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Modeling the determinants of government expenditure in Kenya

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Abstract

Using a modified version of Wagner's Law, this paper sets to analyze the determinants of government expenditure in Kenya. Autoregressive Distributed Lag (ARDL) model was used to analyze time-series data for the period 1970 and 2017. The study finding reveals that GDP, population, trade openness, taxation, and inflation are essential determinants of the size of Kenya's government expenditure. The study recommends strengthening of fiscal and monetary policies to ensure stability in price level and exchange rate.

Keywords: ARDL; government expenditure; Kenya; Wagner's Law

JEL Classification Code: C22; H11; H50.

1. Introduction

Majority of emerging countries, the government is seen as an instrument of change and, hence, the size of government spending reveals the magnitude of government participation in the economy. The shift in the role of government from traditional functions to direct intervention in income-generating activities considerably expanded the scope of governments in many countries across the globe.

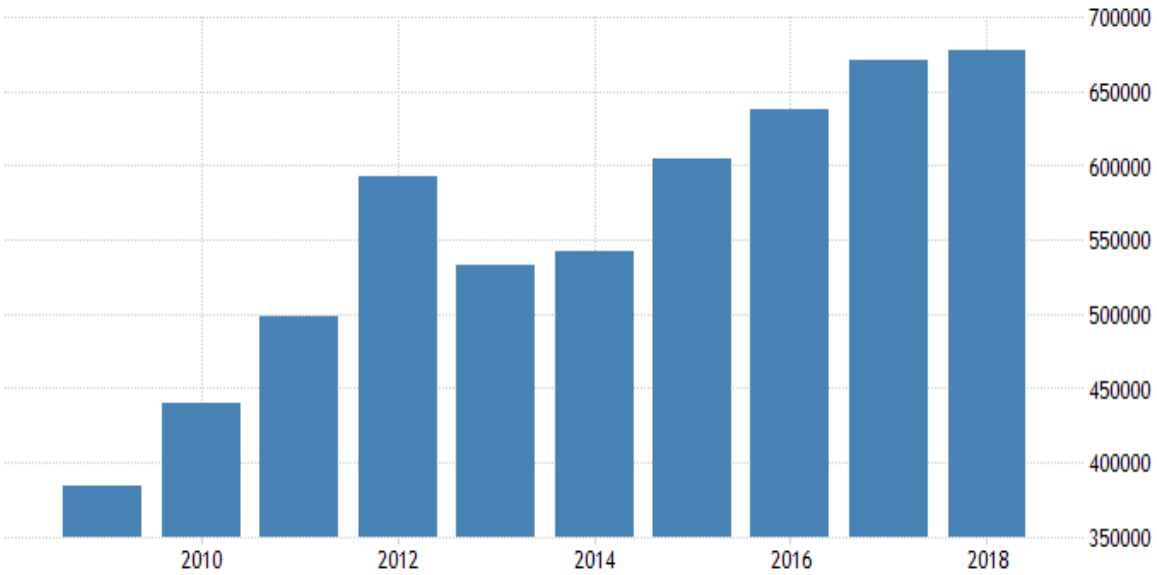
The primary objective of the government is, therefore, to promote societal welfare employing appropriate economic, political, social, and legal programs. These programs, however, have led to an expansion in public expenditure size, particularly in the developing economies like Kenya with a weak and uncompetitive private sector. Wagner (1883) was the first economist who linked economic progress and population growth as factors responsible for the growth of government expenditure using industrialized welfare states. This Law has spawned volume of theoretical and empirical debates to point out factors causing an increase in government expenditure in countries (see Facchini & Melki, 2013; Kumar, Magazzino, Giolli, & Mele, 2015).

The debate on the determinants of government expenditure is necessary because those determining factors are needed not only for managing fiscal imbalances but also to encourage economic stability in the (Aladejare, 2019; Uchenna & Evans, 2014). This study is relevant in a country like Kenya. Despite the significant expansion in government expenditure both in real and as a share to GDP (see Figures 1 and 2), development challenges such as high poverty, unemployment, remain increasingly persistent.

