynamics. The rest of the paper is organized as follows: the second section reviews the available literature; the third section explains the methodology used; the fourth section presents the empirical results and discussions of the results; and the last section concludes.

2. Literature Review

The dynamics of budget imbalances in both developed and developing countries can be explained using various theories. First, the Keynesian theory postulates that a rise in budget deficits, increases aggregate demand in an economy, which may stimulate investment and growth under conditions of less than full employment (Mashakada, 2013). In doing so, Mashakada (2013) explained that the Keynesian model assumes that the economy is not at full employment level of production, that there exists a substantial number of liquidity constrained economic participants and that consumption is related to current income. The combination of these three assumptions leads to a positive effect of a rise in the budget deficit on consumption, investment and consequently output. To the extent that government and private debt do not compete for households' savings, budget deficits stimulate aggregate demand and provide policymakers with a means to offset cyclical fluctuations and to accelerate economic growth (Galli & Padovano, 2002). The Keynesian rationale then implies a deficit reaction function driven by variables such as unemployment and output growth rate.

Second, the optimal finance theory that is in accordance with the Ricardian equivalence proposition. It argues that deficits and taxes are equivalent in their effect on consumption, thus debts can be used by the government to smooth taxes over time (Barro, 1979). The conditions required for Ricardian Equivalence to hold are existence of infinite planning horizons, certainty about future tax burdens, perfect capital markets (or absence of borrowing constraints), rational expectations and non-distortionary taxes (Mashakada, 2013). Galli and Padovano (2002) argued that fluctuations of tax base induced by business cycle need surpluses in upswing periods and deficits during downturn periods to keep government expenditures and tax rate constant.

Third, the government choice theories presented by Galli and Padovano (2002) claim that deficits are an equilibrium result of political choices carried out under a set of institutional constraints. Galli and Padovano (2002) argued that voters and pressure groups choose debt over taxes to redistribute resources in their favor. Hence, changes in the political influence of these groups and in the institutional framework where fiscal choices occur set the equilibrium deficit level. The government choice theories presented by Galli and Padovano (2002) are the special interest group theory, wars of attrition, and political budget cycles. Special interest group theory suggests the identification of interest groups that

prefer debt financing and the political influence of such a group in shifting government policy in their favor. The special interest groups could be youths, women or the elderly and their political influence could increase with their percentage share of the total population.

In the wars of attrition explanation for fiscal deficits, Galli and Padovano (2002) presented the argument by Alesina and Drazen (1991), and Kontopoulos and Perotti (1999) that divided or coalition governments lead to the creation and persistence of budget deficits. For instance, it is argued that decision making in a coalition government has been always a challenge, hence leading to delays in fiscal stabilization and accumulation of more debt. In the theory of political budget cycles, it is argued that an expansionary fiscal policy before elections may lead to a boom in the economy that voters may perceive as a sign of competence of the incumbent government as it seeks re-election (Rogoff, 1990; Alesina, Roubini, & Cohen, 1997). Therefore, budget deficits are likely to increase during the election periods.

Finally, is the Olivera-Tanzi effects theory from the work of Olivera (1967) and Tanzi (1977, 1978). Olivera (1967) suggested that inflation-induced seigniorage might lower real income tax. Thereafter, Tanzi (1977, 1978) analyzed Olivera's work and supported it. The Olivera-Tanzi effect theory postulates that as inflation rises, public expenditure rises while real tax revenue, after adjusting for inflation, depreciates hence fuelling the budget deficit problem. The delay in adjustment of tax revenue to inflation is influenced by the elasticity of tax with respect to nominal income and length of time between an occurrence of taxable event and tax payment (Tanzi, 1978). Given the lag in the collection of taxes, the higher the rate of inflation, the lower the real value of tax revenue collected, holding other factors constant (Tanzi, 1977, 1978). Aghevli and Khan (1978) showed that public expenditures adjust more quickly to inflation than taxes, with the result that the budget deficit is enlarged.

The reviewed literature identifies economic factors (such as inflation, GDP growth, unemployment rate, real exchange rate, openness to international trade and external balance), political economy factors (such as political budget cycles, tax reforms, type of government, corruption) and demographic factors (such as urbanization) as the underlying factors behind the budget imbalances dynamics witnessed in various countries. The most common explanation of the effects of inflation on budget imbalances is presented by the Olivera-Tanzi effect proposition and related empirical studies. Olivera (1967) modelled an increase in size of budget deficits that results from inflation when public expenditure is related to current price level, but government revenues are related to the previous price level, as a result of lags in tax collections. Studies thereafter (Aghevli & Khan, 1978; Heller, 1980; Hossain, 1987; Diokno, 2007) have found similar results showing that with inflation, public expenditures adjust rapidly while at the same time the real value of tax revenue is eroded due to tax collection lags thus resulting in an increase in size of budget deficits.

Economic growth also influences budget imbalances through its impact on government spending and tax revenue growth. Cho (2009) posited that there could be a positive relationship between economic growth and expansion of government spending based on the assumption that pressure for social

progress leads to public sector growth. Cho added that GDP growth influences the budget deficits through its impact on growth in tax revenue, which is expected to grow with increases in national income. Tujula and Wolswijk (2004) used pooled least squares to estimate the factors behind the budget imbalance dynamics for the period 1970-2002 in a panel of OECD countries. They found out that real GDP growth, reduced budget deficits in the countries.

Flexible exchange rate regimes allow macroeconomic effects of unsound public finance policies to manifest themselves immediately through movements in exchange rates, hence are said to promote fiscal discipline (Cho, 2009)**.** According to Easterly and Schmidt-Hebbel (1991) the net effects of real exchange rate fluctuations on budget balances relies on the relative weights of traded and non-traded items in public expenditure and revenue. A real depreciation of the domestic currency raises public expenditure (measured in local currency units) by increasing foreign interest payments and expenditure of traded-goods, capital and intermediate goods acquired by the government (Easterly & Schmidt-Hebbel, 1991). On the other hand, a real depreciation boosts government revenue from higher surpluses of traded-goods producing firms and from taxation of traded goods (Easterly & Schmidt-Hebbel, 1991). Diokno (2007) argued that considering the fact that the foreign debt accounts for about half of total outstanding government debt, it is anticipated that real exchange rates are negatively related with budget balances.

