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GOVERNMENT EXPENDITURE AND ECONOMIC GROWTH IN TANZANIA: A TIME SERIES ANALYSIS

Kelvin Henry Kyissima[1*] Yapatake Kossele Thales Pacific[2] Abeid Ahmed Ramadhan [3]

[1&3] *School of Economics Huazhong University of Science and Technology 1037 Luoyu Rd., Wuhan, China 430074*

[2] *University of Yaoundé II-SOA, Cameroon, Institute of Governance, Humanities and Social Sciences*

ABSTRACT: *This study empirically examines the long-run and short-run relationship between government expenditure and Economic growth in Tanzania over the period of 1996-2014 making the use of annual secondary time series data. The Error Correcting Model (ECM) is employed to examine the long-run and short-run estimates of parameters. In addition to that the granger causality test is employed to determine whether government expenditures granger causes economic growth. In the long-run government expenditure is found to be statistically significant and has positive relationship with economic growth. The short -run estimates show there is no significant relationship between government expenditures and economic growth. The results of granger causality test show uni-directional causality running from economic growth to government expenditures. The government of Tanzania should improve in the allocation of resources in its development expenditure and social services expenditure and channel such expenditure to allow for private sector participation and infrastructure development in order to accelerate economic growth.*

KEYWORDS: Government Expenditure, Economic Growth, Tanzania, Time Series Analysis

INTRODUCTION

Tanzania's economic growth and size of government expenditure has experienced different phases. As from 1965 up to 1985, Tanzania's net government expenditure was reported to be negative (Kapunda and Topera, 2013). The deficit was mostly brought by the ambition of the government to provide social services to all citizens on equal basis; following the 1967 Arusha Declaration -a statement which established African Socialism in Tanzania. Services such as water supply, health education up to university level were provided freely by the government. This phase was followed by a significant oil price shock in1973-1974, severe draught in 1975 and eventually the collapse of the East Africa Community in the year 1977. The country further experienced the Tanzania-Uganda war in 1978-1979 which escalated government expenditure especially in food, weapons and petrol imports (Kapunda and Topera, 2013).

After implementation of economic liberalization policies in Tanzania from as early as 1988, net government expenditure became positive. However, the share of government revenue to expenditure reduced from 82 percent in 1986 to 57 per cent in 2010. On the side of economic growth, Tanzania did perform well during the 1960's and 1970's, reporting average annual growth

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at 5.4 percent. During the 1980's growth declined to 1.9 percent per annum due to economic crisis (Kapunda and Mbogoro, 1989). After implementation of major economic reforms growth rates rose to 5 percent around 1986.

In the early 1990's, Tanzania gradually embarked on a move to liberalize its economy and began pursuing market oriented reforms. The reforms became intensified in 1996 which resulted in major improvement in macroeconomic stabilization and economic growth acceleration. Particularly the average growth rate was 4.8 percent between 1996 to 2013 an improvement compared to the 3 percent average growth from 1990-1995. According to (tradingeconomics website, 2016) over shorter periods, GDP annual growth rate in Tanzania averaged 6.7 percent from 2002 until 2006, reaching an all-time high of 11.9 in 2007 and lowest of 2.6 per cent in 2009 the recorded low growth rate is linked to impact of global financial crisis in 2008. On the side of government expenditure (theglobaleconomy website, 2016) reports that for Tanzania the average value of government spending as percentage of GDP from 1990 to 2014 was 15.1 per cent with a minimum of 8.28 percent in 1997 and a maximum of 19.64 in 1992. It is the goal of this study to analyze the relationship between government expenditure and economic growth after implementation of liberalization policies in Tanzania in 1995.

The relationship between the growth rate of the economy and government expenditure has for sometimes been a subject of debate and analysis. The arguments mostly bear on the question what is the role of government size on economic growth. If the government expenditure can cause economic growth, then consequently the size of the government stands as an important factor in explaining differences in economic growth in different countries.

Among the interesting arguments on the topics are those raised by Barro (1990) who examined and endogenous growth model and present a possible relationship existing between the share of government spending in GDP and the growth rate. This endogenous growth model presents a possible relationship existing between the share of government spending in GDP and the growth rate. This endogenous growth model, unlike other traditional growth models such as those in Cass (1965), Solow (1956) are interesting because they present the underlying phenomenon without depending on exogenous changes in technology or Labour growth. Romer (1986), Lucas (1988) and Becker et al (1990) present good examples.