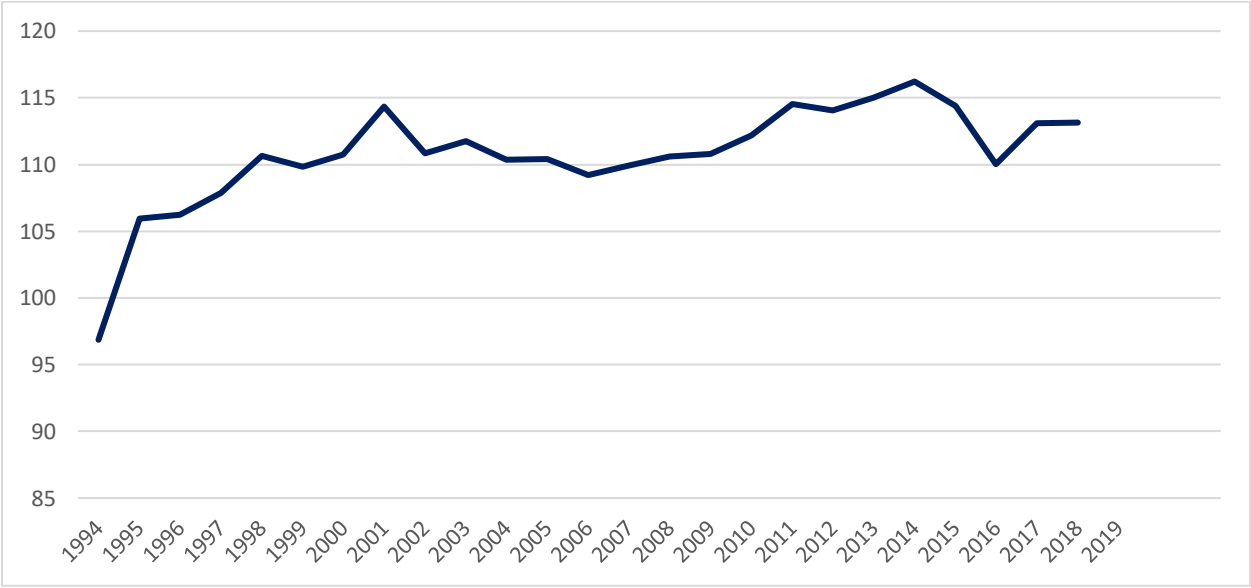
For the past five years, Kenya's fiscal policy has been mostly expansionary. The total central government expenditure has increased from 109% of GDP during 20016/2007 to an average of

113% during 2018/2019. The expenditure expansion is as a result of factors such as a devolved system of government commitment to improve and bridge Kenya's economic and social infrastructure.

Figures 1: Total Government Spending in Kenya



Figures 2: The trend of Kenya central government expenditure share to GDP. Computed from World Bank Development Indicator 2018



Therefore, this paper examines factors responsible for the growth of government expenditure in Kenya within the context of Wagner's Law empirically. Previous studies have revealed different factors causing an expansion in government expenditure. For instance, public debt is found to be a factor influencing the growth of government expenditure (Eterovic & Eterovic, 2012), corruption (Mauro, 1998) and population and urbanization (Ofori-Abebrese, 2012; Shelton, 2007; Shonchoy, 2010). While other studies have identified inflation (Ezirim, Muoghalu, &

