

Original Research Article

Constraints to Fiscal Consolidation Efforts in Kenya: Analysis of the Persistent Growth in Public Recurrent Costs

ABSTRACT

Aims: Kenya faces substantial fiscal consolidation needs in order to create fiscal space for financing its Vision 2030 development projects, sustainable development goals and the current government's election pledges. To achieve these, the country needs to allocate resources optimally to create a platform for the realization of the set goals. However, the government has found it a challenge to control the persistent growth in public recurrent costs, which has further led to challenges in carrying out sustainable fiscal consolidation. This paper looks into the factors behind the persistent rise in public recurrent costs in Kenya that have constrained fiscal consolidation efforts in the country.

Methodology: The study employs four ARDL error correction models in the analysis using 2000 Quarter 1 to 2015 Quarter 4 time series data.

Results: The study shows that persistent rise in public recurrent costs is influenced by the real minimum wage adjustments and the devotion of real tax revenue towards financing of the recurrent expenditures at the expense of development expenditures. Increase in the general price levels in the economy was found to erode the real value of non-wage public spending leading to upward adjustment of their nominal values. Real effective exchange rates was found to be significant in explaining the increases in real development expenditure. Surprisingly, an occurrence of a general election was found to lead to a decline in real public recurrent costs and compensation of government employees implying that the government tend to focus more on fiscal discipline during the election periods.

Conclusion: The study concludes that the persistent growth in public recurrent costs and the growth in public investment spending are not influenced significantly by the same factors and that frequent public wage adjustments and the devotion of domestic taxes to financing public recurrent costs are the main constraints to sustainable fiscal consolidation efforts in Kenya.

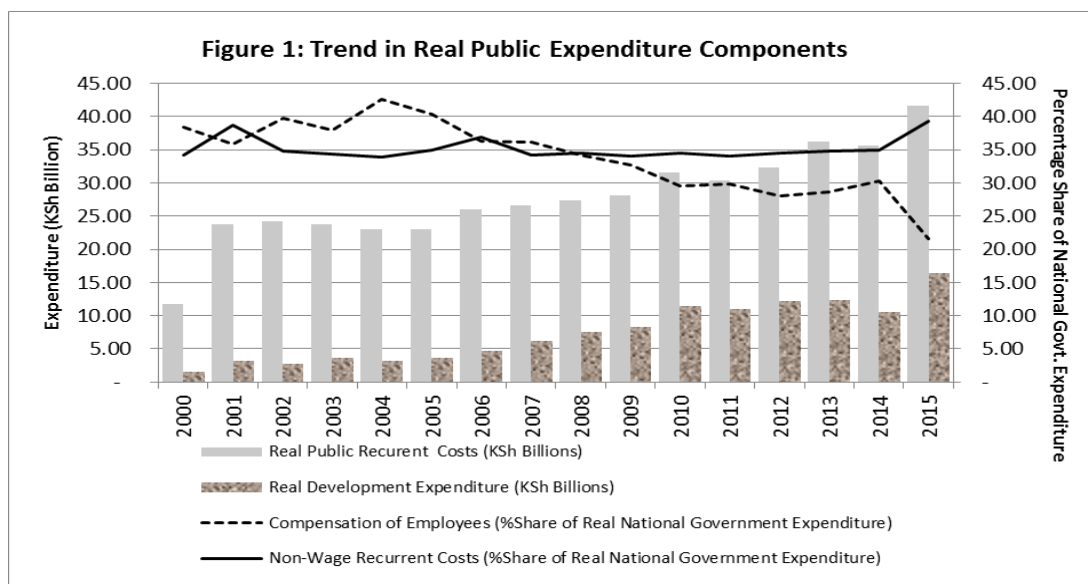
Keywords: *Fiscal Consolidation, Fiscal Adjustment, Public Recurrent Costs, Compensation of Employees, Non-Wage Recurrent Costs.*

1.0 INTRODUCTION

In recent times, rising public expenditure has become a major policy concern in Kenya. This is especially due to the inability of the country to control the rising public recurrent costs¹, which constitute over 70 percent of the public expenditure at both national and county government levels. Previous studies have shown that successful fiscal consolidation is attainable if targeted at the reduction of public expenditure in general and recurrent spending in particular [1;2;3;4;5;6;7;8;9]. The growing consensus that fiscal consolidation should target reduction in public recurrent costs to be effective and long lasting implies that the failure to control persistent growth in these types of expenditure is a major constraint to fiscal adjustment efforts in developing countries. This informs the need to carry out an in-depth analysis of factors behind the persistent growth in public recurrent costs to understand the factors that act as constraints to the fiscal consolidation efforts in Kenya.

Since independence, Kenya's fiscal stance has been broadly expansionary with most of the budgetary resources devoted to the public recurrent costs, which have continued to rise. [10] show that the public recurrent costs (without considering debt repayment) averaged between 15 percent and 20 percent of the GDP in the period 1964-2002. On the other hand, they noted that public development spending during the period was below 10 percent of GDP on average. National government expenditure as a percentage of GDP at current market prices rose from 23.37 percent in 2000 to 35.73 percent in 2015 [11;12;13;14;15]. The trend of the main compositions of the national government expenditure is presented in Figure 1.

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41 Source: Author's analysis of Central Bank of Kenya (2016) Data

42 The bar graphs in Figure 1 show the real public recurrent costs and real public development
 43 spending since 2000. The figure shows that there has been a persistent growth in public
 44 recurrent costs over the years, rising from a real value of Ksh 11.79 billion in the year 2000,
 45 to a real value of Ksh 41.57 billion in 2015. On the other hand, national government

¹ Public recurrent costs in Kenya consist mainly of compensation of employees, foreign travel costs, domestic travel costs, training costs, hospitality costs, costs incurred on conferences and catering services, electricity costs and costs on stationery (including costs on photocopying, printing and publishing of various government documents).

development expenditure has also risen from Ksh 4.75 billion in 2006 to Ksh 16.40 billion in 2015. However, at 28.3 percent, this is still below the envisaged minimum allocation of 30 percent for development expenditure items. Devoting more resources towards development expenditure items enhances the productive capacity of an economy that in turn leads to increased tax base for expanded revenue generation. This justifies development expenditure being given priority than the relatively unproductive public recurrent costs [16].

The line graphs (drawn using the secondary axis in figure 1) show the trend in the main components of public recurrent costs. The figure shows that since 2005, the share of real compensation of public employees in national government expenditure have continued to drop. However, the share of non-wage recurrent costs in national government expenditure has remained stagnant since 2007, with a significant rise noted in 2015. The 2013 Budget Policy Statement (BPS) identifies public wage bill as one of the recurrent costs items that should be reduced from 6.1 percent of GDP in 2012/13 to around 5.1 percent of GDP in 2016/17. The BPS attributes high public sector wage bill to political economy factors such as recruitment of more public sector employees following the formation of the Party of National Unity (PNU) and Orange Democratic Movement (ODM) coalition government in 2008. Between 2008 and 2012, approximately 58,700 new jobs were created in the public sector. Additionally, the realignment of salary structures for civil servants by Salaries and Remuneration Commission (SRC) is also said to have caused an increase in the public sector wage bill as a share of GDP in the financial year 2012/13 [17]. The trends in the figure show that despite the efforts to limit the growth in public recurrent costs by putting more focus on public wage bill, the overall public recurrent costs continue to rise hence constraining the fiscal adjustment efforts in the country.

1.1 Problem Statement

There is a growing consensus that fiscal consolidation that targets cuts in public recurrent costs is more effective and long lasting [2; 3, 4; 8]. This seems to inform the fiscal adjustment efforts in Kenya, mainly targeted at reducing the public recurrent costs. Despite these efforts, Kenya's fiscal stance in the recent years continues being expansionary with the public recurrent costs constituting over 70 percent of the aggregate public outlays. An analysis of Kenya's Economic Survey data for the period 2000-2015 shows that the public recurrent costs has been at an average of 20.98 percent of GDP and development expenditure has been at an average of just 5.35 percent of GDP over the period. Average government spending on compensation of employees during the period was 7.39 percent of GDP, which is above the development expenditure average. A review of public expenditure in Kenya by the World Bank [18] shows that in 2014, administrative recurrent costs and compensation of employees consumed about 30 percent and 46 percent of the county government budgets respectively, with only ten out of 47 county governments allocating at least 30 percent of their budget to development items.

On the other hand, Kenya's narrow tax base which largely relies on income taxes (40 percent of total revenue and 8 percent of GDP), and value-added tax (which constitutes 25 percent of total revenue) [18] makes it difficult for the government to pursue tax-based fiscal consolidations. Development aid has also increasingly become unpredictable in the recent past [19] forcing the government to rely more and more on domestic revenue resources and borrowing. Additionally, there has been limited revenue raising efforts in the counties as evidenced by collection of only 43 percent of the targeted own-source revenue hence increasing the pressure for more national government transfers to the counties [18].