Theoretically economists have shown how the government expenditure may impact economic growth. For Instance, Kweka and Morrissey (2000) presented that in the Traditional Keynesian Macroeconomics theory government expenditure; even recurrent expenditure can affect economic growth positively through the multiplier effect.

In this study, we explore the relationship between government expenditure and economic growth and go further to analyze other variables which we hypothesize to be factors of economic growth particularly these are foreign direct investment and Gross Domestic savings. Following the introduction in section I, the rest of the paper is organized as follows: section II provides a review of related literatures. Section III presents the methodology. Discussion of the results in section IV, while section V concludes the study with policy recommendations.

LITERATURE REVIEW

Empirical studies on government expenditure have previously been conducted in Tanzania for instance Osoro (1997) investigated the relationship between government spending and public revenue using a Granger Causality Approach. They found that there is positive relationship

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between government spending and economic growth. Kweka and Morrissey (2000) used a cointegration approach and studied the impact of government spending on economic growth in Tanzania. Their study covered a period of 32 years and found out that productive investment expenditure was linked to lower level of growth. The negative relationship suggested inefficiency in public investment in Tanzania.

Lin et.al (2010) examined the casual relationship between government expenditure and economic growth. They use a panel data set which includes 182 countries from the period 1950 to 2004. They employed Panel Granger Causality test as developed by Hurling (2004, 2005). Their findings first support Wagner's Law and the hypothesis that government spending helps in economic growth. Secondly, they found that when the countries are disaggregated by income levels and degree of corruption, their results also confirm bi-directional causality between government activities and economic growth for the subsamples of countries except for low income countries. The distinct feature for low income countries is attributed to inefficient governments and inferior institutions.

Kwendo and Muturi (2015) analyzed the effects of public expenditure on economic growth of East African Community. The countries included in their study include Kenya, Uganda, Rwanda, Burundi, and Tanzania. Their paper aimed at investigating the effect of public expenditure on components of consumption, health, defense and agriculture. They used panel data for the period 1995-2010; by using fixed effect model and they found that agriculture and defense expenditure have a negative impact on economic growth, they also found that health and consumption expenditure have a positive effect on economic growth.

Loizides and Vamroukas (2004) examined if the relative size of the government as measured by the share of total expenditure in GNP can be determined on how it causes economic growth. To achieve this, they used a bivariate error correction model within a Granger Causality framework. They further added unemployment and inflation on a separate estimation as explanatory variables, creating a simple "trivariate" analysis for each of these variables. Using data from Greece, UK and Ireland their findings show that government size Granger cause economic growth for all countries in the sample in the short run and in the long run for Ireland and the UK. Their study further found that economic growth Granger causes Increase in the government size for the case of Greece and when inflation is included in the UK.

Hamzah (2011) studied the association between government expenditure and economic growth in Malaysia. The paper covers the period from 1970 2007. A focus is made on governmental development expenditure. The study used OLS regression for the empirical analysis. The findings showed that the rising of total government development expenditure has significant negative relationship with economic growth. The study found the same results for government development expenditure on economic services, when government expenditure was disaggregated. Moreover, the study revealed that there was no relationship between total development expenditure in social services and economic growth. Additionally, the study founds mixed results for expenditure by sectors. Out of eleven sectors in Malaysia only three sectors which are, transport, public utilities and health have a positive and significant relationship towards economic growth. The study concludes that existence of crowding out effect, rent-seeking activities, cronyism, corruption and skilled brain drain that lead to the negative relationship.

Kapunda and Topera (2013) examined government expenditure composition and its influence on economic growth in Tanzania. They used data covering the period from 1965 to 2010 and employed the Ordinary Least Square method. Their study found that the factors which contribute positively and significantly to economic growth are terms of trade and capital expenditure. They also found

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that expenditure on health, agriculture; defense and general public services and infrastructure have a positive but not significant relationship with economic growth. Real exchange rate, real foreign interest and private policy which were measured by a dummy variable also affect economic growth positively, but not significantly. Recurrent expenditure is found to have a negative impact on growth.