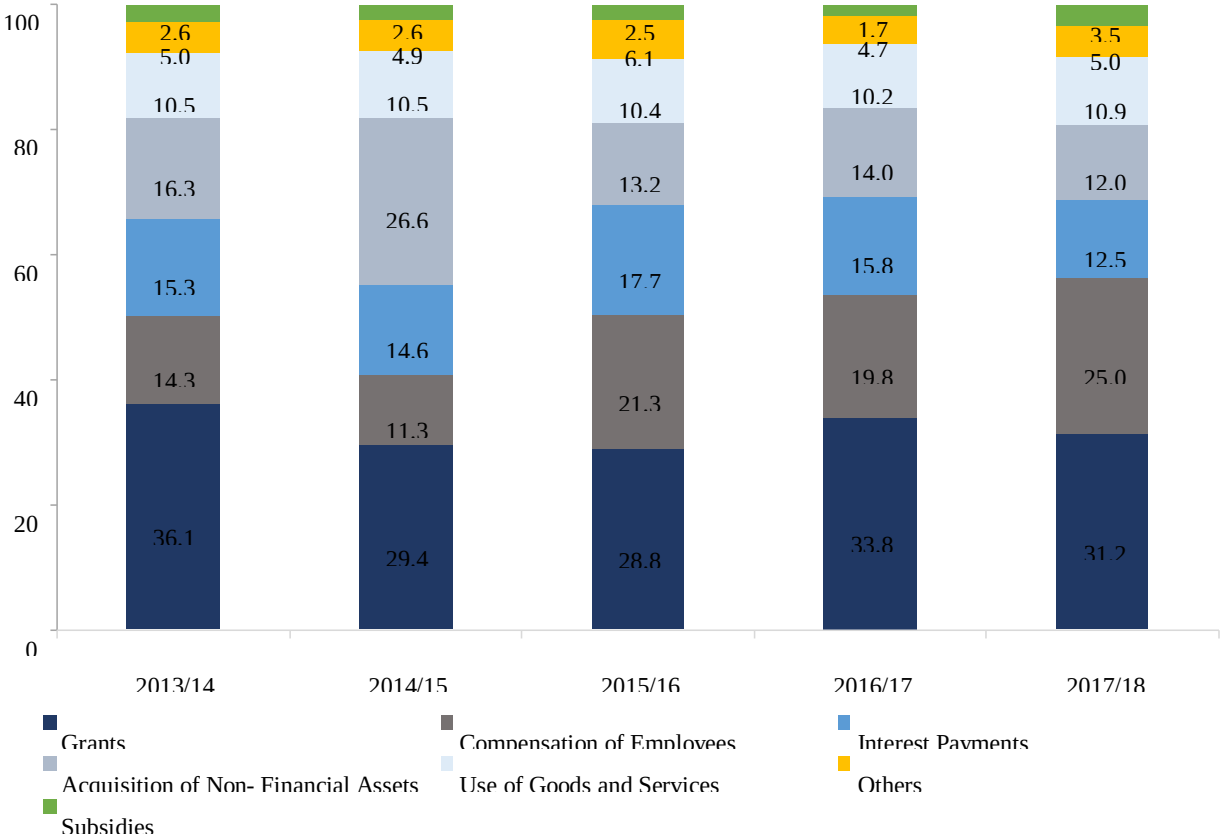
Elike, 2008) and democracy (Obeng & Sakyi, 2017) as the main determinants of government expenditure, other notable factors include foreign aid (Heller, 1975; Njeru, 2003), globalization (Dreher et al., 2008) and trade openness (Cameron, 1978), among others.

There are quite several research on the determinants of government expenditure in Kenya (JN Maingi - 2017; JN Muthui - 2013). Nevertheless, this research was biased in their analyses of common factors. This bias leads to the exclusion of several variables like trade openness, taxation, and exchange rate, among others. The above variables have shown to be significant in various research for other countries and are believed to have a potential role in explaining the growth of public expenditure in Kenya.