The political economy factors that have been found to influence the budget imbalances are political budget cycle, type of government, and corruption in the public sector. During election years, politicians pursue expansionary fiscal policies in order to boost the economy in time to secure electoral support (Cho, 2009; Tujula & Wolswijk, 2004). According to Tujula and Wolswijk (2004) budget balances on average deteriorate by about 0.3 percent of GDP in general election years. Using a sample of Sub-Saharan African countries, Block (2002) showed that political business cycles have effects on budget balances and public expenditure. Alesina and Tabellini (1990a) showed that the strategic interaction between two governments in office at different times could lead to increase in budget deficits through accumulation of government debt over what it could be under a benevolent social planner. Alesina and Perotti (1994) pointed out that the accumulation of debt by incumbent government is higher the less likely it is for it to be re-elected and the greater the disagreement on public expenditure composition between the incumbent and the opposition parties.

Roubini and Sachs (1989) examined the evolution of the size of government and budget deficits in OECD economies during the period 1960-1985. They found out that countries, mostly characterized by multi-party coalitions and proportional representation voting like Italy and Belgium failed to limit the government debt accumulation. They affirmed that budget deficit reduction requires political consensus, which is hard to achieve in multi-party coalitions. In their “war-of-attrition” model, Alesina and Drazen (1991) noted that delayed stabilizations occur due to too many parties forming the government, which render it difficult to reach a consensus on concrete adjustment policies. Thus, broad-based coalition governments have more difficulties in committing to a stabilization program than one-party majority

rule governments. Before the 2002 general elections, Kenya was governed by a single-majority party government (KANU). However, after the elections, National Rainbow Coalition (NARC) government came into power. This was a coalition government of several parties that came together before the elections. After the disputed December 2007 general election until March 2013, Kenya was governed by a coalition government consisting of the Orange Democratic Movement (ODM) and the Party of National Unity (PNU). These parties came together to form the government after the disputed elections. Moreover, following the 2013 general elections, the Jubilee Coalition came into power. However, the parties that formed the coalition before the election later on in 2016 dissolved to form the Jubilee Party. It is therefore of interest to examine how changing the type of government, especially to the grand coalition government of 2008-2013 influenced Kenya's fiscal balances.

The other political economy factor which has been found to influence budget imbalances is the level of corruption in the public sector. More specifically, corruption within government and low tax compliance by its citizens' influence government spending and tax revenue collection. According to Mwakalobo (2015), Kenya, Tanzania and Uganda have institutional weaknesses that lead to revenue leakages through tax evasion and embezzlement of revenue collected. These impacts negatively on the amount of revenue collected and consequently the size of the budget deficit. Gongera et al. (2013) lists corruption, unwarranted public expenditure by the government, inability of Kenya Revenue Authority to hit its targets and high tax non-compliance rate as factors responsible for the persistent budget deficits in Kenya.

Demographic factors also influence the budget imbalances through the pressure they exert on governments to adjust public expenditure to cater for increased demand for public goods and services. Painter and Bae (2001) pointed out that the elderly population proportion has a negative relationship with state public expenditure, which indicates that the elderly have a lower demand for government goods. Youthful populations like the case of Kenya tend to have a higher demand for public goods and services than an aging population. This leads to increased pressure for the government to increase spending, which worsens the budget deficits.

The reviewed literature shows that most studies have focused on economic factors without broadly incorporating other factors such as political and demographic factors. This paper sought to fill this gap by taking a broad view of the factors behind budget imbalance dynamics in Kenya. Additionally, the reviewed literature presents a limited focus on Sub-Sahara African countries with only Block (2002) and Weeks (2008) focusing their analysis on a sample of Sub-Sahara African countries. The sample by Easterly and Schmidt-Hebbel (1991) also included a limited number of Sub-Sahara African countries. Most of the reviewed studies have made use of samples of OECD countries. In an attempt to fill this gap, this paper makes use of country—specific data analysis using a set of simultaneous equations. Moreover, empirical studies on Kenya such as Muriithi and Moyi (2003), Wawire (2006, 2017), and Gongera et al. (2013) have mainly focused on tax revenue performance. This paper sought to fill this gap as well.

3. Methodology

3.1 Theoretical Framework

This paper takes a broad view of the budget imbalance dynamics in Kenya since it is based on an interaction of theories explaining the relationship between various factors and budget imbalances dynamics. However, the paper borrows heavily from empirical studies that have looked at the impact of economic factors, specifically inflation, on budget imbalances through two-step effects on the tax revenue generation and government spending adjustments. The theoretical underpinning for this paper, therefore, is the Olivera-Tanzi effect theory with the assumption that the effect can also take place in a low or a moderate inflation economy like Kenya. More specifically, the paper borrows from the theoretical framework used by Aghevli and Khan (1978) and Heller (1980), modified to incorporate other variables. Aghevli and Khan (1978) analyzed the relationship between inflationary process and budget deficits in developing countries. They modelled the public sector by assuming that the government's "desired" real expenditures are related to real income levels (assuming that real income is exogenous). This is presented as follows:

$$\log\left(G/P\right)_t^d = g_0 + g_1 log\, Y_t \;;\; 0 < g_1 \tag{1}$$

Where log is logarithm, G is nominal government expenditure, P is the price level, d indicates that it's the desired level of real expenditure, t is time variable, Y is real national income, g_1 is real income elasticity of government expenditure which is one if the government increases its expenditure proportionately with the growth of real income.

