EFFECT OF GOVERNMENT EXPENDITURE ON ECONOMIC GROWTH IN EAST AFRICA: PANEL DATA ANALYSIS

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ABSTRACT

The goal of this research was to investigate empirically how government expenditure contributes to economic growth in East Africa from 1980-2010. Using balanced panel fixed effect model, government expenditure was disaggregated to scrutinize its effect of growth. The study tested for panel unit root and found that only two variables, that is, GDP and investment expenditure are stationary at level. The finding confirms the conventional view that relative investment expenditure promotes economic growth while consumption retards it. Finally, human capital expenditure was found to be insignificant. This study suggests that for East Africa, the policy of increasing government expenditure on investment budget to promote economic growth will be appropriate, but fewer funds should be channeled towards other governmental programs.

KEY WORDS: Government Expenditure, East Africa, Panel Data Analysis

1 INTRODUCTION

The role of government in economic growth is an issue of debate since the time of Adam Smith. Recent wave of privatization in many developing and developed countries is based on perceptions that, "for sustainable development and efficient output, the role of government in economic policies should be reduced"(Kakar, 2011). Economists are of two different views about the role of government 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. 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. But now there is a backlash demanding that the deficits used to create the stimulus must be cut back by cutting public spending on a
grand scale. The backlash comes not only from governments, but from international institutions, led by the International Monetary Fund (IMF) and World Bank (WB), which are insisting that public services are now ‘unaffordable’, and that healthcare, education and pensions in particular should be dependent on the market (Mitchell, 2005).

The relationship between government expenditure and economic growth has continued to generate a series of controversies. While some researchers conclude that the effect of government expenditure on economic growth is negative and insignificant (Akpan, 2005) and (Romer, 1990), others indicate that the effect is positive and significant (Korman and Bratimaserene, 2007) and (Gregorious and Ghosh, 2007). Government expenditure on investment and productive activities is expected to contribute positively to economic growth, while government consumption spending is expected to be growth retarding. This instrument of fiscal policy promotes economic growth in the sense that public investment contributes to capital accumulation. Other importance of government expenditure includes the provision of those facilities that are not fully covered by the market economy such as health and education. That is, human capital promotes positive benefits associated with economic growth, but the financial source for public expenditure which is taxation, reduces the benefits of the taxpayers and as such reduces the benefits associated with economic growth (Barro, 1990). But due to lack of sufficient revenue, there is need to categorise productive and non-productive government expenditure for East Africa in order to reduce the non-productive expenditure.

1.1 Economic Growth and Components of government expenditure of East Africa

The East African Community (EAC) was established in 2000 by Kenya, Tanzania and Uganda; Burundi and Rwanda joined in 2007. Its objectives are to deepen cooperation among member states in political, economic, and social fields. The EAC has a population of about 127 million, a land area of 1.8 million square kilometers, and nominal GDP of $73.8 billion (2009). Kenya has the largest economy, with a nominal GDP of US$30.1 billion (41 percent of the region’s total). Uganda is landlocked, Tanzania is actively exploiting natural resources (gold), and two have resources on stream (Uganda, Kenya) (EAC, 2011).

Kenya's economic growth was strong in the first two decades after independence and grew slowly or negative thereafter. For the last ten years, other than in 2005, Kenya recorded lower annual GDP growth than the average for sub-Saharan Africa (SSA), and compared to its neighbours in the East African Community. Kenya’s annual growth rate for the decade averaged 4.6 percent, compared to 6 percent for SSA, 6.9 percent for Tanzania, 7.1 percent
for Uganda, and 7.2 percent for Rwanda (KNBS, 2008). The Kenyan government expanded quickly in the 1970 and 1980s. Between 1972 and 1994, total government expenditures rose by 12 percentage points of GDP to 32%. Expenditure contracted thereafter to 26.1 percent of GDP in 2003. Uganda’s growth acceleration started earlier than the other East African countries and has lasted more than 20 years, with per capita income growth averaging 3.4 percent a year during 1990–2010 (UBOS, 2012). From 1995, Tanzania’s GDP per capita growth averaged 1.3% compared to negative rates throughout early 1990s. In 2009, the real GDP grew by 6.0 percent compared to 7.4 percent in 2008 (NBS, 2012). Capital expenditure as a share of Tanzania’s total budget declined from 36.3 percent in 2008 to 30.5 percent in 2010, though it improved to 35.5 percent in 2011. However, capital expenditure as a share of development expenditure has declined from over 60 percent to a little above 50 percent (NBS, 2012). Excluding South Africa, sub-Saharan Africa grew at an average of 6 percent since 2008. East Africa as a whole grew even more, at 6.5 percent, and without Kenya it would have grown at almost 7 percent (KNBS, 2009). For East Africa, all components of government expenditure recently have been experiencing an increasing trend as presented in the table. Table 1 shows the combined figures of total government expenditure, recurrent expenditure (Cg) and capital expenditure (Ig) at current prices; both figures are in millions of US dollars.

