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Is the Size of Devolved Expenditure Optimal in Kenya? A Balanced Budget Approach

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Abstract

This study, assuming a balanced budget, attempts to estimate the optimal size of county government expenditure in Kenya using the panel ARDL regression and Scully (2008) model for the period 2013-2017. The panel ARDL series analysis reveals that devolved government size is optimized when county expenditures stand at 9.7% of GCP (Gross County Product). The estimated threshold size is higher than the current size of county government in Kenya. The low level of devolved government size in counties reflects the low level of economic development in Kenya. This finding is very much interesting since it highlights that the current size of county government in Kenya is below the optimum level or size and there is still scope of increase in devolved government spending to the GCP ratio in Kenya. County Government expenditure has the potential to stimulate the county economy and remove economic growth sticking points or even deduce market failures. This study therefore recommends that county government should increase its spending on infrastructure, social and economic activities.

Keywords: County, optimal, devolved, expenditure, GCP, balanced budget

1.1 Introduction

Africa shows an impressive decentralization institutional creativity. Two countries, Ethiopia and South Africa, have chosen a quasi-federal system. Nigeria, which used to be the only federal state in Africa, has adopted a new constitution that maintains the federal framework and gives more powers to its sub-national governments. In particular, rural areas are receiving priority over the urban ones in the current decentralizing trends in developing countries (Brosio, 2000; KIPPRA, 2016). In a number of countries, such as Kenya, Ethiopia, Mali, Madagascar and Senegal, devolved government, is a response to the demand for more autonomy from some areas of the country, as well as for a more equitable distribution of national shared resources (Brosio, 2000; Mose *et al.*, 2019).

In Kenya, decentralization started as early as 1963, particularly the *Majimbo* system and the sessional paper No 10 of 1965 entitled "African Socialism and its application to planning in Kenya." Further, Mutie (2014) observes that there are four main philosophies that guide fiscal decentralization. These are expenditure responsibilities, intergovernmental fiscal transfers,

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revenue assignment and sub-national government borrowing. Kenya came up with a new constitution which was promulgated in the year 2010 and fiscal decentralization is integrated in this constitution. Underpinning the devolution agenda was the need to: address deeply entrenched disparities in growth between counties; jumpstart long-term economic growth; improve equity in access to social and economic services at the county level; and, work progressively toward equalizing opportunities for all Kenyans (World Bank, 2014). Before the country prepared a new constitution, fiscal decentralization used to operate at the local authority level as Local Authority Transfer Fund (LATF) (IEA, 2010).

For devolved expenditure, about 20 percent of total government expenditure was spent at sub-national level in 2013/14 for Kenya which is the same level as EAC countries. The share of sub national expenditure closely mimics the levels in the region; in Uganda and Tanzania expenditure by sub-national governments account for 20 and 22 percent (respectively); while in Ethiopia it accounts for 46 percent of total spending. The share of devolved funds traditionally is higher in federal countries, with Nigeria, Brazil, South Africa and Ethiopia as examples (IEA, 2010; World Bank, 2014; SID, 2017; GoK, 2018).

Fiscal policy is one of the government policies that influence economic activities by raising the revenue through taxation and control of the level of expenditure (Muguro, 2017). The Keynes theory presents the multiplier effect and argues that the increase in county government expenditure will increase demand and thus increases county GCP growth (Mutie, 2014). Fiscal policy settings can affect output and economic growth in the medium term as well as over the business cycle. However, the county spending action to the economic growth may be beneficial and at the same time be detrimental (Husnain, 2011). Table 1 shows the trend of GCP growth and government size growth from 2013 to 2017.

Table 1: Government Size in Kenya

YEAR	2013	2014	2015	2016	2017
Real GCP growth rate - (%)	5.9	5.4	5.7	5.9	4.9
National Expenditure - (% GCP)	23.7	25.9	26.6	25.3	24.6
County Expenditure - (% GCP)	4.3	5.4	5.4	5.3	5.3

Source: KIPPRA (2016); GoK (2018); KNBS (2019).

