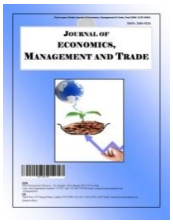

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Effect of Public Spending on Economic Growth in Kenya

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Authors' contributions

This work was carried out in collaboration among all authors. Author GM did literature search, wrote the study and performed the statistical analysis. Author GM also wrote the first draft of the manuscript. Authors JA and JO guided the study and contributed in the finalization of the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

This study aimed at examining the relationship between public spending and economic growth and how the composition of government expenditure affects economic growth in Kenya using time series data from 1980 to 2014. To achieve the objectives, modified Granger causality and Autoregressive Distributed Lag model (ARDL) were used. The results revealed both short term and long term causality from economic growth to government expenditure but only short run causality from government expenditure to economic growth. Based on the economic classification, the long run ARDL regression results showed development expenditure promotes economic growth while government purchases have no significant effect on GDP. Other control variables such as inflation and unemployment had negative effect on economic growth. In terms of functional classification, the regression results showed that expenditure on education and infrastructure are important drivers of economic growth. The positive effect of health expenditure was not significant. Further, the regression results indicated that domestic savings and trade openness had significant positive effect on economic growth. Based on the empirical findings this study therefore recommends resources to be directed towards financing public infrastructure investment to improve economic

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performance. The study also recommends increasing resource allocation in the education sector to improve efficiency and support skills and human capital development that are important in promoting economic growth through increases in labor productivity. The study also recommends policymakers to enhance domestic resource mobilization and pursue favorable trade policies aimed at fostering robust economic growth.

Keywords: Economic growth; public spending; autoregressive distributed lag; granger causality.

1. INTRODUCTION

The long-run growth effect of public spending is hardly contested in policy debates [1]. To assist emerging economies in creating fiscal space, developed countries have in the past given loans and grants aimed at increasing public spending. At the country level the central governments use transfers to support economic growth in regions that are economically lagging behind. Generally, promoting economic growth is among the many objectives why government undertakes spending. Nevertheless, the effect of public spending on economic growth remains inconclusive. The debate focuses on whether an increase in public spending causes GDP growth rate of an economy to increase. As a result, policies that scale back government activities and budgets to constrain public spending from growing faster than output are advocated for Christie [1].

Understanding how the composition of public spending affects economic growth in the long-term is very important for policy purposes. However, this is sometime impossible because fiscal policy is subject to trade-off which occurs due to challenges in evaluating government budget constraint [1]. Like any other identity government budget constraint fundamentally requires every fiscal change to be balanced. Increasing certain categories of public spending requires them be financed by increasing revenue, the level of grants or by cutting down other types of spending. High levels of government expenditure require increase in tax rates which may reduce incentives to work, save and invest further affecting long-run economic growth. An increase in domestic borrowing to finance public spending crowds-out activities in the private sector due to a reduction of private investment. Moreover, government bureaucrats and politician in order for them to remain in power tend to increase expenditure and investments in projects that are not productive or in goods and services that could be produced more efficiently by the private sector [2,3,4,5].

Public spending is one of the key elements of Kenya's macroeconomic policy because of its role in financing investment, consumption activities and meeting growing needs for social services. Public spending in Kenya can be classified into to two major categories namely current and development spending. Current expenditure have been more than development expenditure for the period under analysis implying a reduction in current account surplus to finance capital spending hence increased dependency on borrowing. Specifically, current expenditure increased from Ksh 13 billion in 1980 to Ksh 1.2 trillion in 2015 with average spending of Ksh 313 billion per year. Current spending grew much slowly between 1980 and 1988 in response to government policy to curtail expenditure in order to reduce the current and overall budget deficit [6].

