GOVERNMENT SPENDING AND ECONOMIC GROWTH IN TANZANIA

1985-2015

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT FOR THE REQUIREMENTS OF THE DEGREE OF MASTER OF SCIENCE IN ECONOMICS OF THE OPEN UNIVERSITY OF TANZANIA

2020

CERTIFICATION

The undersigned certifies that, he has read and hereby recommend for acceptance by the Open University of Tanzania this Dissertation titled; "Government Spending and Economic Growth in Tanzania 1985-2015" in partial fulfilment for the requirements of the degree of a Master of Science in economics of the Open University of Tanzania.

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Dr. Felician Mutasa

(Supervisor)

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Date

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DECLARATION

I, Omari Sihaba Ruwinde, do hereby declare that this dissertation is my own original work and that it has not been presented to any other Institute for a similar or any other master degree award.

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Signature

…….……..

Date

DEDICATION

This dissertation is dedicated to my wife Mwanahija, my daughter Shamsia and my sons Alli and Abdullatif whose love and inspiration encouraged me to complete this work.

ABSTRACT

The importance of understanding the relationship between government spending and economic growth has inspired many scholars to investigate the underlying relationship between these variables. In Tanzania the growth in public spending has become a topical issue in the light of escalating debt level and widening budget deficit; as a results, the government is constantly under pressure to borrow to cover the deficit. The aim of this study was to investigate the relationship between government spending and economic growth in Tanzania. The study used secondary data which was sourced from the Tanzania Ministry of Finance and World Bank websites for the period from 1985 to 2015. The data was analyzed using E-Views tool. The econometric tools used to analyze the data are the Autoregressive Distribution Lag (ARDL) and the Pairwise Granger Causality Test. The variables included in the research are government spending and economic growth. Both variables were stationary at first difference. Empirical findings from the study indicate that there is a positive and significant relationship between government spending and economic growth in Tanzania both in the short-run and the long-run. Further, Granger causality test demonstrated a unidirectional and directional causality from government spending to economic growth. In essence, the study recommended more allocation of resources towards public expenditure, including exploiting public-private partnership as a way of increasing expenditure toward social sectors and infrastructure without necessarily increasing the strain on government resources.

ACKNOWLEDGEMENT

This dissertation is made possible through the help and support from everyone. Different people have made significant contribution in accomplishing this fine work. First and foremost, I thank almighty GOD for the strength he gave me throughout the study. I would also wish to thank Dr. Felician Mutasa my supervisor, for his valuable guidance and encouragement. I would also like to thank the coordinator of MSc Economics program and all lectures at Open University of Tanzania for their assistance in one way or another in elevating me to this academic position.

I also appreciate the contribution of my classmate who in one way or another assisted me for the success of this work. Thank my workmate, Ms. Mwajuma H. Ally, head of Procurement Management Unit in Cereals and Other Produce Board of Tanzania (CPB), who supplied me stationary materials.

Furthermore, I would like to thank my late father, my mother, my family and friends; they were a great source of support and encouragement. The product of this work would have not been possible without all of them.

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LIST OF ABBREVIATIONS

EAC	East Africa Community
GDP	Growth Domestic Product
SAP	Structural Adjustment Programme
IMF	International Monetary Fund
HIPC	Heavily Indebted Poor Countries
NGO's	Non Government Organization
WB	World Bank
OCED	Organization for Economic Cooperation and Development
TIC	Tanzania Investment Centre
BoT	Bank of Tanzania
NBS	National Bureau of Statistics
MoF	Ministry of Finance

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

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 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 (trading economics 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 percent 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 (the global economy 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 labor 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.

1.2 Problem Statement

Although government expenditure has been increasing overtime, its impact on the economic growth in the country is still an empirical issue. In some cases the government spending has not been translated into a meaningful economic growth to the country (Grier and Tullock, 1989). It is observed that government expenditure has been increasing faster than the economic growth. Although, there is a direct relationship between the government spending and economic growth but what cause the other is not well known. Tanzania economic growth during the 1960's and 1970's reporting an average annual growth rate at 5.4 percent, during 1980's was recorded at the rate of 1.9 percent. In 1986 recorded at the rate of 5 percent in early 1990's was recorded at the rate of 4.8 percent. The average value of government spending as percentage of GDP from 1990 to 2014 was 15.1 percent. Most of the studies have come with contradicting results about the

relationship between government expenditure and economic growth.

Many similar studies have been conducted, a few in Tanzania on government expenditure for instance Osoro (1997) investigated the relationship between government spending and public revenue using a Granger Causality Approach. He found that there is positive relationship 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. Therefore, this study intends to find out whether there is a causal relationship between the government expenditure and economic growth in Tanzania. The actual relationship between government expenditure and growth is not well understood and there is a need for empirical study to be undertaken (Grier and Tullock,1989).

1.3 Purpose and Significance of the Research

The findings of this study will contribute greatly to the existing literature on the relationship between the government spending and economic growth. Therefore this study can serve as the reference for further studies on all issues concerning the relationship between government spending and economic growth. Moreover the impact of government spending on economic growth has been an important subject among scholars for several years now. The findings of the study will be useful to policy makers and it will complement previous studies to create the basis of expenditure preference that relies on the

relative contribution of the government spending to economic growth. Finally, the study can be used as a reference during budget setting, for proper allocation of revenue to the sectors which promote economic growth.

1.4 Objective of the Study

The main objective of this study is to investigate the relationship between government spending and economic growth in Tanzania using time series data for the period 1985- 2015.

1.4.1 Specific Objectives

i. To examine relationship between government development expenditure and economic growth.

ii. To test causality between government spending and economic growth.

1.5 Research Hypothesis

$H_{0:}$ There is no relationship between government spending and economic growth

$H_{1:}$ There is a relationship between government spending and economic growth.

1.6 Scope and Limitation of the Study

This study covers the 1985-2015 period and focusing on Tanzania mainland. The period chosen is sufficient because it covers the period after implementation of structural adjustment programme in Tanzania. The study covers only the selected sectors which are education, defence, export, health and public investment. There are various limitations associated with this study. Firstly; the study covers only the selected sectors of the economy. This might end up with wrong conclusion about growth and development which is the multi-sectoral function of the economy.

Moreover, studying all sectors of economy is time consuming and expensive. Secondly; the financial constraint that has lead to get information for a short period of time.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews relevant theoretical and empirical literature on government spending and economic growth. Reasons for public sector growth, theoretical and empirical relationship between government spending and economic growth will be examined. Lastly, the chapter presents the summary and emerging gap of the study.

2.1 Theories of Economic Growth

2.1.1 Classical Theories of Economic Growth

The Classical theories of economic growth started with two main critiques of political economies that existed in the 18th Century. The first was steered by the Scottish enlightenment led by David Hume (1711-1776), Adam Smith (1723-1790) and David Ricardo (1772-1823); and the other critique came via the French mercantilist followers led by Jean Baptiste Say (1767-1832) and Destutt de Tracy (1754-1836).

Thomas Malthus (1766-1834) is another equally influential contributor to classical growth theories. In 1776, Adam Smith authored a book called 'An inquiry into the Nature and Causes of Wealth of Nations': his economic growth theory measured the output of any nation by the amount of labor required to produce that output. Coined the "labor theory of value", Smith's argument was that the real measure of any exchangeable value of output was a result of labor production costs (Smith 1776). His theory of any economy's growth trajectory was therefore a simple equation

where: □ = (N,). The inherent weakness of this model of output growth was that it misrepresented the reality of the industrial revolution during his time. His philosophy or synthesis missed important arguments propagated by David Hume, who mooted the importance of money and trade through commerce and industry and also the importance of migration from areas with high production costs to the lowest cost base (Mills 2002).

In addition, the labour theory of value missed important factors such as land: for example Richard Cantillon (1697-1734) had argued that the price and intrinsic value of any good or service was, in general, a measure of the land and labour inputs that were part of its production process (Cantillon, 1730). In essence, combining the Cantillon and Smithian ideas, the growth of output was a function of both land (N) and labour (L). Y = *f*(N,L).

Mercantilism and the phraseological ideology of deduction: Jean Baptiste Say (1767-1832) expounded the Cantillon and Smithian economic growth model by coining the triad of classical factors of economic growth, namely: Land (or natural agents), labor, and capital as the most important inputs or factors of production (Rothbard 1995). In extending the Cantillon and Smithian growth equation, the new function was presented as: Y = (*N*).

Where: Y = Total Output = Land or Natural Agents = Labor = Capital Stock

The principles laid out by Jean Baptiste Say originated from de Tracy's phraseological ideology of deduction where he presented a logic depicting the important role that labor plays in increasing productivity. In de Tracy's argument,

labor was at the centre of the production process where land or natural agents were employed to create physical capital. The newfound investment or technology was then combined with the same labor and land to increase production and productivity (Rothbard, 1995).

De Tracy also argued that distortions arising from government involvement and its use of taxes were wasteful and unproductive and negatively affected the production and productivity of goods and services. In addition, de Tracy argued that the manipulation of the currency through debasements created an incidence of inflation that was also detrimental to production and growth. De Tracy emphasized the role of an entrepreneur as an alternative to government involvement in the production of wealth (Rothbard 1995). The classical production function was, therefore, expounded by the Mercantilists to include government and inflation as important determinants of economic growth:

Y = (N,K,G,I).