From Table 1 above, there is evidence that the size of government has been rising. However, the growth of government size is that of double digit while GCP is growing at a single digit. This can be attributed to increasing county wage bill over the years (OCOB, 2017). In addition, from Table 1, county expenditure as a percentage of GCP was low in comparison to national government expenditure as a percentage of GCP in Kenya during the periods 2013-2017. Specifically, county and national government size has been increasing gradually from 4.3 and 23.7 percent as a share GCP in 2013 to 5.3 and 24.6 percent of GCP in 2017, respectively. During the same period, the rate of growth of GCP was cyclical, depicting no clear pattern and responsiveness to changes in both government sizes (KIPPRA, 2016). Despite the widespread government strategies to foster economic expansion, increase in county government expenditure has tended to grow faster than that of GCP. The trends in this Table 1 reveal a widening gap between county government size and county economic growth and therefore a concern that this study is interested in.

1.2. Problem Statement

The causes of much of the disparities in economic growth over time are not well understood. In particular, the impact of county government expenditure on economic growth has not been investigated exhaustively. From previous studies, the influence of expenditure on economic growth appears to be inconclusive and other provides diverse findings. Despite this uncertainty, economic theory suggests that county spending induce economic growth (Barro & Sala-i, 2003). In Kenya, economic growth has been fluctuating, depicting no clear pattern and responsiveness to changes in government size, despite the devolved expenditure increasing over time (KIPPRA, 2016; KNBS, 2019). With the devolution process, under new constitution (2010), resource allocation has been reorganized, which is expected to tackle the marginalization of certain regions in the past (GOK, 2010). Government expenditure has also been restructured to enhance economic expansion by increasing development expenditures. However, despite devolution process, economic growth has not kept pace with county expenditure growth. Therefore, there is need to investigate the optimal government size for policy recommendations.

1.3. Objective

The objective is to determine the optimum size of county government spending on county economic growth in Kenya.

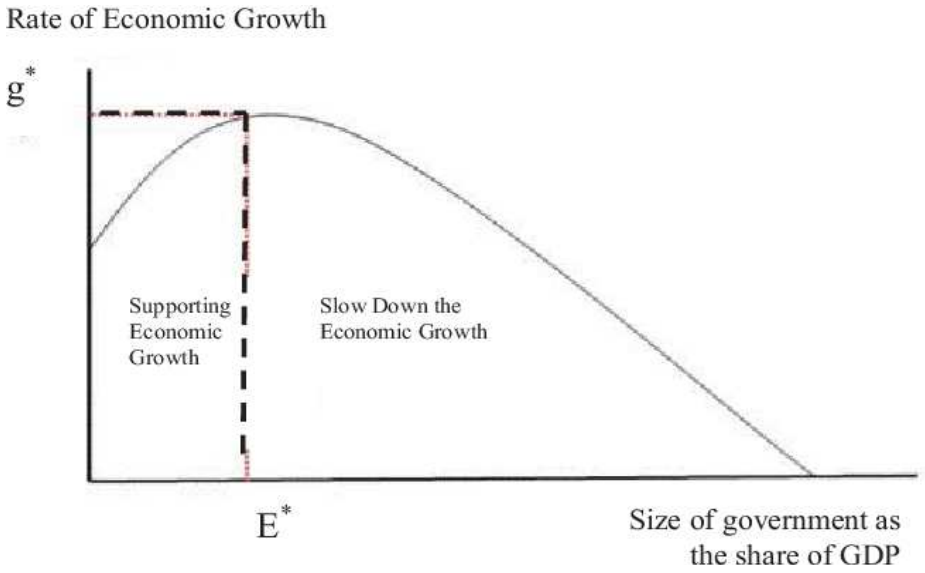
1.4 Research Hypothesis

Optimal size of county government spending on county economic growth does not exist in Kenya.