2. Government expenditure profile

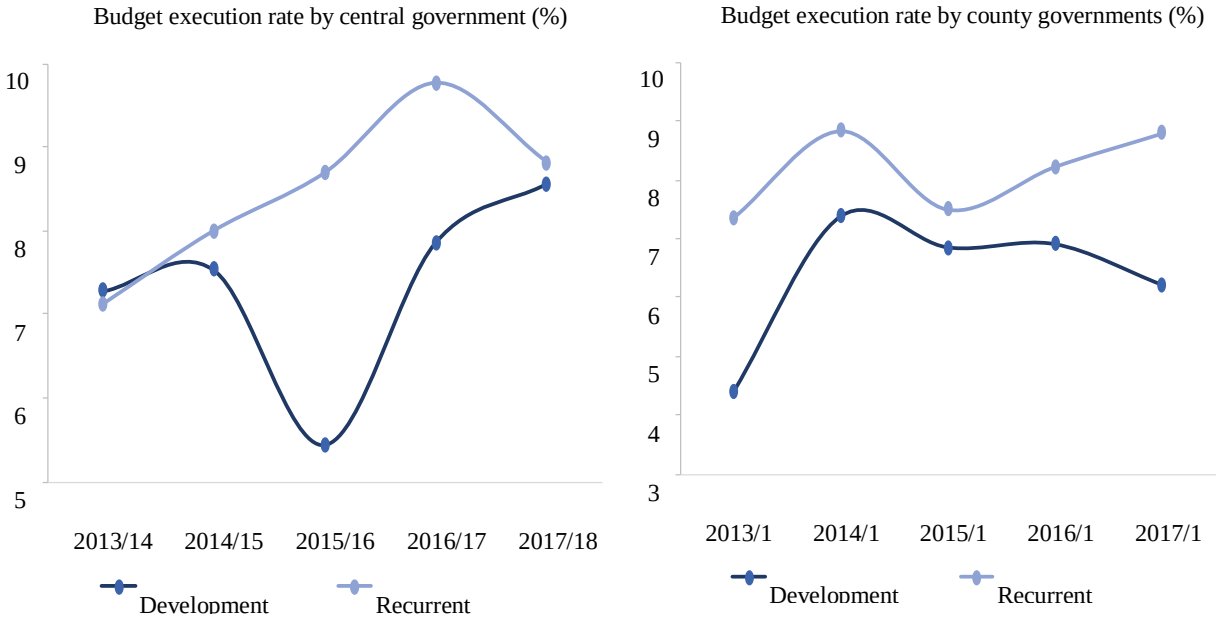
Figure 3 below describes the classification of government expenditures by economic sectors. The data indicate that spending on grants has a larger share of the budget. The expenses on Grants include semi-autonomous funding agencies and other SOEs in the country. The data indicate that grants averaged about 39.1 percent for the financial period (2013/14-2017/18). This data Reflect a growing mandate of counties in delivering public services (i.e., agriculture, health, and devolved infrastructure). Also, the data show that county government funding accounted for more than half of the expenditure averaging 3.8 percent of GDP.

Figure 3: General government expenditures by economic classification (% of total central government expenditure)



Despite increased expenditure, the country's Budget execution remains low, mostly for development spending. The country experienced underspending over the period 2013-18 on the development budget. During the financial year 2013 to 2018, about 31 percent of the budget is not accountable. Figure 4 below indicates that Budget execution was weak at the county level. The low budget absorption has made it difficult for the government to realize its development goals.

Figure 4: Execution of development budget remains a challenge mainly at the county level



The slow execution signals weaknesses in planning, project appraisal, and thus implementation sequence. Projects execution cycles and budgeting appears to be unsynchronized. We can attribute the reason for poor budget absorption to uncertainty regarding multi-year budgets for projects. This uncertainty plays a role in encouraging over-estimation of funds needed for a given project. This uncertainty eventually leads to stalled projects, pending bills, and overall delay in government payment. This cycle increases the risks linked to service supply resulting in inexpensive projects.

3. Literature review

A scholar traces the earliest theory of public expenditure to Wagner (1883). He postulated a model to explain the changes in levels of government spending. Wagner comes up with "the law of increasing state activity." Wagner hypothesizes that as the economy develops over time. This development in turn leads to growth in government expenditure.

