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Article

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The Impact of Government Spending and Taxation on Economic Growth in Tanzania (1967 – 2017)

Ngong'ho B. Sende[1] **and Wilhelm M. Ngasamiaku**[2]

ABSTRACT

This study seeks to examine the effect of government spending and taxation on economic growth in Tanzania for the 1967-2017 period. To achieve this objective, the study utilized secondary data and analyzed it using Augmented Dickey Fuller Test (ADF) and Phillips-Perron test statistics for unit root test and ARDL model for assessing effects on economic growth. Augmented Dickey Fuller Test and Phillips-Perron Test revealed that development expenditure, recurrent expenditure and income tax were initially not stationary at level but they became stationary after first differencing while real GDP was initially stationary at level. ARDL approach to co-integration bound test revealed that there was a co-integration among the variables. Moreover, ARDL revealed that there was significant evidence that, in the short run, recurrent expenditure and income tax negatively affected economic growth while development expenditure affected economic growth positively. The test also revealed that, in the long run, development expenditure had a positive and significant effect on growth rate while income tax had a negative impact. Likewise, recurrent expenditure had a negative and significant effect on economic growth. The study recommends that the government should increase the proportion of its annual budget on development expenditure so as to encourage aggregate demand and therefore influence a higher level of economic growth.

Key words: *Development expenditure, recurrent expenditure, Taxation and Economic growth.*

INTRODUCTION

Economic growth depends on productivity and efficient allocation of available resources. Resource allocation is normally done through government planning and budgeting. Success in this course creates a rise in incomes of the people, which influences demand and encourages auxiliary economic growth. Decreasing demand may lead to unemployment of resources and discourage investment (Kambua, 2014). According to Keynesian view, increase in government spending can be an effective tool in stimulating aggregate demand and increased consumption, which in turn can lead to increased production and faster recovery from recessions for a stagnant economy (Breido 1996).

Government spending measures the real income of a community and the level of investment as an evidence for productivity and living standard of the people in the society (Stephanie, 2015). The expansion of government spending on development may affect the investment in human or physical capital, thereby leading to a transitional positive growth effect (Chude, 2013). The effects of economic growth on human development are likely to flow through government budgetary expenditures. This is because government budget decides how much investment the government

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should take in private and public sectors. Once the government invests more in public infrastructure, it influences the private sector to invest more in economic growth, thus improving human development in terms of income and affordability of social services.

In Tanzania, the amount of revenues has been increasing since independence. However, from 1996 to 2002 the amount of income tax increased compared to the last two decades since independence. The positive changes of income due to taxes imposed on products were the consequence of the reforms in the system of tax collection. The new improvements that had led to the increase in income tax were the rationalization of the exemption system to avoid further erosion of the tax base, changes in tariff rate and indirect tax (Africa Development Bank, 2010). The tax revenues are very important in the economic stability and economic growth in Tanzania because tax is a key tool in fiscal policy for controlling inflation by reducing the amount of money in circulation (Edwards, 2012). In the first three decades after independence, Tanzania used direct taxes revenue which made it very easy for people to evade tax. Tax evasion may cause low revenues to the government and consequentially affect the completion of development projects (Helge, 2003).

Government spending and growth depend on its forms, which are development and recurrent expenditure. Spending in investments and productive sectors positively affect economic growth (Ruturagara, 2013). Some economic theories such as Keynesian theory show how government spending may be beneficial to economic growth in a country, that is, allocation of government spending to recurrent expenditure influences positively economic growth through aggregate demand. Tanzanian economy has experienced both domestic and external economic shocks which have affected its growth rate due to fall in production. For instance, from1973 to 1974, Tanzania experienced oil crises and drought, from 1975 to 1976 it faced a coffee price boom and from 1978 to 1979 the country had to fight a war with Uganda. The growth rate was 5.8% in the 1970s and it decelerated to negative in the 1980s (Nyorekwa & Odhiambo 2014). Moreover, the growth of gross domestic product (GDP) reached 6.7 percent in 2004, which was an increase from the average of 5.5 percent from 1999 to 2003 and 3.3 percent from 1994 to 1998 (African Economic Outlook, 2006). An increase in direct government spending in non-productive activities (recurrent) beyond the collected revenues will affect the saving and investments, and hence affect economic growth. The growth rates have an impact on public and private sectors, which means that a proper allocation of resources for both private and public spending raises the overall economic growth (Vamvoukas, 2004).

The relationship between government spending, taxation and economic growth depends on government activities. Musiba (2013) postulates that government activities can improve economic efficiency and economic growth of a country. He argues that government spending will always be desirable in order to promote economic growth and that the key factor that determines the level of government spending in economic activities is taxes. However, further expansion of government spending will have negative effects on economic growth as they grow more than its revenue collection capacity. This contributes to economic stagnation and decline due to the law of diminishing return (Alegana, 2014). In an attempt to finance rising spending of the government, the government may increase taxes and borrowing from both domestic and external sources. Higher income tax discourages individuals from working and searching for jobs as the government takes more of their earning. This leads to crowd out of the private sectors, thereby reducing private investment in a country (Roger& William, 1970).

