



GOVERNMENT SECTORAL EXPENDITURE AND ECONOMIC GROWTH

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ABSTRACT: *The major objective of this study is scrutinizing the impact of government sectoral expenditure on economic growth in East African countries over the period from 1985 to 2015. It focuses on sectoral expenditures on health, education, defence and agriculture segments. The main contribution of this research is examining expenditure components in line with current government categorization to establish these sectoral budget allocations that have impact on economic growth in order to provide a guide for policy formulation. This study uses secondary data which are obtained from Statistical Abstracts and World Bank reports. The growth impact of government expenditure is estimated by panel Ordinary Least Squares (OLS) technique and fixed effect estimation method to examine the relationship between the variables. The empirical results show that agriculture and education expenditure have an insignificant impact on economic growth and productivity. The regression results further show a significant positive impact on economic growth of expenditure on health and defence. To boost economic growth and productivity a well-defined expenditure strategy and efficient management of budgetary resources allocated to all sectors should be accentuated in East Africa.*

KEYWORDS: East Africa, Government Sectoral Expenditure, Economic Growth, Kenya

INTRODUCTION

Economic theory does not automatically generate strong conclusions about the impact of public sectoral expenditure on economic activities. Economists are of two different views about the role of government spending in economic activities. According to the neo-classical economists, reducing the role of private sector by crowding-out effect is important because it reduces the inflation in the economy; increase in public debt, increases the interest rate which reduces inflation in the economy as well as output (Babu *et al.*, 2014). The new-Keynesians present the multiplier effect in response and argue that the increase in government expenditure will increase demand and thus increase economic growth (Mitchell, 2005). Indeed, most modern economists would agree that there are circumstances in which lower levels of national spending would enhance economic growth and other circumstances in which higher levels of public spending would be desirable. If government spending is zero, presumably there will be very little economic activity because enforcing contracts, protecting property, and developing an infrastructure would be very difficult. In other words, some government expenditure is necessary for the successful operation of the rule of law in any economy (Mitchell, 2005). Economic growth brings about a better standard of living of the people through provision of better infrastructure, health, housing, education services and improvement in agricultural productivity and food security (Loto, 2011).



There are some components of government spending that are productive while some are unproductive. Government expenditures on health and education raise the productivity of labour and increase the growth of national output. Education is one of the important factors that determine the quality of labour. Government expenditure on health could lead to economic growth in the sense that human capital is essential to growth. Good investment in the form of national defense is a necessity for safeguarding and protecting the nation from outside aggression, while agriculture, in the form of food security, is a necessity for human existence. But due to lack of sufficient revenue, there is need to categorise productive and non-productive government expenditure for East Africa in order to eliminate the non-productive expenditure (Mitchell, 2005; Babu *et al.*, 2014).

The composition of government expenditure reflects government spending priorities. The composition of total expenditure across continents reveals many variations. The top three expenditures for Africa in 2002 were health, defence and education. Although education expenditure was the largest (14 percent), the percentage is smaller than in Asia and comparable to Latin America (Fan & Rao, 2003). Public spending on education; total (% of government expenditure) in Sub Saharan Africa was reported at 18.85 in 2008, according to the World Bank (2010). It is not surprising that Asia has the highest quality of human capital among regions. Defense and agriculture expenditure ranked second and third, accounting for 9 percent each, of total government expenditures in 2002, reduced from 18 percent and 15 percent, respectively, in 1980 (Fan & Rao, 2003).

Over the entire period under investigation, total government expenditure in East Africa shows an increasing trend. On average for the entire period under investigation, the top sectors receiving the highest priority in Tanzania, as reflected by the composition of total expenditure, are general public service (19.9 percent), Infrastructure (10.7 percent), education (10.3 percent) and defense (10.3 percent). Overall, human capital development spending in Tanzania received 15.8 percent of total government expenditure. This is mirrored in poor human capital development outcomes in Tanzania as compared to Kenya and Uganda (Mwakolobo, 2009; World Bank, 2010; AFB, 2018). For Kenya, data reveal that the top priority sectors that constitute the largest shares in total government spending are physical capital (20.0 percent), education (18.1 percent) and general public service sector (14.6 percent). Spending on defense and health are respectively 7.2 and 5.4 percent (KNBS, 2018). Uganda's top priority sectors are physical capital (26.0 percent), defense (17.6 percent) and general public service (17.4 percent). Education and health spending received 13.4 percent and 4.5 percent respectively. High spending in defense could be explained by the fact that Uganda has been in a constant civil strife almost for entire period under investigation (Mwakolobo, 2009; AFB, 2018).