The persistent rise in public recurrent costs and the new fiscal pressures emanating from the implementation of the devolved system of governance raise prospects of greater non-priority

94 expenditures. The prospects of higher recurrent expenditures, which are likely to also limit
 95 allocations for operations and maintenance of new public investments, are likely to result in a
 96 recurrent costs problem in the country. Consequently, all these are likely to further constrain
 97 the fiscal consolidation efforts in the country. It is against this backdrop that this study makes
 98 an analysis of the persistent growth in public recurrent costs, as a major constraint to fiscal
 99 consolidation in the country with particular focus on compensation of public employees and
 100 non-wage recurrent costs.

101 **1.2 Objectives**

102 The general objective of this study is to examine the fiscal consolidation constraints that act
 103 through the persistent rise in public recurrent costs in Kenya. Specifically, the study seeks:

- 104 (i) To examine the factors influencing the persistent growth in public recurrent costs
 105 relative to the costs incurred on public investment items in Kenya.
- 106 (ii) To relate how the factors influence the growth in compensation of government
 107 employees and non-wage recurrent costs in Kenya.
- 108 (iii) To examine the effectiveness of the fiscal adjustment efforts in limiting growth in
 109 Kenya's public recurrent costs.

110 **1.3 Policy Relevance**

111 The persistent growth in public recurrent costs at both levels of government has put the
 112 national and county governments under critical focus on their spending priorities.
 113 Additionally, the growth in public recurrent costs is seen as an obstacle to the fiscal
 114 adjustment efforts in the country. In view of these, containing the growth in public recurrent
 115 costs and shifting more resources towards public investment spending is a major point of
 116 policy concern for the Kenyan government, both at national and county level. The results
 117 from this study provides useful fiscal policy insights that can be employed to re-orient the
 118 fiscal adjustment measures in the country. The study also contributes to the literature on the
 119 constraints to fiscal consolidation efforts in developing countries.

120 **1.4 Literature Review**

121 There are several theories put forward in an attempt to explain the growth in public
 122 spending. The main theories include the Wagner's Law, Peacock and Wiseman's
 123 displacement effect theory, Leviathan theory of government, political business cycle theory,
 124 strategic debt accumulation theory, and median voter theorem. Adolph Wagner's law of
 125 increasing state activity postulates that as an economy grows, it is accompanied with an
 126 intensive and extensive increase in government activities in an attempt to maximize social
 127 welfare, which in turn leads to growth in public expenditure [20; 21]. According to [22], as
 128 nations industrialize, there will be growth in size of public sector in the national economy with
 129 the public sector growing faster than the economy. [23] present the development model put
 130 forward by Musgrave and Rostow that shows a relationship between growth of public
 131 expenditure and stages of economic development of an economy. Musgrave and Rostow
 132 argued that in the initial early development stage, high public expenditure on infrastructure,
 133 law and order, health and education is needed to create social overhead capital. In the
 134 middle stage of development, public expenditure complements private investment due to
 135 market failures thus falls considerably while in the third phase of development (maturity
 136 stage) there is high demand for private goods which calls for high public expenditure on
 137 education, health and welfare.

138 [24] put forward the displacement effect theory, which argues that societies have a notion of
 139 tolerable tax burden they are willing to bear and this limits the extent of public expenditure
 140 growth. When a disturbance such as social unrest or war occurs, the government is justified
 141 to increase its expenditure. Consequently, individuals in the society adjust their notion on
 142 tolerable tax burden upwards to cater for the disturbance. The government expenditure,
 143 however, do not fall back to the initial level after the disturbance has been dealt with [24]. A
 144 disturbance, such as the post-election violence witnessed in Kenya in 2007/2008 fiscal year,
 145 imposes new and continuing obligations on governments such as re-settlement of displaced
 146 individuals, reparation costs, interest payment on debts incurred during the period and the
 147 changes in social ideas. Generally, intermittent occurrence of shocks in an economy gives
 148 the government a greater scope to increase its expenditure in a step-wise trend.

149 The theory of political business cycles, first presented by [25], stipulates that the period
 150 between general elections in a given country influences government expenditure
 151 composition and growth. This theory has two variants; theory of opportunistic political budget
 152 cycles and theory of political parties. The theory of opportunistic political cycles argues that
 153 the incumbent government manipulates spending compositions during election years in
 154 order to enhance its chances of being re-elected [26; 27; 28]. This variant of the political
 155 budget cycle theory is more applicable in countries with weak political party ideologies like
 156 Kenya. On the other hand, the theory of political parties argues that the ideologies of the
 157 party in power influences government spending. This variant applies to countries with strong
 158 political party ideologies like the United States of America (USA).

159 The strategic debt accumulation theory put forward by [29] argues that if current policy
 160 makers believe that future policy may be determined by individuals whose views they
 161 disagree with, they will accumulate more debt through expansionary fiscal policy to restrain
 162 future policy makers' spending. The basis of the argument is the fact that high levels of debt
 163 would constrain the spending of future government.

164 The state-as-Leviathan² theory, put forward by Brennan and Buchanan, assumes extremely
 165 egoistic behaviour on the part of government representatives and suggest that their main
 166 objective is to maximize government revenue thus putting unnecessarily high costs on those
 167 governed [30]. The theory observe that there is no bound for the rapacity of state actors
 168 hence they only try to assess the lowest indifference curve the citizens can be moved to with
 169 minimal political repercussions. Therefore, the state will use any opportunity available to
 170 maximize revenue given the tax base and the structure of tax rate within this constraint. On
 171 the other hand, the representative taxpayer assumes an optimal amount of public goods
 172 from the perspective of the entire society thus will try to constrain the government so that it
 173 captures only tax resources that is necessary to finance that particular amount of public
 174 goods [30]. This consequently constrains the growth in government expenditure financed by
 175 the tax resources. If the ability of the state to levy taxes is not restricted by the society, the
 176 state is likely to accumulate as much revenue as they can which will consequently lead to
 177 increase in public spending.

178 The median voter theorem follows the work of [31], [32] and [33]. The theory assumes that
 179 citizens vote in a majority rule voting system with two candidates and only one issue to be
 180 decided on (for instance, the composition of public expenditure). The theorem also assumes
 181 that the voters can place all the alternatives (tax rates, size of government expenditure, how
 182 much to spend on public recurrent costs versus development items) along a one –
 183 dimensional political spectrum and that their preferences are single-peaked. Additionally, the

² The theory views the government as “a revenue-hungry monster” who will use any tool at its disposal to maximize on revenue (Możdzen, 2014).

184 theorem assumes that there is perfect information about the issues and the voter
185 preferences. Thus according to the median voter theorem, if an odd number of voters have
186 single-peaked preferences over a one-dimensional space, then the outcome most preferred
187 by the median voter will be selected. However, there can be cases of inefficient outcome
188 resulting from logrolling. In a logrolling system, majority of voters can trade votes to form a
189 coalition to vote for preferences that serve their special interests at the cost of other voters.

190 Determination of wages in the public sector influences the level of remuneration of the public
191 servants and consequently the growth in the public wage bill. The main theories that can be
192 used to explain public sector wage determination and adjustments are flexible theory of
193 wages, surplus value theory, marginal productivity theory, bargaining theory and investment
194 theory of wage determination. The theories which are relatively applicable to the Kenyan
195 public sector are bargaining theory and investment theory of wage determination. The
196 bargaining theory of wages holds that wages and other working conditions are determined
197 through Collective Bargaining Agreements (CBAs) between employers and workers through
198 their labour unions. According to this theory, wages are determined and adjusted by relative
199 bargaining power of workers' trade unions [34; 35]. The bargaining wage model suite the
200 Kenyan situation since adjustments in public sector employees' compensations over the
201 years have involved government constituted ad-hoc commissions and collective bargaining
202 agreements with workers' trade unions in various sub-sectors. On the other hand, the
203 investment theory of wage determination postulates that workers are paid in terms of their
204 investment in education, experience and training [35].

205 The main factors that have been identified in the literature as key drivers of growth in public
206 spending can be categorized into economic factors, political economy factors and
207 demographic factors. In line with Wagner's law of increasing state activity, increase in
208 income per capita of a country is a key determinant of growth in public expenditure in
209 general and public recurrent costs in particular. Studies such as [36] and [37] have found a
210 significant positive effect of increase in income per capita on government expenditure.
211 Increase in the general price levels in an economy is one of the main factors that influences
212 growth in nominal values of public spending. [38] argues that prices in public sector rise
213 relatively faster than in private sector. Beck gives an example of the United Kingdom (UK)
214 consumer price index which rose from 59.00 to 179.00 (base year 1970 = 100) and the price
215 index of the recurrent spending of public authorities which rose from 44.00 to 2012.00 (base
216 year 1970 = 100) between 1955 and 1975. [39] also observes that inflation rate has a
217 significant impact on the growth in public expenditure in an economy. Increase in cost of
218 living resulting from rise in inflation rates has been a basis for demands by trade unions for
219 upward adjustment of wages paid to the workers they represent [34]. In Kenya, the absence
220 of productivity measurement mechanisms on which public service salaries and remuneration
221 could be based means that public wages are determined and revised based on cost of living
222 adjustments which is influenced by rates of inflation in the economy [40]. The Salaries and
223 Remuneration Commission (SRC) recommends a four-year wage review cycle for the public
224 sector and annual salary adjustments to cushion officers from erosion of their real income
225 due to inflation and escalating cost of living [41]. This affirms that level of inflation in the
226 economy is a key determinant of the adjustments in public wages in Kenya. [34] identifies
227 cost of living adjustment due to inflation and salary adjustments due to labour unions
228 activities as the key determinants of the rise in public sector wages in Kenya.