Aghevli and Khan (1978) argued that government attempts to keep its real expenditure constant in the face of inflation, thus they specified actual real expenditures to adjust to the difference between desired real expenditures and actual real expenditures in the previous period as presented in Equation 2:

$$log\left(G/P\right)_t = \varphi\left[log\left(G/P\right)_t^d - log\left(G/P\right)_{t-1}\right] \tag{2}$$

where φ is the coefficient of adjustment, $0 < \varphi < 1$

Substituting Equation (1) into (2), a solution for level of real expenditures is obtained:

$$log\left(G/P\right)_t = \varphi g_0 + \varphi g_1 \log Y_t + (1-\varphi)\log\left(G/P\right)_{t-1} \tag{3}$$

This is a partial adjustment model. However, for this analysis, the dynamism of the model is determined by the data used. In nominal terms, Equation (3) is expressed as follows:

$$log G_t = \varphi g_0 + \varphi g_1 \log Y_t + (1-\varphi)\{\log G_{t-1} - \log P_{t-1}\} + \log P_t \tag{4}$$

Aghevli and Ghan (1978) also assumed that the desired nominal government revenues are functionally related to the level of nominal income, thus:

$$\log TR_t^d = t_0 + t_1(\log Y_t + \log P_t) \;;\; 0 < t_1 \tag{5}$$

where TR is the nominal total revenue and t_1 denotes the elasticity of total revenue that is expected to be positive. Other variables are as described before. Actual total revenues adjust for the difference between desired total revenue and actual total revenue obtained in the previous period;

$$logTR_t = \tau[\log TR_t^d - \log TR_{t-1}] \quad (6)$$

Where τ is the coefficient of adjustment, $0 < \tau < 1$

Substituting Equation (5) into (6), an equation for nominal total revenues is obtained:

$$\log TR_t = \tau t_0 + \tau t_1(\log Y_t + \log P_t) + (1-\tau) logTR_{t-1} \quad (7)$$

In this framework, even if at the beginning there is a balanced budget, there will be an increasing divergence between expenditure and revenue due to inflation and other factors. The fundamental hypothesis is that expenditure tends to adjust to its desired level more rapidly than revenue (Heller, 1980). Additionally, there could be other economic, institutional and/or political economy factors influencing government spending positively while at the same time limiting revenue growth. Consequently, these factors lead to an increase in size of the budget deficit.

3.2 Empirical Models

In specifying the models for analyzing the budget imbalance dynamics in Kenya, the theoretical framework presented by Aghevli and Khan (1978) which has been applied by authors such as Heller (1980), Hossain (1987) and Neyapti (2003) was employed. In this analysis, the focus is in the adjustments of the budget balance components, which consequently determine the budget imbalance dynamics. The empirical model for the analysis of the nominal adjustments in government expenditure follows Equation (4) with some modification and is specified as follows:

Model 1: Government Expenditure Model

$$\Delta lnG_t = \alpha_0 + \sum \alpha_i \, \Delta lnG_{t-i} + \sum \beta_f \Delta lnY_{t-f} + + \sum \gamma_k \Delta lnCPI_{t-k} + \sum \delta_l \, \Delta lnNEER_{\,t-l} + \sum \vartheta_w \, \Delta lnMW_{t-w} + \sum \pi_n \Delta \ln CorPI_{t-n} + \tau_1 \, ELC + \tau_2 \, GovT + \tau_3 \, @trend + \mu_t \quad (8)$$

Where: Δ is the difference operator; ln is the natural log; t denotes time index in quarters (2000Q1, …, 2015Q4); α_0 is the autonomous adjustments of the dependent variable; $\alpha_i, \beta_f, \gamma_k, \delta_l, \vartheta_w, \pi_n, \tau_1, \tau_2 \; and \; \tau_3$ are coefficients; i, f, k, l, w, n are the lag lengths of the respective variables; G is nominal government expenditure (including interest payment on government debt); Y is nominal national income (nominal GDP); CPI is Consumer Price Indices; $NEER$ is Nominal Effective Exchange rates; MW is nominal minimum wages; $CorPI$ is Corruption Perception Index; ELC is election dummy; $GovT$ is type of government (takes the value 1 for grand coalition government (2008 Q2 to 2013Q1) and 0 otherwise); $@trend$ used to capture time trend; and μ is stochastic disturbance term.

Nominal adjustment in government tax revenue follows Equation (7) with some modification and is specified as:

Model 2: Government Tax Revenue Model

$$\Delta lnTR_t = \alpha_0 + \sum \alpha_i \, \Delta lnTR_{t-i} + \sum \beta_f \, \Delta lnY_{t-f} + + \sum \gamma_k \, \Delta lnCPI_{t-k} + \sum \delta_l \, \Delta lnNEER_{\,t-l} + \sum \vartheta_w \, \Delta lnMW_{t-w} + \sum \pi_n \Delta \ln CorPI_{t-n} + \tau_1 ELC + \tau_2 GovT +$$

$$\tau_3 \, @trend + \mu_t \quad (9)$$

Where *TR* is the nominal government tax revenue (excluding non-tax revenue and grants) and the other variables and symbols are as defined before in Equation (8).

Using specifications in Equation (8) and (9), the decision on how a variable influences the budget imbalance dynamics is based on the sign and magnitude of the coefficients. Additionally, a model for direct analysis of budget imbalance dynamics is specified in order to corroborate the results from the first two models. The model for nominal adjustments in budget imbalances is given by:

Model 3: Budget Imbalance Model

$$\Delta lnB_{bal,t} =$$

$$\alpha_0 + \sum \alpha_i \, \Delta lnB_{bal,t-i} + \sum \beta_f \Delta lnY_{t-f} + +$$

$$\sum \gamma_k \, \Delta lnCPI_{t-k} + \sum \delta_l \, \Delta lnNEER_{\,t-l} + \sum \vartheta_w \Delta lnMW_{t-w} + \sum \pi_n \, \Delta \ln CorPI_{t-n} + \tau_1 ELC + \tau_2 GovT +$$

$$\tau_3 \, @trend + \mu_t \quad (10)$$

Where B_{bal} is the nominal budget balance (which can be a deficit or a surplus in a quarter). The other variables and symbols are as defined before in Equation (8).

3.3 Definitions of Variables and Expected Results

The dependent variables in this analysis are nominal adjustments in aggregate government expenditure, total government revenue and budget balance. Change variables are used since the main focus is to see how the various variables influence budget imbalance dynamics. *Natural log of nominal government expenditure (LnG)* is the natural logarithm of total national government expenditure, including interest payment on government debt in a quarter. *Natural log of nominal government tax revenue (LnTR)* is the natural logarithm of total quarterly nominal government tax revenue (excluding non-tax revenue and grants).

Natural log of nominal budget balance (B_{bal}) is the natural logarithm of quarterly total current government spending plus the interest payment on outstanding debts minus the total tax revenue (excluding non-tax revenue and grants). Since most of the quarterly budget balances take negative (deficit) figures, their log transformation follows the formulae employed by Busse and Hefeker (2007) in log transforming negative numbers, which is:

$$y = \ln\{x + \sqrt{(x^2 + 1)}\} \quad (11)$$

Where *x* captures the budget balance (deficit) figures. Since the budget balances are in the billions and trillions, one trillion (1,000,000,000,000) figure is used in the formulae instead of 1.