Furthermore, Sagarik (2014) explained Wagner's Law of expanding state activity in three ways. Industrialization leads to a considerable amount of public events as a substitute for private ones. There is more need for general protective and regulative activity. Besides, manufacturing would require higher expenditure. Also, contractual enforcement to guarantee the efficient performance of the economy. Wagner's Law, thus, predicts that industrialization leads to an increase in public

expenditure as a share of GDP. Wagner's Law attempts to explain the state's increasing actual behavior, particularly regarding government spending.

More so, many empirical studies investigate the influence of population on public spending. For instance, Goffman and Mahar (1971), in their empirical research, note that the age structure of the society has been a dominant factor in public expenditure growth in developing nations. Thorn (1972) show that urbanization and life expectancy are possible underlying explanations for public sector expansion. Empirical studies by Aregbeyen and Akpan (2013), Obeng and Sakyi (2017) reveal that an increase in population contributes immensely in public sector expansion.

Some studies find a positive and significant association between trade openness and the size of government expenditure (Cameron, 1978; Rodrik, 1998; Shelton, 2007). We can explain these results as exposure to foreign shocks through trade openness increases government expenditure.

4. Model specification

Model 1: Nominal government expenditure

$$lnGE_t = \beta_0 + \beta_1\, lnGDP_t + \beta_2\, lnDEBT_t + \beta_3\, lnPOP_t + \beta_4 INF_t + \beta_5 TOP_t + \varepsilon_t \ldots..1$$

Where GE is the government expenditure, GDP is the gross domestic product, and DEBT is the public debt. While POP is the population, INF is the inflation, and TOP is the trade openness.

The first step in ARDL approach is to estimate the conditional ARDL which is specified for model 1 and expressed in the following equation as

$$\begin{aligned}\Delta lnGE_t = {} & \beta_0 + \beta_1 lnGE_{t-1} + \beta_2\, lnGDP_{t-1} + \beta_3\, lnDEBT_{t-1} + \beta_4 POP_{t-1} + \beta_5 INF_{t-1} \\ & + \beta_6 TOP_{t-1} + \sum_{i=1}^{p} \pi_{i1} \Delta lnGE_{t-1} + \sum_{i=1}^{p} \pi_{i2} \Delta lnGDP_{t-1} + \sum_{i=1}^{p} \pi_{i3} \Delta lnDEBT_{t-1} \\ & + \sum_{i=1}^{p} \pi_{i4} \Delta\beta_4 POP_{t-1} + \sum_{i=1}^{p} \pi_{i5} \Delta INF_{t-1} + \sum_{i=1}^{p} \pi_{i6} \Delta TOP_{t-1} + \varepsilon_t \ldots\ldots..2\end{aligned}$$

Where ß0 is the drift component, ε_t is the stochastic error term, Δ is the first different operator, the parameters ß0–6 denote the long-run parameters. While π1–6 represents short-run parameters of the model which the study will estimate through the error correction framework of ARDL. GE is the natural log of total government expenditure, lnGDP is the natural log of gross domestic product, and lnDEBT is the natural log of public debt. While lnPOP is the natural log of population, INF is inflation, and TOP is trade openness.

Model 2: Real government expenditure as a share of GDP

$$\frac{GE}{GDP_t} + \alpha_0 + \alpha_1 RGDPG_t + \alpha_2 REXCH_t + \alpha_3 + POPG_t + \alpha 4 lnTAXR_t + \alpha_6 TOP_t + \varepsilon_t \ldots..3$$

Where GE/GDP is the real government expenditure as a share of real GDP, RGDPG is the real GDP growth rate, REXCH is the real effective exchange rate. While POPG is the population growth, POPG is the population growth, TAXR is the tax revenue, and TOP is the trade openness.

5. Results and discussions

The result of the ADF unit root test is in Table 1 below. lnGE, lnGDP, lnPOP, lnDEBT, INF, lnTAXR, EXCHR, GE/GDP, RGDPG and TOP represent log of (government expenditure, gross domestic product, population, public debt, inflation, tax revenue, real exchange rate, actual government expenditure as a share of real GDP, real GDP growth rate and trade openness, respectively.)