229 Government revenue has a long run positive relationship with growth in public spending [37;
230 42; 43; 39]. [37] found out that an increase in the previous year's revenue increases
231 development expenditure by over 70 percent and expenditure on recurrent costs by 38
232 percent in Nigeria. [42] note that increasing ability of the government to collect taxes and
233 increase in demand for social security due to ageing population contribute to rise in public

234 spending. [39] observes that most public expenditure variations across Sub-Saharan Africa
 235 countries over time is attributable to tax revenue variations. [39] noted that highly indebted
 236 countries face severe constraints in access to credit for government consumption smoothing
 237 hence their recurrent spending is highly correlated to current government revenue. [44]
 238 found a causality running from revenue to recurrent expenditure but no causality between
 239 revenue and capital expenditure. Using a modified version of the Granger causality test due
 240 to [45], [43] investigated the causal relationship between revenue and public expenditure for
 241 13 African countries. The study found a bi-directional causality running between expenditure
 242 and revenue for Mauritius, Swaziland and Zimbabwe; no causality in any direction for
 243 Botswana, Burundi and Rwanda; unidirectional causality running from revenue to
 244 expenditure for Ethiopia, Ghana, Kenya, Nigeria, Mali and Zambia; and a unidirectional
 245 causality running from expenditure to revenue for Burkina Faso. These studies affirm that
 246 revenue allocation is a key determinant of the rise in government spending, particularly
 247 government recurrent spending.

248 One of the main political economy factors that influences growth and composition of public
 249 expenditure is political business cycle. An incumbent government running for re-election has
 250 an incentive to increase spending on budget items visible to voters so as to signal its level of
 251 "competence" to voters during the election period [46; 47]. Recurrent expenditure items are
 252 arguably more immediately visible than the development expenditure items, thus are of more
 253 direct political value during an election period [46]. The voters may observe type of
 254 government expenditure [46] or the overall level of government spending [48]. [46], [49] and
 255 [37] point out that fiscal manipulation by the incumbent government tend to lead to an
 256 increase in recurrent expenditure during the election period at the expense of public
 257 investment expenditure. [37] found out that there is a tendency for public recurrent spending
 258 to increase by 38 percent during an election period in Nigeria in the long-run. The effects of
 259 fiscal manipulations during election period tend to endure even after the elections and the
 260 incumbents prefer to manipulate the allocations without increasing the fiscal deficit as the
 261 countries engage more in electoral politics [49]. [47] on the other hand suggest that the fiscal
 262 manipulation during election years tend to lead to an increase in public investment spending
 263 in a country. In Drazen and Eslava model, they allow the overall level of public expenditure
 264 (and the deficit) to remain fixed while the political manipulation affects only the composition
 265 of government spending. They assume that voters value some goods more than others, so
 266 that an opportunistic politician may be induced to shift the composition of pre-election
 267 spending towards these goods. [47] found out that infrastructure spending expand
 268 significantly while interest payments, transfers to retirees, and payments to temporary
 269 workers reduce in election years. They show that as level of deficit in the year preceding the
 270 election increases, share of votes received by the incumbent's party decreases. This signals
 271 that well informed voters are averse to high overall government spending and budget
 272 deficits. Generally, composition of public expenditures tends to be tilted towards the public
 273 goods favored by certain interest groups with greater electoral importance [47].

274 Several studies also show that rent-seeking behaviours of public servants influence the
 275 composition and growth of public expenditure in many countries [50; 51; 52]. There is a
 276 tendency for corrupt public officers to channel more budgetary resources towards public
 277 goods such as large infrastructure projects and highly sophisticated military equipment
 278 whose exact value is difficult to determine over expenses such as textbooks for the
 279 education sector. This argument by [50] is supported by the findings of [51], [52] and [37]. In
 280 these studies, there is a general consensus that increase in corruption levels in an economy
 281 would lead to high public expenditure on large capital investments than on public recurrent
 282 costs items. However, in the end, these large capital investments tend to be of low quality
 283 and over-valued, as the public officials seek rent through the tendering process and
 284 execution of the awarded contracts [52]. The general argument is that public investment

285 spending is highly discretionary, allowing for opportunities to misappropriate public funds, as
 286 opposed to recurrent spending (such as salaries and wages) which are spending on
 287 previous commitments with limited discretion to corrupt public officers. The finding of [37]
 288 that corruption has a significant negative effect on spending on recurrent costs but a positive
 289 effect on development expenditure in Nigeria supports this argument.

290 Demographic factors also put pressure on most governments to adjust public expenditure to
 291 cater for increased demand for public goods and services. Population density has a negative
 292 influence on government spending implying that the higher the population density, the less
 293 expensive it is to serve it [36]. [53] estimated a system of median voter demand equations
 294 for a sample of OECD countries and found population density and its age structure as key
 295 factors in determining the rise and composition of public expenditure. [36] point out that the
 296 elderly population proportion has a negative relationship with state government expenditure,
 297 which indicates that the elderly have a lower demand for public goods. [54] opine that
 298 competition for special interest groups in a country's population occurs prior to an election
 299 thus favours sought by certain interest groups such as youths always influence public
 300 policies during and after the elections thus lead to expansionary fiscal policy. This positively
 301 influences the growth in public expenditure as the party forming the government embarks on
 302 fulfilling of the pledges made during the election period.

303 In a nutshell, the reviewed literature identifies some of the main economic, political economy
 304 and demographic factors that influences growth of public expenditure and its components.
 305 The literature, however, shows little focus on political economy and demographic factors and
 306 also generally focuses on how the factors influence growth in aggregate public expenditure
 307 with quite a number being cross-country studies. The studies focusing on Kenya, such as
 308 [10], [34], [55] and [56] have not attempted to specifically analyze the persistent growth in
 309 public recurrent costs and the constraints to fiscal consolidation efforts in the country. This
 310 study therefore fills these research gaps by carrying out a country-specific analysis using
 311 disaggregated quarterly public expenditure data for Kenya for the period 2000 quarter 1 to
 312 2015 quarter 4.

313 **2.0 METHODOLOGY**

314 The theoretical framework collapses the predictions of various competing expenditure
 315 growth theories into a single model to evaluate their different dynamic relationships and
 316 relative explanatory power. However, the central theory of this study is based on the fact that
 317 fundamental public expenditure decisions are always discretionary thus influenced majorly by
 318 the political economy factors. This implies that the decisions can be influenced by the
 319 citizens through voting or any other opportunity available to them. The policy makers and
 320 politicians who make fiscal decisions are conceived as being motivated by the desire to
 321 attain and retain power. Therefore, they are expected to take fiscal decisions that appeal to a
 322 dominant coalition of voters. The voters on the other hand desire the levels and
 323 compositions of expenditures and taxes that would maximize their interests. The central
 324 theory for this study, therefore, is the median voter demand theory. Recognizing the fact that
 325 growth in public expenditure in Kenya is not solely a political phenomenon, other economic
 326 and demographic variables are incorporated in the analysis.

327 An approach to median voter theorem where the decision to be made is based on magnitude
 328 of the components of public expenditure is employed in this analysis. The framework is
 329 similar to that employed by [33] and [53, 57]. However, [53] disaggregated public
 330 expenditure in terms of their functions. In this case, public spending is disaggregated based
 331 on whether the expenditure is towards a development item, compensation of government
 332 employees or non-wage recurrent expenditure.

333 In the median voter model, the citizens are assumed to vote in a majority system with the
334 magnitude of the different components of public spending being the decision items. [33] and
335 [53,57] express the median voter's demand for government expenditure as follows:

$$336 \quad G_i = \varphi Y_i^\alpha P_{gi}^\beta ; \quad i = 1, 2, \dots, N \dots \dots \dots (1)$$

337 where: G_i is quantity of public goods and services demanded by the voter-taxpayer i .

338 P_{gi} is tax-price paid by voter-taxpayer i for G_i

339 Y_i is income of voter-taxpayer i .

340 α and β are income and price elasticities for government provided goods and services,
341 respectively while φ is an adjustment factor.

342 [33] and [53,57] further specify the price to be paid for public goods and services as:

$$343 \quad P_{gi} = T_i C N^\sigma \dots \dots \dots (2)$$

344 where: T_i is the tax share of voter-taxpayer i in total tax revenue.