Where: G = Government factors (expendire, taxes, etc.) I = Inflection or debasement of currency.

David Ricardo and the land theory of value: David Ricardo (1772-1823) is regarded as one of the classical economists: he attempted to explain the relationship between output growth and its factors using a different approach focusing on the distribution of output within macroeconomic classes such as landlords who demanded rent from their land, laborers whose value was determined by wages, and capitalists who expected profit from the capital they invested. In the Ricardian system, total output was distributed as a share of rent to landlords, R; share of

income to capitalists, P; and a share of wages to workers, W (Rothbard 1995). The Ricardian growth equation, therefore, could be represented as

$Y = (R,P)$.

Unlike Adam Smith's approach, in the Ricardian system, the growth in output was seen as a function of the land theory of value where the plausible explanation for dissimilarities in output growth was attributed to differences in the fertility of land. In his theory, Ricardo argued that economic agents would always start using the land with the highest fertility before cultivating areas with the least fertility. The practicability of Ricardo's theory of output accumulation was vehemently questioned as it did not reflect the progress made by economies that went through the industrial revolution, especially with regard to advances made in increasing the productivity of agricultural land, the discovery of new lands, and the use of new agricultural techniques.

Furthermore, the fixing of wages in his analysis was not in line with the realities on the ground (Rothbard 1995). Another significant contribution by David Ricardo also came through the law of comparative advantage that advocated for the production of goods and services where a nation determines what it is best at producing (Rothbard 1995). However, the principle governing how this is linked to economic growth has not been fully studied or specified.

2.2 Review of Empirical Findings

The size of government spending and its impact on long-term economic growth and the reverse have been topical for more than a decade now. Many studies have

analyzed the relationship between government spending and economic growth and how they impact on each other and observed contrasting results from these studies. Therefore, the future still holds hope in a formalized relationship between government spending and economic growth, or a better explanation of the causes of the variation in these research results.

This inter-relationship between government expenditure and economic growth is largely explained by two theories i.e. Wagner's law and Keynesian hypothesis. Wagner considers public expenditure as the endogenous factor that is caused by economic growth by contrast the Keynesian theory considers government expenditure as the exogenous factor that causes economic growth. According to Bagdigen and Cetintas (2004) Wagner's law and Keynesian theory present two opposite views with regard to the relationship between public expenditure and economic growth.

Adolph Wagner (1835 – 1917), a German political economist, in 1883 hypothesized a well-known relationship between the growth of the economy and relative growth in government spending activities. Wagner's law is fulfilled when the share of government spending in the economy increase as economic growth progress in response to the intensification of existing activities and extension of new activities. Wagner's law indicates that, it is the economic growth that leads to an increase in government spending and not the other way round (Garba and Abdullahi, 2013). Wagner referred to this as the "Law of Increasing Extension of State Activity". Hall (2010), states that government spending is key to economic growth and development. He argues that it is more efficient and effective compared to markets

in financing infrastructure, including roads, electricity and water and other services such as health and education all necessary for modern day society. According to Mitchell (2005) John Maynard Keynes (1883 – 1946), a British political economist, in 1935 hypothesized that government spending – particularly increases in government spending – boosted growth by injecting purchasing power into the economy.

Keynes believed that the solution to unemployment is not to reduce wages and prices as advocated by classical economist, but to increase consumption through the spending of money by the government. According to Keynes government can reverse economic downturns by borrowing money from the private sector and then returning the money to the private sector through various spending programmes. The greatest limitation of the Keynesian theory is its inability to consider the problem of inflation which might be brought about by increased government spending (Muthui et al., 2013).

As explained above Wagner's Law and Keynesian theory present two opposite directional relationship between government spending and economic growth. As a result studying the causal relationship between government spending and economic growth has had a sustained interest over the last years. It is not surprising therefore that many studies have analyzed this relationship between government spending and economic growth and their effect on each other and there still is not a commonly held conclusion. The impacts of sector spending on economic growth most studies that have been conducted to examine the sector impact on economic growth have used functional classification of expenditure. According to Galbraith (2000), most

governments classify their expenditure by functional classification so that comparison of major activities over time can be made even as underlying programs and agencies change. Further, functional classification enables analysis of expenditure trends and also enables comparison with the expenditure of other governments. This section of the literature review is focused on studies that have analyzed the impact of expenditure by sectors on economic growth.

Most of the studies that were reviewed in this section of literature review classified expenditure into the following classes; education, health, agriculture, defense, infrastructure, general administrative, recurrent and capital expenditures. However, they all examined the impact of sector expenditure against economic growth as the dependent variable. Li and Liang (2010) conducted a study in East Asia and found that the impact of public education expenditure on economic growth was a little 'fragile'. The statistical results showed that the statistical impact of health on economic growth is stronger than that of education. Given the results, it makes more sense to invest more in health than education human capital. Li and Liang used panel data set from 1961 to 2007, the study covered East Asia economies including China.

The findings in the study by Li and Liang (2010) are important to this study as they inform this study of the impact of educational expenditure on East Asian economies. Further, Li and Liang (2010) found that health expenditure had a more significant effect on the East Asian economies compared to education expenditure. However, Li and Liang used panel data set from 1961 to 2007, in contrast, this study used time series data from 1985 to 2015. While this study is focused on Tanzania and will

analyze the whole government expenditure impact on economic growth, Li and Liang's study focused on health and education expenditure in East Asia.

A study by Nworji, *et al.*, (2012) on effects of government expenditure on economic growth in Nigeria found that a relationship exists between government expenditure and economic growth, and that while some sections of government spending exerted a negative effect on growth and others exerted a positive effect. Expenditure on economic services had insignificant negative effects on economic growth. Capital expenditure on transfers had an insignificant positive effect. However, capital and recurrent expenditure on social and community services and recurrent expenditure on transfers had significant positive effect on economic growth.

The study examined data between 1970 and 2009, the time series data analyzed included gross domestic product (GDP) and government expenditure. The analysis was based on the regression model. The findings by Nworji *et al.* do not support the findings of an earlier study by Soli, Harvey and Hagan (2008) where they deduced that government capital spending has a negative influence on economic growth, but instead, government recurrent expenditure has a positive effect, though not immediately but after two years.

The study by Nworji, *et al.* (2012) has significance to this study as it informs this study of the impact of various sector expenditures on economic growth as a whole. It also highlights the fact that some sectors have positive and others have a negative impact on economic growth. Further, Nworji *et al.'s* study is based on an African country like Zambia and used time series data set from 1970 to 2009 as this study

will also use time series data from 1985 to 2015 in Tanzania.

Another study by Kweka and Morrissey (2000) on government spending and economic growth in Tanzania, found that increased productive expenditure (physical investment) appears to have a negative impact on growth, however, consumption expenditure was found to have a positive effect on growth, especially private consumption. On the other hand, expenditure on human capital investment was found to be insignificant in the regression probably because any effects would have very long lags, however, this is contrary to the findings by Jung and Thorbeeke (2001) who found that public education spending had a positive impact on economic growth. The study confirmed the view that public spending in Tanzania was not productive mainly due to unfavorable macroeconomic conditions. Kweka and Morrissey concluded by stating that it should not be presumed that government spending is growth-promoting. They examined data for a period 1965 to 1996 and used regression model.

Kweka and Morrissey (2000) also highlighted the fact that some sector expenditure have positive and others have a negative impact on economic growth. Kweka and Morrissey's most important contribution lies in their assertion that it should not be presumed that government spending is always growth promoting. This point is at the core of this study which is investigating the effect of government spending on economic growth in Tanzania. Kweka and Morrissey study was based on Tanzania and used time series data for a period 1965 to 1996. Carter, Craigwell and Lowe (2013) found that government spending on education typically has a significant and negative impact on economic growth, both in the short and long run, while health

and social security spending had little influence on per capita economic growth.

These findings on the effects of human capital expenditure are contrary to the finding by Kweka and Morrissey (2000). However, Carter et al, also found total government spending to produce a drag on economic growth, particularly in the short run, with a much small impact over time. This study also concluded that reallocation of government spending from one function to another may have growth enhancing effects without having to change the level of government spending.

The study by Carter et al. (2013) though it examined the sectors expenditure impact; it also examined the impact of total government spending on economic growth. Further, the study by Carter et al. also provided insights into growth-enhancing effects of expenditure reallocation. Though Carter et al. used Dynamic Ordinary Least Squares and the Error Correctional Model to analyze time series data from Barbados spanning from 1976 to 2011; this study will use ADF, ECM, ARDL and Pairwise Granger causality tests to analyze time series data from Tanzania for a period 1985 to 2015.

Acosta-Ormaechea and Morozumi (2013) also examined the impact of government expenditure reallocation on economic growth and found that the reallocation involving a rise in education spending has a positive and statistically robust effect on growth, when the compensating factor remains unspecified, or when this is associated with an offsetting reduction in social protection spending. The study also found that government capital spending relative to current spending appears to be associated with higher economic growth.