The tremendous increase in current spending over the years can partly be attributed to government inefficiency, corruption, bloated government ministries, and excessive members of Parliament. This in turn led to greater amount of government spending being allocated to compensate public officers [7]. Development spending on the other hand rose from Ksh 4 billion in 1980 to Ksh 900 billion in 2015. The recognition of infrastructure as a critical component of reducing cost of production and doing business as well as improving country's competitiveness led to increase in development expenditure beginning 2002. The infrastructure included among them construction, rehabilitation, and expansion of road networks, enhance energy and water supply capacities, rolling out of the information communication and technology. The sharp increase in development expenditure during this period is also attributed to National Rainbow Coalition (NARC) government which embarked on massive infrastructure development as enshrined in 2002 sessional paper on poverty eradication [8]. Generally, substantial amount of resources is allocated towards physical infrastructure, improving health and education as well as on economic services such as agriculture and mining sectors. This has

created a dilemma yearning for empirical investigation.

Thus, study contributes to the existing literature on expenditure growth nexus but departs significantly in the following ways: First, this is a single country study which seeks to provide reliable results as opposed to cross-country studies which provide pooled estimates. Second, to take into account lag period associated with government programs the study endeavors to find out whether public spending affect economic growth in the short run or in the long run. Thirdly, the theoretical framework and the estimation method are more robust unlike previous studies. These ways of depart creates a gap and a niche for this study in the economic literature.

1.1 Problem Statement

Public spending in Kenya has increased in many sectors of the economy. The government spending stands at about 40 percent of GDP. Moreover, the government has over the years developed strategies and restructured public spending to improve economic growth by increasing development expenditure targeting public investment in productive sectors. However, economic growth has been lagging behind the rising expenditure. Empirical studies in Kenya [2,3] give mixed results. Moreover, the results from these studies do not state whether the effect is in the short run or in the long run. The current study therefore seeks fill this gap and contributes to the literature by examining the relationship between public expenditure and economic growth. Specifically, the objective of this study is to analyze the effect of the composition of public spending on economic growth in Kenya focusing on both economic and functional classification of government expenditures.

2. LITERATURE REVIEW

The theoretical literature linking public spending and economic growth remains controversial. There are conflicting theories explaining the impact of public spending on economic performance [4]. According to new classical theory, when government spending increases, taxes also tend to go up and this creates distortions thereby diminishing economic growth. The new classical argued that market supply and demand decisions are made by rational economic agents and are able to bring the long run equilibrium in the economy leading to socially desirable outcome. In their view, government policy instruments cannot be used to accomplish specific policy objective. The Keynesian theory on the other hand considers public spending an exogenous factor and a policy instrument that can be used to positively promote economic growth. When consumption expenditure incurred by government increases it leads to a chain of multiplier effects on aggregate demand which raises employment and investment. It is through the increase in aggregate demand that causes output to increase depending on the level of government expenditure multiplier [9]. The endogenous growth theory postulates that economic growth occur due to technological advancement which makes it possible to effectively utilize productive resources effectively over time. Barro [10] argued that productive public spending effects economic growth whereas unproductive spending does not. Health and education spending are considered to positively impact labor productivity thereby enhancing economic growth.

Human capital is widely recognized as an important factor that promotes economic growth [11]. This is depicted in the seminal contribution from human capital theory of Schultz [12], Welch [13], Mincer, [14] and Becker [15]. Jorgenson and Fraumeni [16] asserts that the tenets of human capital theory is that, just like physical capital, skills, knowledge, abilities, experience, and training when developed accrue a stream of future benefits. The productivity of human capital will depend on the quality of education in a country's education system [8]. Public spending on education is an indicator for human capital formation that increases workers' productivity hence contributing to economic growth [17]. Through its ability to generate human capital education directly affects workers' productivity by introducing technological innovation that enhances efficiency [15].

These divergent theoretical views have resulted into a number of empirical studies. Al-Fawwaz [18] investigated whether spending had any effect on economic growth in Jordan over the period 1980-2013 using Ordinary Least Squares (OLS) method. The results indicated that total spending and current expenditure have positive impact on economic growth. Shioji [19] estimated the dynamic effects of public capital on per capita output using income convergence equations augmented with public capital. A disaggregated panel data obtained from United States and

Japanese regions was used to estimate the equations. Results from both countries showed that the component of infrastructure in public capital had significant positive effect on economic growth.