In view of these developments, we have noted that economic growth in developing countries is still a challenge. This challenge has directed effort towards assessing the inconsistent evidence that exists in the government spending and taxation on how they affect economic growth. The assessment of the effect of government spending and taxation has been using different analytical methods in different time periods, which has resulted in inconsistent evidence. The government of Tanzania faces challenges on how to raise the required resources and better allocate the resources in order to achieve steady growth. Sustained economic growth has not been achieved, partly owing to how and where the resources are allocated despite of the sizeable amount of budget allocated in various development projects every year. Economic growth has been fluctuating overtime, yet little has been done recently to, specifically, assess the combined impact of government spending and taxation on economic growth in Tanzania. Since the government has been playing a leading role in implanting various policies to stabilize the economy, the increase in direct government spending in non-productive activities (recurrent) beyond the collected revenues has led to poor saving and investments and consequently affecting economic growth. Therefore, the main objective of this paper is to empirically assess the impacts of government spending and taxation on economic growth in Tanzania. This paper also aims to establish the short run and long-run effects of recurrent expenditure, development expenditure and income tax on economic growth. In other words, we would like to find out how the resources should be shifted from the less productive to the more productive sectors as well as income tax of the economy so as to boost economic growth.

Motivation of the Study

In the last three decades, there has been a prominent policy concern on debates on economic take-off among economically backward countries in Asia, Latin America and Africa. Through various economic initiatives, only a small proportion of the economically backward countries have made noticeable progress in terms of economic growth with Asian tigers being one of the blocks so to point. The majority of the economically backward countries are still stuck in poverty and most of them are in Africa, Tanzania inclusive.

For the last 4 years, there has been substantial evidence that the government of Tanzania is determined to transform its economy by increasing investments in development projects, including public infrastructures. Taxation is one of the key policies that are emphasized by the government as a tool that will generate revenue to finance government spending and hence facilitate economic growth. However, literature indicates that over-dependence on tax as the main source of revenue may lead to economic stagnation. It is with the view of envisaged industrial economy that the current study is motivated to investigate the impact of government spending and taxation on economic growth in Tanzania.

LITERATURE REVIEW

Theoretical Literature

Economic growth is the increase in the inflation-adjusted market value of goods and services produced by an economy over time. It is conventionally measured as the percentage of increase in real gross domestic product (IMF, 2013). There are several models which have explained the

drivers of economic growth. The most prominent model is the Solow-Swan model by Solow and Swan (1956). The Solow-Swan model explains the key insights on what creates the difference in per capital incomes in the world. The model uses Cob-Douglas production function to describe how population growth, savings rate and depreciation rate have a role to play in explaining economic growth. This model is further supported by Harrod (1939), and Domar (1946) model famously known as the Harrod-Domar model attempting to explain the drivers of economic growth. This model presents savings and productivity of investment as the key drivers of growth. The model proposes that growth depends on the amount of capital and labor, and the more people are endowed with high incomes the higher the growth which emanates from high savings.

Furthermore, Romer*et.al.* (1992) in their attempt to uncover sources of economic growth developed an endogenous growth3 model which explains growth as being a result of increase in savings rate. They argued that marginal product of physical capital increases if the savings rate increases, thereby triggering growth in the economy. This was augmented by Lucas (1988) two sector growth model that explains growth in two episodes. The model assumes an economy with both physical capital and human capital with the view to test the key drivers of growth of an economy. The study findings show that in the short run, returns to physical capital tend to dominate growth, but in the long run, returns to human capital dominate growth.

Baro (1991) formulated a government expenditure growth model. In this model he highlighted the advantages which flow from a productive government expenditure. In the model he argues that government expenditure has a positive effect on marginal physical productivity and enhances productivity of physical capital. He further remarks that in order to have a sustained equilibrium growth, the level of government expenditure has to be proportional to the scale of the economy. The model concludes that growth and economic performance are to a great extent enhanced by optimal tax policy. Chamley (1986) developed an optimal tax growth model which explains growth as being a result of an optimal tax on capital. He argues that in order to have sustained long run growth, the optimal tax on capital has to converge to zero. In this model he specifies the level of government expenditure as endogenous and proportional to the level of growing capital stock. The major shortcoming of this model is that it does not consider any externalities which result from the level of government expenditure. These theoretical drivers of economic growth have powered the need for economists to empirically estimate the effect of government spending and taxation on economic growth.

Theoretical Framework

This part develops econometric model for the relationship of the government spending and taxation on economic growth. The economic growth model used in this study is based on the augmented Solow growth model with modification that extends the growth model to allow taxation as an additional input to enter the growth function. According to the Solow's function, Economic growth is a function of technology (T), capital accumulation (K) and labor force (L), that is; $Y =$

[3]Endogenous growth is the growth that is driven by internal rather than external factor such as investment, knowledge and human capital.