Hsieh and Lai (1994) examined the intertemporal interactions among the growth rate in per capita real GDP, government spending and the ratio of private investment to GDP for a group of seven countries to untangle the nature of the relationship between government expenditure and economic growth. They employed a multivariate time series analysis with particular attention paid to the casual shape of the impulse-response function in vector Auto regression. The results showed that the relationship between government expenditure and economic growth varies over time and across countries. They found no consistent evidence that government spending can increase per capita output growth. They also found no evidence to support the negative Argument. For most countries in their study they found that public spending has a small contribution to economic growth. Their study builds from Barro (1990) endogenous growth model. Mekdad et.al (2014) examined the effect of public spending on economic growth in Algeria for the period 1974-2012. Their study used Ordinary Least Square and Johansen Co-integration test and causality tests, their results showed that public spending on education effects economic growth positively.

Koeda and Kramarenko (2008) studied the impact of government expenditure on growth in Azerbaijan. In their study, they made a review of historical precedents and neoclassical growth model. They reviewed the experiences of Nigeria and Saudi Arabia during the 1970 and 1980's. Their study found that the fiscal policies scenarios evaluated carry significant medium and long-term risks. Lessons from historical experience of managing large surges of oil revenue, expenditure and Azerbaijan-specific model show that for Azerbaijan a growth deceleration could be unavoidable once oil production declines. Irmen and Kuehnel (2008) provided a comprehensive survey of recent literature on the relationship between productive government expenditure and economic growth. They review Barrow's (1990) seminal paper and put forward that understanding of the core results of the ensuing contributions can be obtained from their Euler equations. They recommended that future research has to focus on idea-based endogenous growth models; so as to check if policy recommendations are robust. They further suggested that inclusion of government expenditure which haven't been previously explored such as "rule of law" will be desirable.

Churchill et.al (2015) conducted an empirical synthesis of the link between economic growth and government expenditure in health and education by using meta-analysis. They used a sample of 306 estimates from 31 studies. Their study found that government expenditure on education has a positive relationship with growth, while health is found to have a negative effect. Their meta-regression results suggested that factors such as econometric specifications, publication features as well as data features account for heterogeneity in the literature. Gisore et.al (2014) investigated empirically the contribution of government expenditure to economic growth in East Africa. They disaggregate expenditure from 1980 to 2010 and used a balanced panel fixed effect model. They found that expenditure on health and defense are positive and statistically significant. They however found that education and agriculture expenditure were not significant. They recommended channeling fewer funds towards education, agriculture and other sectors and more expenditure towards health and defense to boost growth for East African countries.

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METHODOLOGY

The aim of this paper is to examine the relationship between government expenditure on economic growth in Tanzania. The study covers the sample period between 1996-2014. In order to examine the relationship between the government expenditure and economic growth, the paper employs four variables. Economic growth is a function of government expenditure, gross domestic investment, and foreign direct investment. It is mathematically specified as follows:

$$GR_t = f(GE_t, GDI_t, FDI_t) \quad \text{.....} \quad (1)$$

Thus, our growth function become:

$$GR_t = \beta_0 + \beta_1 GE_t + \beta_2 GDI_t + \beta_4 FDI_t + \varepsilon_t \quad \text{.....} \quad (2)$$

Where:
GR = economic growth at time t (% of GDP)
FDI = Foreign Direct Investment at time t, measured as Foreign Direct Investment as a percentage of GDP
GE = Government Expenditure at time t, measured as Government Expenditure as a percentage of GDP
GDI = Gross Domestic savings (% of GDP)
t = time
ε = Error term
β = slope coefficient

The stationarity of the variables employed in this study is checked using the Augmented Dickey Fuller test (ADF) and confirmed using the Philip Peron test (PP). The general form of the ADF and PP test is estimated as follow:

ADF: $\longrightarrow$ $\Delta Y_t = \beta_0 + \beta_1 \gamma_{t-1} + \sum_{t=1}^{n} \beta \gamma_t + \delta_t + \varepsilon_t$ .....(3)

PP: $\longrightarrow$ $\Delta Y_t = \beta_0 + \beta_1 \gamma_{t-1} + \varepsilon_t$ .....(4)