Table : 1. PP unit root test

Table 1. PP unit root test

Variable	At level		First difference		Order of integration
	Intercept	Trend and intercept	Intercept	Trend and intercept	
lnGE	−1.077	−2.001	−7.886***	−8.036***	I(1)
lnGDP	−0.402	−2.029	−6.841***	−6.767***	I(1)
lnPOP	−0.4007	−1.6427	−6.732***	−7.432***	I(1)
lnDEBT	−1.242	−1.267	−6.558***	−6.645***	I(1)
INF	−3.247**	−3.320**	–	–	I(0)
TOP	−2.396	−2.042	−9.171***	−9.813***	I(1)
lnTAXR	−0.460	−2.915	−6.154***	−6.675***	I(1)
EXCR	−2.219	−2.566	−4.333**	−4.263**	I(1)
GE/GDP	−2.051	−4.455**	–	–	I(0)
RGDPG	−5.514***	−5.574***	–	–	I(0)
POPG	2.682	2.687	−5.776***	−5.986***	I(1)

** And ***denote significance at 5% and 1% levels. (c) Optimal lag length is determined by Akaike Information Criterion. (d) I (0) stands for order of integration at order zero while has I (1) stood for integration at order one.

The results confirm that the variables are in order zero and order one— which pave the way for the application of ARDL approach to co-integration.

Co-integration analysis

The result of the F-statistic for model 1—when nominal total government expenditure is normalized and model 2—when real government expenditure as a share of real GDP is normalized presented in Tables 2 below.

Table 2. Result of bounds test for co-integration

Bound test for model 1 [1, 1, 0, 1, 0, 1, 0]

Test statistics	Value	Significance	I(0)	I(1)
F-statistic	5.89	10%	2.12	3.23
K	5	5%	3.45	3.61
		1%	3.15	4.43
Bound test for model 2 [1, 1, 1, 1, 1, 1, 0]				
F-statistic	5.17	10%	2.17	3.22
K	5	5%	2.55	3.71
		1%	3.424	4.88

Lag length on each variable is selected using the AIC criterion. The study generates Critical values under the model with unrestricted intercept and no trend.

We have computed F-statistic for model 1 when total government expenditure is normalized equals to 5.89, which is higher than the upper critical values at 10%, 5% and 1% levels of significance. Besides, when real government expenditure as a share of real GDP is normalized, the F-statistic is 5.17. This F-statistic value is higher than the upper limit at 5% level of significance. This value signifies a long-run relationship in both models 1 and 2 variables.

Long-run relationship of the determinants of the size of government expenditure

The results of the bound test show that a long-run co-integration relationship exists between the variables. Hence, we can employ ARDL.

In model 1, the result indicates that in the long-run, the GDP coefficient has a positive and significant relationship with the size of government expenditure. The result is at 1% level of significance. This result implies a 0.45% change in government expenditure as a result of a 1% increase in GDP.

The positive GDP coefficient reveals that Wagner's Law of ever-increasing government expenditure. Wagner (1883) holds for Kenya. The result indicates that the economic growth level in Kenya has a significant influence on the size of government expenditure in the long-run.

The result also indicates the existence of a positive and significant long-run link between trade openness and the size of government expenditure. The finding suggests the impact of external

shocks to the economy via trade openness increases government expenditure. We can attribute the increase in government expenditure to the fact that the government needs to provide more goods and services to people to curb the impact of external shocks to the economy.

Besides, trade openness leads to more demand for social services, administrative and institutional support through the creation of new institutions, and bodies can push government expenditure to higher levels.