The study by Acosta-Ormaechea and Morozumi (2013) is important in as far as it supports the concept of expenditure reallocation as an economy growth enhancer, though this study is focused on the impact of total government spending on economic growth. Nevertheless, studies by Acosta et al. and Carter et al. could provide valuable insights depending on the findings of this research, as recommendations could be made for future research on Tanzania to consider sector impact and examine expenditure reallocations.

Sennoga and Matovu (2010) examined the interrelationship between government expenditure composition and Uganda's development goals including economic growth and poverty reduction. The study demonstrated 'that government spending composition does indeed influence economic growth and poverty reduction' (Sennoga and Matovu, 2010). To be more specific this study found that improved public sector efficiency coupled with reallocation of government spending away from unproductive sectors such as public administration and security to the productive sectors including agriculture, energy, water and health leads to higher GDP growth rates and accelerates poverty reduction.

Additionally, the rate of poverty reduction is faster among rural households compared to urban households. The major contribution of this study is that investing in agriculture particularly in value addition and investing in complementary infrastructures such as roads and affordable energy contributes to higher economic growth rates and accelerates poverty reduction. This study used a dynamic CGE model to analyze this interrelationship.

The key finding in this study by Sennoga and Matovu (2010) is that public spending composition does influence economic growth. However, Sennoga and Matovu's study is based on Uganda and used dynamic CGE model to analyze the interrelationship between sector impacts on among other variables economic growth as opposed to what this study will do by using an econometric model to analyze time series data from Tanzania for the period 1985 to 2015.

A study done on government spending in developing countries by Fan and Saurkar (2003) found that government spending on agriculture and infrastructure had large returns to GDP as the study by Sennoga and Matovu (2010) has shown. The study also showed that the impact of infrastructure and agriculture spending on poverty reduction was strong. However, structural adjustment programs adversely affected funding to these two sectors as also argued by Fan and Rao (2003). The study concluded by stating that performance of government spending on economic growth is mixed.

In Africa and Asia, government spending on agriculture and education were particularly strong in promoting economic growth. The study by Fan and Saurkar (2003) makes a significant contribution to this study because it informs the current study of the impact of agriculture and educational expenditure on economic growth in Africa and Asia, especially that this study is focused on Tanzania which is an African country.

Yasin (2008) found that government spending on capital formation, trade-openness and private investment spending all had a positive and significant impact on

economic growth. However, the study found that official development assistance and population growth rate were both statistically insignificant to economic growth, this is contrary to the findings of Garba and Abdullahi (2013). This paper examines the impact of government spending on economic growth in Sub-Saharan Africa using panel data set for the period 1987 to 1997. The data input fact was government spending, foreign development assistance, population growth and trade openness. The paper concluded by suggesting increased government spending on capital formation and the creation of a favorable economic environment for sufficient private sector investment spending.

Yasin (2008) used panel data set for the period 1987 to 1997. The data input fact (independent variable) was government spending, foreign development assistance, population growth and trade openness. This study will use time series data from 1985 to 2015. A study by Musaba, Chilonda and Matchaya (2013) examined the impact of government sectoral expenditure on economic growth in Malawi, using co-integration analysis in the context of error correction model. The sectors examined are agriculture, education, health, defense, social protection, transport and communication.

The results of the study showed that in the short run there is no significant relationship between public expenditure and economic growth. However, in the long run, the results indicated a significant positive effect on economic growth of expenditure on agriculture and defense. The expenditure on education, health, social protection and transport and communication were negatively related to economic growth. The study by Musaba, *et al.,* is important to this study though Musaba, *et al.*

are examining the government sectoral impact on economic growth and this study is examining aggregate government expenditure, nevertheless, both studies are examining causality between government expenditure and economic growth and both studies are using ECM model to analyze the data and both studies are examining data from Southern African countries. Jung and Thorbeeke (2001) examined the impact of public education expenditure on human capital, growth and poverty in Tanzania and Zambia, their results showed that education expenditure can raise economic growth.

However, to maximize the benefit from education expenditure, a sufficiently high level of physical investment is needed, as are measures that improve the match between the pattern of education output and the structure of effective labor demand. Another important result of this simulation experiment is that a well-targeted pattern of education expenditure can be effective for poverty alleviation. At the time of the study both Tanzania and Zambia were classified as heavily indebted poor countries. Jung and Thorbeeke‘s study used data from Zambia and Tanzania and examined sector expenditure impact on economic growth while this study is drawing data only from Tanzania and is examining the impact of total expenditure on economic growth. The study by Jung and Thorbeeke is, for now, the closest study to this one, having drawn data from Zambia and having a similar dependent variable economic growth.

All the studies reviewed above are mainly similar to this study in the sense that they have their dependent variable as economic growth; however, they use various sector expenditures as sole or multiple independent variables. The bulk of the studies

considered the following as their independent variables; education, health, agriculture, infrastructure, recurrent and capital expenditures. However, these studies do not show a whole picture of total government spending and this is the contribution of this study by using total government spending as the independent variable.

Nevertheless, these studies are important in as far as helping to inform policymakers as to which sectors have a greater impact in stimulating economic growth. However, it is important to bear in mind that again in this sphere, there is no consensus from the many studies done on which sector yields more economic growth. Further, some sectors impact is negative while other sector impact is positive while some impacts are significant and others are insignificant. More studies must be done to help shape policy.

The Impact of Total Spending on Economic Growth A study by Bagdigen and Cetintas (2004) analyzed data from Turkey for the period between 1965 and 2000 and used econometric techniques to analyze the causal relationship between public expenditure and economic growth. The study found no causality from either direction in their study. In Bagdigen and Cetintas' study, government spending is the dependent variable. The study used co-integration test and Granger causality test and concluded that neither Wagner's Law nor Keynes hypothesis is valid for the Turkish case. Though Bagdigen and Cetintas are using the same variable as this study, this study is using government spending as the independent variable while Bagdigen and Cetintas used government spending as the dependent variable. However, both studies are employing econometric tools of analyses.

A study by Sevitenyi (2012) analyzed the relationship and direction of causality between government expenditure and economic growth in Nigeria using annual data from 1961 to 2009. The variable government expenditure was total government expenditure at the aggregate level and total recurrent expenditure, total capital expenditure, administration, social and community services, economic services and transfers were at disaggregate level. This study employed an econometric methodology and used co-integration and Toda-Yamamoto Granger Causality test.

From the Augmented Dickey-Fuller (ADF) test the study found that the variables were non-stationary at level, but become stationary at first difference. From Toda-Yamamoto causality test the study found unidirectional causality running from total government spending to economic growth thereby supporting the Keynesian hypothesis. At the disaggregate level, the research found all variable except total recurrent expenditure to cause economic growth. The study by Sevitenyi is important to this study because both studies are examining the same variables i.e. government spending and economic growth and use a similar data set which is time series data. Further, both studies employed econometric methodology and both examined data from African countries.

However, this study is examining data for twenty years while Sevitenyi examined 48 years data. Garba and Abdullahi (2013) also investigated the causal relationship between public expenditure and economic growth in Nigeria and used Johansen cointegration approach and the Granger causality test. Their results indicated a significant long run positive relationship between government spending and economic growth in Nigeria. This study also found that there is a positive long-term

relationship between government spending and economic growth.

The study by Garba and Abdullahi examined data from Nigeria another sub-Saharan African country like Zambia, a country this study is focusing on. Both studies are examining the same variables i.e. government spending and GDP except for the fact that Garba and Abdullahi also considered the effect of population growth on GDP and use a similar data set which is time series data. However, this study is examining data for twenty years while Garba and Abdullahi examined 30 years data. Further, this study will also use a similar methodology and test to the one used by Garba and Abdullahi. Egbetunde and Fasanya (2013) studied government spending and economic growth in Nigeria for the period 1970 to 2010 and their findings indicated that the impact of total public spending on growth was negative contrary to the finding of Nworji et al. (2012) and Garba and Abdullahi (2013).

However, the study found that recurrent expenditure had little significant positive impact on growth; this particular finding is consistent with the results of a study by Nworji, et al. (2012), except for the fact that Nworji et al. were more specific with regard to which sectors recurrent expenditure was applied. This study used bound testing (ARDL) approach to examine long run short-run relation in government expenditure and growth in Nigeria. The study by Egbetunde and Fasanya is important to this study because both studies are examining the same variables i.e. government spending and economic growth and use a similar data set which is time series data. However, this study is examining data for twenty years while Egbetunde and Fasanya examined 40 years data. Further, this study will also use a similar methodology as the one used by Egbetunde and Fasanya and both studies analyzed

data from African countries.

Gangal and Gupta (2013) analyzed the impact of government spending on economic growth using data from India for the period 1998 to 2012. This study used annual data on total government spending and gross domestic product (GDP) per capita as an indicator for economic growth. Like Garba and Abdullahi (2013), Gangal and Gupta also used the co-integration test and the Granger causality test in addition to the ADF unit root test to analyze the data set. Gangal and Gupta also found that there is a positive relationship between public expenditure and economic growth. The Granger causality test found a unidirectional relationship from total public expenditure to GDP.