Where:
Y= is a time series
t= linear time series trend
Δ = first difference
β_0 = is the constant
n= optimum number of lags in the dependent variable
ε_t = random error term

The Johansen Cointegration test is employed to check the long-run relationship between our variables. The Equation (2) is rewritten to know the disequilibrium error as:

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$$\varepsilon_t = GR - \beta_0 - \beta_1 GE_t - \beta_2 GDI_t + \beta_3 FDI_t + \varepsilon \text{.....(5)}$$

The direction of integration of the predictable residual ε is established. If Cointegration occurs, then equation (5) produces a non-unit root time series and has a zero mean. They should be non-unit root, I (0) with $\varepsilon = 0$. The Vector Error Correction Model (VECM) is involved to examine for the presence of a long-term association in the equation only. If a cointegrating association is recognized from the Johansen test, a Vector Error Correcting Model (VECM) is used to model the long-run causation and the short-run dynamics. The purpose of the VECM is to show the speed of corrections from the short-run equilibrium to the long-run equilibrium state. The greater the coefficients, the higher the speed of correction of the model from short-run to long-run. The VECM is expected as shown below:

$$\Delta GR_t = \beta_0 + \beta_1 + \sum_{t=1}^{n} + \beta_2 + \sum_{t=1}^{n} \Delta GE_{t-1} + \beta_3 + \sum_{t=1}^{n} \Delta GDI_{t-1} + \beta_3 + \sum_{t=1}^{n} \Delta FDI_{t-1} + \alpha_1 ECM(-1) + \varepsilon \text{ .....(6)}$$

Where is the error term, ECM is the error correction term α_1 which captures the short-run effect. The short-run influences are caught through individual coefficients of the differenced terms β while the coefficients of the ECM variable comprise information almost the influence previous values have on the present values the magnitude and the statistical importance of the coefficients of the ECM measures the tendency of each variable to return to the equilibrium. Whether a coefficient is significant, it suggests that previous equilibrium mistakes plays a role in influencing the present results. In addition to that the granger causality test is employed to determine whether one variable (Y) granger causes another variable (X). This test was established by Granger (1987) and variable X is said to granger cause variable Y if Y aids in the forecasting the behaviour of X or whether the coefficients on the lagged of Y are statistically significant.

RESULTS AND DISCUSSIONS

Table 1: Unit root test by Augmented Dickey Fuller (ADF)

	At level		First difference		Included
Variables	t. stat	Prob	t. stat	Prob.*	
GR	-3.5879	0.0172	-9.8521	0.0000***	Intercept
GE	-2.5164	0.0757	-5.2224	0.0007***	Intercept
GDI	-1.4262	0.5464	-3.0899	0.0466**	Intercept
FDI	-4.4812	0.0028	-4.8424	0.0017***	Intercept

***, **, * indicates rejection of the null hypothesis of Unit Root Test at 1%, 5% and 10% levels of significance
Source: Prepared by the authors, based on Eview 8

Checking the order of integration is a pre-requisite for nearly all time series analysis. In this paper, we employed the Augmented Dickey-Fuller (ADF), Phillips-Perron (PP). The outcomes of the unit root tests are described in Table 1 and Table 2. At the 1 % significant level, the outcomes of ADF unit root test advocate that all variables are integrated of order one, I (1) process. Nevertheless, the PP unit root tests display that all variables are non-unit root at the first difference.

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Table 2: Unit Root Test by Phillips Perron (PP)

	At level		First difference		Included
Variables	t. stat	Prob	t. stat	Prob.*	
GE	-2.8164	0.0757	-5.1974	0.0008***	Intercept
GDI	-1.4185	0.5501	-2.9720	0.0580**	Intercept
FDI	-4.9104	0.0012	-10.4056	0.0000***	Intercept
GR	-3.5879	0.0172	-9.8521	0.0000***	Intercept

***, **, * indicates rejection of the null hypothesis of Unit Root Test at 1%, 5% and 10% levels of significance
Source: Prepared by the authors, based on Eview 8

Table 3: Johansen Test for unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eiqenvalue	Trace Statistics	0.05 Critical Value	Prob. *
None	0.9101	69.5940	47.8561	0.0001***
At most 1	0.7022	28.6230	29.7970	0.0678*
At most 2	0.3066	8.0249	15.4947	0.4628
At most 3*	0.1004	1.7995	3.8414	0.1798