The East African Community (EAC) region growth declined from 6.1 per cent in 2015 to stabilize at 5.4 per cent in 2016 and 2017. The decline was attributed to a slowdown in credit growth to the private sector and prolonged effects of drought which dampened agricultural output and GDP growth in Kenya, Uganda and Tanzania (KNBS, 2017). However, the EAC region recorded an average growth rate of 5.6 per cent higher than the SSA regional average of 3.4 per cent during the review period. Sectoral GDP growth in East Africa has historically been driven by growth in agriculture due to its major contribution to GDP and employment in most countries. However, the agricultural sector has been largely underfunded despite its potential to deal with both rural and urban poverty, create employment and bolster economic



growth in many economies worldwide. On average, none of the EAC countries spends more than five percent of total government expenditure on the agricultural sector (EAC, 2011).

Economic Growth and Government Expansion

Development models of government expenditure growth are best represented by the works of Musgrave and Rostows. Their views are generalizations gleaned from examination of a large number of different historical trends of developed economies. In the early stages of economic growth and development, public sector investment as a proportion of the total investment of the economy is found to be high since public capital formation is of particular importance at this stage. The public sector is therefore seen to provide social infrastructure overheads such as roads, transportation systems, sanitation systems, law and order, health and education and other investments. Rostow's claims are that once the economy reaches the maturity stages the mix of public expenditures will shift from expenditures on infrastructure to increasing expenditures on education, health and welfare services. In the mass consumption stage, income maintenance programs, and policies designed to redistribute welfare, will grow significantly relative to other items of public expenditure and also relative to economic activities (Brown & Jackson, 1996).

For Keynesians model, sectoral demand is a prerequisite for growth in productivity and output. According to Harrod-domar model, to determine an equilibrium growth rate (g) in the economy, the balance between supply and demand for a nation's output should be maintained. On the supply side, saving is a function of the level of GDP (Y), say $S=sY$. The level of capital K needed to produce an output Y is given by the equation $K=rY$ where r is called capital output ratio. Investment (I) represents an important component of the demand for the output of an economy as well as the increase in capital stock (Thus, $\Delta K=r\Delta Y = I$). Therefore, the equilibrium rate of growth (g) is given by $g = \Delta Y/Y = s/r$ (Romer, 1990). This is a very significant result as it tells us how the economy can grow such that the growth in the capacity of the economy to produce is matched by the sectoral demand for economy's output (Barro & Sala-i-Martin, 2004).

The empirical findings by Korman and Bratimasrene (2007) and Musaba *et al.* (2013), showed that expenditure on education had a negative and insignificant relationship with economic growth, while on the other hand health expenditure was found to be positively and significantly related to economic growth. Further, Loto (2011) and Musaba *et al.* (2013) found government spending on security, transport and communication to have positive but insignificant effect on economic growth. Spending on agriculture though was found to be significant and negatively related to economic growth. In contrast, Fan and Rao (2003) concluded that in Africa, government spending on agriculture and health was particularly strong on promoting economic growth and productivity. Some studies argued that defence spending has a negative effect on economic growth such as Tomori and Adebisi (2002). However, others found a positive relationship between them (Diamond, 1989).



METHODOLOGY

Specification of Model

In this study, an econometric model adopted from Ram (1986) and developed further by Kweka and Morrissey (1999) and Mose *et al.* (2020) was adopted for this econometric analysis. In the model, output (Y) was assumed to be a function of three factors of production, Capital (K), Labour (L) and Government sectoral expenditure (G).

$$Y = f(K, L, G, O, P, T) \quad (2)$$

Thus, the model to be estimated was specified in logarithm form as:

$$\ln grgdp_{i,t} = \beta \ln X_{i,t} + \gamma \ln G_{i,t} + \mu_i + v_t + \varepsilon_{i,t} \quad (3)$$

Where: μ_i – country fixed effects v_t – time fixed effects $\varepsilon_{i,t}$ – is the error term

$Y_{i,t}$ - is the dependent variable and is given as y - real Gross Domestic Product (GDP) per capita growth, while the explanatory variables, $X_{i,t}$, are op – Openness, tt - Terms of trade, pg - Population and tg - Total government expenditure. Finally the $G_{i,t}$ – is the expenditure variable which is made up of sectoral expenditures. These expenditures included eg - education, dg - defence, hg - health and ag - agricultural expenditure. It was expected that the components of public expenditure would have a positive sign, implying that they are productive expenditure. In addition, openness variable was also introduced based on the fact that in most of the selected countries, growth has occurred in connection with export-led growth strategies. The study used data from East African countries (Kenya, Uganda and Tanzania), which were selected mainly based on the availability of data for the period under consideration. The data covered the period between 1985 and 2015. The government spending data was collected from the World Bank reports, Statistical abstracts and Central Bank reports.