$F(T, K, L)$.But according to the endogenous growth theory on economic growth, 'taxation (T_x)' is very significant in explaining changes in economic growth but not captured by the general model and hence the model can be modified by encompassing taxation in one aggregate function such that:

$$Y = F(T, K, L, T_x) \quad \ldots\ldots (1)$$

From this model, technology, capital and labor can be termed as government expenditure. Government spending can be decomposed into two components, namely recurrent expenditure (R_e) and development expenditure ($D_{e)}$ while taxation can be decomposed into three components; which are customs and excise duties (E_d), income tax (I_t) and sales tax (S_t). Specifically, for this study the model can be exaggerated as follows:

$$Y = F(R_e, D_e, I_t) \quad \ldots\ldots (2)$$

Empirical Review

There are a number of studies conducted in both developed and developing countries trying to examine the causal relationship between public spending, taxation and its impact on economic growth. For instance, Hasnul(2016)used time series data to examine the impact of government expenditure on economic growth in Malaysia for the 1970-2014 period. The study used ordinary least square (OLS) techniques and the findings concluded that large government expenditure led to lower economic growth. Both government expenditure, namely development expenditure and recurrent expenditure were significant but led to lower economic growth. Moreover, the findings revealed that education, defense, healthcare, and development expenditure did not significantly contribute to the economic growth. Basing on the Keynesian hypothesis, these findings are not applicable to Malaysian economy. The study suggested that government should promote the efficiency in the allocation of resources in the development process.

Kweka and Morrissey (2000) studied the impact of government spending and economic growth using time series data for the period from1965 to 1996in Tanzania. The research used co-integration test and error correction term method and the findings indicated that government consumption and private investment impacted positively on economic growth while public investment had a negative and significant effect on economic growth in the short run. Furthermore, the findings revealed that government consumption had a positive impact and was insignificant to economic growth but private investment had a positive and significant effect on economic growth while investment spending impacted negatively economic growth. The study concluded that aid had an important role in supporting consumption although allocation of more aid to productive expenditures would affect positively economic growth in the long run. Likewise, Kapunda (2013) used time series data and the Ordinary Least Square method (OLS) to study the public expenditure composition and economic growth in Tanzania over the period 1965-2010.). The findings indicated that capital expenditure and terms of trade had a positive and significant impact on economic growth while expenditure on health, agriculture, general public services, defense and infrastructure had a positive and insignificant impact on economic growth. The study recommended for a need to promote exports of traditional and non-traditional products rather than importation of unnecessary goods to enhance terms of trade and growth. A similar study by Kairanya (2016) investigated the impact of taxation on economic growth in Kenya for the 1975-2014period. The study used Ordinary Least Square (OLS) method and the findings revealed that indirect tax had a negative and statistically significance to explain economic growth in Kenya in

the short run while Foreign Direct Investment (FDI) and net exports had a positive effect and were significant in explaining economic growth. Generally, there was a long run relationship running from independent to dependent variables but their coefficient was not estimated. The study recommended that policy makers should focus more on how to enhance international relations in order to attract FDI and export more so as to increase the exports, which is crucial for economic growth.

Abdon *et al.*(2014) examined the relationship between fiscal policy and economic growth in developing Asia for the 1990-2011period. The study used regression analysis and the findings revealed that the coefficient of property taxes was positively significant implying an economic growth increase by the rate of 0.427% for every 1% increase in property taxes. Inversely, income tax, corporate income tax and property income tax had a negative effect on economic growth because they discouraged investment in capital and productive investments while government spending on education and infrastructure (transport and communication) had a positive impact on economic growth. The study recommended that countries should mix both their revenue and expenditure in order to maximize the contribution of fiscal policy to economic growth. Knelle*et al.* (2004) analyzed the long run impact of fiscal policy on economic growth in OECD countries for the 1970-2004period. The study used pooled mean group regressions and the findings revealed that productive expenditure and non-distortionary tax had a positively significant effect on economic growth while recurrent expenditure and distortionary taxes had a negative impact on economic growth in the long run. The study recommended that governments should increase productive expenditure and inhibiting distortionary taxes to finance them so as to affect positively economic growth.

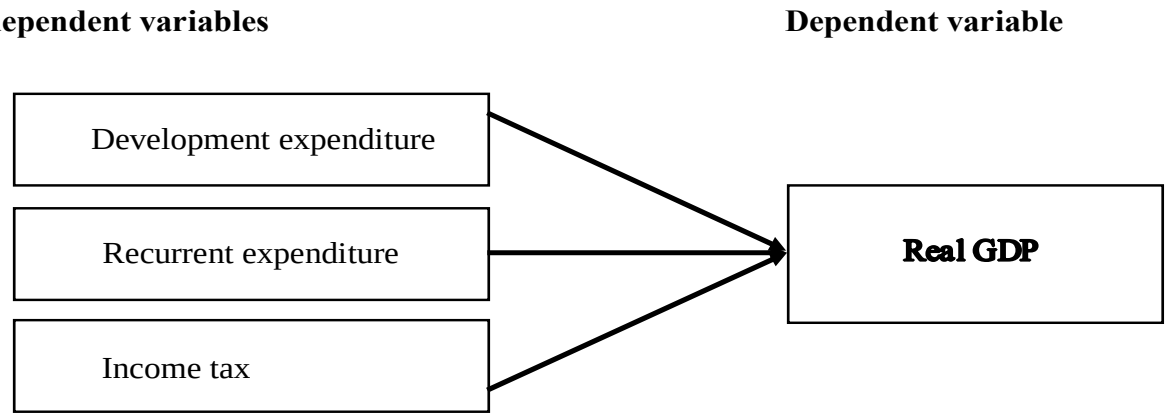
From the foregoing literature review we note that economic theories suggest that government spending and taxation affect economic growth positively through the proper allocation of public resources and negatively through the improper allocation of public resources. The literature examined both the positive and negative effects of public spending and taxation on overall growth in the economy by different authors in both developed and developing countries Abdon *et al* (2014) and Kneller *et al* (2004). It is further evident that the results and evidence on how the government spending and taxation impact economic growth differ by country/region, as well as depending on the analytical methods employed. We also note that empirical studies conducted to determine the impact of government spending on economic growth in Tanzania, such as Kapunda (2013) and Morrissey & Kwela (2000), did not consider income tax as one of the important components of the tax bracket. We, therefore, seek to extend the analysis by assessing the impact of both government spending and taxation on economic growth in Tanzania in order to come up with empirically guided findings with the view to inform fiscal policy making in the country.