Trace test indicates 1 cointegration) at the 0.05 level and * denotes rejection of the hypothesis at the 0.05 level.
Source: Prepared by the authors, based on Eview 8

Table 4: Johansen Test for unrestricted for Max-eigenvalue Test

Hypothesized No. of CE(s)	Eiqenvalue	Trace Statistics	0.05 Critical Value	Prob. *
None	0.9101	40.9709	27.584	0.0005***
At most 1	0.7022	20.5981	21.1316	0.0592**
At most 2	0.3066	6.2253	14.2646	0.5845
At most 3*	0.1004	1.7995	3.8414	0.1798

Trace test indicates 1 cointegration at the 0.05 level and * denotes rejection of the hypothesis at the 0.05 level.
Source: Prepared by the authors, based on Eview 8

The Johansen's test is used to examine long-run association between the dependent and independent variables. The results are presented in Table 4 and Table 5. The results of both tests suggest the presence of unique co-integrating relationship among the variables under consideration at 5% level of significance. This suggests that the series under thought are determined by at least one common trend. This signifies the prevailing association among government expenditure, foreign direct investment, gross domestic savings and economic growth and that the regression is not spurious.

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Table 5: Granger Causality Test

Null Hypothesis	F-Statistics	P-value.
GE does not Granger Cause GR	0.1592	0.8546
GR does not Granger Cause GE	25.9133	0.0000***
GDI does not Granger Cause GR	0.3960	0.6815
GR does not Granger Cause GDI	0.1289	0.8802
FDI does not Granger Cause GR	0.5375	0.5976
GR does not Granger Cause FDI	1.8178	0.2044

, * denote rejection of the hypothesis at the 0.05 and 0.10 levels
Source: Prepared by the author, based on Eview 8

Table 5 indicates that economic growth un-directionally granger causes government effectiveness. This is revealed by the significance of its respective F-statistic values and probability value while gross domestic savings, foreign direct investment indicates independence neither uni-directional nor bi-directional causality.

Table 6: short run analysis, Error Correction Mechanism

Dependent Variable: Economic Growth (GR)				
Variable	Coefficient	Std. Error	T. Statistic	Prob*
D (GE (-1))	0.2276	0.2157	1.0552	0.3105
D (GDI (-1))	0.2012	0.1819	1.1060	0.2888
D (FDI (-1))	0.1783	0.2160	0.8256	0.4239
ECM (-1)	-0.6611	0.2084	-3.1721	0.0054***

***, **, * indicates rejection of the null hypothesis at 1%, 5% and 10% levels of significance
Source: Prepared by the authors, based on Eview 8

The results of the ECM in Table 7 indicates that our model is a good fit as the value of ECM is negative and significant at 5% level of significance which means that our model is convergent. Moreover, -0.6611 value of ECM is an indication that co-integrating association presence among the variables. The coefficient on the error correction term (ECM) denotes that 66.11 % of the disequilibrium initiated by earlier converge to the long-run equilibrium in the present year. The government expenditure, gross domestic savings and foreign direct investment are not significant in the short-run where they exert a positive effect on economic growth.

The positive values indicate that rises in government expenditure, gross domestic savings, and foreign direct investment rise economic growth. A 100 rise in government expenditure, gross domestic savings and foreign direct investment, all things being equal will lead to 22 %, 20%, 17% rise in economic growth respectively. For this result the independent variables are all necessary

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but insufficient to effect significantly the economic growth. It in line with our estimated sign in table 1 but not in line with the theoretical thought.

Table 7: Estimated results for Long-run

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GE	0.2127	0.0953	2.2319	0.0403**
GDI	0.1242	0.0812	1.5296	0.1456
FDI	0.2957	0.1963	1.5060	0.1515

***, **, * indicates rejection of the null hypothesis Test at 1%, 5% and 10% levels of significance
Source: Prepared by the authors, based on Eview 8

The table 7 presents the long-run influences of independents variables on economic growth. Government effectiveness exerts a positive and significant effect on economic growth. The result is in line with the estimated sign and theoretical thought that government expenditure can influence the economic growth. The coefficient of 0.2127 suggests that in the long-run, a 100 rise in government expenditure will lead about 21 % rise in economic growth. However, gross domestic savings and foreign direct investment exert a positive and insignificant on economic growth.