Using data from 1995 to 2009 for Economic Cooperation Organization countries (ECO), Gashti et al. [20] investigated how different components of government expenditure affect economic development in these countries. These authors considered expenditures on health, education, and defense as explanation variables. Dynamic panel data method and generalized methods of moments (GMM) were used to analyze the results. The results showed negative effect from health while spending on education and defense positively influences economic growth. Nekarda [21] analyzed the effect of government consumption expenditure at industrial level aimed at determining the transmission mechanism of government spending on aggregate economy using panel data set. The results indicated that when government demand increases it raises output and hours but lowers real wages and labor productivity with no effect on the markup. The estimated results also gave evidence of constant returns to scale.

Connolly and Cheng Li [9] used panel data from 1995 - 2011 obtained from 34 OECD countries to investigate the effect of government spending on economic growth. The study considered consumption spending, aggregate public spending, and capital investment on growth using (GMM) estimation technique. The results indicated that increasing social spending affects economic growth negatively. The results also revealed absence of economic growth effects from government consumption spending and public investment. Kandil and Hassan [10] used autoregressive modeling to investigate various categories of government expenditure in order to determine those that are more important in promoting short term or long tern economic growth in Egypt. To fully analyze the data, longtime horizon were taken into account that aimed at detecting presence the cyclical effect on GDP. The findings generally indicated low economic growth effect arising from different types of expenditure ratios. Specifically, government purchases had.

3. METHODOLOGY

3.1 Data

Time series data over the period 1980-2014 was used for the analysis. The data was sourced from the World Bank data base and economic surveys published by Kenya National Bureau of Statistics (KNBS). The descriptions of the variables used in the study are given in Table 1.

3.2 Estimation Technique

This study distinguishes itself from the previous studies in Kenya by adopting modified Granger Causality techniques and Autoregressive Distributed Lag Model (ARDL) [11,12]. The ARDL model was chosen because first it allows the use of OLS to estimate the cointegration equations as long as the number of lags in the model has been identified. Secondly, it is a simple method of analysis compared to cointegration techniques proposed by Johansen and Juselius [22]. Thirdly, the model can be used on *I(0) or I(1)* variables or a combination of both. However, before actual estimation, Augmented Dickey-Fuller (ADF) was used to examine stationarity of the variables.

3.3 Model Specification

To examine the relationship between public spending and economic growth, a modified non-Granger causality represented as an error correction framework was used. This is expressed as follows:

$$Y_t = \alpha_0 + \sum_{i=1}^{n} \alpha_1 \Delta Y_{t-1} + \sum_{i=0}^{n} \alpha_2 \Delta Gov_{t-1} + \alpha_3 ECM_{t-1} + \mu_{1t} \quad (1)$$

$$Gov_t = \beta_0 + \sum_{j=1}^{n} \beta_1 \Delta Y_{t-1} + \sum_{i=0}^{n} \beta_2 Gov_{t-1} + \beta_3 ECM_{t-1} + \mu_{2t} \quad (2)$$

To incorporate various categories of public spending this study first decomposes aggregate public spending into economic and functional classification. The equations are estimated using ARDL expressed as:

$$GDP_t = \alpha_0 + \sum_{i=1}^{p} \alpha_1 GDP_{t-1} + \sum_{i=0}^{q1} \alpha_2 CURR_{EXP_t} + \sum_{i=0}^{q2} \alpha_3 DEV_{EXP_t} + \sum_{i=0}^{q4} \alpha_5 X_t + \mathcal{E}_t \quad (3)$$

$$GDP_t = \alpha_0 + \sum_{i=1}^{p} \alpha_1 GDP_{t-1} + \sum_{i=0}^{q1} \alpha_2 ED_{EXP_t} + \sum_{i=0}^{q3} \alpha_3 HE_{EXP_t} + \sum_{i=0}^{q4} \alpha_4 INFR_{EXP_t} + \sum_{i=0}^{q5} \alpha_5 X \quad (4)$$