Conceptual Framework

The economic growth of a country is usually measured by real gross domestic product (GDP). The total output in the economy is contributed to by different sectors in the economy. The performance of the sectors is sometimes attributable to the performance of other macroeconomic fundamentals such as government spending and taxes. These factors are the main factors that affect economic growth because government spending or expenditure can be a source to raise more or lower the output in the economy. Likewise, the tax rate can be a channel of attracting investors or economic activities, increasing or reducing disposable income. We should note that when a tax system is not fair, it could discourage investors to invest in the country and affect the distribution of disposable

income in the economy. Thus, the estimation of growth equation may estimate the coefficient of government spending and taxation on how they affect economic growth if the direction of the relationship exists from government spending and taxation to economic growth. This relation is given by the graphical framework in figure 1.

Figure 1: Pictorial Representation of Conceptual Framework



Source: Author's Creation from Literature Review.

The change in economic growth is a function of development expenditure, recurrent expenditure and income tax.$\mathrm{RealGDP} = \mathrm{f}(\mathrm{D.exp}, \mathrm{R.exp}, \mathrm{INC.tax})$.

METHODOLOGY AND APPROACH

The aim of this study is to assess the effects of government expenditure and taxation on economic growth in Tanzania mainland. The study adapted the model by Kelvin, Yapatike and Abeid (2017) who studied the impact of government spending and taxation on economic growth in Tanzania. This study employed a time series analytical technique while making use of data extracted from the National Bureau of Statistics (NBS) and Bank of Tanzania (BoT) database. This technique was preferred because of the availability of a long set of time series data recorded at a regular interval covering the sample period between1967-2017. In pre-testing the average imputation procedure was used to replace outliers with values that were within acceptable range in each data series.

Data Type and Methods of Analysis

The type of data used for this study were secondary time series data from 1967 to 2017with a focus on government spending, income tax and real domestic product and were analyzed using a statistical software package called ***EViews version 9.***The selection of data from 1967-2017 aimed to capture growth patterns during different government regimes, economic reforms undertaken during this period as well as ensuring that we obtain sufficient observations that enhance the robustness of our econometric analysis.

Unit Root Test

Time series data were checked for stationarity identify the order of integration so as to help in the selection of appropriate model according to the order of integration. To perform this Augmented Dickey-Fuller test (ADF) and Phillips-Perron test were used to test stationarity of the variable because it is more powerful than **Dickey–Fuller test** (DF) for stationarity (Phillips, 1987). The test ensures that the null hypothesis is accepted unless there is strong evidence against it to reject

in favor of the alternate Stationarity hypothesis which states that *"there is no unit root (it is stationary)*". The models below are the ADF and Phillips-Perron test estimated.

$$\Delta x_t = \alpha + \beta x_{t-1} + \sum_{i=1}^{k} \gamma_i \Delta x_{t-i} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

This is the augmented model which implies that there is intercept and trend only.

Whereby:
t is the time index, α is an intercept constant, β is the coefficient presenting process root, that is, the focus of testing, k is the lag order of the first-difference autoregressive process, x_{t-1} is one period lagged value of the variable x_t and$\Delta x_{t-i}$is the difference of the lagged dependent variable.

Lag Length Selection
The Akaike Information Criterion (AIC) was used in this study because it is a more powerful criterion than other standards criteria in the selection of lag. This is because AIC is significant in the sample size of not more than 60 observations (Liew, 2004). That is, the lower AIC value was used to detect the suitable lag to be used in the model.

ARDL Bounds test of Co-integration
This test was employed to test whether there was a long run relationship among variables. The F-statistic was used to test whether the variables were co-integrated or not. The test involves hypotheses which are null hypothesis and alternative hypothesis. The Null hypothesis was that there was no long run relationship between the variables against the alternative hypothesis that the variables had long run relationship. The guideline was to reject the null hypothesis if the calculated F-Statistic was greater than the upper bound critical value at 5% level of significance.