Natural log of nominal national income (LnY) is the natural logarithm of quarterly nominal Gross Domestic Product (GDP). *Natural log of consumer price index (LnCPI)* is the natural logarithm of consumer price index used to capture the general price levels in the economy and the effects of inflation on budget imbalances.

Natural log of nominal effective exchange rates (NEER) is the natural logarithm of a weighted average of the Kenya Shilling (KSh) relative to a basket of the trading partners' currencies, weighted in accordance with the importance of the issuing countries as a trade partner. NEER is not adjusted for the

effects of inflation and is reported annually by UNCTAD hence the data is converted to quarterly time series data using *Eviews*. The index base for the NEER data used in the analysis is the year 2000.

Natural log of nominal minimum wages (LnMW) is the natural logarithm of nominal values of gazetted monthly basic minimum wages in urban areas (Nairobi, Kisumu, Mombasa), excluding house allowances. These cities have a relatively high concentration of public servants hence the decision to use their minimum wages instead of that in the agricultural industry.

Natural log of corruption perception index (LnCorPI) is the natural logarithm of the corruption perception index for Kenya, reported by Transparency International. A country's score represents the perceived level of public sector corruption on a scale of 0 (highly corrupt) to 100 (very clean). Increase in perceived public sector corruption levels is represented by decline in corruption perception index score.

Election dummy (ELC) captures the influence of the political business cycle. It takes the value 1 for a period where there were general elections (that is, three quarters before and including the quarter when the election is held) and 0 for a period when there were no general elections. The dummy is defined for the period before the elections since the interest is to capture the effects of pre-election fiscal manipulations.

Type of government (GovT) is used in the models to capture the influence of the composition of the government on budget imbalances. It takes the value 1 for the grand coalition government (formed in March 2008 after the 2007 post-election violence—ruled until March 2013) and 0 otherwise.

3.4 Data Sources and Type

This paper utilizes secondary time series data for the period 2000 Quarter 1 to 2015 Quarter 4. The quarterly data on government expenditure, national income (GDP at market prices), Consumer Price Index, interest payment on government debt was obtained from the Central Bank of Kenya and Kenya National Bureau of Statistics (KNBS). Quarterly tax revenue data were obtained from Kenya Revenue Authority, whereas minimum wage data was obtained from the Kenya Economic Surveys published by Kenya National Bureau of Statistics. Data for nominal effective exchange rates was obtained from UNCTAD (2017) online statistics. Public sector corruption perception indices data was obtained from the Transparency International's annual reports on Kenya. The annual data for nominal effective exchange rate and corruption perception indices were transformed into a quarterly data using *Eviews* statistical software to conform to the data structure of the other variables.

4. Results and Discussions

4.1 Diagnostic Tests Results

Test for presence of unit roots in the series was carried out using Augmented Dickey-Fuller (ADF), Philips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests. Before performing the diagnostic tests, the trend of the variables was determined. The results of the unit root tests show that election dummy (*ELC*) is integrated of order zero, whereas the log of nominal government expenditure

(*LnG*), log of nominal tax revenue (*LnTR*), log of budget balances (*LnBbal*), log of national income (*LnY*), log of consumer price index (*LnCPI*), log of nominal effective exchange rate (*LnNEER*), log of nominal minimum wages (*LnMW*), log of corruption perception index (*LnCorPI*), and government type (*GovT)* are integrated of order one.

Heteroskedasticity test was carried out using Breusch-Pagan-Godfrey Test with the null hypothesis of no heteroskedasticity. The results showed that there is no heteroskedasticity in the models. Additionally, the results for serial correlation test, which was carried out using the LM test, concluded that there is serial correlation among the variables included in all the three models. Multicollinearity test which detects the existence of a high correlation among independent variables was also carried out. Results of correlation analysis show that the log of national income (*LnY*) is highly correlated with most of the variables. Therefore, the variable is dropped from the models to correct for multicollinearity.

To test for structural break in the data series, multiple breakpoint tests were applied to identify periods of possible structural breaks in the data series and then Chow breakpoint test was applied on the periods identified by the former test to confirm its significance. The results showed that for the government expenditure model, there are no break dates whereas for government tax revenue and budget imbalances models there are break dates in 2012Q1 and 2004Q4 respectively. The Chow Breakpoint test showed that the 2012Q1 break point was insignificant whereas the 2004Q4 breakpoint was found to be significant. This breakpoint was captured in the model by the dummy variable for political budget cycle, capturing the period preceding the 2005 national referendum on change in constitution.

4.2 ARDL Bounds Cointegration Test and Model Selection

Since the variables are not integrated of the same order, the Johansen cointegration procedure cannot be applied in testing for cointegration in the models. Consequently, Autoregressive Distributed Lag (ARDL) model developed by Pesaran et al. (2001) is employed. The Autoregressive Distributed Lag (ARDL), also known as Bounds Testing, methodology of Pesaran and Shin (1999) and Pesaran et al. (2001) can be used with a mixture of data series that are integrated of order zero or one, and the variables can enter the model at different lag-lengths. However, none of the variables should be integrated of order two.

To determine the appropriate lag structure before carrying out the Cointegration test, the study made use of Akaike's information criterion (AIC), Schwarz's Bayesian information criterion (SBIC), and Hannan and Quinn information criterion (HQIC) lag-order selection statistics. The lower the AIC, SBIC or HQIC value the better the model. The results found an optimal lag length of 4 for government expenditure model, optimal lag length of 8 for the government tax revenue model and optimal lag length of 4 for the budget imbalances model.

To test for Cointegration, Bound testing was then carried out where coefficient diagnostics for the level lagged variables was done using F-Test. The null hypothesis of the test is that there is no long-run equilibrium relationship (cointegration) between the variables. That is, H_0: $\theta_1 = \theta_2 = \theta_3 = \theta_4 = \theta_5 = 0$.