The study also found a positive impact of shocks from total government spending to GDP and vice versa. Gangal and Gupta's study was done on India while this study is on Tanzania, these two studies have some similarities; both studies are examining the same variables i.e. economic growth and GDP and uses similar data sets i.e. time series data. However, this study is examining data for twenty years which is a much larger data sample while Gangal and Gupta who examined 14 years data. Further, this study will also use a similar methodology to the one used by Gangal and Gupta. Further, this study will also use Engel Granger and ECM as replacements for co-integration test in establishing the long run and short run relationship in this study.

On the contrary, a study by Ahmad (2014) on government expenditure and economic growth found a unidirectional causality running from GDP/ GDP per capita to public expenditure thus supporting Wagner's hypothesis of increasing public sector

expenditure in India. Since the study did not find any causality running from public expenditure to GDP, using government spending as an effective policy instrument for long run economic growth is not supported by empirical evidence in this study. This study used Engel Yoo three step co-integration method along with Augmented Dickey-Fuller (ADF) test and Engel-Granger causality test on time series annual data for Indian economy for the period 1980-81 to 2012-13.

A study by Medhi (2014) examined the relationship between government spending and GDP growth in India using annual data for the period 1974 to 2010. The study used cointegration and vector error correction mechanism and the following are the findings of the study, the study found long run equilibrium relationship between spending and growth in India. The study also found a unidirectional causality from government spending to economic growth.

Medhi (2014) and Gangal and Gupta (2013) both found a positive relationship between government expenditure and economic growth. Their studies also found causality running from government expenditure to economic growth. However, on the contrary, Ahmad (2014) found causality running from economic growth to government expenditure. Nevertheless, all three studies Ahmad (2014), Medhi (2014) and Gangal and Gupta (2013) examined data from India and had a similar approach and strategy though their results were not identical.

However, Medhi examined thirty-six years data, Ahmad examined thirty-two years data while Gangal and Gupta only used fourteen years data. Though Ahmad and Medhi's study were done on India and this study is on Zambia, these studies have

many similarities as they are all examining the same variables i.e. public expenditure and GDP and uses a similar data set which is time series data. However, this study is examining data for twenty-five years while Ahmad examined 32 years data and Medhi used 36 years data. Further, this study will also use a similar methodology to the one used by Ahmad and Medhi.

Another similar study was conducted in Asia to examine the aggregate impact of government spending on economic growth by Lahirushan and Gunasekara (2015). The countries included in this study are Singapore, Malaysia, Thailand, South Korea, Japan, China, Sri Lanka, India and Bhutan and used data from 1970 to 2013. This data was analyzed using econometric techniques of co-integration, panel fixed effect model and Granger causality. This study had the following empirical findings; government expenditure had a positive impact on economic growth, government expenditure and economic growth indicated a long run relationship in Asian countries and finally, there is bidirectional causality between economic growth to government expenditure and government expenditure to economic growth in Asian countries.

Hence, Lahirushan and Gunasekara's study validated both the Keynesian theory and Wagner's law. The study by Lahirushan and Gunasekara is important to this study as it also employed econometric models to analyze its data. This study synchronizes the study by Gangal and Gupta (2013), Medhi (2014) and Ahmad (2014) as it validates both the Keynesian theory and Wagner's law. Khan, *et al.,* (2012) also found government expenditure had a significant negative effect on real economic growth, tax receipts have a positive effect on real economic growth and the size of the budget

deficit has a significant negative effect on real economic growth in Pakistan. Their study objective was to empirically investigate a two-way statistical relationship between fiscal variables (i.e. government spending and revenue and budget deficit) and economic growth by using time series data, cointegration and Granger causality test on data drawn from 1980 - 2010.

The causality results moderated the conventional view that economic growth has significant long run causal effects on fiscal variables in Pakistan. Another study by Muhammad, Xu and Karim (2015) also based on Pakistan, examined time series data running from 1972 to 2013 and used ADF, Johansen co-integration test and Granger causality test and concluded that there was no relationship between expenditure and GDP in the long run. This conclusion was informed by the co-integration test. These two studies have different conclusions though they draw their data from the same country and used the same methodologies and test, with the only difference being the length of time period i.e. one study considered data for 30 years and the other considered 41 years data, nonetheless the 30 years was within the period of the 41 years study.

However, both studies are significant to this study as they examine the same variables i.e. public expenditure and economic growth except that Khan et al. considered other variable in addition to public expenditure. These two studies used co-integration and Granger causality test, though Muhammad et al. also used ADF to establish the stationary properties of the variables. However, this study will also use ADF, ECM, ARDL and the Granger causality test, the ARDL and ECM will test for long and short run relationship in this study.

Eideh (2015) explored the causal relationship between public expenditure and economic growth in the Palestinian territories for the period 1994 to 2013. This study used econometric techniques to analyze time series data. The study used the ADF test to empirically investigate the stationary properties and the order of integration of the variables. The Engle-Granger co-integration test was used to determine the long-run relationship between public expenditure and economic growth. The study also used the Granger causality test to establish which variable causes the other. Eideh's study is also not only examining the causal effects of the same variable as this study but is also using econometric tools to analyze the data. However, Eideh's study is focusing on Palestinian territories and is analyzing 20 years data as opposed to this study which is analyzing 25 years data from Zambia

A study by Odhiambo (2015) examined causality between government spending and economic growth using data from South Africa and used auto-regressive distribution lag model (ARDL) – bound testing approach to examine this linkage. The empirical findings of the study showed that both public expenditure and economic growth Granger cause each other in the short run, however, in the long run, economic growth Granger causes public expenditure.

The study by Odhiambo is important to this study because both studies are examining causality between public expenditure and economic growth and both studies are using ARDL model to analyze the data and both studies are examining data from countries in Southern Africa though South Africa has a much more robust economy compared to Tanzania. Lamartina and Zaghini (2008) analyzed government expenditure on economic growth in 23 OECD countries and used panel

co-integration analysis.

The findings of the study indicate a structural positive correlation between public spending and per-capita GDP and they argued that this is consistent with Wagner's Law. The study found that public expenditure was being influenced by the increase in economic activities. Another study on OECD countries investigated the relationship between the size of government and economic growth using data from 1960 to 2000, (Hietger 2001). This study observed that government expenditure on public good basically have a positive effect on growth, but this effect tends to decline or reverse when the governments become excessive by providing private goods.

The study analyzed panel data from 21 OECD countries. Total government spending, as well as expenditure by type, indicated a significant negative impact on economic growth except for transfers and public investments. Though the study by Lamartina and Zaghini (2008) is based on 23 countries, used panel data, the study Hietger (2001) is also based on 21 countries and also used panel data but their findings are a direct contrast to each other. However, these studies are similar to this study in that all three studies are examining the same variable i.e. public expenditure and economic growth. Further, Hietger brings out an interesting aspect of observation on what caused what should have been the positive effects of public expenditure to turn negative.

2.3 Theoretical Framework

This part examines theoretical frame work on the linkage between government expenditure and economic growth. The question of what size the government has

traditionally been divided in two extremes. One extreme advances a view that a large government is typically detrimental to efficiency, productivity and growth. This view is based on the premise that the public sector is not responsive to market signals in those regulatory processes though fiscal and monetary policies could cause market distortions and lead to higher production cost. Moreover, centralized decision-making and lack of profit motive make government production less efficient than the private sector's.

On the other extreme, a large government is viewed as a vehicle for provision of certain essential goods and services to place the economy on a predetermined growth path that would otherwise not be provided by the private sector. Other benefits of government expenditure in support of a large government include the correction of market failure and the preservation of property rights through legislation and the provision of services (Seymour and oral, 1997). It is widely accepted that government activity may increase total output indirectly through its interaction with the private sector.

At the basic level, government provides legal and social frameworks on which the private sector is based. In the traditional Keynesian macroeconomics, growth theory maintains that many categories of public expenditures, particularly of the recurrent nature, contribute positively to economic growth. High level of government consumption I likely to increase employment, profitability and investment through multiplier effect on aggregate demand. Studies based on endogenous growth models distinguish between productive and unproductive expenditures. Expenditures are categorized as productive if they are included as arguments in private production

function and unproductive if they are not (Barro and Sala-i-Martin, 1992). This categorization implies that productive expenditures have a direct effect upon the rate of economic growth but unproductive expenditures have an indirect or no effect.

Expenditure items should be categorized as productive or unproductive is a subject of debate as they may be difficult to define a priori. Although it seems difficult to categorize government expenditure items, policy makers are increasingly interested in the composition of public spending. This interest partly stems from the recognition that expenditure allocation in favor of education and health can boost economic growth (Barro, 1997, Tanzi and Chu, 1998). Gupta, et all (1999) and Gupta and Verhoeven (2001) suggest that both the size and the efficiency of public education expenditure are important in improving socio-economic performance.

Thus, it is common for various international financial institutions, donors, NGOs among others to call for increased government spending in education and health sectors. The particular emphasis on increasing public spending on primary health care is generally justified that such spending reduces the impact of diseases on the productive life years of the population, which may promote economic growth in run Filmier, Hammer and Pritchett (1998) attempt to address the issue of allocation within the health sector in their cross sector analysis. The following section provides the empirical studies done by other scholars.