Econometric Panel Data Analysis

Descriptive and econometric analyses were used to analyse the data, all in an effort to investigate the relationship between government sectoral expenditure and economic growth. The Panel data was estimated using the panel Ordinary Least Squares (OLS) method and balanced fixed effect estimation technique, geared at controlling for time-invariant and unobservable country effects. In the model with fixed effects, all unit-specific characteristics that are constant over time were absorbed in the constant terms.

The Hausman (1978) test was applied to underpin the application of the panel fixed effects model in this analysis. Fixed-effects (FE) model is used whenever one is only interested in analysing the impact of variables that vary over time (Baum, 2006; Mose *et al.*, 2020). If the error terms are correlated, then FE model is not suitable since inferences may not be correct and one would need to model that relationship (probably using random-effects - RE) (Greene, 2012).

Panel Unit Root Test

If a variable contains a unit root, then it is non-stationary and if not, then it is stationary. A unit root is a feature of some stochastic processes (such as random walks) that can cause



problems in statistical inference involving time series models. Macroeconomic time series data are generally characterised by stochastic trend which can be removed by differencing. This study adopted Levin-Lin-Chu (LLC, 2002) technique to verify the presence of unit root and in order to reduce chances of spurious findings (Greene, 2012).

Panel Co-integration Test

There are two major procedures to test for the existence of cointegration, namely, the Engle-Granger two step procedures and the Johansen Maximum Likelihood Estimation procedure. Following Engle and Granger, the study attempted to determine whether long-run relationship exist between the variables (Granger, 1988). The importance of panel cointegration test is its instinctive ability for solving problems that arise when estimating non-stationary variables, specifically those assumed to carry long-run equilibrium relationship (Granger, 1988; Granger *et al.*, 1995).

Panel Diagnostic Tests

Post-estimation panel diagnostic tests were carried out during the study. Heteroskedasticity, serial correlation and cross-sectional dependence correlation were tested for the above econometric models before estimation and corrected accordingly.

RESULTS

Panel Unit Root Test

Accordingly, Levin-Lin-Chu (LLC, 2002) technique was conducted at level and at first difference and the result is reported in Table 1. The results reveal that all the variables are non-stationary at level except economic growth. However, they become stationary after the first difference implying that the variables are integrated of order one, I (1).

Table 1: LLC Unit Root Test Results

Variables in Logs	Levin-Lin-Chu at Level		Order	LLC at First difference		Order
	Unadjusted t	Adjusted t		Unadjusted t	Adjusted t	
<i>ln y</i>	-5.5309	-3.2789	I(0)	–	–	–
<i>ln hg</i>	-1.8285	0.5157	I(1)	-7.5225	-4.6993	I(0)
<i>ln eg</i>	-0.6204	1.2257	I(1)	-8.5838	-5.5125	I(0)
<i>ln dg</i>	-2.6601	-0.6566	I(1)	-9.1705	-6.1553	I(0)
<i>ln ag</i>	-1.9751	-0.2468	I(1)	-9.4167	-6.5761	I(0)
<i>ln tg</i>	-1.7508	-0.0060	I(1)	-6.7663	-3.9830	I(0)
<i>ln op</i>	-1.3804	0.2276	I(1)	-6.6571	-3.7979	I(0)
<i>ln tt</i>	-2.7023	-0.1778	I(1)	-6.3576	-3.1815	I(0)
<i>ln pg</i>	-3.6390	-1.0393	I(1)	-8.1229	-5.3380	I(0)



Panel Co integration Test

Engel-Granger (Granger, 1988) has shown that if two series y_t and x_t are cointegrated of order d, b , that is, $y_t \sim CI(d, b)$, then the series have a long-run equilibrium relationship and any deviation from this equilibrium is temporal and will eventually be corrected and the long-run equilibrium restored. For this to happen, however, estimation of cointegrating relationship requires that all time series variables in the model to be integrated order of one. But from the results in Table 1, the dependent variable real GDP per capita growth is already stationary I (0) while the rest of the variables are of order (1), hence they are not of the same integration. This therefore implies there was no co-integration since the variables are of different level of integration.