Table 8: Diagnostic test

Diagnostic	Statistic	Conclusion
Heteroscedasticity Test: Breusch-Pagan-Godfrey	F-statistic =4.1410 P-value = 0.0252 Obs*R-squared = 8.6073	There is no heteroscedasticity
Breusch-Godfrey Serial Correlation LM Test	F-statistic = 0.5459 P-value = 0.5920	No serial correlation
Normality Test	Jarque-Bera Test = 0.9295 P-value = 0.6282	Residual are normally distributed

Source: Prepared by the author, based on Eview 8

The diagnostic test (Table 8) and stability (figure 1) test are conducted. The results show that the model passes all diagnostic residual tests and stability test.

Figure 1: stability test of residual (CUSUM and CUSUM of Squares)

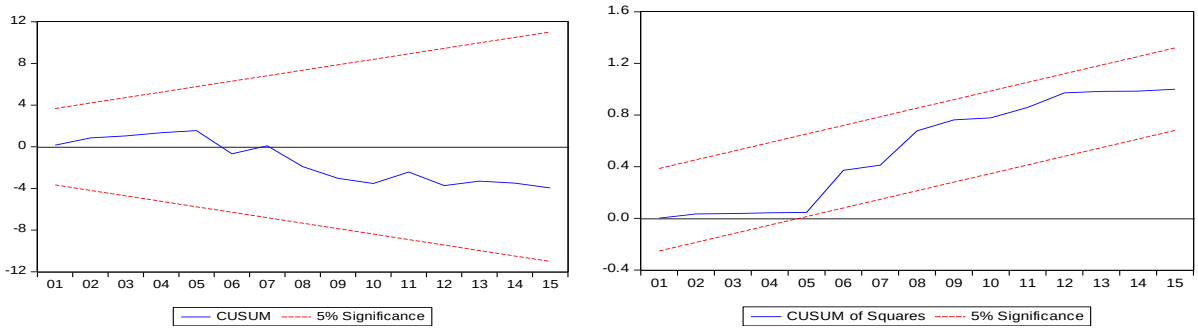

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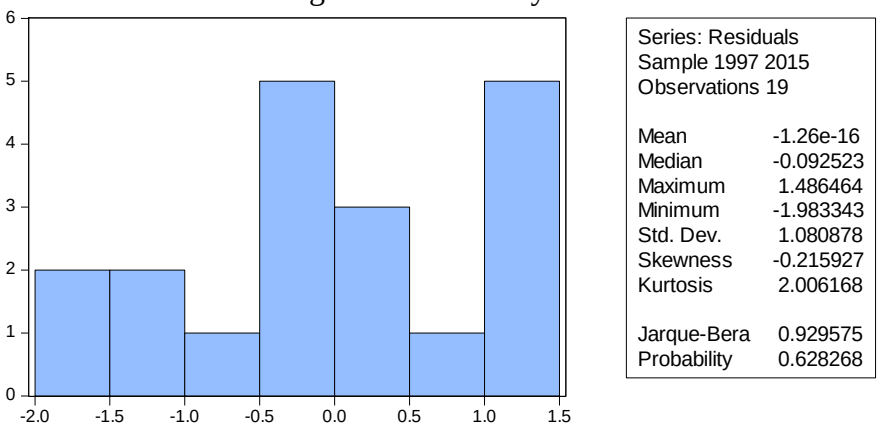
Figure 2: Normality test



CONCLUSION AND RECOMMENDATIONS

The main objective of this paper is to investigate the relationship between government expenditure and economic growth in Tanzania. We used time series of annual data for Tanzania over the period of 1996-2014 employing ECM and Granger causality approach. The findings show the presence of long-run relationship among variables in the model and that government expenditure has a positive and significant effect on economic growth. We also found an un-directionally granger causality running from economic growth to government expenditure.

Based on these findings, the study suggested that government expenditure can promote economic growth of Tanzania. To achieve this objective, the government should also direct its expenditure towards the productive sectors like social services and infrastructure development in order to raise the economic growth. Such expenditure can also be channeled in such a way to allow for private sector participation in development since the private can play a significant role in improving economic growth.

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