2.4 Summary and Research Gap

The literature review shows that there is a relationship between government spending and economic growth. This study extends the literature on relationship

between economic growth and government expenditure in Tanzania. Previous studies which have been done in Tanzania are Osoro, 1993; Kweka, 1995; Yabu (2003); Ruturagara (2013) and Kyissima (2014). They used secondary time series to analyze the relationship between government expenditure and economic growth in Tanzania. This study extends the existed literature by adding sample period data from 1985 to 2015.

Table 2.1: Raw Data (Figures are in Tanzania shillings)

Year	GDP	Educ.	Health	Public Investment	Defence	Export
1985	2.6	8.28	5.66	25.144	2.3	18.954
1986	2	25.82	20.65	21.343	4.66	17.514
1987	5	26.2	21.3	26.678	5.51	18.147
1988	4.4	26.26	21.48	19.804	4.24	18.774
1989	2.6	26.18	21.49	22.09	3.52	19.204
1990	6.2	26.02	21.4	32.417	3.29	19.416
1991	2.8	25.79	21.23	32.378	3.06	19.292
1992	1.8	25.47	20.99	33.868	2.91	20.73
1993	0.4	22.67	18.7	31.355	2.65	20.211
1994	1.4	18.64	15.39	30.659	2.28	20.872
1995	3.6	15.15	12.51	24.469	1.92	21.924
1996	4.79	9.64	5.24	20.364	1.93	22.107
1997	3.58	14.48	5.32	17.848	1.99	23.223
1998	4.1	8.88	6.91	19.874	2.46	23.429
1999	4.8	9.47	7.97	4.633	2.29	23.782
2000	4.9	22.17	8.79	13.787	2.17	26.133
2001	6.08	23.97	9.76	13.211	2.31	25.433
2002	7.2	23.26	9.23	13.19	2.52	25.416
2003	6.86	21.77	13.48	15.969	1.85	25.93
2004	7.8	11.28	7.5	18.945	2.29	27.576
2005	7.4	8.85	10.28	21.472	2.13	28.702
2006	6.7	9.02	7.56	26.04	1.66	29.9
2007	7.14	9.11	6.16	32.849	1.22	30.123
2008	7	7.72	7.09	32.076	1.43	30.77
2009	6.04	12.28	4.85	25.125	1.4	26.55
2010	7	17.61	10.38	27.296	0.9	28.838
2011	6.4	16.88	8.94	33.24	0.9	30.532
2012	6.9	19.02	8.48	28.503	0.9	30.584
2013	7.3	17.14	8.21	30.324	1	30.399
2014	7	17.45	8	30.997	1	30.184
2015	7.1	17.2	8.095397	31.259	1	29.294

Source: National Bureau of Statistics, World Bank, Bank of Tanzania

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section presents the theoretical and empirical methodology which is employed to provide a clue to objectives stated in this study. The chapter discuss/derive the model that will be used to explain government expenditure and economic growth in Tanzania. It is broaden to capture theoretical framework and also provide insight on where the data obtained and techniques that employed in analyzing data.

3.2 Theoretical Foundations of the Model Used in the Study

To establish linkages with the theoretical foundations, the empirical dynamic model adopted in this study is assumed to follow a Cobb-Douglas aggregate production function with labor augmenting (Harrod-neutral) technological progress. Building on Fischer (1993); Knight et al. (1993); and Acikgoz and Mert (2014) methodology, the aggregate Cobb-Douglas production function is assumed to take the form:

$$Yt = (\{K,H,C,L\})\ 1\text{--}a\beta$$

From equation above; K, H, C and L represent the traditional inputs – physical capital, human capital and labor, respectively; *a* represents the partial elasticity of output with respect to physical capital; and β is the partial elasticity of output with respect to human capital. When using time series data, the literature recommends that the technological change (*At*) should be assumed to be labor-augmenting and should follow a Harrod-neutral technical change (Uzawa, 1965; Lucas, 1988;

Acikgoz and Mert, 2014). The model builds on Fischer (1993) approach where he assumes the labor-augmenting technology to have two multiplicative components – the overall economic efficiency which is dependent on institutional factors and government economic management policy; and the level of technological progress which is assumed to be labor augmenting (Harrod-neutral).

This framework has also been supported by Barro (1999) where the empirical model of the long run or equilibrium level of per capita output was assumed to depend on government policies, institutions and the national population. Barro (1990) concluded that better enforcement of regulations and fewer market distortions will tend to raise the long run equilibrium level of per capita output and, hence, its growth rate. According to the World Bank (1990a) report, sustainable economic growth has three requirements, namely: a stable macroeconomic environment; an appropriate price mechanism and regulatory structure; and efficient and effective institutions that can convert national savings into productive investments (World Bank 1990a, p.100).

Fischer's (1993) definition of a stable macroeconomic framework implies a policy environment that is conducive to growth. This reflects an environment where inflation is low and predictable, real interest rates are at appropriate levels to attract savings, fiscal policy is stable (distortions are sustainable), the real exchange rate is competitive and predictable, and the balance of payments position is perceived to be viable (World Bank 1990a, p. 4). Rather than assuming economic efficiency factors to be fixed repressors these factors have been assumed to consist of policy variables that affect the stabilization curve of the exogenous growth model (Fischer 1992,

1993). Fischer (1993) regressed the growth rate of real GDP on inflation rate, ratio of budget surplus to GDP, black market premium on foreign exchange, and terms of trade.

In Bassanini *et al.,* (2001) framework, using a cross-country regression, the included variables were real GDP per capita, accumulation of physical capital, human capital, growth of working age population, inflation, government consumption, government capital accumulation, tax and non-tax receipts, direct/indirect taxes, business and non-business research and development, private credit, stock market capital, and trade exposure. The rationale of taking this approach originates from three fronts, namely: the Solow residual or total factor productivity; the conditional convergence hypothesis; and macroeconomic uncertainty or the efficiency of traditional inputs of growth.

First, in the exogenous growth model, total factor productivity is defined as the portion of production and productivity that cannot be explained by the amount of traditional inputs such as the accumulation of physical capital and human capital stock. As such, the Solow residual is a source of omitted variables. Mosley et al. (1987) used export growth in addition to domestic savings, foreign aid, foreign direct investment and literacy growth to isolate the components of total factor productivity that drive economic growth. In addition,

Fischer (1993) argued that the standard procedure of adding policy-induced macroeconomic variables to a growth regression implicitly assumed that policy variables affected economic growth through the productivity residual. Thus, rather

than assuming these important determinants to be lumped in with the Solow residual, isolating their influence on growth is important to guide policy decision makers. Second, the absolute convergence hypothesis of the neoclassical growth model (Solow 1956; Cass 1965) postulate that poorer economies grow faster and tend to catch up with richer economies.

However, Barro (2003) argued that this hypothesis did not empirically hold and in order to understand why this is the case the relationship between growth rates and the initial position of real GDP per capita has to be examined after holding constant some variables that are unique to each country or a set of countries. Thus, the empirical growth framework should integrate state variables that consist of the accumulation of physical and human capital stock as well as policy variables that include common characteristics driven by governments and private agents such as the ratio of government consumption to GDP, the extent of international openness, indicators of macroeconomic stability, and political stability measures such as maintenance of the rule of law and democracy (Barro 2003).

Third, macroeconomic stability matters for growth through uncertainty (Fischer 1992). In the theoretical literature, two sources of uncertainty are described. The first is through policy induced macroeconomic uncertainty that affects the efficiency of the price mechanism (Lucas 1973; Froyen and Waud 1980). The second is temporary uncertainty which affects the future potential of the rate of investment to grow and causes capital flight (Pindyck 1988; Pindyck and Somalino 1993). Thus, the sources of uncertainty based on the endogenous and empirical growth theorists have assumed the efficiency of capital (both physical and human)

to be affected by a number of policy-related factors that include trade policy, inflation, financial repression, real exchange rate instability, among others (Easterly and Wetzel 1989; World Bank 1990a; Dollar 1992; Fischer 1993).

3.3 Econometric Model Specification

Different authors, Chan and Gustafson (1991), Hsieh and Lai (1994) and Ghali (1998) have talked about the impact of government spending on economic growth using different variables depending on their literature reviewed, country resources and availability of data. This research will incorporate some of variables used by Ketema (2006) and that of Kweka and Morrissey (1999) in Ethiopia and Tanzania respectively, the selection f these variables best suit the literature reviewed and also due to data availability. The structural equation can be presented as follows:

$$GDP=\beta_0+\beta_1 EDUC.+\beta_2 HEALTH+\beta_3 EXPORT+\beta_4 DEFENCE+\beta_5 PUB+ \mu$$

Where, **μ** the error term which follow all the assumptions of classical linear regression, GDP is gross domestic products, PUB is public investment expenditure, HEALTH is health expenditure, DEFENCE is defence expenditure, EDUC. is education expenditure and EXPORT is export expenditure, β_0 is the intercept, β_1.β_5 are coefficients of dependent variables. Independent variables could be expressed as a ration of GDP but this could lead to simultaneity bias and multicollinearity problem.

3.4 Variables Definition

Dependent variables: The dependent variable in the study is gross domestic product (GDP), GDP is measured by annual percentage growth rate of GDP at market price

based on constant local currency. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Independent variables which were deemed essential for economic growth in Tanzania includes, export expenditure, defence expenditure, public investment expenditure, education expenditure and health expenditure.