345 C is per unit cost of public goods and services (G)

346 N is the total population while σ is the degree of publicness of the government
347 provided goods and services.

348 Assuming that there is no discrimination in taxation [31], T_i is assumed to be equal to $1/N$ thus
349 the price to be paid for the public goods and services is given by $P_{gi} = C N^{\sigma-1}$. With this
350 information, Equation 1 can be expressed as:

$$351 \quad G_i = \varphi Y_i^\alpha C^\beta N^{\beta(\sigma-1)} ; i = 1, 2, \dots, N \dots \dots \dots (3)$$

352 Since this is a time-series analysis, [33] suggest that Equation 3 should be modified to allow for
353 change in relative public/private sector prices (Pr) which is given as:

$$354 \quad P_r = C / P_x \dots \dots \dots (4)$$

355 Where P_x is the price of private sector goods and C is per unit cost of public goods and services
356 (G). Total nominal government expenditure (E) is given by:

$$357 \quad E = G_i P_{gi} N^\sigma ; \text{ where } G_i = G / N^\sigma$$

358 [33] notes that to compute real government expenditure (G), nominal government expenditure
359 (E) should be divided by the tax-price (P_{gi}). However, since the degree of publicness (σ) is not
360 known, it is divided by the unit cost of the government provided goods (C) then the coefficient
361 for population is modified accordingly to accommodate this in the model. Using relative prices
362 and aggregating to express the demand for government provided goods and services in terms
363 of total expenditure, [33] specify the standard median voter demand model as follows:

$$364 \quad G = \varphi Y^\alpha P_r^\beta N^\emptyset \dots \dots \dots (5)$$

365 Where $\emptyset = (\beta + 1)(\sigma - 1) + \sigma - \alpha$, G is total real government expenditure, Y is total
366 real national income (real GDP), Pr is the relative public/private sector prices, N is the total
367 population.

368
369 This specification is the standard median voter demand model where the citizens are fully
370 aware of costs and benefits of government provided goods and services [33]. In contrast to [33]

and [53], this analysis assumes that there is no fiscal illusion (the voter-taxpayer is aware of the true tax-price of government provided goods) thus adopt Equation 5 as the theoretical model. In specifying the empirical model, G, the total real government expenditure is disaggregated into development spending and recurrent spending (which is further disaggregated into compensation of government employees and non-wage recurrent costs incurred by the government). In the model, the median voter income is proxied by the GDP per capita and minimum wages. Instead of the total population, N, the empirical model for this study uses population density, which is used to approximate the concentration of the median voter per square kilometre. Other economic and political economy factors identified in the literature are also included in the model.

In specifying the empirical models for this analysis, the standard median voter demand model presented in Equation (5) is log transformed and modified by inclusion of additional variables identified in the literature. Since the interest is to determine the factors that influence the growth in cost of the various expenditure items, the variables enter the models at their difference (Δ) levels. The empirical models are specified as follows:

Model 1

$$\begin{aligned} \Delta \ln G_{rc,t} = & \alpha_0 + \sum \alpha_f \Delta \ln G_{rc,t-f} + \sum \omega_i \Delta \ln GDPC_{t-i} \\ & + \sum \vartheta_m \Delta \ln MW_{t-m} + \sum \aleph_s \ln PopD_{t-s} \\ & + \sum \beta_j \Delta \ln TR_{t-j} + \sum \gamma_k \Delta \ln PD_{t-k} + \sum \delta_l \Delta \ln CPI_{t-l} \\ & + \sum \varphi_r \Delta REER_{t-r} \\ & + \sum \pi_n \Delta \ln CorPI_{t-n} + \tau_0 F_{adj,t} + \tau_1 ELC_t + \tau_2 @trend + \mu_t \dots \dots \dots (6) \end{aligned}$$

Model 2

$$\begin{aligned} \Delta \ln G_{ds,t} = & \alpha_0 + \sum \alpha_f \Delta \ln G_{ds,t-f} + \sum \omega_i \Delta \ln GDPC_{t-i} + \sum \aleph_s \ln PopD_{t-s} \\ & + \sum \beta_j \Delta \ln TR_{t-j} + \sum \gamma_k \Delta \ln PD_{t-k} + \sum \delta_l \Delta \ln CPI_{t-l} \\ & + \sum \varphi_r \Delta REER_{t-r} \\ & + \sum \pi_n \Delta \ln CorPI_{t-n} + \tau_0 F_{adj,t} + \tau_1 ELC_t + \tau_2 @trend + \mu_t \dots \dots \dots (7) \end{aligned}$$

Model 3

$$\begin{aligned} \Delta \ln G_{cs,t} = & \alpha_0 + \sum \alpha_f \Delta \ln G_{cs,t-f} + \sum \omega_i \Delta \ln GDPC_{t-i} + \sum \vartheta_m \Delta \ln MW_{t-m} + \sum \aleph_s \ln PopD_{t-s} \\ & + \sum \beta_j \Delta \ln TR_{t-j} + \sum \gamma_k \Delta \ln PD_{t-k} + \sum \delta_l \Delta \ln CPI_{t-l} + \sum \varphi_r \Delta REER_{t-r} \\ & + \sum \pi_n \Delta \ln CorPI_{t-n} + \tau_0 F_{adj,t} + \tau_1 ELC_t + \tau_2 @trend + \mu_t \dots \dots \dots (8) \end{aligned}$$

397 Model 4

$$\begin{aligned} \Delta \ln G_{nwrc,t} = & \alpha_0 + \sum \alpha_f \Delta \ln G_{nwrc,t-f} + \sum \omega_i \Delta \ln GDPC_{t-i} \\ & + \sum \vartheta_m \Delta \ln MW_{t-m} + \sum \aleph_s \ln PopD_{t-s} \\ & + \sum \beta_j \Delta \ln TR_{t-j} + \sum \gamma_k \Delta \ln PD_{t-k} + \sum \delta_l \Delta \ln CPI_{t-l} \\ & + \sum \varphi_r \Delta REER_{t-r} \\ & + \sum \pi_n \Delta \ln CorPI_{t-n} + \tau_0 F_{adj,t} + \tau_1 ELC_t + \tau_2 @trend + \mu_t \dots \dots \dots (9) \end{aligned}$$

398

399

400 Where $\ln$ is the natural log; Δ denotes change/difference; t denotes time index (from
401 2000Q1 to 2015Q4); α_0 are the autonomous adjustments of the dependent variables;
402 $\alpha_f, \omega_i, \vartheta_m, \aleph_s, \beta_j, \gamma_k, \delta_l, \varphi_r, \pi_n, \tau_0, \tau_1, \tau_2$ are coefficients; $f, i, m, s, j, k, l, r, n$ are the lag
403 lengths of the respective explanatory variables; G_{rc} is real aggregate public recurrent costs;
404 G_{des} is real public development expenditure; G_{ce} is real compensation of government
405 employees; G_{nwrc} is real public non-wage recurrent costs; $GDPC$ is real national income
406 (real GDP) per capita; MW is real minimum wages; $PopD$ is population density; TR is real
407 domestic tax revenue; PD is real public debt; CPI is Consumer Price Index; $REER$ is real
408 effective exchange rates; $CorPI$ is Corruption Perception Index used to capture perceived
409 level of corruption in the public sector; F_{adj} is Fiscal adjustment dummy; ELC is election
410 dummy; $@trend$ is used to control for time trend in the models; and μ is stochastic
411 disturbance term.

412 The variables, except the indices and dummy variables, are expressed in real values
413 to remove the effects of general price level changes over time. The variables included in the
414 models employed in the analysis are as explained below:

415 *Real Public Recurrent Costs (G_{rc})* captures the aggregate public recurrent costs incurred
416 by the national government in every quarter. This consists of the compensation of
417 employees, non-wage recurrent costs and interests payment on debt by the national
418 government.

419 *Real Development Expenditure (G_{des})* is the budgetary costs of national government
420 development spending in every quarter.

421 *Real Compensation of Employees (G_{ce})* is measured by the quarterly government
422 expenditure on its employees' wages, allowances, pensions and other social contributions.

423 *Real Non-Wage Recurrent Costs (G_{nwrc})* captures the costs of goods and services utilized
424 by the government. This includes quarterly government spending on operations and
425 maintenance costs, stationery costs, training costs, travel costs, electricity costs, expenses
426 on conferences and catering services.

427 *GDP per capita* measures the national income per capita and is used to proxy the median
428 voter income as well as to capture Wagner's hypothesis. A positive significant influence on
429 public recurrent costs' growth and its components is expected [36, 37]. GDP per capita is
430 reported annually by the World Bank. The annual data was transformed into quarterly data

431 using the Eviews Statistical software to conform with the data structure of the other
432 variables.

433 *Real minimum wages (MW)* is measured using real values of gazetted monthly basic
434 minimum wages in urban areas (Nairobi, Kisumu, Mombasa), excluding house allowances.
435 Nairobi, Kisumu, and Mombasa are the cities in Kenya and they have a relatively high
436 concentration of public servants hence the decision to use their minimum wages instead of
437 that for agricultural industry. Real minimum wages is also used to proxy the median voter
438 income and an increase in real minimum wages is expected to positively influence the
439 growth in public recurrent costs.