2.1 Literature Review

2.1.1 The Optimal Government Size

Armey (1995); and Scully (2003) did theoretical and empirical research and popularized the existence of an optimal size of government as depicted by an inverted U-curve. As government continues to grow as a share of the economy, expenditures are channelled into less productive (and later counterproductive) activities, causing growth to diminish and eventually decline (Vedder & Gallaway, 1998; Leach, 2002; Barro & Sala-i, 2003).



Notes: g – *Real Gross County Product (Proxy for Economic Growth)* E – *Equilibrium*

CGE – *County Government Expenditure (Proxy for Government Size)* T – *Time variable*

Figure 1: Armey Curve (Armey, 1995; Leach, 2002; Scully, 2003).

Explanations for this trend can be found in the decrease of private investments due to the 'crowding- out' effect, higher tax rates and less free market. Additionally, the Armey Curve indicates an optimal size of the government E*, where maximum economic growth is reached. At this point, an increasing amount of public expenditure leads to a decrease of economic growth. This point differs country by country and may rely on economic factors like openness of the economy as well as social factors like population size (Armey, 1995; Leach, 2002).

The Armey Curve can be expressed in a simple quadratic form, as follows:

$$(g_{i,t}) = \alpha + \beta(CGE)_{it} + \delta(CGE)^2_{it} + \gamma T \quad (1)$$

The positive sign on the linear term, CGE, is designed to show the beneficial effects of government spending on economic expansion, while the negative sign for the squared term means the variable measures any adverse effects associated with increased government size. Since the squared term increases in value faster than the linear term, the presence of negative effects from government spending eventually will outweigh the positive effect, producing downward-sloping portion of the Armey Curve (Armey, 1995; Leach, 2002; Wanjuu *et al.*, 2017). To control for factors unrelated to government spending, Vedder and Gallaway (1998) introduced the time variable (T). Therefore, the faster and greater the expenditure increases, the greater the probability of diminishing returns and ineffective use.

2.1.2 The Armey Curve Quadratic Equation

In order to test the relationship between County Government Expenditures (CGE) and economic growth that is theoretically characterized by the inverted U curve, this study uses a simple

quadratic equation following Armey (1995); Vedder and Gallaway (1998); Facchini and Melki (2013); and Wanjuu *et al.* (2017).

$$(GCP_{i,t}) = a + b(CGE)_{it} + c(CGE)^2_{it} \quad (2)$$

The (CGE) which guarantees the optimal level of county economic growth (GCP) is derived by taking the first derivative of the equation (2) in respect to CGE and then equated to zero.

$$\frac{\partial GCP}{\partial CGE} = b + 2(c)CGE_{i,t} \quad (3)$$

Equating equation 3 to zero gives the optimum government size percentage.

$$CGE = -\frac{b}{2c}. \quad (4)$$

2.1.2 The Scully Model

Scully (2003); and Scully (2008) developed a model that estimates the share of county government spending (or general tax rate) that maximizes real economic growth. According to the Scully model, both the public as well as private sectors contributes to the gross domestic product in counties. Public sector provides goods and services which are financed with tax collections from the population. This becomes the public sector spending. On the other hand, the private people give taxes to government and fraction of the rest of their income is saved which in turn is used to produce goods and services. The fraction of income of the private people given to the county government is given by;

$$\frac{T}{Y} = \tau$$

where T is total taxes and τ is the associated tax rate and Y is the GDP. Or in other words, τ is the share of county public sector in GDP. The share of the private sector in GDP is "1- τ". (1- τ) is the share of the income of the people left with them after taxation which leads to the production of goods and services. The functional form of this relationship is given by the following Cobb-Douglas production form as;

$$Y_{it} = \gamma \left(\frac{G}{Y}\right)^{\alpha} (1-\tau)^{\beta} \quad (5)$$

α and β are the shares of the public and private sectors respectively. Equation (5) is a nonlinear production. Y is GDP and G is county government expenditure. 'τ' shows the ratio of tax to GDP and 'γ' shows total factor productivity. The log transformation of equation (5) is given by;

$$lnY_{it} = ln\gamma + \alpha\, ln\left(\frac{G}{Y}\right) + \beta \ln(1-\tau) \quad (6)$$