Public investment expenditure: Are the expenditures used by the government to finance investment projects such as harbors, aircrafts, and roads construction and also used in housing sector expecting future returns indirect/directly from the user of the services.

Health expenditure: Are those expenditures used in health sector such as providing medication and buying of new or related equipment for better provision of good services. Also it includes on all infrastructures related to health sectors.

Defence expenditure: Include all amount of money located by the member of the government for security purposes at a given year. Includes expense on buying new military equipment, on job training and also amount of fund allocated to new trainee in the defence force.

Export expenditure: This implies values of tradable commodities from all sectors of the economy sold outside of the country for a given year in a formal way.

Education expenditure: Include those expenditures stated in the budget of a given year to finance education in primary school, secondary schools and at tertiary level.

Expenditures on these sectors include building more schools infrastructure and providing schools facilities.

3.5 Hypotheses

i. Public investment has positive relation with GDP growth
ii. Health expenditures has positive GDP relation with growth
iii. Defense expenditures has negative relation with GDP growth
iv. Export has positive relation with GDP growth
v. Education expenditures has positive relation with GDP growth

3.6 Test Under Time Series Data

Estimation of regression model without taking into consideration of stationarity of the time series data result to spurious regression results that are not accurate in prediction and forecasting. The study first will examine the stationarity of data, long run relationship between variables and error correction model is developed if criteria are satisfied as discussed below.

3.6.1 Unit Root Test

To test for unit root, augmented dick-fuller and philp-peron test will be employed. The test is explained as shown in the equation below.

$$Y_t = \beta_0 + \beta_1 Y_{t-1} + \beta_2 T + \sum_{i=1}^{p} \alpha_i \Delta Y_{t-1} + u_t$$

As indicated on the equation above, suppose Y_t is the variable under concern. To test for unit root we start by maximum number of lags, P, that are significant in explaining the variable with trend T and drift β_0 being included in the model. If

the variables are not stationary we make an assumption that unit root might be due to the presence of trend, we eliminate trend T by setting β_2 **=0**and then if still not stationary we also remove drift β_0 **= 0** using criteria (basing on sum square residual of the restricted and unrestricted model). The process continues by differencing the variable if all procedures don't make the variable stationary.

3.6.2 Cointegration Test

Co integration is an econometric technique that is used to address the problem of integrating short run dynamic with long run equilibrium. Time series data are usually non-stationary and as such, are differenced to arrive at a stationary time series before an econometric test is carried out. Therefore, if the variables are non-stationary and may have the same order of integration, co integration test is carried out to examine if they have long run relationship.

There are two main techniques (method) of testing co integration which include; Johansen (1988) co integration technique which is the approach for Multivariate Models and the Engle-Granger (1986) Approach for Univariate Models. For the case of this study Johansen co integration approach is not used because it's subjected to the following shortcomings. First, given the small size of observations, the method cannot be accepted as an appropriate one since the points of estimates obtained for co integrating vector may not be particularly meaningful. Furthermore, some additional problems occur if we do not have a unique co-integrating vector. The problem of multiple long run relationship is presumably best as seen as an identification problem can be resolved by granger (1986).

Therefore in this study Engle-Granger two steps procedure is used to check if the variables are co integrated or not. The approach is selected because in practice Engle-Granger is regarded as a convincing evidence and confirmation for the existence of co integration found in the first step. Moreover there is no danger of estimating a spurious regression because of the stationary of the variables ensured. A combination of the two steps then provides a model incorporating both the static long run and the dynamic short run components. It is also important to know that if the variables are co integrated, then the regression on levels of variables will be meaningfully and valuable. In this case error correction model will be used to estimate short run dynamics.

3.6.3 Error Correction Model Estimate

According to granger (1986) any system of co integrated variables can best be presented by an error correction mechanism in which the legged residuals that are obtained from underlying co integrating relationship are added to the original vector of co integrating stationary variables. The coefficient of the error correction mechanism (ECM) represents the process by which the dependent variable adjusts it long run equilibrium position as shown in the equation below;

$$DGDP=\beta_0+\beta_1 DEDUC.+\beta_2 DHEALTH+\beta_3 DEXPORT+\beta_4 DDEFENCE+\beta_5 DPUB+\boldsymbol{\mu}$$

Where:

DGDP - is the first difference of GDP

DEDUC - is the first difference of education expenditure

DHEALTH - is the first difference of health expenditure

DEXPORT - is the first difference of export expenditure

DDEFENCE - is the first difference of defence expenditure

DPUB - is the first difference of public investment expenditure

β_0 - is the intercept

β_1-β_5 - are the short run coefficients

μ - is the error term that shows the speed of the adjustment to the long run Equilibrium position.

3.7 Diagnostic Test

Under this test, different tests are performed to test if the regression model follows the classical linear regression model properties. The residual series is tested for heteroscedasticity using Autoregressive conditional heteroscedasticity test (ARCH test) also using white heteroscedasticity test, test for serial correlation and normality assumption using Jacque-Bera test statistic.

3.8 Data Type and Sources

The study uses secondary annual data which is time series covering the period 1985 to 2015 that will be obtained from various sources. Most of the data are obtained from central bank of Tanzania (BOT) on various publications, Ministry of Finance Tanzania, National Accounts obtained from National Bureau of Statistics (NBS), economic journals and from Tanzania Investment Centre (TIC), International Monetary Fund (IMF) and World Bank (World Bank data by country).

3.8.1 Data Processing and Analysis

In data processing and analysis, Eviews software is very essential in producing various statistics and also providing regression results as explained above. Eviews

software Will be applied for unit root test, co integration test summary statistics diagnostic test results and then providing error correction mechanism for the study.

CHAPTER FOUR

PRESENTATION OF FINDINGS AND DISCUSSION

4.1 Introduction

This chapter provides the empirical and discussion of the results as obtained from data analysis. Section 4.1 presents descriptive statistics, section 4.2 presents correlation test results section 4.3 provides Time Series properties. Section 5.0 presents cointegration test and section 6.0 presents Error Correction Model, section 8.0presents diagnostics Test and section 9.0 presents Pair wise Granger Causality.

Table 2.1: Descriptive Statistics for Economic Growth Model

	GDP	PUB	EDUCATION	HEALTH	EXPORT	DEFENCE
Mean	5.125484	24.42603	17.53806	11.71114	24.64332	2.248065
Median	6.040000	25.14400	17.45000	8.940000	25.41600	2.170000
Maximum	7.800000	33.86800	26.26000	21.49000	30.77000	5.510000
Minimum	0.400000	4.633000	7.720000	4.850000	17.51400	0.900000
Std. Dev.	2.119745	7.421890	6.650181	5.971510	4.526432	1.123798
Skewness	-0.61445	-0.67086	-0.085949	0.720300	-0.04679	1.073709
Kurtosis	2.132979	2.806787	1.559392	1.913483	1.532169	4.031822
Jarque-Bera	2.921629	2.373523	2.718831	4.205474	2.794240	7.331577
Probability	0.232047	0.305208	0.256811	0.122122	0.247308	0.025584
Sum	158.8900	757.2070	543.6800	363.0454	763.9430	69.69000
SumSq. Dev.	134.7996	1652.533	1326.747	1069.768	614.6575	37.88768
Observations	31	31	31	31	31	31

Source: Researcher's Finding 2018

4.2 Descriptive Statistics

Exploratory data analysis is employed to ascertain the statistical properties of the variables used in the empirical analysis (Mukherjee, White &Wuyts, 1998). Table 1.1 reports descriptive statistics of the variables of the estimation model. The descriptive statistics indicate that the average growth of all variables included in the economic growth model has average from 5.13 to the lowest being of GDP. The standard deviation is highest at 7.42 compared to the rest of the variables used in this

study. The statistics also show that all the data except heath and defense spending are negatively skewed meaning that most values are concentrated on the left of the mean with extreme values to the right; hence the data are not normally distributed in this case.

Table 3.2: Correlation Matrix of the Variables Correlation Results

Covariance Analysis: Ordinary						
Date: 10/12/18 Time: 17:47						
Included observations: 31						
Correlation						
Probability	Defence	Education	Export	GDP	Health	Pub.
Defence	1					

Education	0.568989	1				
	0.0008	-----				
Export	-0.834755	-0.499393	1			
	0	0.0042	-----			
GDP	-0.512369	-0.330096	0.802106	1		
	0.0032	0.0697	0	-----		
Health	0.762219	0.811719	-0.701021	-0.531707	1	
	0	0	0	0.0021	-----	
Pub	-0.192886	0.066795	0.1295	-0.060581	0.215454	1
	0.2985	0.7211	0.4875	0.7461	0.2444	-----

Source: Researcher's Finding 2018

4.3 Correlation Test

Table 4.2 report the correlation matrix of the variables of the estimation model. The results of the correlation matrix suggest that export expenditure is highly positively correlated with economic growth. Defence expenditure and health expenditure seem to have negative correlation with economic growth. Education and public investment (PUB) expenditure seem to have less weak negative correlation.