1.2 Significance of the Study
The study is significant in the following ways. First, due to disaggregation of data, the study provides more understanding of the relationship between components of government spending and economic growth as compared to empirical studies that used an aggregate government expenditure measures. The results of the study may help in deciding on how the resources should be shifted from the less productive to the more productive sectors of the economy so as to boost economic growth. Finally, one of the major advantages of this study was that it incorporated the most recent data and employed advanced econometric technique (panel data estimation) to study the effect of government expenditure on economic growth.

2 LITERATURE AND THEORETICAL REVIEW
Aggregate government expenditure is decomposed into five different functional components. First, social expenditure is total spending allocated to education, health, social security, housing and community amenities. Infrastructure expenditure is defined as spending on electricity, gas, water, roads, waterways and other transport and communications. Productive
expenditure is on economic services such as agriculture, forestry and fishing, mining, manufacturing and construction, and other economic services. Defence (military spending) is another component. Finally, the rest of expenditures (spending on cultural, religious and recreational services and other expenditure) are grouped together. This disaggregation is chosen because it outlines the main activities of the government mentioned earlier.

Determination of total government expenditure and its patterns is complex and may include many factors, such as fiscal conditions and political, demographic factors, cultural and economic factors. Most governments have continued to rely on external assistance to finance some of their public expenditures. A stronger association of aid with higher government consumption rather than with public investment would suggest both a “flypaper effect” and fungibility. This may imply that aid recipient governments view foreign aid like any other source of revenue and consequently use it for increased consumption, tax reductions or reduced fiscal deficits (future tax obligations) (Hindriks, 2004).

2.1 Expenditure Growth Models

The German economist Adolf Wagner (Backhaus, 1997) advanced his ‘law of rising government expenditures’ by analysing trends in the growth of government expenditure and in the size of public sector in many countries of the world. Wagner’s law or the law of increasing public expenditure postulates that; (i) the extension of the functions of the states leads to an increase in public expenditure on administration and regulation of the economy; (ii) the development of modern industrial society would give rise to increasing political pressure for social progress and call for increased allowance for social consideration in the conduct of industry (iii) the rise in government expenditure will be more than the proportional increase in the national income (income elastic wants) and will thus result in a relative expansion of the public sector. Wagner’s model, while containing many insights, suffered from different criticisms. These critics view Wagner’s predictions as essentially explaining causes of increase in expenditure and argue that the relationship lacks a firm theoretical basis. Wagner assumed away the problems of public choice by employing an organic theory of the state. Thus the state was assumed to behave as if it were an individual existing and making decisions independently of the members of society (Brown and Jackson, 1996).
Keynesian analysis leads to the conclusion that aggregate demand management policies can and should be used to improve economic performance. For Keynesians, demand is a prerequisite for growth. According to Romer (1996), the Harrod-Domar growth model is the prominent model in Keynesian framework which gives some insights into the dynamics of growth. 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. The assumption of fixed coefficient of production is relaxed by neo-classical growth model. According to Solow (1956) model, other things being equal; saving/investment and population growth rates are important determinants of economic growth. Higher saving/investment rates lead to accumulation of more capital per worker and hence more output per worker. On the other hand, high population growth has a negative effect on economic growth simply because a higher fraction of saving in economies with high population growth has to go to keep the capital-labour ratio constant. The principal conclusion of Solow (1956) model is that the accumulation of physical capital cannot account for either the vast growth over time in output per person or the vast geographic differences in output per person. The model predicted technological progress typically assumed to grow at a constant ‘steady state’ - is what determines most output growth.