Table 3. Estimated long-run coefficient using ARDL approach

Model 1 [1, 1, 0, 1, 0, 1, 0]			**Model 2 [1, 1, 1, 1, 1, 1, 0]**		
Dependent variable: LOGGE			**Dependent variable: GE/GDP**		
Regressor	Coefficient	P-value	Regressor	Coefficient	P-value
Constant	−17.92**	0.0051	Constant	−0.486	0.2450
LOGGDP	0.453***	0.0008	RGDPG	0.054***	0.0008
INF	0.002*	0.1052	REXCH	−0.003	0.3377
LOGPOP	3.166**	0.0311	POPG	0.396**	0.0105
TOP	0.006***	0.0007	LOGTAXR	0.502***	0.0001
LOGDEBT	−0.169	0.2195	TOP	−0.006	0.1584

*, ** and ***denote significance at 10%, 5% and 1% levels. (c) Optimal lag length is determined by Akaike Information Criterion.

The coefficient of inflation shows a definite long-run link with the size of government expenditure. The inflation coefficient is significant at 10%. This result runs contrary to the theoretical postulation that inflation increases the prices of goods and services, which in turn pushes government expenditure upwards. We can explain this phenomenon from the perspective proposed by Baumol (1967).

The reason attributed to this phenomenon is low competition in producing goods or services in the public sector compared to that in the private sector. The above integral nature of the public sector renders productivity in the industry difficult. Thus an increase in the cost of production causing — the high price of production leaders public expenditure to increase over time.

The coefficient of the population shows a positive and significant influence on the size of government expenditure in the long run at 5% significant level. The finding provides strong support for Wagner's Law. Kenya's population growth rate remains above the country's resources. In spite of various effort to manage the population growth to levels that are in line with the country’s socio-economic development. Such a high population growth necessitate increasing government spending, particularly in the area of education and health. An increase in population is linked to demand public utilities such as road, hospital, schools, among others, to meet the growing community.

The coefficient of public debt describes a negative and insignificant link with the size of government expenditure in the long run. The result implies that public debt does not influence growth of government expenditure in Kenya. The finding is contrary to the theoretical postulation that public debt servicing increased government spending. The last few years' development spending Kenya has been the main reason for the increase in government spending. The main areas include the completion of infrastructure projects in the transport and energy sub-sectors. Furthermore, the Kenya government uses debt in funding recurrent expenditure.

In model 2, real GDP growth and population growth have a long-run relationship. The study result indicates a positive and significant long-run relation between tax revenue and government size. The result is following the tax—spend hypothesis (Friedman, 1978). Kenya has been making efforts in recent years to improve the share of tax revenue to total revenue. The integral relationship is that collecting more taxes increases the government capability to public spending more.

Trade openness and exchange rate coefficients indicate a negative long-run link with the size of government expenditure. The result of trade openness contradicts the result of the first model. In the case of the exchange rate, the depreciation of Kenya Shillings (ksh) value brings about reduction in government expenditure. Currency depreciation decreases the purchasing power of government expenditure in dollar terms.

Short-run relationship of the determinants of the size of government expenditure

Table 4 presents the result of the short-run dynamic of models 1 and 2. In model 1, the short-run effect reveals a negative and insignificant link between GDP and government expenditure. This result is in contrast to the long-run impact. Kenya's output growth does not explain the bulging of government expenditure in the short run.

The performance of the economy in the previous year was found to influence the current level of government expenditure as shown by one lag of GDP. The finding is in line with Wagner's Law that level of growth and development determines government resource outflow. In short-run population has a positive and significant effect on government expenditure. The implication of a large population is the demand for more public utilities, thus an expansion of government expenditure.

Trade openness coefficient in short-run was positive but not significant. This result contradicts the long-run effect. Several factors can c the insignificant nature of Trade openness variable. For instance, the main driver of the Kenyan economy is Agriculture with a weak productive base. Thus the country export base does not respond sufficiently to trade openness.

Further, the coefficient of inflation in the short run is found to be positive and significant at 5% level. This is in line with the theoretical postulation that higher inflation increases the cost of publicly produced goods and services, expanding the level of government expenditure.