Model Specification
The study used econometric techniques by following Solow model. The mathematical model used to assess the effects of development expenditure, recurrent expenditure and income tax on economic growth is specified as:$\mathrm{RGDP} = f(\mathrm{REC}, \mathrm{DEV}, \mathrm{ITAXS})$.

$$\mathrm{RGDP} = \mathrm{C} + B_1\mathrm{REC} + B_2\ \mathrm{DEV} + B_3\mathrm{ITAXS} + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (4)$$

Where:

RGDP = Real Gross Domestic Product (% of GDP)
REC = Recurrent expenditure (% of GDP)
DEV = Development expenditure (% of GDP)
ITAXS = Income tax (% of GDP)

Autoregressive Distributed Lag (ARDL)
Autoregressive Distributed Lag (ARDL) was employed in the analysis because the variables were integrated in I(0) at level and I(1) at first difference.. A negative error correction term and significant coefficient indicate that the model hada long run relationship running from explanatory variable to the dependent variable. The regression equation form of ARDL is as follows:

$$\Delta \mathrm{RealGDP} = \beta_0 + \beta_1 \mathrm{ECT}_t + \sum_{i=1}^{p} \beta_2 \Delta\, \mathrm{GDP}_{t-1} + \sum_{i=1}^{p} \beta_3 \Delta\, \mathrm{R.exp}_{t-1} + \sum_{i=1}^{n} \beta_4 \Delta\, \mathrm{D.exp}_{t-1} + \sum_{i=1}^{p} \beta_5 \Delta\, \mathrm{INC.tax}_{t-1} + \varepsilon_t$$

Where, PRepresents maximum number of lag, $\beta_0$represents intercept of the ARDL, $\beta_1$represents coefficient of error correction term, ECT_trepresents error correction term which according to Iheonu (2016), must be negative and significant,$\beta_2, \beta_3, \beta_4, \beta_5$represent coefficient of variables and $\varepsilon_t$represents random error**.** In addition to that, the Granger causality testis employed to examine the causal relationship between variables. This means that if the value of independent variables granger causes the value of dependent variable, the value of the independent variables' past should significantly help predict the value of the dependent variable's future.

FINDINGS AND DISCUSSION OF RESULTS

Test for Stationarity (Unit Root Test)

This test was conducted to determine the stationarity of the data in each variable. Table 1 summarizes the unit root of the data at level and at first difference.

Table 1: Unit Root at 95% level of confidence

Variable	ADF test statistics (with trend and intercept)		Phillips-Perron test statistics (with trend and intercept)	
	I(0)	I(1)	I(0)	I(1)
Income tax	-2.4898	-6.7594	-2.5885	-10.1489
	0.3317	0.0000***	0.2871	0.0000***
Recurrent Expenditure	-2.5069	-8.6364	-2.3901	-8.8570
	0.3237	0.0000***	0.3801	0.0000***
Development Expenditure	-2.6778	-8.6675	-2.6954	-11.8911
	0.2499	0.0000***	0.2429	0.0000***
Gross Domestic product	-6.2309		-6.2526	
	0.0000***		0.0000***	

Source: Author's Computation from **Eviews** Version 10

Note: **** significant at 1%; **significant at 5% and *significant at 10%*

Table 1 indicates that the unit root results for all variables were stationary in first difference I (1) except Gross Domestic Product which was stationary at levelI (0). Since data series were integrated at I (0) and I (1), it is evident that the method of (ARDL) was appropriate in estimating the short run and long run effect of our independent variables on dependent variable because the condition for ARDL model estimation was met.

Bounds Test for Co-integration Analysis

The study conducted a co-integration test to examine the long run relationships among the variables. The F-statistic that was computed within the framework of the Unrestricted Error Correction Model was compared with the lower and upper critical values in Pesaran et al. (2001).

Table 2: F-Statistic Bound Test for Co-integration relationship

				Bound Critical Values† (Restricted Intercept and no Trend)	
Test Statistic	Value	Lag	Significance level	I(0)	I(1)
F-Statistic	7.69	4			
K	3		10%	2.37	3.2
			5%	2.79	3.67
			2.5%	3.15	4.08
			1%	3.65	4.66

Note: I (0) = lower bound and I (1) = Upper bound
K is the number of regressor.

Table 2 presents the bounds test for co-integration results for Real GDP (RGDP) against recurrent expenditure, development expenditure and income tax. From Table 2, the F-statistic for the model with Real GDP (*RGDP*) as the dependent variable is 7.69. It exceeds the upper critical bound at 5 percent level of significance for restricted intercept and no trend. This means that the null hypothesis of no co-integration among the variables is rejected. This confirms that there was a long-run relationship between Gross Domestic Product and its explanatory variables.