4.3 Time Series Properties of the Data

4.3.1 Stationary Test

Table 4.3 and 4.4 represent the ADF unit not tests results. The null of the

stationary process is rejected at 5 percent significance level. As reported in the ADF test table 4.3 all variables with the exceptional of defence and health expenditure are stationary in their level, suggesting that the hypothesis of a unit root cannot be rejected in all variables in level [*I*(0)] except defence and health expenditure. These results conclude that all variables are stationary with the exceptional of defence and health expenditure. The variables in consideration however, as reported in table 4.4 are stationary in the first differences. However, the test at first difference was performed with no constant and no trend meaning that the process under the null hypothesis is a random walk without drift i.e. it is a difference stationary process (DSP). This also suggests that the variables are potentially cointegrated.

Table 4.3: Unit root test (Level Variable)

	Augmented Dickey - Fuller		
Variable	Test statistics	critical value at 5%	critical value at 1%
Defence	-4.117045	-3.568379	-4.296729
Education	-3.343601	-3.587527	-4.33933
Export	-2.96368	-3.568379	-4.296729
GDP	-3.039927	-3.568379	-4.296729
Health	-3.794029	-3.568379	-4.296729
PUB	-1.909266	-3.568379	-4.296729

Source: Researcher's Findings, 2018

Table 5.4: Unit root test (First Difference)

	Augmented Dickey - Fuller		
Variable	Test statistics	critical value at 5%	critical value at 1%
Defence	-6.578178	-3.574244	-4.309824
Education	-5.911142	-3.574244	-4.309824
Export	-6.566147	-3.574244	-4.309824
GDP	-7.07845	-1952910	-2.64712
Health	-7.819587	-3.574244	-4.309824
PUB	-6.449083	-3.574244	-4.309824

Source: Researcher's Findings, 2018

Given the cointegration requires all variables to be integrated of the same order, the results in the Table 4.4 indicates that the variables in this study are cointegrated of the same order, I(1). The next procedure is to investigate whether the linear combination of these variables is stationary. To do this, Engle Granger test for cointegration is applied.

4.4 Cointegration Test Results

Since the data are provided to be non-stationary at levels, the existence of cointegration for set variables in the model is examined. The aim is to search for linear combination of individually non stationary time series that is itself stationary. Given the variables are integrated of order one the linear combination of the variables is stationary, this justify the presence of co-integration equation using Engle- Granger to test for cointegration series we follow two steps procedures by first running Ordinary Least Square (OLS) equation and estimate residuals. Residual is then tested for unit root if it is stationary. As shown on the table 4.5, p-value is less than 5 percent level, then the null hypothesis is rejected, the residual has no unit root and become stationary. When the variables are cointegrated, we can run for Error Correction Model.

Table 6.5: Results for Cointegration Test

Null Hypothesis: U has a unit root
Exogenous: Constant
Lag Length: 3 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.900905	0.0005
Test critical values:	1% level	-3.699871	
	5% level	-2.976263	
	10% level	-2.627420	

*MacKinnon (1996) one-sided p-values.

Source: Researcher's Findings, 2018

4.5 Error Correction Model

After establishing one order of integration of the variables in the research, the next step was to estimate the error correction model (ECM), which incorporated variables both in their first difference and capture the short run disequilibrium as well as the long run equilibrium adjustments between the variables. The ECM was subjected to the following diagnostic test; serial correlation, heteroscedasticity and normality tests. The desired model obtained is presented in Table 4.6.

Table 7.6: Results for Error Correction Model

Dependent Variable: D(GDP)
Method: Least Squares
Date: 07/27/19 Time: 10:21
Sample (adjusted): 1986 2015
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.110162	0.213212	0.516677	0.6103
D(EDUC)	-0.048689	0.056266	-0.865330	0.3958
D(HEALTH)	0.008884	0.076297	0.116435	0.9083
D(EXPORT)	0.310033	0.190050	1.631324	0.1164
D(DEFENCE)	0.731379	0.512266	1.427733	0.1668
D(PUB)	0.017644	0.042410	0.416040	0.6812
U(-1)	-0.814834	0.193751	-4.205583	0.0003

R-squared	0.525205	Mean dependent var	0.150000
Adjusted R-squared	0.401345	S.D. dependent var	1.395535
S.E. of regression	1.079764	Akaike info criterion	3.192326
Sum squared resid	26.81549	Schwarz criterion	3.519272
Log likelihood	-40.88489	Hannan-Quinn criter.	3.296919
F-statistic	4.240321	Durbin-Watson stat	1.977859
Prob(F-statistic)	0.005117		

Source: Researcher's Findings, 2018

The error correction model above explains short run and long run dynamic of the economic growth model. Short run disequilibrium adjustment is captured by the variables under the study while the long run is explained by the error correction term. The coefficient of error correction term is negative and significant, it means that it gives validity that GDP and Education, Defence, Export, Public Investment (PUB), Health have long run relationship. Error Correction Term correct disequilibrium, the speed at which she is correcting disequilibrium is 81% annually.

The information on the table above can be presented in the form of equation as follows;

GDP = 0.11 – 0.05DEDUC + 0.01DHEALTH + 0.31DEXPORT + 0.73DDEFENCE + 0.02DPUB- 0.81ECT.

DEDUC= -0.05, DHEALTH= 0.01, DEXPORT= 0.31, DDEFENCE= 0.73 and DPUB= 0.02 are short run coefficients while -0.81 is the Error Correction Term (ECT) =U(-1).

The results of the Error Correction Term (ECT) in Table 4.6 indicates that our model is a good fit as the value of ECT is negative and significant at 5 percent level of significance which means that our model is convergent. Moreover, -0.814834 value of ECT is an indication that cointegrating association presence among the variables. The coefficient on the error correction term (ECT) denotes that 81 percent of the disequilibrium initiated by earlier converge to the long-run equilibrium in the present year. The health expenditure, export expenditure, defence expenditure and public investment are significant in the short-run and they exert a positive effect on economic growth while education expenditure is significant but exert a negative effect on economic growth.

The positive values indicate that rises in health expenditure, export expenditure, defence expenditure and public investment rise economic growth. A 100 percent rise in health expenditure, export expenditure, defence expenditure and public investment, all things being equal will lead to 0.89 percent, 31 percent, 73 percent, 1.76 percent rise in economic growth respectively.

4.6 Diagnostic Test

Under this section, residual series is tested if it follows the assumption of the classical linear regression modal. Serial correlation test, heteroscedasticity test and normality test are performed in this section as follows.

4.6.1 Test for Serial Correlation

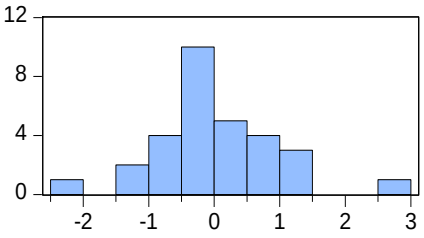
Breausch – Godfrey serial correlation LM Test is employed. Using Obs*R-squared corresponding Probability. Chi–square as indicated on the Figure 4.1 the null hypothesis is rejected at 5 percent level of significance that the model is not suffering from serial correlation, since P-value is greater than 5 per cent level of significant.

Table 4.7: Breausch – Godfrey Serial Correlation LM Test Results

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.870671	Prob. F(2,23)	0.4320
Obs*R-squared	2.181838	Prob. Chi-Square(2)	0.3359

Source: Researcher's Findings, 2018

4.6.2 Test for Normality Distribution



Series: Residuals	
Sample 1986 2015	
Observations 30	
Mean	-9.25e-17
Median	-0.128225
Maximum	2.895002
Minimum	-2.298218
Std. Dev.	0.961599
Skewness	0.547825
Kurtosis	4.667632
Jarque-Bera	4.976805
Probability	0.083043

Figure 4.1: Normality Distribution

Source: Research Findings, 2019

Normal distribution test is employed. Using Jarque – Bera corresponding probability as indicated on the Table 4.8 the alternative hypothesis is not rejected at 5 percent level of significance that series is normally distributed.

4.6.3 Test for Heteroscedasticity

In testing for constant variance for the residual series autoregressive conditional heteroscedasticity test is employed. Using F - Statistic and Obs* R-square for both test as indicated on the table 4.9 the null hypothesis is rejected at 5 percent level of significance that series is not suffering from heteroscedasticity.