The computed F-statistic was compared with the tabulated Pesaran Critical values at the five percent level of significance for a model with unrestricted intercept and unrestricted trend. Pesaran et al. (2001) present a lower bound which is based on the assumption that all of the variables are integrated of order zero, I (0), and an upper bound based on the assumption that all of the variables are integrated of order one, I (1). As a crosscheck, Bounds t-test of H_0: $\theta_1 = 0$, against H_1: $\theta_1 < 0$ was performed. Table 1 presents the ARDL Bounds cointegration test results.

Table 1. ARDL Bounds Cointegration Test Results

		Government Expenditure Model (1)	***Government Tax Revenue Model (2)***	***Budget Imbalance Model (3)***
Specification		Unrestricted intercept and unrestricted trend; k = 5	Unrestricted intercept and unrestricted trend; k = 5	Unrestricted intercept and unrestricted trend; k = 5
F-statistic		15.9726	11.9560	738.5547
Pesaran Critical Values at 5 percent Level of Significance	Lower Bound	3.12	3.12	3.12
	Upper Bound	4.25	4.25	4.25
t-statistic		-8.8623	-7.6156	-58.8581
Pesaran Critical Values at 5 percent Level of Significance	Lower Bound	-3.41	-3.41	-3.41
	Upper Bound	-4.52	-4.52	-4.52
Conclusion		Cointegrated	Cointegrated	Cointegrated

Source: Authors (2018).

The results show that the F-statistics for all the three models are greater than the Upper Bound Pesaran's critical values, thus the null hypothesis of no cointegration is rejected. Results for the Bounds t-test also show that in absolute terms, t-statistics of the three models are greater than Upper Bound Pesaran's critical values at 5 percent significance level. These results show that the variables have a long run relationship. In view of these results, a long-run level model as well as an Error Correction Model (ECM) is estimated to measure the long-run equilibrating relationship and the short-run dynamic effects.

4.3 Efficiency and Dynamic Stability of the Models

The test for serial correlation was carried out to confirm if the errors are serially independent. This is a key requirement for ARDL model efficiency. Additionally, the Jarque-Bera test was used to determine the normality of the residuals, with the null hypothesis that residuals are normally distributed. The results are presented in Table 2.

Table 2. Results of Tests for Models' Efficiency

Test	***Government Expenditure Model (1)***	***Government Tax Revenue Model (2)***	***Budget Imbalance Model (3)***	***Conclusion***
Breusch-Godfrey Serial Correlation LM Test (F-statistic)	0.4317	2.4415	0.4408	No serial correlation
Jarque-Bera Normality Test (Test-statistic)	1.7328	1.9192	0.1240	Residuals are normally distributed

Note. *, **, *** Denote the rejection of the null hypothesis at 10 percent, 5 percent, and 1 percent level of significance, respectively.

Source: Authors (2018).

The results show that the residuals in the models are serially independent and normally distributed, which is desirable for their specification. Further, the dynamic stability of the models was tested using the CUSUM test and the AR roots graphs. The null hypothesis in CUSUM test is that the parameters are stable (which is desirable). The results for the CUSUM test are presented in the following figures.

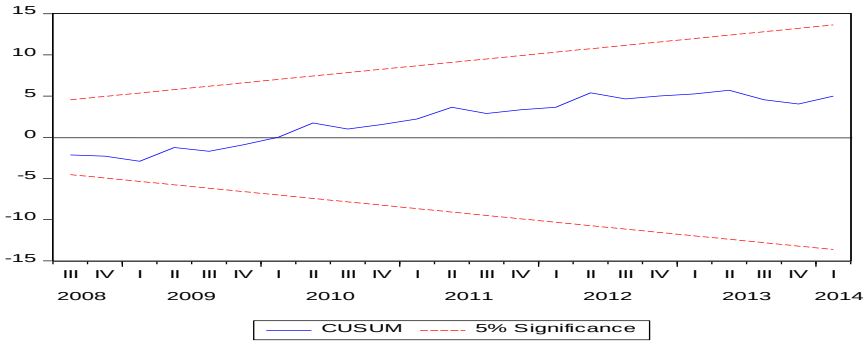

Figure 2. Result of CUSUM Test for Stability of the Government Expenditure Model

Source: Authors (2018).

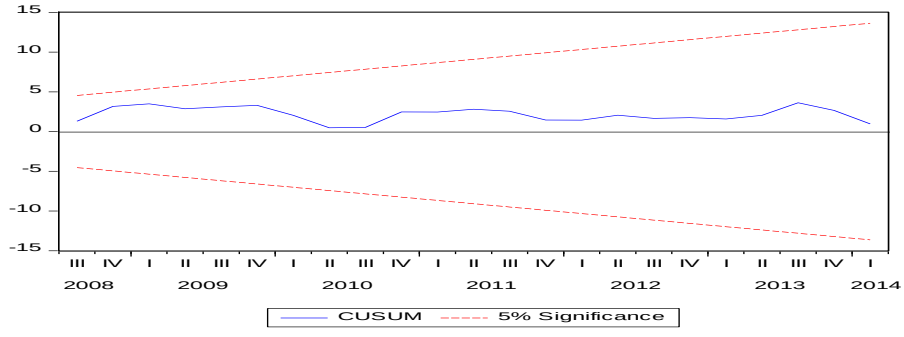

Figure 3. Result of CUSUM Test for Stability of the Government Tax Revenue Model

Source: Authors (2018).

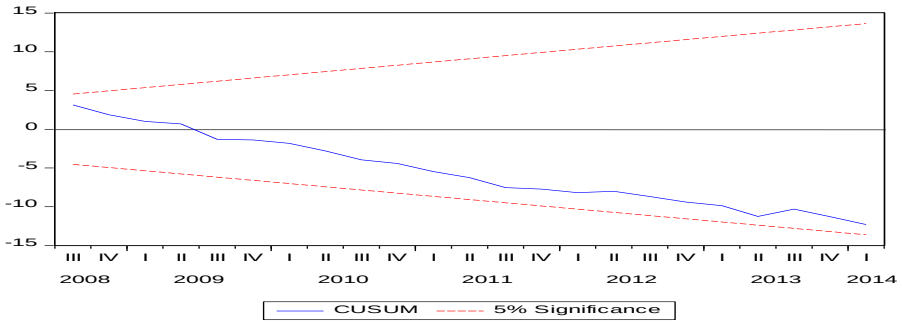

Figure 4. Result of CUSUM Test for Stability of the Budget Imbalance Model

Source: Authors (2018).