2.2 The Empirical Literature

According to the Keynesian macroeconomic school of thought, government expenditure can contribute positively to economic growth. Hence, an increase in the government consumption is likely to lead to an increase in employment, profitability and investment through multiplier effects on aggregate demand. As a result, government spending augments the aggregate demand, which provokes an increased output depending on expenditure multiplier (Romer, 1996). The opponents of this approach stipulate that government consumption crowds out private investment, discourages economic growth in the short-run and diminishes capital accumulation in the long-run.

Kweka and Morrissey (1999) examined the effect of government expenditures on GDP growth using OLS method for a sample of time series data (1965-1996) on Tanzania. They found that increased productive expenditure is associated with lower growth. According to them, this negative relationship suggests the inefficiency associated with the use of public funds and public investments in Tanzania. The negative association between total government expenditure and growth also seems to indicate the unproductive effect of
government investment spending. Consumption expenditure relates negatively to growth, as anticipated, but appears to be associated with increased private consumption. They also found that there is positive relationship between growth and expenditure on human capital.

Korman and Brahmasrene (2007) studied the economy of Thailand on relation to economic growth, by making use of the Granger causality tests. Their finding was that government expenditures and economic growth are not co-integrated but indicated unidirectional relationship. This is because, causality runs from government expenditure to growth, and also detected a significant positive effect of government expenditure on economic growth. Gregorious and Ghosh (2007) made use of the heterogeneous panel data to study the effect of government expenditure on economic growth. The result was that countries with large government expenditure tend to experience higher economic growth.

Kalio (2000) examined the effect of different components of government expenditures on GDP growth using OLS method for a sample of time data (1970-1992) on Kenya. The study concluded that government expenditure on capital expenditure had a positive effect on GDP growth and that of recurrent was negatively related to economic growth. Bose et al. (2003) examined the growth effect of government expenditure for a panel of thirty developing countries over the decades of the 1970s and 1980s, with a particular focus on sectoral expenditures. Their primary results are twofold. Firstly, the share of government capital expenditure in GDP is positively and significantly correlated with economic growth, but current expenditure is insignificant. Secondly, at the sectoral level, government investment and total expenditures on education are the only outlays that are significantly associated with growth once the budget constraint and omitted variables are taken in to consideration.

3 MATERIALS AND METHODS

In spite of various theoretical advances of endogenous growth models, their particular characteristics, especially those related to the presence of exactly constant returns to scale in the key production processes (that is, human capital and knowledge in Romer (1990), require very specific values of parameters, which makes their empirical tests rather difficult. Therefore, the use of a neoclassical Solow model augmented with some of the key variables in endogenous growth models seems to be a better option to study the determinants of real GDP growth. Thus a number of empirical studies have introduced different modifications to the neoclassical Solow model aiming at highlighting the role of a (some) factor(s) in explaining growth (Mankiw et al., 1992). Mankiw emphasises the importance of adding
human capital to the Solow model. Islam (1995) examines whether or not the results of the augmented Solow model obtained by MRW using cross-section regressions change by using different techniques, namely panel data. Barro (1990), in turn, allows for the government to affect the production function. Building on Ram (1986) model, total government expenditure is disaggregated into investment expenditure, consumption expenditure and human capital expenditure. Therefore, the regression equation was specified as:

\[ Y_{i,t} = \beta X_{i,t} + \gamma G_{i,t} + \mu_i + v_t + \epsilon_{i,t} \]  

(3.1)

Where:

- \( Y_{i,t} \) - is the dependent variable.
- \( X_{i,t} \) - set of explanatory variables.
- \( G_{i,t} \) – is the government expenditure variable.
- \( \mu_i \) – country fixed effects
- \( v_t \) – time fixed effects
- \( \epsilon_{i,t} \) – is the error term.