Panel Estimation Result

From the Hausman test result, p-value is 0.02, hence the null hypothesis is rejected and the fixed effect model is selected. Table 2 presents the results on panel fixed effect estimation model.

Table 2: Panel Estimation Results

Variable	Coefficient	Standard error	t- Statistics	P-value
<i>constant</i>	4.058***	1.437	2.82	0.006
<i>ln eg</i>	0.318	0.238	1.33	0.315
<i>ln hg</i>	0.746**	0.079	9.40	0.011
<i>ln dg</i>	0.719*	0.388	1.86	0.068
<i>ln ag</i>	0.094	0.336	0.28	0.805
<i>ln op</i>	0.952**	0.479	1.99	0.051
<i>ln tg</i>	0.757**	0.165	4.60	0.044
<i>ln tt</i>	-1.288	0.978	-1.32	0.319
<i>ln pg</i>	-2.358***	0.134	-17.64	0.003
Goodness of Fit Test	R ² = 0.362		Adjusted R ² = 0.309	
F(7,85) = 5.862	P-value(F) = 0.000		Durbin.W = 1.935	
Wooldridge Test	F(1,2) = 10.428		Prob > F = 0.084	
Modified Wald Test	$\chi^2(3) = 1.51$		Prob > $\chi^2 = 0.681$	
Breusch-Pagan Test	$\chi^2(3) = 4.347$		Pr = 0.227	

The findings show that government expenditure on health has a positive and statistically significant impact on economic growth at five percent level of significance. This implies that a 1 percentage increase in expenditure on health sector will increase real gross domestic product per capita by about 0.746 per cent. The findings show that public expenditure on health is critical in enhancing economic growth and labour productivity in East Africa. This is because a healthy labour force is productive, which is necessary in increasing both the industrial and the agricultural output. The improvements in health programmes brings about



an increase in the preference for smaller families, which, together with better provision of family planning services, helps to deal with the population problems in many developing countries. The same is expected to happen by switching spending from expensive curative health care systems to preventive systems. These findings are consistent with the findings by Fan and Rao (2003) and Loto (2011) that spending on health has a positive effect on economic growth but seem to contrast that of Devarajan *et al.* (1993).

Defense expenditure in East Africa is positive and statistically significant at ten percent level of significance. This implies that a 1 % increase in defense expenditure will lead to a 0.719 % increase in economic growth. Investment in the form of national defense is a necessity for safeguarding and protecting the East African nations from outside aggression. It also increases investors' confidence through increased security and stability. Defense expenditure, which is an integral part of government expenditure, serves as an injection to the economy, and as such could positively stimulate the demand in the economy. The increase in any of the aggregate demand variables will increase the capital stock in the society, which will lead to high profits and may induce high investments, thus generating short-run positive effects and higher long-run growth rates on the aggregate economy (Lai *et al.*, 2002). Thus, defence expenditure can affect an economy positively through an expansion of aggregate demand or through increased security (Diamond, 1989; Lai *et al.*, 2002; Fan & Rao, 2003) and negatively through a crowding out of investment (Tomori & Adebisi, 2002).

It is evident from Table 2 that education expenditure is insignificant at any conventional level of significance. However, from coefficient sign, education expenditure is positively related to economic growth. Theoretically, education expenditure should boost economic growth and productivity. There are other factors also such as the country's institutional structure which determines whether investments in education sector will impact growth significantly or not. The reason for insignificance result could be that, compared to other sectors, it takes a longer time for education expenditure to impact growth because of long time of schooling especially in East Africa (Kenya 8-4-4, Tanzania 7-4-2-3 and Uganda 7-6-3), the teacher-pupil ratio, which is often used as an index of efficiency of an education system had deteriorated at all levels of education. In addition, fewer development funds are allocated to the educational sector (KNBS, 2015). These findings are consistent with the findings by Korman and Bratimasrene (2007), but contrast with those by Donald and Shuanglin (1993) and Musaba *et al.* (2013).