The corresponding error correction representation for equations (3) and (4) is;

$$\Delta GDP = \alpha_0 + \sum_{i=1}^{p} \emptyset_1 \Delta GDP_{t-1} + \sum_{j=i}^{q1} \emptyset_2 \Delta CURR_{EXP_{t-j}} + \sum_{j=i}^{q2} \emptyset_3 \Delta DEV_{EXP_{t-j}} + \sum_{j=i}^{q3} \emptyset_4 \Delta X_t + \pi ECM_{t-1} + \mathcal{E}_t \quad (5)$$

$$\Delta GDP_t = \alpha_1 + \sum_{i=1}^{p} \emptyset_1 \Delta GDP_{t-1} + \sum_{j=1}^{q1} \emptyset_2 \Delta ED_{EXP_t} + \sum_{j=1}^{q3} \emptyset_3 \Delta HE_{EXP_t} + \sum_{j=1}^{q4} \emptyset_4 INFR_{EXP_t} + \sum_{j=1}^{q5} \emptyset_5 \Delta X_t + \pi ECM_{t-1} + \mathcal{E}_t \quad (6)$$

Where $\emptyset_1 - \emptyset_5(\emptyset_6)$ are short-run dynamic coefficients that determine whether the model convergences to equilibrium while π captures the adjustment speed toward equilibrium.

Table 1. Description and measurement of variables

Variable	Definition and measurement	Expected sign	Unit of measurement
Economic growth (GDP)	Gives the value of all goods and services produced in a country over a period of time.	Dependent variable	Annual percentage
Total government expenditure	This is the central government recurrent and development expenditure less transfers.	Negative	Percentage of GDP
Development expenditure	The sum of public investment expenditure for acquiring assets such as buildings, and machinery used in the production process.	Positive	Percentage of GDP
Current expenditure	This is government consumption expenditure on goods and services.	Negative	Percentage of GDP
Education expenditure	This is the share of government spending on education.	Positive	Percentage of GDP
Health expenditure	This is the sum of government spending on health sector	Positive	Percentage of GDP
Infrastructure expenditure	This is government expenditure on capital overheads which comprises of electricity, transport and communication spending.	Positive	Percentage of GDP
Trade openness	This is the sum of exports and imports over GDP in reference to a country's inward or outward orientation in respect to international trade.	Positive	Index
Inflation	This is the overall increase in price level of goods and services over a certain period of time.	Negative	Rate
Unemployment	This is the proportion of the labor force that is not in any form of employment yet seeking employment. It is the number of unemployed persons over total labor force.	Negative	Rate
Domestic savings	This is the sum of private sector and public sector savings given as GDP less final aggregate consumption expenditure.	Positive	Ratio

4. EMPIRICAL RESULTS

Table 2 presents results for unit root conducted using (ADF). From the results, GDP, aggregate government spending, health spending, unemployment, openness and inflation are stationary in levels as well as in their first differences. However, expenditures on development, consumption, infrastructure, domestic savings, and education are non-stationary in levels but become stationary after differencing once. Therefore, the variables GDP growth, aggregate government spending, health spending, unemployment, openness and inflation are *I(0*) while the variables development spending, consumption, infrastructure and education spending and savings are *I(1).* The null hypothesis is therefore rejected in levels and in first difference.

Table 3 reports the F- statistic test for the three equations. The result showed the calculated F-statistic for equation (1), (2) and (3) is 5.807, 3.66 and 3.89 respectively. It is evident from the results that the calculated F-statistics are larger than the upper bound critical values hence significant at 5 and 10 percent respectively. The results therefore indicated rejection of no cointegration implying existence of long-run relationship amongst the variables.

Once the long run relationships were identified, the short run and the long run causality between GDP and total government expenditure were determined using modified Granger causality test within an error correction framework. The results are tabulated in Table 4.

Results presented in Table 4 indicate short-run and long-run causal effect from economic growth to government expenditure. This is captured by the F-statistics and the error-correction coefficient term attached to the government expenditure equation that are significant at 5 percent and 1 percent respectively. It is evident that government expenditure causes economic growth in the short-run as captured by the F-statistics in the economic growth equation which is significant at 1 percent level. However, government expenditure has no long-run causal effect on economic growth since the coefficient of the error-correction term is insignificant. The findings implies that while economic growth has short-run and long-run causal effect on government expenditure, the latter has only short-run causal effect on economic growth.