and the subscripts \( i \) and \( t \) represent country and time period respectively.

\[ \text{RGDPG} = f (\text{Open}, \text{Tot}, \text{Pop}, \text{TgY}, \text{HgY}, \text{CgY}, \text{IgY}) \]

(3.2)

Analysis of the influence of components of government expenditure on economic growth was performed by the balanced panel fixed effects model. This model enables the ability to analyse time series (different periods) and cross-sections (different countries) simultaneously, each with one dependent and possible multiple independent variables. Following recent advances in panel data estimation methods, this study therefore utilises balanced fixed effect model of panel estimation technique which addresses the problems of omitted variable bias, endogeneity, and multicollinearity. The government spending data was collected from the World Bank (World Tables, 2012), Statistical abstracts, and Central Bank reports. The real GDP growth was used to capture the effect of inflation on economic growth. Government expenditure on investment and human capital goods were supposed to add a country’s physical capital (infrastructure) and human resource which, in turn, could complement private sector productivity and increase growth in the process. The sign of the
variables are therefore expected the positive. But consumption expenditure was expected to
give a negative result, since most recurrent expenditure is for consumption purposes and
therefore an increase in the ratio should reduce real GDP growth. Openness and terms of
trade were expected to have a positive and significant effect on economic growth because
open economies can have more access to foreign resources and markets. Population growth
was also expected to retard economic growth especially in developing economies. Hence the
study expected a negative sign. Total government expenditure was expected to affect real
GDP growth positively.

The Hausman (1978) test was applied to underpin the application of the balanced panel fixed
effects model in this analysis. This statistical test was generally used for deciding between
applying a fixed or random effects model. The Hausman test (H) was estimated by the
following equation:

\[ H = (\beta_{FE} - \beta_{RE}) \cdot \text{INVERSE}[V_{FE} - V_{RE}] \cdot (\beta_{FE} - \beta_{RE}) \]

This study adopted Levin-Lin-Chu (2002) technique to verify the presence of unit root.
Following Engel and Granger, the study attempted to determine whether long-run
relationship exist between the variables. Having established the existence of a long-run
relationship, one may proceed to specify the short-run dynamic relation for the economic
aggregates hence vector error correction models. Post-estimation panel diagnostic tests were
carried out during the study. Heteroskedasticity, serial correlation and cross sectional
dependence/contemporaneous correlation were tested for the above models before estimation
and corrected accordingly.

4 RESULTS AND DISCUSSIONS

Accordingly, Levin-Lin-Chu (LLC, 2002) method was conducted at level and at first
difference and the result is reported in Table 2. The results reveal that all the variables are
non-stationary at level except real GDP and government investment. However, they become
stationary after the first difference implying that the variables are integrated of order one, I
(1). But from the results in Table 2, the dependant variable real GDP 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 integration. The Hausman (1978) test was applied to underpin the application of the
balanced panel fixed effects model in this analysis. From the result, p-value is 0.0329, hence the null hypothesis is rejected and the fixed effect model is selected.

### 4.1 Effect of Expenditure Components on Economic Growth

Estimation process of the role of government expenditure starts by disaggregating it into just three levels of economic components, namely human capital, consumption and investment expenditure. The rationale for doing so is that one strand of the economic growth literature shows that investment and human capital are important factors in explaining growth. In contrast, consumption expenditure has been considered as growth retarding (Barro, 1991). Thus, the model to be estimated was specified in logarithm form as:

\[ \ln\text{gdp}_{it} = \beta \ln\text{G}_{it} + \gamma \ln\text{C}_{it} + \mu_t + \nu_i + \alpha_{it} \]