440 *Population Density (PopD)* refers to the number of people per square kilometre. It is used to
441 proxy the influence of concentration of median voters per square kilometre on growth in
442 public expenditure components. Population density is reported annually (as at 1st July of
443 every year) by United Nations, Department of Economic and Social Affairs, Population
444 Division (2015). To conform with the data structure of the other variables, the annual data
445 was transformed into quarterly data using *Eviews* and adjusted accordingly to run
446 concurrently with the respective quarters. An increase in population density is expected to
447 have a positive influence on growth in public recurrent costs.

448 *Real Government Tax Revenue (TR)* is measured by the total government tax revenue in
449 every quarter. It excludes grants and non-tax revenue. Government tax revenue is expected
450 to have a positive relationship with growth in public expenditure and its components [37; 39;
451 42; 43].

452 *Real Public Debt (PD)* is captured by the end of quarter public debt amounts. It is expected
453 to have a positive influence in growth of all public expenditure categories.

454 *Consumer Price Index (CPI)* is used to measure the effect of inflation on growth in
455 public recurrent costs. It is expected that inflation impacts negatively on real wages and
456 consequently the aggregate compensation of public employees hence result in increased
457 agitation for the cost of living adjustment of wages in the public sector [34; 58]. On the other
458 hand, inflation is expected to have a positive significant effect on the growth of non-wage
459 recurrent costs, aggregate public recurrent costs and development expenditure.

460 *Real Effective Exchange Rates (REER)* is calculated from the Nominal Effective Exchange
461 Rates (NEER) and a measure of the relative price between the home country (Kenya) and
462 its trading partners. This analysis employs CPI-based REER reported by UNCTAD. The
463 REER are reported annually hence the data is converted to quarterly time series data using
464 *Eviews*. The CPI - based REER is thus a weighted average of the KSh relative to a basket of
465 the trading partners' currencies, adjusted for the effects of inflation. Therefore, a rise in
466 REER (a depreciation of the KSh) is expected to have a positive influence on government
467 spending [59] as this makes the imports consumed by the government expensive in
468 domestic currency.

469 *Corruption Perception Index (CorPI)* captures perceived level of corruption in the public
470 sector as reported by Transparency International for every country. It is measured on a scale
471 of 0 (highly corrupt) to 100 (very clean). A decline in corruption perception index score
472 (interpreted as an increase in corruption levels in the country's public sector) is expected to
473 have a positive effect on growth in public development expenditure and a negative or
474 insignificant effect on growth in public recurrent costs [37; 50; 51; 52].

475 *Fiscal Adjustment Dummy* (F_{adj}) is used to capture the improvement or decline in the
 476 primary budget deficit. The fiscal balances are computed by the difference between total
 477 revenue (including non-tax revenue but excluding grants) and total government expenditure
 478 as reported by the Central Bank of Kenya (CBK) in every quarter. It is captured by 1 for the
 479 periods when there were improvements (positive growth) in fiscal balances and 0 for period
 480 with decline (negative growth) in fiscal balances.

481 *Election dummy* (ELC) captures the influence of political business cycle on growth in
 482 various components of public expenditure. It takes the value 1 for the periods when there
 483 were general elections (three quarters before the election and the quarter when the election
 484 is held) and 0 for the period where there were no general elections. The dummy is defined
 485 for the period before the elections since the interest here is to capture the pre-election fiscal
 486 manipulations. A positive influence on the growth of various components of government
 487 spending during election periods [37; 46; 47; 48; 49] is expected.

488

489 The quarterly data on components of government expenditure, public debt and Consumer
 490 Price Index was obtained from Central Bank of Kenya [60] and Kenya National Bureau of
 491 Statistics (KNBS) online statistics. Data on GDP per capita was obtained from the World
 492 Bank database [61]. Quarterly data on tax revenue was obtained from Kenya Revenue
 493 Authority. The data on minimum wages was obtained from Kenya's Economic Surveys
 494 published by KNBS. Data on Kenya's population density was obtained from the World
 495 Population Prospects by United Nations, Department of Economic and Social Affairs,
 496 Population Division [62] whereas data on Corruption Perception Indices for Kenya was
 497 obtained from various Transparency International's annual reports. Data for real effective
 498 exchange rates was obtained from UNCTAD statistics [63].

499

500 **3.0 RESULTS AND DISCUSSIONS**

501 This study employs secondary time series data for the period 2000 Quarter 1 to 2015
 502 Quarter 4. Before estimating the models, the stationarity properties of the time series data is
 503 examined using Augmented Dickey-Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski-
 504 Phillips-Schmidt-Shin (KPSS) tests. Additionally, diagnostic tests for heteroskedasticity,
 505 serial correlation, structural breaks and cointegration are carried out on each model.

506 **3.1 Diagnostic Tests**

507 The trend analysis of the variables was carried out before testing for unit roots. Results from
 508 the unit root tests show that the variables are not integrated of the same order. The
 509 variables³ $LnGrc$, $LnGde$, $LnGce$, $LnGnwrc$, $LnMW$, $LnTR$, $FAdj$ and ELC are integrated of
 510 order zero ($I(0)$) whereas $LnGDPC$, $LnPD$, $LnCPI$, $LnREER$ and $LnCorPI$ are integrated of
 511 order one ($I(1)$). Order of integration of the variable $LnPopD$ could not be determined since
 512 the three test statistics gave conflicting results for tests at both levels and differences. On
 513 first differencing the $I(0)$ variables, it is confirmed that they are still stationary which is

³ The regression variables : G_{ce} is real government expenditure on compensation of employees; G_{nwrc} is real government expenditure on non-wage recurrent costs; G_{rc} is real government expenditure on recurrent costs; G_{de} is real government expenditure on development items; $GDPC$ is GDP per capita; MW is minimum wage; TR is real tax revenue; PD is real public debt; CPI is consumer price index; $CorPI$ is public sector Corruption Perception Index; $REER$ is Real Effective Exchange Rates; F_{adj} is Fiscal Adjustment; ELC is elections dummy; and Ln is the Natural Log

appropriate in view of the intended dynamic analysis of the models. However, the variable *LnPopD* is found to be non-stationary at first difference, thus it is dropped from the models henceforth.

The results from the Breusch-Pagan-Godfrey heteroskedasticity test show that there is no heteroskedasticity in all the models except Model 2 for development expenditure which is heteroskedastic at 10% level of significance. The test for serial correlation was carried out using Breusch-Godfrey LM Test with the null hypothesis that there is no serial correlation in the models. At 5% level of significance, the null hypothesis is rejected hence the conclusion that there is serial correlation in the models. The test for multicollinearity which detects the existence of a high correlation among the independent variables was also carried out. The results show that *LnGDPC* is highly correlated with *LnTR*, *LnCPI*, *LnREER* and *LnCORPI*. Consequently, to control for the problems associated with multicollinearity, the variable for GDP per capita (*LnGDPC*) is dropped from the model henceforth.

When there is an unexpected shift in time series then there could be a structural break in the data series. In situations where structural break is already known and single, Chow breakpoint test is employed. However, when it is not known whether structural break exists or not, then multiple breakpoint test is applied to identify possible multiple structural breaks. In this analysis, multiple breakpoint test was applied to identify periods of possible structural breaks and then Chow breakpoint test was applied on the periods identified to confirm whether they are significant or not. Table 1 presents the results for the structural break tests.

Table 1: Test for Structural Break

	Multiple Breakpoint Test			Chow Beakpoint Test	Conclusion
	<i>Break Test</i>	<i>F-statistic</i>	<i>Break Dates</i>	<i>F-statistic</i>	
<i>Model 1</i>	0 vs.1	67.7667	2013Q1	1.4684	Break point not significant
	1 vs. 2	3.4005			
<i>Model 2</i>	0 vs. 1	66.1426	2013Q1	3.5106***	Break point significant
	1 vs. 2	3.2814			
<i>Model 3</i>	0 vs. 1	98.1122	2013Q1	1.5076	Break point not significant
	1 vs. 2	3.2174			
<i>Model 4</i>	0 vs. 1	1.8081	None	-	No Break point
*, **, *** denote the rejection of the null hypothesis at 10%, 5%, 1% level of significance, respectively.					

Source: Author (2017)

The results show a significant breakpoint in Model 2 for the period 2013Q1. This breakpoint is associated with the March 2013 general election when the Jubilee Coalition government was voted into power. The structural break point is catered for in the models by the election dummy (ELC) which is used to capture the political business cycle.

3.2 ARDL Bounds Cointegration Test and Model Selection

Before testing for cointegration, the appropriate lag structure for the models is determined. This analysis made use of the Akaike's information criterion (AIC), Schwarz's Bayesian

information criterion (SBIC), and the Hannan and Quinn information criterion (HQIC) lag-order selection statistics. For these criteria, the lower the AIC, SBIC or HQIC value the better the model. The results for the selection of optimal lag lengths show that the optimal lag length for model 1 and Model 4 is nine lags whereas the optimal lag length for model 2 and model 3 is eight lags. This is within the expected optimal lag length of 12 found by most studies using quarterly time series data. However, during the analysis the lag lengths were consequently reduced due to limited observations.