Table 3: Error Correction Model (ECM) for RGDP

Variable	Coefficient	Std. Error	t-Statistic	Prob
D (RGDP (-1))	-0.3198	0.0866	-3.6938	0.0009***
D (RGDP (-2))	-0.1813	0.0491	-3.6864	0.0009***
D(REC)	-3.7163	0.3086	-12.0418	0.0000***
D (REC (-1))	-3.0269	0.7458	-4.0586	0.0003***
D (REC (-2))	-0.8389	0.4947	-1.6957	0.1007
D (REC (-3))	0.5990	0.3668	1.6330	0.1133
D(DEV)	-1.2913	0.6478	-1.9934	0.0557*
D (DEV (-1))	4.3576	0.7556	5.7672	0.0000***
D (DEV (-2))	2.8296	0.8768	3.2272	0.0031***
D (DEV (-3))	2.8422	0.6979	4.0726	0.0003***
D(TAXS)	2.8422	0.9573	4.0726	0.0003***
D (TAXS (-1))	-2.8007	0.9573	-2.9255	0.0066***
D (TAXS (-2))	17.5448	1.3716	12.7911	0.0000***
D (TAXS (-3))	3.5960	2.2037	1.6318	0.1135
CointEq (-1)	-0.40718	0.0615	-6.6159	0.0000***
R-squared				0.9758
Adjusted R-squared				0.9663
Durbin-Wats on stat				2.2633
Akaike info criterion				4.4853

Source: Author's Computation from **Eviews** Version 10
Note: **** significant at 1%; **significant at 5% and *significant at 10%*

The results in table 3 reveal that the coefficient of error correction terms in the co-integration equation (-0.40718) was negative and statistically significant at 5 percent level, meaning that the variables converged with the speed of 40.71% towards the long run equilibrium, if there was disequilibrium of the economy in the short run. This means that all the variables, namely recurrent expenditure, development expenditure and income tax were significant at 1%, 5% and 10% levels of significance. Table 3 also reveals that the results about recurrent expenditure with no lag and lagged with one period were negative and statistically significant. This implies that a 1 percent increase in recurrent expenditure would lead to a decrease in growth rate by 3.71 percent with no lag and 3.02 percent when lagged with one period. These results are consistent with Volkov (1998) who found that recurrent expenditure had a negative impact on economic growth in Ukraine. This could be due to the fact that expenditures on social services have a long gestation period to unleash to positive benefits associated with such expenditures coupled with lack of prudential budget expenditures management. The income tax lagged with one period was negatively and statistically significant. This implies that a unit increase in income tax would lead to decrease in GDP in a one period.

However, when we estimated the income tax with no lag and lagged with two periods, the results tended to contribute to economic growth positively. This result implies that a unit increase in income tax increases economic growth by 2.84 percent and 17.54 percent at lags 0 and 2 respectively. The development expenditure, lagged with one, two and three periods were positively and statistically significant at 5percent level as expected. Intuitively, a1percent change in development expenditure would lead to increase in the GDP by 4.36percent, 2.83percent and 2.84percent respectively. These results are supported by Volkov (1998) who found that development expenditure had a positive impact on economic growth in the short run. Their similarity could be due to redirection of public investment into investment in infrastructure, human capital and market reforms. This could be cited as possible reason for stimulating demand for product, which in turn allows producer to raise production and thus expand the gross domestic product. However, the value for adjusted R-squared was 0.966, a figure which is large enough to account for the overall fit of the model. The Adjusted R-Squared value illustrates that the independent variables were able to explain the variations in the dependent variable by 96.6%. The value of *Durbin-Watson statistics* was 2.26 which, is within the range of 1.5-2.5 which indicates that the model has no multicollinearity between the independent variables.

Model Diagnostics

Under this test, different tests were tested to ensure that ARDL model produces the best preferred model upon which we can infer our results econometrically. The results are presented in table 4 for the long run ARDL test results.

Table 4: Long Run ARDL (3, 4, 4, 3) Model Results

Regressor	Coefficient	Std. Error	Prob
REC	6.8198	3.2483	0.0446**
DEV	-5.7663	2.7134	0.0422**
TAXS	-17.7920	10.0185	0.0862*
Constant	3.4711	1.2433	0.0092***

Source: Author's Computation from **Eviews** Version 10. Dependent variable: **RGDP**

Note: **** significant at 1%; **significant at 5% and *significant at 10%*

The coefficient of development expenditure (-5.7663) was negative and statistically significant at 5 percent as expected. This means that a unit increases in development expenditure would lead to a decrease in growth rate of real GDP by (-5.7663). This negative relationship implies that, as long as the government increases expenditure on development, it will lead to lower economic growth of the country; this may be due to inefficiency in its targeting and misuse of the funds particularly for long term public investment projects. In view of this, it may lead to a delay or failure to complete public projects that might bring positive impact on economic growth in time. These results are consistent with Hasnul (2015) who found a negative relationship between…development expenditure and economic growth. However, the results differ from Kneller et al. (2004), Abdon (2014) and Volkov (1998) who found that development expenditure has a positive relationship with economic growth. The positive effect could be as a result of decrease in spending on general public services and on social protection. Moreover, increase in proportional share of budget in development expenditure like expenditure on infrastructure and education affects productivity of all firms and industries, and the entire economy.