#### 4.1.1 Effect of investment expenditure on economic growth

Table 3 represents the result on effect of component expenditure on economic growth. From the results, the effect of investment expenditure on real GDP growth is positive and significant at five percent level of significance. This result is in line with the hypothesis that the capital component of government expenditure and economic growth are positively related. Hence the study rejects null hypothesis at five percent significance level. It implies that a ten percent increase in investment expenditure will lead to about five percent increase in economic growth. This type of expenditure could be associated with the productive government expenditure that Barro (1990) and Gemmell (2001) pointed out to be an additional input to the private production function. This public investment, as argued in growth models, is necessary to increase productivity and to gear up the economy for take-off into the middle stages of economic and social development. Public investment in basic infrastructure is an essential precondition for capital accumulation in the private sector (Barro, 1990). Niloy et al. (2003) employed the same disaggregated approach as followed by Josaphat and Oliver (2000). They examined the growth effects of government expenditure for a panel of thirty developing countries over the decades of the 1970s and 1980. The primary research results showed that the share of government capital expenditure in GDP is positively and significantly correlated with economic growth, but current expenditure is insignificant. In contrast Josaphat and Oliver (2000) and Morrissey and Kweka (1999) found the relationship between investment expenditure and growth for Tanzania to be negative.
4.1.2 Effect of Consumption Expenditure on Economic Growth

The above results point out that consumption expenditure has a negative and statistically significant effect on economic growth at one percent level of significance. Since the result is significant at 1 percent level of significance, null hypothesis is rejected at 1 percent level of significance. From the result, it means a 10 percent increase in consumption expenditure will lead to a 22.98 percent decrease in economic growth. This finding is consistent with the research expectation and gives some credibility to the policy advice given out by various international institutions such as World Bank and IMF. They recommend a cut in consumption expenditure other than investment expenditure in order to foster long term economic growth. It can be said that increased government consumption expenditure is usually at the expense of investment expenditure or the private sector’s investment which in most cases leads to instances of reduced economic growth. Classical and Neoclassical theories consider consumption expenditure ineffective on the grounds of well known crowding out phenomenon, that is, when public goods are substituted for private goods, this leads to lower private spending on education, health, transportation and other goods and services. As the governments borrow heavily to fund spending, pressure in the credit market results in higher interest rates which discourages private investment. With regard to government consumption spending, the results of this study agree with the findings obtained by researchers like Barro (1991), and Kalio (2000). Kalio examined the effect of government consumption expenditure on GDP growth using the OLS method and time series data for Kenya and concluded that countries with high shares of this spending in their GDP grow slower than others. In contrast Josaphat and Oliver (2000) and Kwake and Morrissey (1999) found the relationship to be positive in Tanzania which they associated with increased private consumption. However, Lin (1994) while using a panel data analysis for the period 1960-1985 on 62 countries, both developing and developed economies, obtained mixed results, that is, government consumption was insignificant in developed economies, but significantly positive in developing countries.

4.1.3 Effect of Human Capital Expenditure on Economic Growth

From the regression results the coefficient of human capital is positive as expected but statistically insignificant at any conventional level. While low starting levels of human capital may have hindered East Africa’s economic growth, its poor performance cannot be attributed to a lack of subsequent investment in human capital. A possible explanation is the low level of government spending in investment expenditure (infrastructure). Low rates of investment
in physical capital have implications for the rates of return on human capital, particularly education (Appleton and Teal, 1998). This finding conforms to the findings by Loto (2011) and Knight et al. (1996) but contrasts those by Gemmell (2001) and Devarajan et al. (1993) for 140 OECD countries. According to Morrissey and Kweka (1999) Josaphat and Oliver (2000) on their study on Tanzania, expenditure on human capital investment was insignificant in the regressions, probably because effects from education sector would have very long lags.

4.1.4 Effect of Control Variables on Economic Growth

Population growth is negatively and significantly related to economic growth at one percent significant level. This implies a 10 percent increase in population growth will lead to 23 percent decrease in economic growth. The population growth rate affects both the consumption and the productivity of a country’s economy. In East Africa, where the population growth is increasing more and more drastically, the economic growth also changes critically over time. The Malthus (1826) model stated that population growth can reduce the output per capita because population increases at a geometrical rate while production rises at an arithmetic rate so that output growth rate cannot keep the same pace. 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. In contrast, Barro and Sala-i-Martin (2004), concluded that population growth has exerted a significant negative effect on economic growth in developing countries.