This is simplified as follows;

$$\alpha \left(\frac{Y}{G}\right)\left(\frac{1}{Y}\right) = \alpha\, G^{\beta-1}$$

Now taking second derivative with respect to G, thus get;

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$$\frac{\partial^2 \ln Y}{\partial G^2} = -\alpha G^{-2}$$

This exercise shows that the value of the first derivative is positive while the second derivative is negative as is shown by the negative sign of the second derivative. This shows that public expenditure affects growth positively but the magnitude of this effect decreases over the time i.e it affects economic growth at decreasing rate afterward. This results into non-linear relationship between expenditure and growth (Scully, 2003; Husnain, 2011).

2.2 The Empirical Literature

Wanjuu *et al*. (2017) investigated the optimal expenditure from 1970 to 2014 using panel ARDL. The study established that the optimum government sizes were 36.61%, 15.61%, and 23.13% of the real GDP for the 27 OECD, 50 African, and 77 African and OECD countries, respectively.

Munene (2015) using an OLS and Armey curve quadratic equation to analyse the optimal size of expenditure and economic growth in Kenya in the period 1963 – 2012. The major finding of this study is that growth maximizing expenditure as a percent of GDP was estimated to be 23 %.

Shumaila & Abdul (2014) estimated optimum government size for growth in Pakistan by using Scully (2008) methodology for period from 1973 to 2012. The optimal size of the government size or equivalently the optimal size of the public spending was found to be around 17 per cent of the GDP. The actual size of the spending was 18 per cent.

Olaleye *et al.* (2014) used an OLS and Armey curve quadratic equation to analyse the effect of government expenditure and economic growth in Nigeria in the period 1983-2012. The study concluded that Nigeria optimum government expenditure size is 11% of the GDP.

Facchini and Melki (2013) analysed the presence of Armey curve in France (1871 – 2008). The study used the OLS linear model to estimate. The findings confirmed the Armey curve and the optimal government size for France was 30 % of GDP.

Husnain (2011) estimated the optimal government size in Pakistan following the methodology of Scully (2008). The findings have shown that the threshold level of the government expenditure is 21.48 percent of GDP which is lower than the current size.

Scully (2008) argue that optimal tax rate or equivalently the optimal size of the government ranges from 19 to 23 percent. This study also affirmed that the optimal tax rate for New Zealand on average is 19.7 percent of the GDP over the period 1927-1994.

3.1. Methodology

This study employed historical research design so as to capture the trend of county economic growth and government expenditure in Kenya. This was carried out in the period 2013 - 2017 using annual series secondary data for 47 counties and panel ARDL technique, resulting in 235 county-year observations. This study was carried out in Kenya. This is because in the study

period, there has been a significant transfer of funds to 47 county governments by the national government in order to address disparities in country growth.

The data was from previous publications which could only be sourced from secondary sources. The study utilized annual data from Statistical abstracts, Economic surveys, Gross County Product report and County Budget Implementation Review Reports.

3.2 Panel Data Analysis Techniques

Building on previous studies (Facchini & Melki, 2013; Mose *et al.*, 2019), a simple growth panel model was formulated from equation (7).

$$lnY_{i,t} = \beta lnX_{i,t-1} + \gamma ln\ G_{i,t-1} + \mu_i + v_t + \varepsilon_{i,t} \quad (7)$$

Where, $\ln Y_{i,t}$ - the dependent variable-County economic growth

$lnX_{i,t-1}$ - set of explanatory variables apart from devolved county expenditure

$\ln G_{i,t-1}$ – the county devolved government expenditure variables

β and γ - are parameters to be estimated

μ_i – county fixed effects v_t – time fixed effects $\mathcal{E}_{i,t}$ – the error term

and the subscripts i and t represent county and time period respectively

To achieve objective, this study followed Scully (2008); and ARDL model that explains the level of government size (G) in a county economy and the corresponding level of economic growth. ARDL model is applicable irrespective of whether the underlying variables are I(0) or I(1) and applicable for small sample size estimation (Narayan & Smyth, 2005).