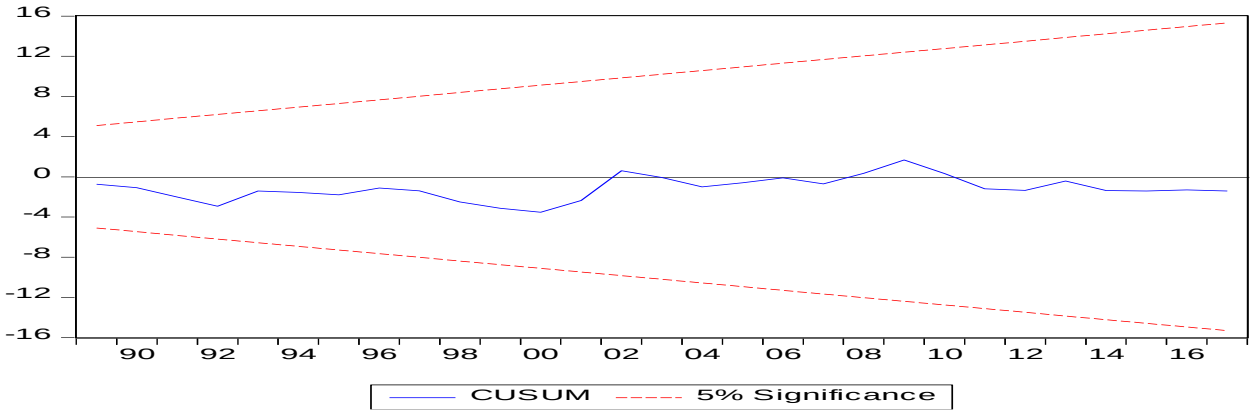
The coefficient of recurrent expenditure (6.8198) was positive and statistically significant at 5 percent as expected. This implies that a unit increase of recurrent expenditure would lead to a decrease in growth rate of real GDP by (6.8198%). This positive relationship implies that as the government increases the recurrent expenditure, the economic growth of the country increases. These results are in contrast with the findings by Kneller *et al*. (2004) and Hasnul (2015) who found negative relationship between recurrent expenditure and real GDP in the long run. These views were possibly due to increases in unproductive spending with a deficit budget which negatively affected economic growth. The effect of recurrent expenditure in the long run also supports the idea of Keynesian theory that increase in government spending, especially recurrent expenditure, stimulates aggregate demand and increases consumption, which in turn leads to increased production and faster recovery from recessions for a stagnant economy.

The coefficient of income tax (-17.7920) was negative and statistically significant at 10 percent as expected. A unit increase of income tax would lead to decrease in growth rate of real GDP by (17.7920%). This implies that income tax such as Individual Tax, pay-as-you-earn tax (PAYE) and Corporation Tax lower the rate of growth of economy of the country. These results concur with Kneller (2004), who found a negative and significant effect on economic growth in OECD countries. The negative effect from these views could be a result of raising the proportion of personal and corporate income taxation that tends to decrease growth, although the magnitude of the effect differs across studies. Hence, increase in taxes leads to fall in disposable income for households and private consumption may fall accordingly.

Stability test

Cumulative Sum (CUSUM) was used to test for the stability of the model at 5% level of significance. Since the results of Cumulative Sum (CUSUM) as evidenced in Figure 2 reveals that the model was stable since the graphs of recursive residuals were within the boundary of the critical regions.

Figure 2: CUSUM of Residual



Serial correlation test

Breusch-Godfrey serial Correlation LM test, at 5% level of significance and two (2) lags was used and the results were presented in Appendix 1. The tests gave no evidence to reject the null hypothesis of no serial correlation because the Obs*R-Squared (3.2890) was statistically insignificant (0.1931) at 5% level and F-statistics results for 2 lags produced larger probabilities indicating that the residuals were not serially correlated. Thus, this test found no evidence of serial correlation among residuals.

Heteroskedasticity test

The t-statistic in appendix 2, at 5% level of significance reveal that the p-value (0.3612) was greater than5%level of significance and the variance of the error term was constant (homoscedasticity). Probabilities for Obs*R-Squared 0.6393 as produced by Breush-Pagan-Godfrey test did not give enough evidence to reject the null hypothesis. Thus, it was concluded that residuals were homoscedastic.

Normality test

The results in Appendix 3 reveals that residuals of the model were normally distributed because the probability value 0.8783 of the equation was greater than 5 percent critical value and histogram was bell shaped. Therefore, the null hypothesis was accepted that the residuals of the equation were normally distributed.

Granger Causality Test

Granger causality test was conducted to confirm the existence of causal relationship between recurrent expenditure, development expenditure, income tax and real GDP and to further confirm existence of the long run co-integration relationship between variables.

Table 5: Pairwise Granger Causality Tests

Null hypothesis	Obs	F-Statistics	Prob.
REC does not Granger Cause RGDP	47	5.1176	0.0021***
RGDP does not Granger Cause REC		1.2132	0.3212
DEV does not Granger Cause RGDP	47	4.6999	0.0035***
RGDP does not Granger Cause DEV		0.7031	0.5947
TAXS does not Granger Cause RGDP	47	1.3151	0.2819

RGDP does not Granger Cause TAXS		7.5853	0.0001***
DEV does not Granger Cause REC	47	1.8973	0.1309
REC does not Granger Cause DEV		3.3682	0.0187**
TAXS does not Granger Cause REC	47	8.4494	6.E-05***
REC does not Granger Cause TAXS		1.2636	0.3012
TAXS does not Granger Cause DEV	47	11.724	3.E-06***
DEV does not Granger Cause TAXS		2.7711	0.0409**

Source: Author's Computation from **Eviews** Version 10.