Terms of trade are negatively related to economic growth but insignificant at any conventional level of significance. Terms of trade control for the effects of external sector activities. Thus, a high ratio of terms of trade will accelerate economic growth. Morley (1992) examined stabilisation programs in least developed countries using panel data 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. Effect of total government expenditure on real GDP growth is positively related and significant at 1 percent level of significance, suggesting that the productivity of government spending exceeds the deadweight loss associated with the tax used to pay for it. This implies that 10 percent increase in total expenditure will lead to 8 percent increase in economic growth. If appropriately managed and utilised, total government spending has significant positive effect on economic growth, especially in less developed
countries where there exists inadequate infrastructural facilities and where the private sector is not developed enough to play its expected role in the economy. In most studies, total government expenditures have a negative effect on growth (Romer, 1990). This was to be expected as our earlier results confirm the need to try and decompose government spending. In contrast, Gregorious and Ghosh (2007) found positive relationship between total expenditure and economic growth. Openness was found to be positively related to economic growth but insignificant at any conventional level of significance. A large number of studies used trade shares in GDP and found, as reviewed in Harrison (1996), openness had a positive and strong relationship with economic growth. This implies that export in EAC remains unproductive. The countries continue to export the same primary commodities as they did for many years while world prices are on a declining trend. The adjusted $R^2$ is 0.31 implying that 31 percent of the variations of the dependent variable are explained by the explanatory variables in the model. The F statistic test result reveals that the null hypothesis is rejected and a conclusion made that the estimators are non zero and therefore are simultaneously significant at 1 percent level of significance.

Different post estimation panel diagnostic tests were carried out. A modified Wald test was carried out to test for heteroskedasticity and the result presented as shown in table 3 the null is homoskedasticity (or constant variance). From above result (0.7099) the null hypothesis is accepted hence no heteroskedasticity. The p-value is above 0.05 and as such it is not significant hence revealing that heteroscedasticity is not a problem. Contemporaneous correlation was tested using Breusch-Pagan Lagrange Multiplier (B-P/LM) test of independence. B-P/LM test is used to test whether the residuals are correlated across entities. The p-value is greater than 0.05 (0.2648) and therefore not significant at five percent level of significance. From the B-P/LM test cross-sectional dependence is not a problem. The study used Wooldridge test for autocorrelation in panel data. Serial correlation causes the standard errors of the coefficients to be smaller than they actually are and higher R-squared. The null is no serial correlation (0.0691). From Table 3 result, the p-value is greater than 0.05, the study fails to reject the null hypothesis and conclude that the data does not have first-order autocorrelation. The Durbin Watson statistic is used to test the existence of serial correlation between the variables. Durbin Watson is equal to 1.9, implying serial correlation is not a problem. This is because the closer the Durbin Watson value is to 2, the better the evidence of the absence of autocorrelation.
5 CONCLUSION AND POLICY RECOMMENDATIONS

5.1 Conclusion

This study has determined the effects of different components of government expenditure on the real GDP growth rate in a set of East African countries over the period 1980 - 2010. Government spending was disaggregated because the literature shows that some categories of it are more likely to have a significant effect on growth than others. The study then proceeded to use recent developments in econometrics by employing balanced fixed panel data analysis to analyse some of the important variables affecting real GDP growth in East Africa. Heteroskedasticity, serial correlation, Hausman test and contemporaneous correlation were tested before estimation and corrected accordingly. The study employed Levin-Lin-Chu (LLC, 2002) test to test for panel unit root and found that the variables were stationary at first difference except real GDP and investment expenditure that are stationary at their level.

The results reveal that spending on investment should be a priority for a government interested in promoting economic growth. Conversely, government expenditure on consumption spending may not translate into sustainable economic growth since they will affect mainly the demand side of the economy. However, consumption expenditure seems to have a strong negative effect on growth, suggesting that the composition of this expenditure category needs to be re-examined with a view to re-organising it so that it contributes to economic growth. Neoclassical theories consider consumption spending ineffective on the grounds of the crowding-out effects, that is, when public goods are substituted for private goods. With respect to government spending on human capital, this study expected to find a positive and significant effect on growth. However, the result was not significant. Perhaps one of the reasons of this finding has something to do with poor governance and high levels of corruption, features that tend to be more common in less developed countries, like the ones considered in this study, than in rich countries. Moreover, the full impact of public spending on education 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 sectors. Population growth and overpopulation hinders the growth output per worker, as a result of dependency effect, which suggests that saving is more difficult for households when there are more children and that higher fertility causes social investment funds to be diverted away from high-productivity uses.
5.2 Recommendations