Table 4. Estimated short-run error correction model using ARDL approach

Model 1 [1, 1, 0, 1, 0, 1, 0] **Dependent variable: LOGGE**			**Model 2 [1, 1, 1, 1, 1, 1, 0]** **Dependent variable: GE/GDP**		
Regressor	Coefficient	P-value	Regressor	Coefficient	P-value
Constant	−17.92***	0.0053	Constant	−0.344	0.2829
lnGE (−1)	−0.765***	0.0000	TOP	−0.004	0.1844
lnGDP	−0.093	0.7015	RGDPG	0.002	0.2820
lnGDP (−1)	0.346**	0.0150	REXCH	−0.005**	0.0473
INF	0.002**	0.0050	POPG	1.087**	0.0037
lnPOP	2.422**	0.0588	GE/GDP (−1)	−0.709***	0.0004
TOP	0.002*	0.0231	RGDPG (−1)	0.004**	0.0046
TOP (−1)	0.005**	0.0076	REXCH (−1)	−0.002	0.3173
lnDEBT	−0.129	0.2310	lnTAXR (−1)	0.356**	0.0137
ECM (−1)	−0.765***	0.0000	ECM (−1)	0.709***	0.0000

*, ** and ***denote significance level at 10%, 5% and 1% levels. (c) Optimal lag length is determined by Akaike Information Criterion.

The short-run result shows that public debt is negative and statistically insignificant. Implies that public debt in Kenya does explain the growth of government expenditure. We can describe this based on the fact that most emerging countries use public indebtedness to cover the revenue shortfall.

The 1st lag of government expenditure coefficient depicts a negative and significant link with current government expenditure at a 1% level of significance. The result indicates that previous year government expenditure leads to a reduction in current year expenditure. The finding seems inconsistent with the belief that government expenditure on items such as wage bills and debt servicing depends on previous government commitments. We can attribute this to the fact that during elections, there are many political deliberations in budgetary preparation relative to measurement errors.

In model 2, 1st lag real government expenditure to real GDP has a negative and significant coefficient. The finding confirms our regression in model 1. The result contradicts the theoretical postulation that government spending is a continuation of past spending with only incremental modifications. The theory suggests that government or policymaker has inadequate information to explore possible alternatives into existing policy as there are many uncertainties involved. Public spending is made incrementally to reduce risks.

In the short run, Real GDP growth rate indicates a positive and insignificant link with government size. An explanation of this is that, although policymakers plan for sustainable real growth, these policies usually lag on implementation. The possible reasons for this inefficacy in budget implementation include rent-seeking, long tendering process, delays in payment, and unhealthy competition between different ethnic groups in the country.

ECM coefficient in model 1 signifies the speed of adjustment of the model to equilibrium in the event of shocks. It shows that 76% of the disequilibrium errors are corrected annually. For model 2, interpreting its value suggests that 70% of the disequilibrium errors are adjusted annually.

6. Conclusion and policy recommendations

The study attempts to identify long-term determinants of government expenditure in Kenya using time series data between 1970 and 2017. The paper applied the autoregressive distributed lag (ARDL) model for data analysis.

The paper obtained a variety of exciting results that are helpful for future policy prescription in government expenditure decision. The short-run and long-run results imply that Wagner's Law holds for Kenya. The study suggests that industrialization cause an increase in public expenditure. Control variables in the models provide consistent results, suggesting that population, tax revenue, and inflation are strong determinants of government expenditure size.

Trade openness provides a mixed result in the two models. Other variables such as debt stock and exchange rate are found to have no significant effect on the share of government expenditure size. This insignificant might be due to poor handling of the debt contracted besides the fact that the government uses the debt to cover the revenue shortfall, thus increasing spending.

Based on the findings, there is a need for the government to diversify the revenue base of the country. There is also a need for proper use of debt in financing-efficient projects in the economy. Given the strong positive correlation between population and government size, it is therefore essential for the government to encourage less family size. This can be done to lessen the pressure of population explosion, which is always accompanied by high demand for public utilities, including education, health, among others.

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