The results of CUSUM test for stability in Figures 2-4 show that the models are dynamically stable since the CUSUM statistics (blue lines) lay within the bands. This implies that the models are steady and reliable in explaining the relationships the dependent and the explanatory variables.

For the AR roots graphs, an estimated model is stable (stationary) if all roots have modulus less than one and lie inside the unit circle. The AR roots graphs, which report the inverse roots of the characteristic AR polynomial, are presented in the following figures.

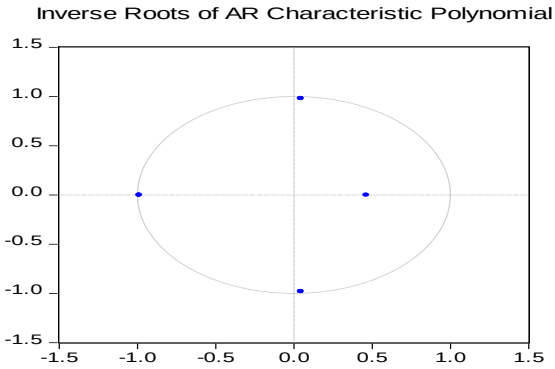

Figure 5. AR Roots Graph for Government Expenditure Model

Source: Authors (2018).

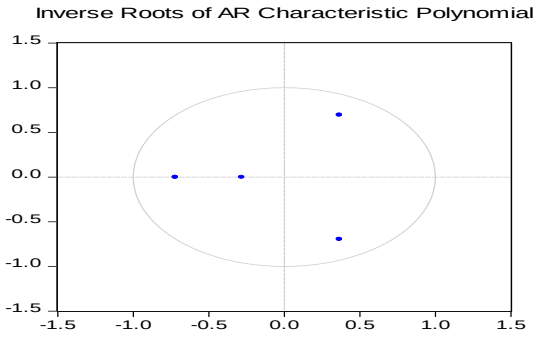

Figure 6. AR Roots Graph for Government Tax Revenue Model

Source: Authors (2018).

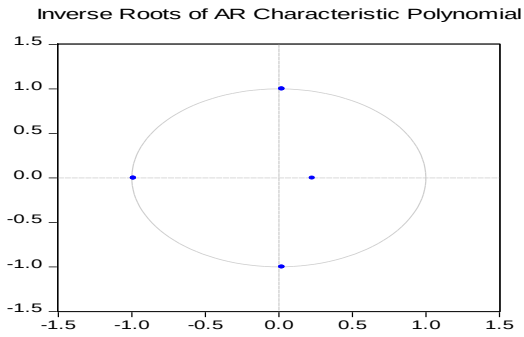

Figure 7. AR Roots Graph for Budget Imbalance Model

Source: Authors (2018).

The AR roots graphs in Figures 5 and 7 show that in the government expenditure and budget imbalance models, some roots lie on the unit circle, which implies that even though the systems are stable, they are likely to have a random walk/process with time. This may weaken the validity of the standard errors with time. The AR roots graph in Figure 6 shows that for the government tax revenue model, all roots have modulus less than one and lie within the unit circle. This implies that the process is bounded or forced around a trend thus is stable and is not likely to have a random walk with time. That is, the standard errors remain valid even with a larger period.

Using the pairwise Granger causality test, the causality between the variables is tested and the results of the test are presented in the Table 4 in the appendix. The results show that change in log of consumer price index ($\Delta lnCPI$) granger causes change in log of government tax revenue ($\Delta lnTR$) at the five percent levels of significance. The results also show that change in log of consumer price index ($\Delta lnCPI$) does not granger cause change in log of budget balance (ΔlnB_{bal}) at the second lag level where it enters the budget imbalance model. However, a further test of granger causality between the two variables at fourth lag level, where the variable enters the government expenditure and tax revenue model, reveals that change in log of budget balance (ΔlnB_{bal}) instead granger causes change in log of consumer price index ($\Delta lnCPI$) (see Table 5 in the appendix). This is an indication that the methods of financing Kenya's budget deficits could be partly inflationary.

4.4 Discussion of the Regression Results

The Error Correction Model regression results for the three models used to analyze the fiscal imbalances dynamics are presented in Table 3.

Table 3. ARDL ECM Regression results for Analysis of Budget Imbalance Dynamics

	Government Expendituure Model	***Government Tax Revenue Model***	***Budget Imbalance Model***
Regressors	**Dependent Variable**: Change in log of government expenditure (ΔlnG_t)	**Dependent Variable**: Change in log of government tax revenue ($\Delta lnTR_t$)	**Dependent Variable**: Change in log of budget balance ($\Delta lnB_{bal,t}$)
Change in log of government expenditure, lagged twice (ΔlnG_{t-2})	0.2870 (0.1917)	-	-
Change in log of government tax revenue, lagged twice ($\Delta lnTR_{t-2}$)	-	0.3678*** (0.0658)	-
Change in log of budget balance, lagged once ($\Delta lnB_{bal,t-1}$)	-	-	-0.1277 (0.0833)
Change in log consumer price index ($\Delta lnCPI_{\ t}$)	-	-	9.7729** (4.5629)
Change in log of consumer price index, lagged twice ($\Delta lnCPI_{\ t-2}$)	-	-	8.4025* (4.6807)
Change in log of consumer price index, lagged four times ($\Delta lnCPI_{\ t-4}$)	9.2574 (6.0788)	-0.9700** (0.4164)	-
Change in log of nominal effective exchange rate, lagged three times ($\Delta lnNEER_{\ t-3}$)	-	0.2620 (0.3806)	4.3719 (4.2718)
Change in log of nominal effective exchange rate, lagged four times ($\Delta lnNEER_{\ t-4}$)	1.3653 (5.6298)	-	-
Change in log of minimum wages ($\Delta lnMW_t$)	-	-	13.5752*** (2.4678)
Change in log of minimum wages, lagged once ($\Delta lnMW_{t-1}$)	6.1093* (3.1982)	-	-
Change in log of minimum wages, lagged twice ($\Delta lnMW_{t-2}$)	14.0827*** (4.6792)	-	-
Change in log of minimum wages, lagged three quarters ($\Delta lnMW_{t-3}$)	-	0.9430*** (0.2197)	-
Change in log of minimum wages, lagged four quarters ($\Delta lnMW_{t-4}$)	-	-	13.6265*** (2.7829)
Change in log of corruption perception index, lagged once ($\Delta \ln CorPI_{t-1}$)	-4.2191 (5.9250)	-	-
Change in log of corruption perception index, lagged twice ($\Delta \ln CorPI_{t-2}$)	-	-	-6.7946* (3.6277)
Change in log of corruption perception index, lagged three quarters ($\Delta \ln CorPI_{t-3}$)	-	-0.0376 (0.3280)	-
Election dummy (ELC_t)	-0.2727 (0.2537)	0.0157 (0.0184)	0.3090* (0.1806)
Government Type ($GovT_t$)	-0.6949** (0.3428)	0.0150 (0.0196)	-0.3317 (0.2169)
Constant Term	-0.4926 (0.3430)	0.0272 (0.0224)	-1.1482*** (0.2841)
Error correction term (ECT_{t-1})	-1.1399*** (0.2361)	-1.0307*** (0.1667)	-0.4876*** (0.1698)
Time trend ($@trend$)	0.0104 (0.0101)	-0.0006 (0.0007)	0.0067 (0.0073)
Number of Observations	52	48	49
F-statistic	5.7616***	36.5099***	27.6321***
Adjusted R-squared	0.4828	0.8718	0.8592