Thus, equation 7 was reformulated as a panel ARDL model, to determine the underlying relationship between dependent and independent variables, to obtain models (8) below.

$$\Delta lnY_{i,t} = \sum_{i=1}^{k} \beta \Delta lnX_{i,t-1} + \sum_{i=1}^{k} \gamma \Delta ln\ G_{i,t-1} + \mu_i + v_t + \varepsilon_{i,t} \quad (8)$$

Now to find the optimal level of government size, this study follow Scully (2008); and Heerden (2008) to impose the restriction of a balance budget of the counties, that is (G = T). So to impose this balanced budget restriction the tax rate is given by;

$$\frac{G}{Y} = \tau$$

τ now is called the anticipated tax rate. Where G is government spending and Y is GDP. Or in other words, τ is the share of county public sector in GDP. The share of the private sector in GDP is "1- τ". (1- τ) is the share of the income of the people left with them after taxation which leads to the production of goods and services. The functional form of this relationship is given by the following Cobb-Douglas production form as;

$$Y_{it} = \gamma \left(\frac{G}{Y}\right)^{\alpha} (1-\tau)^{\beta} \quad 9$$

α and β are the shares of the public and private sectors respectively. Equation (9) is a nonlinear production. Y is GCP and G is county government expenditure. 'τ' shows the ratio of tax to GCP and 'γ' shows total factor productivity. The log transformation of equation (9) is given by;

$$lnY_{it} = ln\gamma + \alpha\, ln\left(\frac{G}{Y}\right) + \beta \ln\,(1-\tau) \qquad (10)$$

Now substitute ' $\frac{G}{Y} = \tau$ ' into equation (10), thus get;

$$lnY_{it} = ln\gamma + \alpha\, ln\tau + \beta \ln\,(1-\tau) \qquad (11)$$

So to find growth maximizing level of government size, this study differentiates equation (11) w.r.t 'τ'. After differentiation then;

$$\frac{\partial \ln Y}{\partial \tau} = \frac{\partial \alpha \ln \tau}{\partial \tau} - \frac{\partial \beta \ln(1-\tau)}{\partial \tau} = 0 \qquad (12)$$

$$\frac{\alpha}{\tau} - \frac{\beta}{1-\tau} = 0$$

Solving for "τ" (the optimal tax rate), this study get $\beta\tau = \alpha\,(1-\tau)$, and finally,

$$\tau^* = \alpha/(\alpha+\beta)$$

In order to provide intuitive interpretation of the findings obtained from this study, several post estimation panel diagnostic tests were conducted.

4. RESULTS

The panel ARDL regression results are reported in Table 2 given below.

Table 2: Optimal Devolved Expenditure Regression Result (SBC - 1, 0, 0)

Variable	Coefficient	Standard error	t- Statistics	P-value
$ln\ y(-1)$	0.842831***	0.033217	25.37367	0.0000
$ln\tau$	0.152954***	0.032901	4.648914	0.0000
$\ln\,(1-\tau)$	1.422697**	0.601285	2.366096	0.0188
$Cons$	0.995023***	0.171124	5.814626	0.0000
LM Test	F = 0.988767		Prob > F = 0.4147	
Breusch - Pagan Test	F = 8.876056***		Prob > F = 0.0000	
Pesaran CD	z = -1.156541		Pr = 0.2475	
Ramsey-Reset Test	F = 1.818203		Pr = 0.1789	
Goodness of Fit Test	F statistics = 226.6525***		P-value(F)= 0.0000	
Goodness of Fit Test	R^2 = 0.747241		Adjusted R^2 = 0.743944	

***Notes**: *** significant at 1%, ** significant at 5%, all the absolute values of the variables are expressed in natural log.* lnY_{it} *– County real GCP (economic growth),* $\ln\tau$ *- devolved expenditure (recurrent +capital),* $1-\tau$ *- share of the private sector in GCP.*