Since the variables are not integrated of the same order, Autoregressive Distributed Lag (ARDL) model is used to test for cointegration. The ARDL/Bounds Testing methodology of [64] and [65] can be used with a mixture of I(0) and I(1) data series, and different variables can be assigned different lag-lengths as they enter the model. However, none of the variables should be I(2). This explains the dropping of the variable for population density (*LnPopD*) which is neither integrated of order zero nor order one. The following ARDL model is employed in testing for cointegration:

$$\begin{aligned} \Delta \ln DepVar_t = & \alpha_0 + \sum \alpha_i \Delta \ln(DepVar)_{t-i} \\ & + \sum \vartheta_m \Delta \ln MW_{t-m} + \sum \beta_j \Delta \ln TR_{t-j} + \sum \gamma_k \Delta \ln PD_{t-k} \\ & + \sum \delta_i \Delta \ln CPI_{t-i} + \sum \varphi_r \Delta REER_{t-r} \\ & + \sum \pi_n \Delta \ln CorPI_{t-n} + \theta_0 \ln(DepVar)_{t-1} + \theta_1 \ln MW_{t-1} \\ & + \theta_2 \ln TR_{t-1} + \theta_3 \ln PD_{t-1} + \theta_4 \ln CPI_{t-1} + \theta_5 \ln REER_{t-1} \\ & + \theta_6 \ln CorPI_{t-1} + \tau_0 Fadj_t + \tau_1 ELC_t + \tau_2 @trend + \mu_t \dots (10) \end{aligned}$$

Where *DepVar* is the dependent variable that is *lnGrc*, *lnGde*, *lnGce*, and *lnGnwrc*, for the respective models. Δ is the difference operator and *@trend* is used to control for time trend in the models. Other variables are as defined before. Note that in the second model (development expenditure model) the variable for minimum wages is omitted since it is assumed that the variable is not relevant in this model. This applies to the entire analysis.

Bound testing was then carried out where coefficient diagnostics for the level lagged variables was done using F-Test. The F-test has a non-standard distribution which depends on whether the variables in the model are I(0) or I(1), the number of regressors ($k+1$), and whether the model contains an intercept and/or a trend [64]. Null hypothesis of the test is that there is no long-run equilibrium relationship (cointegration) between the variables, that is, $H_0: \theta_0 = \theta_1 = \theta_2 = \theta_3 = \theta_4 = \theta_5 = \theta_6 = 0$; against the alternative that H_0 is not true. Since the models employed in this analysis have unrestricted intercept and unrestricted trend, F-statistic obtained from Wald Test is then compared with the tabulated Pesaran Critical values at 5% level of significance for a model with unrestricted intercept and unrestricted trend. [64] present lower and upper bounds on the critical values for asymptotic distribution of the F-statistic. The lower bound is based on an assumption that all of the variables are I(0), and the upper bound is based on an assumption that all of the variables are I(1). If the computed F-statistic falls below the lower bound, then the conclusion is that the variables are I(0), hence no cointegration is possible, by definition. If the F-statistic exceeds the upper bound, then there is cointegration in the model while the test is inconclusive if the F-statistic falls between the bounds.

As a cross-check, Bounds t-test of $H_0: \theta_0 = 0$, against $H_1: \theta_0 < 0$ is performed. The conclusion that there is a long-run relationship between the variables is supported if t-statistic for level lagged independent variable is greater than the upper bound tabulated by [64]. Contrary, if the t-statistic is less than the lower bound, then the conclusion is that the data are all stationary. The results for the ARDL Bounds cointegration test are presented in Table 2.

Table 2: ARDL Bounds Cointegration Test

			Model 1	Model 2	Model 3	Model 4
Specification			Unrestricted intercept and unrestricted trend; number of regressors (k) = 7	Unrestricted intercept and unrestricted trend; number of regressors (k) = 6	Unrestricted intercept and unrestricted trend; number of regressors (k) = 7	Unrestricted intercept and unrestricted trend; number of regressors (k) = 7
F – statistic			4.5621	63.0724	450.4870	89.5382
Pesaran Critical Values at 5% Level of Significance	Lower Bound		2.69	2.87	2.69	2.69
	Upper Bound		3.83	4.00	3.83	3.83
t – statistic			-4.4364	-17.4469	-53.6470	-23.2677
Pesaran Critical Values at 5% Level of Significance	Lower Bound		-3.41	-3.41	-3.41	-3.41
	Upper Bound		-4.85	-4.69	-4.85	-4.85
Conclusion			Cointegrated	Cointegrated	Cointegrated	Cointegrated

Source: Author (2017)

The ARDL Bounds cointegration test results show that F-statistics for all the models are greater than the Upper Bound Pesaran's critical values. Therefore, the null hypothesis of no cointegration is rejected. On the other hand, the results for Bounds t-test show that the t-statistics for all models except Model 1 are greater than the Upper Bound Pesaran's critical values (in absolute terms) at 5% level of significance. The results for model 1 show that the Bounds t-test statistic fall between the lower bound and the upper bound but closer to the upper bound. This implies that the test is indeterminate. Despite the mixed result for one of the models, the conclusion is that there is cointegration in all the models based on the strength of the F – statistics results which are significantly above the upper bound. In view of the ARDL Bounds cointegration test results, the analyses employ an Error Correction Model (ECM). In modelling the ECM, the error correction term (ECT) is given by residuals of the long-run level relationship of the models. This is obtained from the estimation of the following equation:

$$\ln DepVar_t = \alpha_0 + \theta_1 \ln MW_t + \theta_2 \ln TR_t + \theta_3 \ln PD_t + \theta_4 \ln CPI_t + \theta_5 \ln REER_t + \theta_6 \ln CorPI_t + \tau_0 Fadj_t + \tau_1 ELC_t + \tau_2 @trend_t + \varepsilon_t \dots (11)$$

Where **DepVar** is the dependent variable, that is, *lnGrc*, *lnGde*, *lnGce*, and *lnGnwrc* for the respective models; α_0 is the constant; $\theta_1, \dots, \theta_6$ and $\tau_0, \dots, \tau_2$ are the coefficients; and ε is the error term. Other variables and notations are as defined before. The Error Correction Model (ECM) for each of the models' cointegrated data is estimated using the following equation:

$$\begin{aligned} \Delta \ln DepVar_t = & \alpha_0 + \sum \alpha_i \Delta \ln (DepVar)_{t-i} \\ & + \sum \vartheta_m \Delta \ln MW_{t-m} + \sum \beta_j \Delta \ln TR_{t-j} + \sum \gamma_k \Delta \ln PD_{t-k} \\ & + \sum \delta_l \Delta \ln CPI_{t-l} + \sum \varphi_r \Delta REER_{t-r} \\ & + \sum \pi_n \Delta \ln CorPI_{t-n} + \tau_0 Fadj_t + \tau_1 ELC_t + \tau_2 @trend + \sigma ECT_{t-1} \\ & + \mu_t \dots (12) \end{aligned}$$

606

607

608 Where *DepVar* is the respective dependent variables (*lnGrc*, *lnGde*, *lnGce*, and *lnGnwrc*).

609 *ECT* is the error correction term obtained from Ordinary Least Squares (OLS) residual series

610 from the long-run cointegrating relationship (Equation 11).

611 3.3 Efficiency and Dynamic Stability of the Models

612 The efficiency and dynamic stability of the regression models are ascertained through test
613 for serial correlation, residual normality, CUSUM test of parameters stability, AR roots
614 graphs test of stability and Granger causality test. The test for serial correlation was carried
615 out to confirm if the errors are serially independent. This is a key requirement for ARDL
616 model efficiency. The null hypothesis is that there is no serial correlation in the models.
617 Additionally, Jarque-Bera test was used to determine the normality of the residuals, with the
618 null hypothesis that residuals are normally distributed. The results for these tests are
619 presented in Table 3.

620 **Table 3: Test for the Models' Efficiency**

Test	Model 1	Model 2	Model 3	Model 4	Conclusion
Breusch-Godfrey Serial Correlation LM Test (F-statistic)	1.5759	1.2414	2.4489	0.7513	No serial correlation
Jarque-Bera Normality Test (test – tatistic)	0.2881	4.2321	0.2191	0.1870	Residuals are normally distributed
*, **, *** denote the rejection of the null hypothesis at 10%, 5%, 1% level of significance, respectively.					