Note: **** significant at 1%; **significant at 5% and *significant at 10%*

The Granger Causality test results in Table 5reveal that there was unidirectional causation of Real GDP and recurrent expenditure in Tanzania. The direction of causation between Real GDP and recurrent expenditure ran from recurrent expenditure to real GDP. In addition, there was no reverse causation from real GDP to income tax. The test also revealed unidirectional causation of Development expenditure and Real GDP. The direction of causation between development expenditure and Real GDP ran from development expenditure to real GDP. There was no reverse causation from real GDP to development expenditure. Furthermore, the test revealed evidence of unidirectional causation between income tax and Real GDP. The direction of causation between income tax and Real GDP ran from Real GDP to Income tax. There was no reverse causation from income tax to Real GDP. However, there was bidirectional causation of development expenditure and Income.

CONCLUSION

This study adopted the Solow Model (1956) to examine the effects of government spending and taxation on economic growth both in the long run and short run. The study provides the following conclusion:

(i) There is significant evidence that development expenditure and income tax positively affect economic growth while recurrent expenditure affects economic growth negatively in the short run. This could plausibly be due to the fact that returns on investment in sectors such as infrastructure, education and health takes long time to be realized in the short run. However, the study found that in the long run there is evidence that development expenditure and income tax negatively affect economic growth while recurrent expenditure affects economic growth positively. In the long run, some forms of government spending such as capital spending in form of development financing tend to promote economic growth. For the case of recurrent expenditure, somehow the results imply that spending on government consumption indirectly raise the disposable income of firms and households and therefore affects economic growth positively.

(ii) This study also established presence of unidirectional running from independent variables (i.e. recurrent expenditure, development expenditure, income tax) to real gross domestic product. This implies that essentially there is a need for formulating strong fiscal policy architecture, particularly with focus on the key variables studied in this study, since most of them have significant dynamic effect on economic growth in the short run and long run. Therefore, the government should formulate policies to ensure optimal and prudent public expenditure management that contributes positively to the economic growth of the country both in the short run and long run.

(iii) Likewise, the findings imply that both in the short and long run, raising taxes to finance government spending could potentially damage economic growth. Therefore, the government should identify revenue gaps in our tax system with the view to identify new sources of government revenues that may not have adverse impacts on the economy, and the government should also widen its tax base. To this end, there should be more emphasis towardsincreasing the proportion of annual budget for development expenditure given its effects on economic growthand come up with policies that convey a balance between public and private investment in order to bring positive impacts on economic growth. This would in turn minimize the potential for crowding out private investment in the economy.

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APPENDICES

Appendix 1: Serial correlation test

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 4 lags

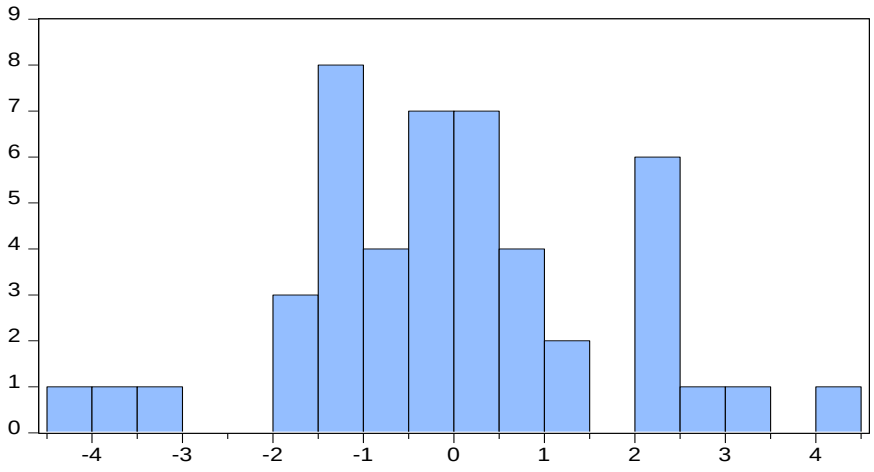
F-statistic	1.061030	Prob. F(4,25)	0.3964
Obs*R-squared	6.820985	Prob. Chi-Square(4)	0.1457

Appendix 2: Homoskedasticity test

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	0.575341	Prob. F(17,29)	0.8832
Obs*R-squared	11.85374	Prob. Chi-Square(17)	0.8089
Scaled explained SS	5.198384	Prob. Chi-Square(17)	0.9972

Appendix 3: Normality test



Series: Residuals
Sample 1971 2017
Observations 47

Mean	-8.54e-15
Median	-0.013473
Maximum	4.331357
Minimum	-4.055508
Std. Dev.	1.710238
Skewness	0.100203
Kurtosis	3.303790
Jarque-Bera	0.259383
Probability	0.878366