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The above results of the equation for the optimal size of the government show that all the variables have carried out significant coefficients as shown by high "t" statistics.

$$lnY_{it} = 0.995023 + 0.152954\, ln\tau + 1.422697 \ln(1 - \tau) \quad (13)$$

To calculate the optimal county government size, this study use equation (11). So substitute the values of "α" and "β" from the above in equation (13), then getting;

$$\tau = \frac{0.152954}{0.152954 + 1.422697} * 100 = 9.7 \quad (14)$$

The optimal size of the devolved government size (both capital and recurrent) is found to be around 9.7 percent of the GCP as is shown by the above empirical analysis against actual 5.4 percent of GCP in 2017. This reflects a reduction in public spending over the optimal target. On the other hand, actual average size of the government spending is 5.4 percent for 2015-2017 (KIPPRA, 2016; SID, 2017). The optimum government size was low considering counties only receive 15% of total revenue from national government. This finding is very much interesting since it highlights that the current size of county government in Kenya is below the optimum level or size and there is still scope of increase in devolved government spending to the GCP ratio in Kenya. Further, about 20 percent of total government expenditure was spent at sub-national level in 2013/14 which is the same level as East African Community countries. The share of devolved funds traditionally is higher in federal countries, with Nigeria, Brazil and Ethiopia (World Bank, 2014; OCOB, 2014; GoK, 2016). The finding of this study fits into Obben (2013) study which found 7.4% of GDP for OECD countries, including Kenya. In contrast, Legge (2015) did not find any optimum government size in the countries (DCs and LDCs) studied.

From the result on Table 2 above, cross-sectional dependence and autocorrelation were not a problem in this study. However, heteroscedasticity was a problem but the study used panel robust standard error to correct it. Also, the adjusted R^2 was 0.74 implying that 74 percent of the variations of the dependent variable are explained by the explanatory variables in the model. This indicated that the overall goodness of fit was satisfactory.

5. Conclusions

The Result for objective of this study was to estimate optimum size of devolved county government. According to the estimation results of Scully model, optimum government sizes were 9.7 % of the GCP. The actual average government sizes was 5.4% of the GCP for the devolved for Kenyan counties during period of review. The optimum county government size was above the actual government in the panel regression model. The low level of devolved government size in counties reflects the low level of economic development in Kenya. This study concludes that there exists inverted U shape curve in the panel regression models. Also, devolved expenditure had a significant positive effect. Hence, suggesting that the productivity of devolved spending exceeds the deadweight loss associated with high taxes. As a result, county spending augments the aggregate demand, which stimulates an increased output depending on expenditure multipliers.

6. Recommendations and Areas for further study

Based on the results above, it is clear that the significant effects of the government expenditure on economic growth are not independent from government size. Verifying their relationship as a U-shaped curve, implementation of the following recommendations for 47 counties becomes worthy of attention: Fixing the share of government expenditures in counties with the optimum government size (9.7% of GCP), this recommendation can guarantee high and stable county economic growth. The low level of government size in counties reflects the low level of economic growth in Kenya, hence this study recommend devolved expenditure be increased by county government from 5.4% to 9.7% of GCP. Also, in comparison to other countries, Kenyan share of county level expenditure, 20% of total expenditure, closely mirrors the levels in the region. However, for Ethiopia, it accounts for 46.0 per cent of total expenditure, probably because it has been implementing devolution for longer than Kenya. Thus, Kenya has room to improve budget allocation to be in the same league with her peers like Ethiopia. However, an increase in spending that is not matched by an increase in revenues leads to a budget deficit that needs to be financed. If the deficit is financed by issuing domestic debt, it can have negative consequences for domestic interest rates, which crowds out private spending before retarding county growth.

In future studies, macroeconomic analysis should be extended to include a more detailed disaggregation of county government expenditures by functions. Such a disaggregation would allow extension of the analysis and distinguish among the optimal size of devolved recurrent spending, capital expenditure and human expenditure on county economic growth.

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