Table 2. Unit root test

Variable	Level			First difference		
	t-statistics	1% critical value	5% critical value	t-statistics	1% critical value	5% critical value
GDP	-3.526 (0.0074)**	-3.689	-2.975	-6.531 (0.0000)***	-3.696	-2.978
Agg gov exp	-3.465 (0.0089)**	-3.689	-2.975	-8.316 (0.0000)***	-3.696	-2.978
Dev exp	-2.134 (0.2311)	-3.682	-2.972	-5.699 (0.000)***	-3.696	-2.978
Consmp exp	-1.920 (0.3225)	-3.689	-2.975	-5.016 (0.000)***	-3.696	-2.978
Infra exp	-1.414 (0.5756)	-3.689	-2.975	-7.203 (0.000)***	-3.696	-2.978
Edu exp	-2.347 (0.1573)	-3.689	-2.975	-4.791 (0.0001)***	-3.696	-2.978
Health exp	-3.683 (0.0044)**	-3.689	-2.975	-9.295 (0.000)***	-3.696	-2.978
Unemployment	-3.173 (0.0216)**	-3.689	-2.975	-7.132 (0.0000)***	-3.696	-2.978
Openness	-3.095 (0.0269)**	-3.689	-2.975	-5.950 (0.0000)***	-3.696	-2.978
Infl	-3.339 (0.0132)**	-3.689	-2.975	-6.543 (0.0000)***	-3.696	-2.978
Savings	-1.147 (0.6959)	-3.689	-2.975	-6.605 (0.0000)***	-3.696	-2.978

*Source: Owner's computation: ***(**) denotes rrejection of the null hypothesis at 1% and 5% respectively H0: There is unit root. The values in parenthesis are p-values*

Table 3. Results for bounds test (Equations 1, 3 and 4)

	Equations	F-statistics	Critical values		Decision
			Lower bound	Upper bound	
1.	F_{GDP}*(GDP/Agg.gov exp)*	5.807**(*)	1%[6.84] 5%[4.94] 10%[4.04]	7.84 5.73 4.78	Cointegration
2.	F_{GDP}*(GDP/Devexp, Consump exp, Opnness, Unemployment, Savings)*	3.660*	1%[3.15] 5%[2.45] 10%[2.12]	4.43 3.61 3.23	Cointegration
3.	F_{GDP}*(GDP/Edu exp health exp, Infraexp, Opns, Unemployment, Savings)*	3.389**(*)	1%[2.96] 5%[2.32] 10%[2.03]	4.26 3.50 3.13	Cointegration

*Source: Owner's computation; Ho: No Cointegration: Accept if F< upper bound; Reject if F>upper bound; the critical values are cited from Pesaran et al. [23], case 3; ** (*) denote 5 % and 10% levels of significance*

Table 4. Results for non-granger-causality test

Dependent Variable	Short run causality		Long run causality
	ΔY_t	ΔGov_t	ECM_{t-1}
	F-statistics (Probability)	F-statistics (Probability)	ECM_{t-1} coefficient (t-Statistics)
ΔY_t	-	3.65 (0.003)***	-0.1255583 (-1.29)
ΔGov_t	2.41 (0.013)**	-	2.41911(0.0025)***

*Source: Owner's computation; ** (***) denotes significance at 5% and (1%) significance levels*

We then estimate equations (3) using ARDL model. Following theory, public spending is divided into two main categories; productive and non-productive which comprise of development and public consumption spending. The regression results are reported in Table 5.

The regression results indicated that the measure of goodness of fit, the R-squared is 0.71 and the adjusted R squared is 0.52 implying the independent variables development and government consumption spending among other explanatory variables inflation, trade openness, unemployment, and domestic savings explain 70 percent of the variations in GDP growth rate. From the estimated long-run coefficients, it is evident that government consumption spending one of the variables of interest is statistically insignificant in explaining GDP growth rate. However, public development spending is statistically significantly in explaining GDP growth in Kenya. Specifically, the coefficient of development spending is 0.51 and significant at 5 percent implying that holding all other factors constant a unit increase of public capital investment will increase GDP growth rate by 0.51 units.

This study also investigated the effects of various categories of public spending based on functional classification. Thus equation (4) was estimated using ARDL to determine the effect of health, education, and infrastructure spending on economic growth. The regression results are given in Table 6.