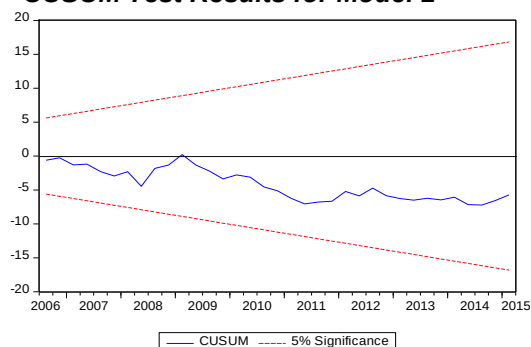
621 Source: Author (2017)

622 The results show that residuals in the models are serially independent and normally
623 distributed which is desirable for their specification. Further, the test for dynamic stability of
624 the models was carried out using the CUSUM test and the AR roots graphs. The null
625 hypothesis for CUSUM test is that the parameters are stable (which is desirable). The
626 decision criteria is that, if the blue line lies between the two redlines representing the lower
627 bound and upper bound, then the null hypothesis cannot be rejected thus the conclusion is
628 that the parameters are stable. The results for CUSUM test are presented in Figure 2.

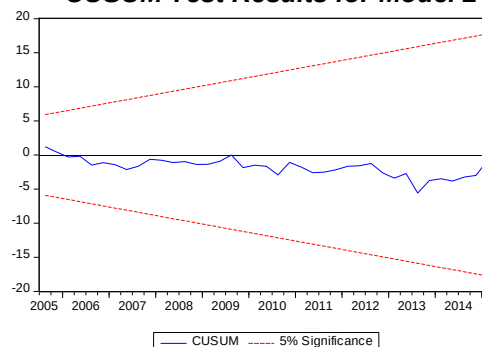
629

Figures 2 CUSUM Test for Stability of the Models

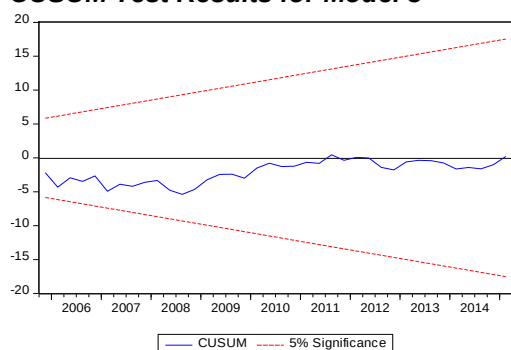
CUSUM Test Results for Model 1



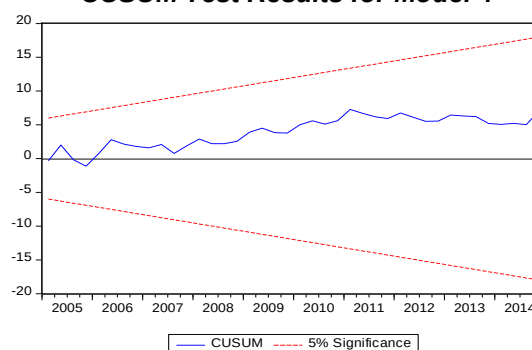
CUSUM Test Results for Model 2



CUSUM Test Results for Model 3



CUSUM Test Results for Model 4



Source: Author (2017)

The figures show that the models are dynamically stable since the blue line lies between the two redlines representing the lower bound and upper bound. 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 (not presented) confirm that all the models are stable.

Using pairwise Granger causality test, causality between the independent variables and the dependent variables in each model was also tested. Null hypothesis is that variable X does not Granger cause variable Y ($X \rightarrow Y$ (where Y is the dependent variable)). The results show that real minimum wages Granger causes growth in public recurrent costs and compensation of government employees. Real tax revenue was found to have bidirectional causality with the public recurrent costs and its components but a unidirectional causality running from public development spending to real tax revenue. The feedback effect between real tax revenue and public recurrent expenditure implies that whereas tax revenue is used to finance the expenditure, the public expenditures also act as a base for income tax and VAT revenue. Inflation ($\Delta \ln CPI$) was found to Granger cause real public recurrent costs and its two components. The results also show a unidirectional causality running from fiscal adjustment dummy to real non-wage recurrent costs. The empirical results are presented in Table 4.

657 Table 4: ARDL ECM Regression results for Growth in Public Recurrent Costs

	<u>Model 1</u>	<u>Model 2</u>	<u>Model 3</u>	<u>Model 4</u>
Regressors	Dependent Variable: $\Delta \ln G_{rc,t}$	Dependent Variable: $\Delta \ln G_{det}$	Dependent Variable: $\Delta \ln G_{ce,t}$	Dependent Variable: $\Delta \ln G_{nwrc,t}$
$\Delta \ln G_{rc,t-1}$	-0.0081 (0.1507)	-	-	-
$\Delta \ln G_{det-4}$	-	0.9445*** (0.0574)	-	-
$\Delta \ln G_{ce,t-1}$	-	-	0.3940** (0.1916)	-
$\Delta \ln G_{nwrc,t-1}$	-	-	-	0.0905 (0.1320)
$\Delta \ln MW_{t-1}$	6.0941*** (1.9065)	-	6.0253** (2.5621)	-
$\Delta \ln MW_{t-2}$	8.5692*** (1.7122)	-	-	-
$\Delta \ln TR_{t-2}$	4.6864*** (1.1335)	-	6.5124*** (1.5260)	3.9299*** (1.0373)
$\Delta \ln TR_{t-3}$	5.1718*** (1.1904)	-	3.2095** (1.2028)	-
$\Delta \ln TR_{t-4}$	5.2155*** (1.1072)	0.4807 (0.3759)	-	-
$\Delta \ln PD_{t-2}$	-	0.5906 (1.5096)	-	0.9450 (3.1686)
$\Delta \ln PD_{t-4}$	-1.7323 (2.1055)	-	1.6185 (2.7791)	-
$\Delta \ln CPI_t$	-5.8345 (3.7489)	-	-4.0173 (5.4270)	-
$\Delta \ln CPI_{t-1}$	-	-	-	-9.2714* (5.4732)
$\Delta \ln CPI_{t-2}$	-	-1.8135 (2.6267)	-	-
$\Delta \ln REER_t$	-	-	-	3.2150 (2.6505)
$\Delta \ln REER_{t-1}$	1.9971 (2.1288)	-	-	-
$\Delta \ln REER_{t-2}$	-	2.6329** (1.2454)	2.5888 (2.5991)	-
$\Delta \ln CorPI_t$	-	-	2.3987 (3.8112)	-
$\Delta \ln CorPI_{t-1}$	2.0538 (3.3426)	-	-	-
$\Delta \ln CorPI_{t-3}$	-	-2.7477 (1.8110)	-	-
$\Delta \ln CorPI_{t-4}$	-	-	-	5.9097 (4.0648)
$Fadj_t$	0.2810 (0.1797)	0.0596 (0.1163)	0.7793*** (0.2073)	1.0134*** (0.2194)
ELC_t	-0.3598** (0.1678)	-0.0046 (0.1188)	-0.3715* (0.2183)	-0.3583 (0.2462)
@trend	-0.0032 (0.0045)	0.0004 (0.0030)	-0.0051 (0.0059)	-0.0087 (0.0068)

Constant	-0.1121 (0.2185)	-0.0474 (0.1494)	-0.3746 (0.2801)	-0.2441 (0.3357)
ECT_{t-1}	-0.4466** (0.1931)	-0.1952* (0.0997)	-0.7311**(0.2703)	-0.8608*** (0.2625)
Number of Observations	50	50	51	51
F - statistic	19.5254***	91.1655***	10.5422***	12.5737***
Adjusted R-squared	0.8411	0.9485	0.6961	0.6983
R-squared	0.8865	0.9590	0.7690	0.7587
<i>Note: Level of significance are denoted by * p=.1, ** p=.05, and *** p=.01. The figures inside the parentheses are robust standard errors</i>				

Source: Author (2017)

The empirical results show that in the public development expenditure model, the systems adjust towards the long run equilibrium at the speed of 19.52 percent whereas in the public recurrent costs model, the system adjusts towards the long run equilibrium at a speed of 44.66 percent. On the other hand, the analysis shows that the systems in the compensation of government employees' model adjust towards its long run equilibrium at a speed of 73.11 percent as compared to that of the government non-wage recurrent costs that adjusts at speed of 86.08 percent towards its long-run equilibrium. This explains why growth in public recurrent costs always adjusts faster than growth in development spending.

The factors found to significantly influence the changes in public recurrent costs are real minimum wages, real tax revenue and the political budget cycles. The study found out that at 1% significance level, a percentage unit increase in real minimum wages lagged once would lead to a 6.09 percent rise in public recurrent costs whereas a percentage unit increase in real minimum wages lagged twice would lead to a 8.57 percent rise in public recurrent costs. Real minimum wages variable was not included in the development expenditure model. The analysis also shows that at 5% level of significance, a percentage increase in real minimum wages (lagged once) would lead to a 6.03 percent rise in compensation of government employees. This results implies that the persistent trade union demands for adjustments of public sector wages, which are often accompanied by the annual adjustments in the minimum wages across the board, tend to significantly lead to an increase in compensation of public employees.