Expenditure on agriculture was found to have a positive impact on economic growth but insignificant at any conventional level of significance. This insignificance can be attributed to poor funding of this sector. On average, none of the East African countries (EAC) spends more than 5 percent of total government expenditure on the agriculture sector (EAC, 2011; KNBS, 2018). Agriculture is the most important sector in the EAC economies given its contribution to employment, foreign exchange, food, and its productive linkages with other sectors of the economy (Nyangito *et al.*, 2004; Mose & Ouru, 2017). It is possible to argue that agriculture has less to explain in GDP growth in EAC probably because the economies are highly dependent on labour intensive agricultural sector which in turn depends on vagaries of nature (availability of rain fall). For the Agricultural sector, the declining productivity can be attributed to low government spending especially in infrastructure, research and extension which culminates in low factor productivity growth (Nyangito *et al.*, 2004; Mose & Ouru, 2017). This finding is in agreement with the finding by Fan and Rao



(2003). But the findings contrasted studies by Loto (2011) and Mudaki and Masaviru (2012) who found government spending on agriculture to have a negative and significant impact on growth.

Impact of total government expenditure on real GDP growth is positively related and significant at five percent level of significance, suggesting that the productivity of aggregate government spending exceeds the deadweight loss associated with the tax used to pay for it. If appropriately managed and utilised, total government spending has significant positive impact on economic growth, especially in less developed countries where there exist inadequate infrastructural facilities and where the private sector is not developed enough to play its expected role in the economy (Mwakalobo, 2009). In most studies, total government expenditures have a negative impact on growth (Romer, 1990). In contrast, Mitchell, (2005) and Gregorious and Ghosh (2007) found positive relationship between total expenditure and economic growth.

Population growth is negative and significantly related to economic growth at five percent significant level. The population growth rate affects both the consumption and the production of a country's economy. Solow stated that an increase in the population growth rate can decrease the capital per worker as well as the steady-state output per worker (Romer, 1990). As a result, higher population growth can be detrimental to the productivity and economic growth of East African countries. Further, Barro and Sala-i-Martin (2004), concluded that population growth has exerted a significant negative impact on economic growth in developing countries. In contrast, Simon (1981) went as far as suggesting that population growth may have had a positive impact on per capita GDP growth in the long-run through improvement of productivity and the learning-by-doing resulting from increased production volume.

Trade Openness is statistically significant at five percent level and positively related to economic growth. Furthermore, the openness variable was introduced based on the fact that in most of the selected countries growth has occurred in connection with agricultural export-led development strategies. Trade openness brings competition into the domestic market, encourages redistribution of skilled workers on trade related activities and reduces opportunities for rent seeking and thus accelerate GDP growth (Teshome, 2006).

Terms of trade is negatively related to economic growth but insignificant at any conventional level of significance. Terms of trade control for the effects of external sector activities. Morley (1992) examined stabilisation programs in least developed economies and found that the terms of trade had a significant positive impact on investment and output. However, this is not the case for East Africa since they are primary product exporters and prices for exports are extremely volatile. As a result, the growth rate of export earnings is held at a relatively low level due to price fluctuations.

The adjusted R^2 is 0.309, implying that 31 percent of the variation of the dependant variable is jointly explained by the explanatory variables in the model. From Table 2 results, heteroskedasticity, serial correlation and contemporaneous correlation were tested and found not to be a problem.



CONCLUSION

From a policy standpoint, these findings suggest that East African countries should increase government expenditure on health, which can enhance human capital formation and productivity, and on defence, which is closely associated with spending on security and aggregate demand. Agricultural expenditure should also be increased for the sake of food security and probably economic growth enhancement. Theoretically, education expenditure should boost economic growth and productivity. However, the full impact of education spending on East African GDP growth is likely to take longer time periods than the time considered under this study. In addition, it may largely depend on the budget allocation to the concerned sector. Further, to increase spending on these sectors, governments should also reduce expenditure on other categories given the presence of a budget constraint. A reallocation of government spending like the above-mentioned, giving more preference to more productive sectors is not only critical for boosting growth and productivity, but also for achieving more sustained fiscal adjustments.

In order to boost economic growth, the government should address the factors causing the negative and insignificant impact of sectoral spending. A well-defined expenditure strategy should be pursued and efficient management of resources in the development of education and agriculture should be accentuated. For instance, East African countries could strengthen the call for African Union under the Maputo pronouncement to allocate at least 10 percent of the budgetary resources to agriculture in support of agricultural investments for more productivity. On average, none of the East African countries spends more than 5 percent of total government expenditure on the agricultural sector.

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