Note. Level of significance are denoted by * p<0.1, ** p<0.05, and *** p<0.01. The figures inside the parentheses are robust standard errors.

Source: Authors (2018).

The variables enter the respective models at different lag levels and the F-tests show that the coefficients are jointly significant in explaining the sample variations in government expenditure, tax revenue and budget deficits. At one percent level of significance, the coefficients of all the error correction terms included in the three models were found to be negative and significant. This implies that at one percent significance level, the systems in the government expenditure, government tax revenue and budget imbalance models adjusts towards long run equilibrium at a speed of 113.99 percent, 103.07 percent and 48.76 percent respectively. It is worth noting that the government expenditure model adjusts quickly to its long run equilibrium than the tax revenue model. This partly explains the persistent widening of the government expenditure—tax revenue gap witnessed during the study period.

Since the variables included in the models are expressed as logarithms, except the election dummy and government type dummy, their coefficients are interpreted as elasticity. The empirical results show that the lagged dependent variables do not influence the changes in the current dependent variables except for the government tax revenue. The results show that at the one percent level of significance, a percentage increase in nominal government tax revenue (lagged twice) would lead to a 0.37 percent rise in current nominal government tax revenue.

Inflation, which is captured in the models by the changes in log of consumer price indices, was found to have a positive but an insignificant coefficient in the government expenditure model. However, the coefficient of change in log of consumer price index was found to be significant in the government tax revenue and budget imbalance models. The results show that at the five percent level of significance, a percentage rise in the consumer price index (lagged four quarters) would lead to a 0.97 percent decline in nominal government tax revenue. On the other hand, at the five percent level of significance, a percentage rise in current period's consumer price index would lead to a 9.77 percent increase in nominal budget imbalances (deficits) whereas at 10 percent significance level, a percentage rise in the consumer price index (lagged four quarters) would lead to 8.40 percent increase in the nominal budget imbalances (deficits). This is a combined effect of approximately 18.17 percent increase in nominal budget deficit in a year. These results support the findings of Aghevli and Khan (1978), Heller (1980), Hossain (1987) and Diokno (2007) who found out that government expenditure adjust more quickly to inflation than tax revenue, with the result that the budget deficit is enlarged. These results also provide an empirical support to the results of Gongera et al. (2013) who noted that inflation heavily contributes to budget deficits in Kenya.

Looking back at the Granger causality test in the previous section, which revealed that change in log of budget balance Granger causes change in log of consumer price index at the fourth lag level, it can be pointed out that the financing of the annual nominal budget deficits in the country is partly inflationary in nature. The empirical results and the Granger causality test results are suggestive of a possible Olivera-Tanzi effect, which postulates that as inflation rises, government expenditure rises while real tax revenue, after adjusting for inflation, depreciates hence fuelling the budget deficit problem (Olivera,

1967; Tanzi, 1977, 1978).

The nominal minimum wages were found to have a positive influence on government expenditure, government tax revenue and budget imbalances. Nominal minimum wages were used in the models to capture the influence of the frequent wage adjustments to the budget imbalance dynamics in Kenya. The results showed that at the one percent level of significance, a percentage rise in nominal minimum wages (lagged once) would lead to a 14.08 percent increase in nominal government expenditure, whereas at the 10 percent level of significance, a percentage increase in nominal minimum wages would lead to a 6.11 percent increase in government expenditure. For the government tax revenue and budget imbalance models, the results show that at the one percent level of significance, a percentage increase in nominal minimum wages (lagged three quarters) would lead to an increase in nominal government tax revenue by 0.94 percent, whereas a percentage increase in nominal minimum wages (lagged four quarters) would lead to a 13.62 percent increase in nominal budget deficits (that is, worsen the budget imbalances).

The variable used to capture corruption in the public sector (corruption perception index) was found to have a negative coefficient in all the models, but the coefficient was only significant in the budget imbalance model. A decrease in the corruption perception index implies an increase in the perceived public sector corruption level. Therefore, the negative coefficient shows that a percentage rise in corruption levels in the public sector would lead to a 6.97 percent increase in nominal budget deficits (worsen the budget imbalances) within three quarters of a year. The result supports the arguments by Mwakalobo (2015) who found out that the institutional weaknesses in Kenya lead to tax revenue leakages through tax evasion, non-tax compliance and revenue embezzlement which impacts negatively on the amount of tax revenue collected, consequently worsening the budget deficits.

The election dummy variable (read political budget cycles) was found to have an insignificant coefficient in the government expenditure and the government tax revenue model but a positive significant coefficient in the budget imbalance model. The results show that at the 10 percent level of significance, an occurrence of a general election would lead to a 0.31 percent increase in nominal budget deficits. The result supports the findings of Tujula and Wolswijk (2004) that budget imbalances on average worsen by about 0.3 percent of GDP in general election years.