Table 5. The long run ARDL regression results (Equation 3)

Dependent variable is Y_t (GDP growth rate); 1 lags selected based on AIC				
Variable	**Coefficient**	**Std error**	**T-ratio**	**P>t**
C	-4.160117	9.467618	-0.44	0.665
Dev exp	0.5102605	0.2245276	2.27	0.034**
consump exp	0.0449677	0.4123053	0.11	0.914
Inflation	-0.1920359	0.0782846	-2.45	0.023**
Trade Openness	0.091271	0.0809799	1.13	0.273
Unemployment	-0.6590595	0.3372651	-1.95	0.065*
Domestic savings	1.6656973	.1289896	1.15	0.263

*Source: Owner's computation ** denotes significance at 5%; Log likelihood = -56.571519; R-Squared = 0.70772755; Adj. R Squared =0.51775046 Root MSE = 1.6656973*

Table 6. Long run ARDL regression results (Equation 4)

Dependent variable is Y_t (GDP growth rate); 2 Lags selected based on AIC				
Variable	**Coefficient**	**Std error**	**T-ratio**	**P>t**
Education exp	2.465675	0.7062938	3.49	0.007***
Helath exp	0.0416444	4.533948	0.01	0.993
Infra exp	0.6680591	0.2296411	2.91	0.017**
Savings	0.5228404	0.1656405	3.16	0.012**
Inflation	-0.6654657	0.2083441	-3.19	0.011**
Openness	0.5766361	0.2406016	2.40	0.040**
Unemployment	-1.595815	0.8042175	-1.98	0.079*

*Source: Owner's computation; ***[**],[*] denotes significance at 1%,5% and 10% level; Log likelihood = -37.082066; R-Squared = 0.9019539; Adj. R Squared = 0.65139165; Root MSE = 1.4253279*

Table 7. Error correction results (Equation 5)

Dependent variable is Y_t (GDP growth rate); 1 Lags selected based on AIC				
Variable	**Coefficient**	**Std error**	**T-ratio**	**P>t**
∆Development exp	0.3472751	0.3038123	1.14	0.267
∆Consumption exp	-0.4962746	0.3903746	-1.27	0.218
∆Inflation	0.1121493	0.0722558	1.55	0.136
∆Openness	-0.1225812	0.0784355	-1.56	0.134
∆Savings	0.0686364	0.1333974	0.51	0.613
∆Unemployment	0.7387826	0.3677948	2.01	0.058*
ECM (-1)	-0.9632684	0.2281099	-4.22	0.000

*Source: Owner's Computation; * denotes significance at 10% level*

Table 8. Error correction results (Equation 6)

Dependent variable is Y_t (GDP growth rate); 1 Lags selected based on AIC				
Variable	**Coefficient**	**Std error**	**T-ratio**	**P>t**
∆Education expenditure	-3.556682	1.089692	-3.26	0.010***
∆Healthexpedditure	6.30682	2.627564	2.40	0.040**
∆Infrastructure expenditure	-0.5350526	0.1985198	-2.70	0.025**
∆Openness	-0.3415677	0.1315524	-2.60	0.029**
∆Savings	0.2973939	0.1616752	1.84	0.099*
∆Unemployment	0.085948	0.4368967	0.20	0.848
∆Inflation	0.4887174	0.1503564	3.25	0.010***
ECM (-1)	-0.9815416	0.3318504	-2.96	0.016**

*Source: Owner's computation: ***,[**],[*] denotes significance at 1%,5% and 10% respectively*

Table 6 presents the long run regression results for various categories of government expenditures. The results indicated that about 90 percent of changes in GDP growth rate is attributed to the independent variables under consideration as captured by the R-squared. The results further show that public education spending and infrastructure spending are significant in explaining GDP growth rate while health spending has no significant effect on GDP. All other determinants of GDP included in the model are significant in explaining GDP growth in Kenya. The coefficient of education expenditure is significant at 1 percent level implying changing public education expenditure by a unit will cause GDP growth to increase by 2.47 units. Similarly, the coefficient of infrastructure expenditure is 0.67 and significant at 5 percent level implying increasing public infrastructure spending by one unit will lead economic growth to increase by 0.67.

The short-run results obtained from error correction equation (5) and (6) are presented in Tables 7 and 8 respectively.