From a policy standpoint, these findings suggest that East Africa countries should increase government expenditure on investment expenditure, this instrument of fiscal policy promotes economic growth in the sense that public investment contributes to capital accumulation. However, to increase spending on these sectors, governments should also reduce expenditure on other categories given the presence of a budget constraint. In addition, the government can employ better financial management and try to fight graft. The study cautions the adoption of reduced government spending on consumption expenditure which was found to be a negative determinant of economic growth. According to the Keynesian macroeconomic thought, government expenditure can contribute positively to growth by injecting purchasing power into the economy. Hence, an increase in the government consumption is likely to lead to an increase in employment, profitability and investment through multiplier effects on aggregate demand. Government expenditure on human capital was found to be insignificant. The study infers that inadequate amount of resources allocated to this component, insufficient investments and inefficiencies, inadequate factor productivity growth, slow adoption of technology and corruption in these areas led to this adverse finding. However, the study resorted to economic theory to recommend increased spending in this component which is an important contributor to labour productivity in these economies. Higher population growth can be detrimental to the productivity and economic growth of East African countries.

5.4 Areas of Further Research:

From the findings of this study, it is important to explore further what portfolio of government outlays are ideal for growth to support resource constrained governments on optimal resource allocation and prioritization of expenditure. Important is the need for further disaggregation of the data in human capital expenditure. This result may imply that a finer disaggregation is required for human capital into education and health spending. There is need for further sectoral disaggregation into consumption and capital expenditure for deeper policy prescription. Given the small size of the sample, it is also important to extend the analysis to cover a wide region such as Sub-Saharan Africa economies in order to test the robustness of the results. Finally, although the focus of this research was solely on measuring the effect of government expenditure on growth, an important issue to address in future studies is what determines governments’ budget allocation for various sectors and in particular, the role of demographic factors and the nature of the political process. Thus, an
important avenue for future research could be to extend our growth regression framework so as to account for the effect of government spending choices.

APPENDIX

Table 1 Components of Government Expenditure

<table>
<thead>
<tr>
<th>Year</th>
<th>CURRENT Mln $</th>
<th>CAPITAL Mln $</th>
<th>TOTAL Mln $</th>
<th>Cg Mln $</th>
<th>Ig Mln $</th>
<th>TOTAL Mln $</th>
<th>Cg Mln $</th>
<th>Ig Mln $</th>
<th>TOTAL Mln $</th>
</tr>
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<tbody>
<tr>
<td>2005</td>
<td>5135</td>
<td>865</td>
<td>6000</td>
<td>2066</td>
<td>1024</td>
<td>3090</td>
<td>1249</td>
<td>662</td>
<td>1911</td>
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<tr>
<td>2006</td>
<td>5837</td>
<td>1275</td>
<td>7112</td>
<td>2648</td>
<td>1066</td>
<td>3714</td>
<td>1499</td>
<td>460</td>
<td>1959</td>
</tr>
<tr>
<td>2007</td>
<td>7612</td>
<td>3075</td>
<td>10687</td>
<td>2906</td>
<td>1456</td>
<td>4362</td>
<td>1641</td>
<td>575</td>
<td>2216</td>
</tr>
<tr>
<td>2008</td>
<td>10175</td>
<td>2731</td>
<td>12906</td>
<td>4132</td>
<td>1766</td>
<td>5895</td>
<td>1706</td>
<td>976</td>
<td>2682</td>
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<tr>
<td>2009</td>
<td>8175</td>
<td>3265</td>
<td>11443</td>
<td>4479</td>
<td>1978</td>
<td>6457</td>
<td>2123</td>
<td>1244</td>
<td>3367</td>
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<tr>
<td>2010</td>
<td>8566</td>
<td>3719</td>
<td>12285</td>
<td>4991</td>
<td>1919</td>
<td>6910</td>
<td>2564</td>
<td>1297</td>
<td>3861</td>
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Table 2 Panel Unit Root Test Results