Change in government type (*GovT*) into a grand coalition government from March 2008 to March 2013 was found to have a negative effect on the nominal government spending, but no effect on government tax revenue and nominal budget balances. The results show that the change of government from that, led by Party of National Unity (PNU) into a grand coalition government with the Orange Democratic Movement (ODM) led to a 0.69 percent decline in nominal government spending. This result is suggestive of improved fiscal discipline during the grand coalition government days. However, the results are contrary to the argument by Cho (2009) that one-party majority governments are more likely to maintain tighter fiscal discipline than coalition governments. Though insignificant, the negative coefficient of the type of government dummy in the budget imbalance model is in line with the wars of

attrition model explanation for fiscal deficit presented by Galli and Padovano (2002), Alesina and Drazen (1991), and Kontopoulos and Perotti (1999). The other variable included in the model, that is, nominal effective exchange rate (NEER) was found to have a positive but an insignificant coefficient in all the three models.

5. Conclusion and Recommendations

The study shows that the system in the government expenditure model adjusts quickly to its long run equilibrium than the tax revenue model, partly explaining the persistent growth in budget imbalances (deficits) in Kenya. Whereas the consumer price index has a positive insignificant coefficient in the government expenditure model, the empirical results show that at the five percent level of significance, a percentage rise in the consumer price index (lagged four quarters) leads to 0.97 percent erosion of the nominal value of government tax revenue. Consequently, this leads to an increase in the budget deficits as indicated by the budget imbalance model, which shows that a percentage rise in the consumer price index has a combined effect of approximately 18.17 percent increase in nominal budget deficits in a year. Together with the Granger causality results which showed that change in the log of nominal budget balances Granger causes change in log of consumer price index at the fourth lag level (in a year), the results indicate that the Olivera-Tanzi effect proposition can be used to explain the budget imbalance dynamics in the Kenyan economy. The fact that Kenya is not a high inflation economy like the economies where the Olivera-Tanzi effect has been experienced before puts to question the assertion that the proposition only applies to high inflation economies. The empirical results show that increase in the general price levels in the economy (captured in the models by change in log of consumer price indices), upward adjustment of nominal minimum wages, rise in perceived levels of corruption in the public sector and an occurrence of a general election in the country worsen the budget imbalances (deficits) in Kenya. These variables consequently act as constraints to the fiscal consolidation efforts in the country as they worsen the fiscal deficits.

From the findings, the study recommends measures to reduce the fiscal imbalance gap in Kenya. First, there is a need for more concerted efforts on both supply and demand sides of the economy to check the inflationary pressure in the country. This is because the changes in general price levels in the economy were found to substantially worsen the nominal budget imbalances (deficits) in Kenya. Domestic production of consumer products needs to be enhanced and the supply side constraints that lead to inadequate supply of food items and other consumer products need to be addressed. Additionally, the expansionary fiscal stance that creates inflationary pressure on the demand side of the economy needs to be checked. More of the government resources should be devoted to the supply side's productive public expenditure aimed at reducing the cost of doing business and enhancing production in the key sectors of the economy.

Second, decisive and punitive actions need to be taken to reduce the perceived level of corruption in Kenya's public sector. This is because the study shows that rent-seeking behaviour in the public sector

worsens the budget imbalances (deficits) in the country. There is a need for more focus on ensuring value for money spent on infrastructural development projects among other development projects in the country. The fight on corruption should focus on the over-pricing of mega infrastructural projects in the country. For instance, the expenditures of constructing a kilometre of road should be standardized across the country. The same should apply to other infrastructural projects. Corruption tends to compromise the quality and value for money spent on the development projects. Indeed, rent seeking behaviour of the public officers and tax evasion are challenges that need to be dealt with decisively in controlling unproductive public expenditure and enhancing domestic revenue mobilisation in the country.

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Appendix

Table 4. Pairwise Granger Causality Test Results

	Government Expenditure Model		**Government Tax Revenue Model**		**Budget Imbalance Model**	
	Dependent variable = ΔlnG		Dependent variable = $\Delta lnTR$		Dependent variable = ΔlnB_{bal}	
Variables and Direction of Causality	***Lag length***	***F-Statistics***	***Lag length***	***F-Statistics***	***Lag length***	***F-Statistics***
$\Delta lnCPI \rightarrow Dependent\ Variable$	4	0.7033	4	2.9728**	2	1.0326
$Dependent\ Variable \rightarrow \Delta lnCPI$	4	2.0813	4	1.7091	2	0.3581
$\Delta lnNEER \rightarrow Dependent\ Variable$	4	0.4041	3	0.7466	3	3.8136**
$Dependent\ Variable \rightarrow \Delta lnNEER$	4	0.1250	3	0.4919	3	0.0331
$\Delta lnMW \rightarrow Dependent\ Variable$	2	2.1404	3	5.2829***	4	9.1553***
$Dependent\ Variable \rightarrow \Delta lnMW$	2	0.2302	3	12.3760***	4	0.2186
$\Delta lnCorPI \rightarrow Dependent\ Variable$	1	0.0054	3	0.3703	2	0.0504
$Dependent\ Variable \rightarrow \Delta lnCorPI$	1	0.0047	3	0.5647	2	0.0025
$ELC \rightarrow Dependent\ Variable$	1	0.1052	1	1.4701	1	0.0998
$Dependent\ Variable \rightarrow ELC$	1	3.2970*	1	0.2959	1	3.4502*
$GovT \rightarrow Dependent\ Variable$	1	0.0083	1	0.0102	1	0.0112
$Dependent\ Variable \rightarrow GovT$	1	0.0002	1	0.2409	1	0.0003

Note. The null hypothesis is that variable X does not Granger cause variable Y. *, **, *** Denote the rejection of the null hypothesis at 10 percent, 5 percent, 1 percent level of significance, respectively.

Source: Authors (2018).

Table 5. Pairwise Granger Causality Tests for $\Delta lnCPI$ and ΔlnB_{bal}

Date: 05/21/17 Time: 13:12			
Sample: 2000Q1 2015Q2			
Lags: 4			
Null Hypothesis:	Obs	F-Statistic	Prob.
$\Delta lnCPI$ *does not Granger Cause* ΔlnB_{bal} *L*	51	1.31363	0.2806
ΔlnB_{bal} *does not Granger Cause* $\Delta lnCPI$		2.89217	0.0334

Source: Authors (2018).