The ECM results indicated that development and public consumption spending have no short-run significant effects on economic growth. The results however showed the short-run effect of health expenditure on economic growth is positive and significant. The impact of education

and public infrastructure spending on economic growth is negative in short-run. The coefficient of unemployment is insignificant while openness, domestic savings and inflation are significant in explaining short-run dynamics on economic growth. The estimated equilibrium correction coefficients have the correct signs of -0.9632684 and -0.9815416, that are significant implying after a shock the system adjusts to the long –run equilibrium at a high speed.

4.1 Discussion of the Results

The regression result indicated that growth in government expenditure whether in the short run or in the long run is attributed to economic growth. This was confirmed by the significance of the F-statistics at 5 percent and the error-correction term at 1 percent. These finding suggests that one of the causes of increases in government spending is increase in economic growth rate. The results also showed there was only short-run causality effect from government expenditure to economic growth. In this regard, policies designed to enhance efficiency in public spending would be important because this can to some extend ensure resources are put into better use thereby improving economic growth. The empirical finding support Katrakilidis and Tsaliki [24] who found that government expenditures had long-run relationship with economic activity. However, the empirical results for this study are somewhat different from the finding of Katrakilidis and Tsaliki [24] in that there was only short-run causal effect from government expenditure to economic growth.

The results reported in Table 5 indicated that economic growth is positively influenced by development spending. This is in line with the theoretical assertion that capital formation plays critical role in production hence the positive association with GDP growth rate. The regression reported that increasing development spending by one percent will cause GDP growth to increase by 0.51 percent.

The result also showed the coefficient of consumption expenditure is negative in the short-run though not significant implying an increase in the allocation of resources to finance current spending is detrimental to economic growth in Kenya, finding that were also established by Hokmeng and Moolio [25]. This is also supported by the theoretical assertion that current expenditures are unproductive and the government should reduce current spending and allocate more resources to finance capital development [10,26]. The results are however contrary to empirical findings of Al-fawwaz [18] whose findings established that current expenditure promotes economic growth.

Education and infrastructure spending enhances economic growth as confirmed by their positive coefficients. This gives an indication that government investment in education sector has positive implication on economic growth through improvement in human capital [27]. This outcome is supported by the theoretical postulation that spending on education is important not only for human capital development but also it enhances workers' productivity [27,28]. Moreover, the positive contribution of infrastructure spending support the theoretical narrative that if countries are to achieve sustainable economic growth they must invest in infrastructure networks. From the theoretical point of view, infrastructure development reduces transport cost thereby lowering overall cost of private production in an economy which ultimately raises the firms' profits. The findings are also in line with Aschauer [29] that public infrastructure investment promotes private sector productivity.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

This study used autoregressive distributed lag model to analyze the effect of public spending on economic growth in Kenya over the period 1980 to 2014. GDP growth was used as the dependent variable while different government expenditure components were considered as independent variables based on economic function and sectoral classification. Results from the Granger causality showed presence of short-run and long-run causal effect from economic growth to government expenditure. The results further indicated only short-run causality effect emanating from government expenditure to economic growth. The ARDL modeling of economic growth effect revealed that public spending on education positively effects economic growth while health expenditure had no significant effect on economic growth. Further the findings indicated that public investment has positive effect on economic growth while government consumption expenditure has no significant effect on economic growth.

5.2 Recommendations

This study recommends the government to consider maintaining or increasing resource allocation in the education sector and pursue policies that would improve efficiency in the education sector in order to support skills and human capital development. In addition, the government should consider increasing resources towards improving infrastructure networks. This will help in reducing transport cost thereby enhancing the private sector productivity. Development spending had a positive effect on economic growth which is an indication that capital formation is very critical for achieving development goals like unemployment and poverty reduction. Policy-makers should, therefore, develop policies that are geared toward improving public investment to improve the productivity of domestic firms. In this case, the government should ensure that most of the resources that accrue to the economy are used to finance public capital investment as opposed to consumption expenditure. Finally, the government should put measures that ensure that the resources allocated in the health sector are used prudently in order to improve the health status of people thereby contributing to a reduction in mortality rate while increasing life expectancy.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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