<table>
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<th>Variables in Logs</th>
<th>Levin-Lin-Chu at Level</th>
<th>Order</th>
<th>LLC at First difference</th>
<th>Order</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Unadjusted t</td>
<td>Adjusted t</td>
<td>Unadjusted t</td>
<td>Adjusted t</td>
</tr>
<tr>
<td>LnRGGDP</td>
<td>-5.5309</td>
<td>-3.2789</td>
<td>I(0)</td>
<td>_</td>
</tr>
<tr>
<td>LnIgY</td>
<td>-4.8545</td>
<td>-2.6132</td>
<td>I(0)</td>
<td>_</td>
</tr>
<tr>
<td>LnCgY</td>
<td>-2.0781</td>
<td>-0.0564</td>
<td>I(1)</td>
<td>-7.6901</td>
</tr>
<tr>
<td>LnHgY</td>
<td>-1.1185</td>
<td>0.7759</td>
<td>I(1)</td>
<td>-9.0697</td>
</tr>
<tr>
<td>LnTgY</td>
<td>-1.7508</td>
<td>-0.0060</td>
<td>I(1)</td>
<td>-6.7663</td>
</tr>
<tr>
<td>LnOPEN</td>
<td>-1.3804</td>
<td>0.2276</td>
<td>I(1)</td>
<td>-6.6571</td>
</tr>
<tr>
<td>LnTOT</td>
<td>-2.7023</td>
<td>-0.1778</td>
<td>I(1)</td>
<td>-6.3576</td>
</tr>
<tr>
<td>LnPGR</td>
<td>-3.6390</td>
<td>-1.0393</td>
<td>I(1)</td>
<td>-8.1229</td>
</tr>
</tbody>
</table>

Order (Order of Integration) All at 1 % level of significance (critical value:-2.460)

Table 3 Effect of Expenditure Components on Economic Growth

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard error</th>
<th>t- Statistics</th>
<th>p –Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>4.476</td>
<td>1.406</td>
<td>3.18</td>
<td>0.002</td>
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<tr>
<td>lnIgY</td>
<td>0.494</td>
<td>0.175</td>
<td>2.816</td>
<td>0.0456</td>
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<tr>
<td>DlnCgY</td>
<td>-2.298</td>
<td>0.808</td>
<td>-2.844</td>
<td>0.0056</td>
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<tr>
<td>DlnHgY</td>
<td>0.532</td>
<td>0.302</td>
<td>1.76</td>
<td>0.220</td>
</tr>
<tr>
<td>DlnTgY</td>
<td>0.804</td>
<td>0.264</td>
<td>3.04</td>
<td>0.0093</td>
</tr>
<tr>
<td>DlnOPEN</td>
<td>-1.103</td>
<td>0.893</td>
<td>-1.46</td>
<td>0.282</td>
</tr>
<tr>
<td>DlnPGR</td>
<td>0.777</td>
<td>0.457</td>
<td>1.70</td>
<td>0.231</td>
</tr>
<tr>
<td>DlnTOT</td>
<td>-2.388</td>
<td>0.529</td>
<td>-4.51</td>
<td>0.000</td>
</tr>
<tr>
<td>Goodness of Fit Test</td>
<td>R² = 0.361031</td>
<td>Adjusted R² = 0.308410</td>
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<td></td>
</tr>
<tr>
<td>F(7, 85)</td>
<td>6.067661</td>
<td>P-value(F) = 9.34e-06</td>
<td>D.Watson = 1.934719</td>
<td></td>
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<tr>
<td>Wooldridge Test</td>
<td>F(1,2) = 12.991</td>
<td>Prob &gt; F = 0.0691</td>
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<tr>
<td>Modified Wald Test</td>
<td>χ²(3) = 1.38</td>
<td>Prob&gt; χ² = 0.7099</td>
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<tr>
<td>Breusich-Pagan Test</td>
<td>χ²(3) = 3.970</td>
<td>Pr = 0.2648</td>
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</tbody>
</table>
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