The study shows that at 1% level of significance, a percentage increase in real tax revenue at second, third and fourth lag level would lead to a 4.69 percent, 5.17 percent and 5.22 percent rise in public recurrent costs respectively. This is a combined effect of about 15.08 percent within a year, which implies that government revenue is mainly devoted to financing of the public recurrent costs at the expense of the public development expenditure. Real tax revenue was also found to have a significant positive effect on the rise in both public recurrent costs components. The results show that at 1% significance level, a percentage increase in real tax revenue (lagged twice) would lead to a 6.51 percent rise in compensation of government employees and a 3.93 percent rise in government non-wage recurrent costs. Additionally, the results show that at 5% level of significance, a percentage increase of real tax revenue (lagged with three quarters) would lead to a 3.21 percent rise in real compensation of government employees. It is worth noting that for a percentage increase in real government revenue, real compensation of government employees increases by about 5.79 percent more than non-wage recurrent costs. The results on public

694 recurrent costs, is supported by the findings of [37], [39], [43], and [44]. However, real tax
695 revenue was found not to significantly influence growth in government development
696 expenditure meaning that government revenue is mainly devoted to financing of the public
697 recurrent costs at the expense of the public development expenditure.

698 The analysis found out that the consumer price index has a negative insignificant coefficient
699 in the public recurrent costs model, government development expenditures model and
700 compensation of government employees' model but a significant negative coefficient in the
701 government non-wage recurrent costs model. The results show that at 10% level of
702 significance, a percentage increase in consumer price index would lead to a 9.27 percent
703 decline in real value of government non-wage recurrent costs. This implies that an increase
704 in inflation erodes the real value of non-wage public spending thus tend to lead to an upward
705 adjustment of their nominal values leading to an overall rise in nominal government
706 expenditure.

707 The study also shows that real effective exchange rates is insignificant in explaining the
708 changes in real public recurrent costs and its components but significant in explaining the
709 changes in real development expenditure. The results show that at 5% level of significance,
710 a percentage increase in real effective exchange rates (lagged twice) would lead to a 2.63
711 percent increase in real development expenditure. This shows that most of the inputs used
712 in government development projects are imported thus their costs and consequently the
713 aggregate cost of public investment are greatly influenced by the depreciation of the shilling.
714 This supports the arguments by [59] that rise in REER (a depreciation of the Kenya Shilling)
715 has a positive influence on government spending as this makes the imports consumed by
716 the government expensive in domestic currency.

717 The election dummy was found to have a significant negative coefficient in the real public
718 recurrent costs model and real compensation of government employees' model but an
719 insignificant negative coefficient in the real development expenditure model and real
720 government non-wage recurrent costs model. The results show that at 5% level of
721 significance, an occurrence of a general election would lead to a 0.36 percent decline in real
722 public recurrent costs whereas at 10% level of significance, an occurrence of a general
723 election would lead to a 0.37 percent decline in compensation of government employees.
724 These results are contrary to the findings of [37], [46] and [49] who pointed out that fiscal
725 manipulation by the incumbent government tend to lead to an increase in recurrent
726 expenditure during the election period at the expense of public investment expenditure.
727 These results show that the Kenyan government tend to focus more on fiscal discipline
728 during the election periods to avoid increasing the fiscal deficit. This is in line with the
729 argument by [47] who show that as the level of deficit in the year preceding the election
730 increases, the share of votes received by the incumbent's party decreases. This signals that
731 well informed voters are averse to high overall government spending and budget deficits.

732 Fiscal adjustment, on the other hand, was found to have a positive coefficient in all models.
733 The results show that at 1% level of significance, an improvement in fiscal balances would
734 lead to a 0.78 percent increase in real compensation of government employees and a 1.01
735 percent rise in real government non-wage recurrent costs. These findings confirm that the
736 fiscal adjustment measures are not effective in limiting the growth of public wage bill as well
737 as the non-wage recurrent costs. The results show that the fiscal adjustment measures are
738 not effective on the expenditure side and the improvement on the fiscal balances could be
739 because of improvement on revenue collection, which in turn leads to increase in
740 government spending.

The other variables included in the models but found to have insignificant coefficients are real public debt and corruption perception index. The results show that real public debt has a negative coefficient in the real public recurrent costs model but a positive coefficient in the real development expenditure model, compensation of government employees' model and government non-wage recurrent costs' model. Corruption perception index has a positive but insignificant coefficient in the real public recurrent costs model, compensation of government employees' model and government non-wage recurrent costs' model but a negative insignificant coefficient in the real development expenditure model. Since in the models, an increase in the corruption perception index (*CorPI*) implies a reduction in perceived corruption level in the public sector, the results show that a rise in corruption in the public sector tend to lead to a decline in real public recurrent costs and its components but an increase in costs of public investment items in Kenya.

5.0 CONCLUSION

The general objective of this study was to examine the fiscal consolidation constraints that act through the persistent rise in public recurrent costs in Kenya. The study concludes that the persistent growth in public recurrent costs and the growth in public investment spending are not influenced significantly by the same factors. The study found out that the growth in public recurrent costs is mainly influenced by the real minimum wages and real tax revenue whereas the growth in real government development spending is mainly influenced by its lagged values and the real effective exchange rates. The study also show that compensation of government employees adjust faster to the significant factors as compared to government non-wage recurrent costs. The results confirm that within four quarters, the combined effect of the significant factors on the rise in compensation of government employees is about 16.16 percent whereas the combined effect on the rise in government non-wage recurrent costs is about 14.21 percent. From these results, the conclusion is that frequent public wage adjustments (mainly resulting from minimum wage adjustments and demands by labour unions for wage renegotiations) and the devotion of domestic taxes to financing public recurrent costs (leaving public investment spending to be financed through debt) are the main constraints to sustainable fiscal consolidation efforts in Kenya. Consequently, the study concludes that the persistent growth in public recurrent costs and the growth in public investment spending are not influenced significantly by the same factors. The study also concludes that fiscal adjustments effort does not significantly limit growth in public recurrent costs in Kenya. The results from the study confirm that the fiscal adjustment dummy has a positive coefficient in all the three models. In the third and fourth models, the results show that at 1% level of significance, an improvement in fiscal balances would lead to a 0.78 percent increase in real compensation of government employees and a 1.01 percent rise in real government non-wage recurrent costs. These results confirm that the fiscal adjustment measures are not effective in limiting the growth of public wage bills as well as the non-wage recurrent costs.

From the findings, the following recommendations are derived:

First, the Kenyan government, through Salaries and Remuneration Commission, should do more to restrict public sector wage adjustments. For instance, the government can consider restricting wage adjustments to the amounts usually paid as years of service increments only.

Second, the Kenyan government non-wage recurrent costs were found to adjust faster to their long-run equilibrium than the compensation of government employees. Thus, the government should also put more focus in reducing the level of spending on goods and services used by the various state ministries, departments and agencies. This can be

789 realized by cutting down on non-priority expenditures and increasing the efficiency of
790 procurement through better sourcing and reducing wastages.

791 Third, fiscal adjustment was found to increase expenditure on the public recurrent costs'
792 components. This confirms that more and more resources are still being channeled towards
793 recurrent spending thus making it difficult for both levels of government to meet the fiscal
794 responsibility principles of the Public Finance Management (PFM) Act of 2012 that requires
795 public investment spending to be a minimum of 30 percent of the total national or county
796 government budget. This calls for strict enforcement of the fiscal responsibility principles of
797 the Public Finance Management (PFM) Act of 2012 at both national and county government
798 levels.

799 Last but not least, from the literature reviewed, there is a general consensus that
800 expenditure based consolidation measures are more effective than tax based consolidation
801 measures. Therefore, the government needs to carry out significant expenditure reforms to
802 signal government commitment to fiscal management and sustainability. For instance, the
803 government needs to begin the fiscal adjustment efforts with a large upfront adjustment to
804 signal its seriousness on fiscal consolidation and deliver credible change in debt dynamics.
805 Additionally, adherence to fiscal responsibility principles of the Public Finance Management
806 Act of 2012 at both levels of governance through the Office of the Budget Controller should
807 be ensured.

808 **Areas for Further Research**

809 During the study period (since 2000), the developments in the Kenyan labour market show
810 that there has been an increase in unionization of labour in the country. This has seen the
811 establishment of Union of Kenya Civil Servants (UKCS) and increased activities of organized
812 labour unions such as Kenya National Union of Teachers (KNUT), University Academic Staff
813 Union (UASU) among others. These unions have been able to negotiate wage increments
814 on behalf of their members over the years. This study however faced limitations of data in an
815 attempt to examine the effect of the trade unions' activities on growth in public recurrent
816 costs with a particular focus on compensation of public sector employees. A further study in
817 this area is therefore recommended.

818 **COMPETING INTERESTS**

819 There is no competing interest per se, however, it is worth noting that the first version of this
820 paper appears as Chapter Two of my Ph.D. dissertation. The publication of the paper is in
821 partial fulfilment of the requirements for award of Degree of Doctor of Philosophy in
822 Economics of the University of Nairobi.

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