Table 4.8: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.859587	Prob. F(6,23)	0.5386
Obs*R-squared	5.495005	Prob. Chi-Square(6)	0.4821
Scaled explained SS	5.922935	Prob. Chi-Square(6)	0.4319

Source: Research Findings, 2019

4.6.4 Parameters Stability Test – (Cumulative sum of recursive residuals)

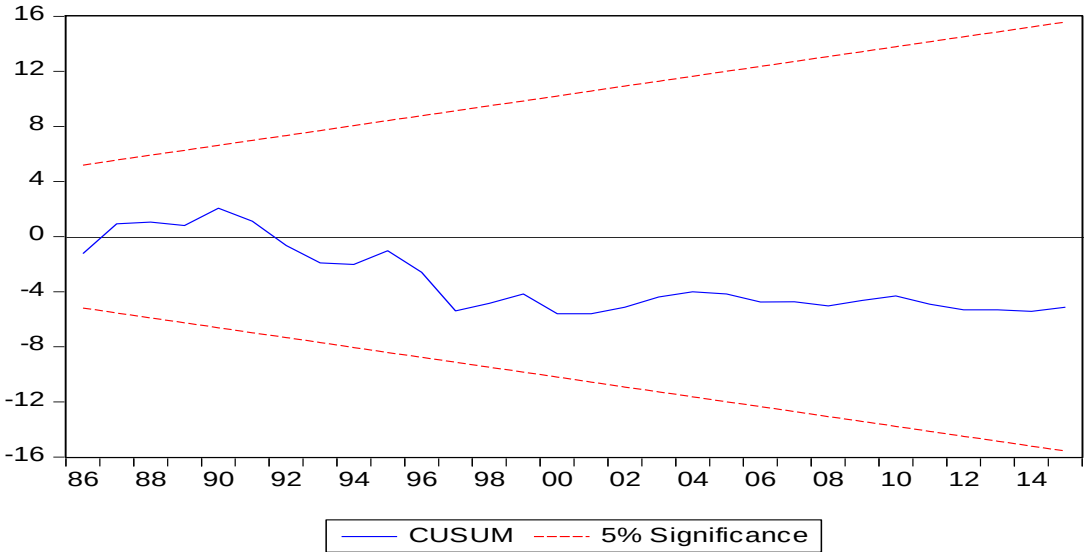


Figure 4.2: Cumulative Sum of Recursive Residuals

Source: Research Findings, 2019

We want to know the coefficient changing behavior. Changing automatically or not. The null hypothesis, parameters are stable (desirable and alternative hypothesis parameters are not stable (not desirable). The table 4.10 shows that parameters are stable because blue line is existing within red straight lines, hence we accept null hypothesis of stable parameters.

4.6.5 Granger Causality Test

The objective of this test is to verify the direction of causality between the variables of our study. The null hypothesis of this test states that there is no granger causality between the variables while the alternative states that there is causality and it equally indicates if the causality is unidirectional or bidirectional. Table 4.11 in appendices shows the results of the granger causality test between the government spending and economic growth in Tanzania for the period 1985-2015.

The results show that, there is a unilateral causality running from GDP to health expenditure, health expenditure does not granger cause GDP. This implies that, increase expenditure on health can be very important mechanism to increase the quality of human capital and thus economic growth, however this is not direct mechanism where increase health expenditure will translate to economic growth, the necessary institutional framework have to be efficient and corrupt free to spur economic growth. This is revealed by the significance of its respective F-statistic values and probability value. Our granger causality test also highlights that education expenditure, export expenditure, defence expenditure and public investment indicate independence neither unidirectional nor bidirectional causality.

CHAPTER FIVE

RESEARCH CONCLUSION AND RECOMMENDATION

5.1 Conclusion

The aim of this research was to determine the effect of government spending on economic growth in Tanzania, to analyze the direction of causality between public expenditure and economic growth and to establish the short run and long run relationship between government spending and economic growth in Tanzania. In order to achieve the aims of the research the following tests were conducted in E-Views, the first step was to run a regression equation to determine cointegration between public expenditure and economic growth in Tanzania.

The second step was to run the Augmented Dickey-Fuller test to establish the order of integration of the variables under research and determines the appropriateness of subsequent tests. The third step was to run an error correction model (ECM) test to determine the long run and short run relationships between government spending and economic growth in Tanzania. Finally, Pair wise Granger causality test was run to determine which of the two, namely government spending or economic growth Granger causes the other in Tanzania.

The results of the various tests conducted on the secondary data collected from the Central bank of Tanzania (BOT) on various publications, Ministry of Finance Tanzania, National Accounts obtained from National Bureau of Statistics (NBS), economic journals and from Tanzania Investment Centre (TIC), International Monetary Fund (IMF) and World Bank (World Bank data by country) indicate the following; the regression equation established co-integration between public

expenditure and economic growth in Tanzania. This means that there exists a long-run relationship between government spending and economic growth in Tanzania.

The diagnostic tests that were done on the regression equation showed that the research produced a good regression model as it was not serially correlated, nor was it heteroskedastic and the residuals of the model were normally distributed. The variables of study, GDP, Defence, Education, Export, Health and Public Investment(PUB)were initially non-stationary at level I(0), but were converted to stationary after taking the first difference I(1). This made possible to do the other tests such as Error Correction Model (ECM). This is so because if any of these variables was stationary at second difference I(2), it would have been a challenge to conduct these test as they can only be done at I(0) or I(1).

The ECM established both a short run and a long run relationship between GDP, Defence, Education, Export, Health and Public Investment (PUB). The coefficient of the error term, U(-1) was negative and significant and this validate the existence of a long-run equilibrium relationship among variables GDP, Defence, Education, Export, Health and Public Investment(PUB) as stated in the regression model. Because U (-1), the coefficient of the error term is -0.81, this means that the system corrects its previous year's disequilibrium at a speed of 81% annually.

In short, the speed of adjustment is 81% annually, meaning approximately 81% of disequilibria from the previous year's shock converge back into the long-run equilibrium in the current year. This model was not found to be spurious given that the R-square is less than the Durbin-Watson statistic. Further, the diagnostic tests

that were done on the ECM model showed that the research produced a good model as it was not serially correlated, nor was it heteroskedastic and the residuals were normally distributed. However, the research found the model to be good enough given that the most important test for series data, serial correlation test, is in good order.

The model was also subjected to a stability test, the cumulative sum (CUSUM) plot from recursive estimation of the model which also indicated stability in the coefficients over the research period. Therefore, the results of the regression equation, ECM model was consistent in this study and the research concludes that there exist long-run relationship between GDP, Defence, Education, Export, Health and Public Investment (PUB) in Tanzania. Based on empirical findings, this research establishes the existence of a long-run relationship between government spending and economic growth in Tanzania. This finding is supported by the results of the regression equation and ECM.

As such, better target spending is likely to yield higher economic growth in Tanzania. Therefore, the implication of this study is that government spending is an important tool in achieving economic growth. This conclusion is supported by the findings of this research which found that government spending and GDP are cointegrated and have long-run relationship in economic activities or GDP results in the increase in government spending to address social needs. Therefore, in this case, well-targeted government spending is likely to achieve enhanced economic growth in Tanzania.

5.2 Recommendation

As proposed by many researchers like Ahmad (2014) in his study on Nigeria, this study also recommends the use of government spending as an effective policy instrument for long-run economic growth in Tanzania. This recommendation is based on empirical findings that there exists a long-run relationship between government spending and economic growth based on the regression equation and ECM tests.

Since there is a relationship between public government spending and economic growth, especially therefore, necessitates the continued use of fiscal policy instruments to achieve macroeconomic objectives in Tanzania. This recommendation is based on the research test results, namely regression equation and ECM, which found cointegration between government spending and economic growth.

It can therefore be said that the higher the government spending, the higher the level of economic growth (ceteris paribus) and the lower the government spending, the lower the level of economic growth of the nation. Overall, the empirical evidence suggests that the increase in the government spending in this work has been based on the fact that there is no corruption in the system, increasing transparency and accountability in achieving targets. It could therefore be recommended that government should promote efficiency in the allocation of development resources through emphasis on private sector participation and privatization\commercialization.

Given that the study found a positive effect of export on economic growth, government in Tanzania should embark on more trade liberalization policies in order to increase export. That is export promotion should be intensified as part of trade liberalization policies. Export promotion can excellently be done through trade fair organizations. In addition, there should also be diversification of our exports. Government should endeavor to add more value to their export to increase the export value of country. Thus if adhered to would promote growth in Tanzania. Government should also try its best to reduce taxes on imported items intend for production. This will encourage the private sector to come on board in complementing government's effort to achieving economic growth and development.

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APPENDIX

GRANGER PAIRWISE CAUSALITY TEST RESULTS

Pair wise Granger Causality Tests
Date: 07/27/19 Time: 11:50
Sample: 1985 2015
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
EDUC does not Granger Cause GDP	29	1.47604	0.2486
GDP does not Granger Cause EDUC		0.08167	0.9218
HEALTH does not Granger Cause GDP	29	3.50271	0.0463
GDP does not Granger Cause HEALTH		0.23017	0.7961
EXPORT does not Granger Cause GDP	29	2.10447	0.1438
GDP does not Granger Cause EXPORT		0.38923	0.6818
DEFENCE does not Granger Cause GDP	29	0.70574	0.5037
GDP does not Granger Cause DEFENCE		0.99475	0.3846
PUB does not Granger Cause GDP	29	1.42462	0.2602
GDP does not Granger Cause PUB		2.72774	0.0856
HEALTH does not Granger Cause EDUC	29	0.88806	0.4245
EDUC does not Granger Cause HEALTH		2.04262	0.1516
EXPORT does not Granger Cause EDUC	29	0.95629	0.3985
EDUC does not Granger Cause EXPORT		0.38051	0.6876
DEFENCE does not Granger Cause EDUC	29	0.96221	0.3963
EDUC does not Granger Cause DEFENCE		4.09666	0.0295
PUB does not Granger Cause EDUC	29	1.16994	0.3275
EDUC does not Granger Cause PUB		1.31201	0.2879
EXPORT does not Granger Cause HEALTH	29	2.59310	0.0956
HEALTH does not Granger Cause EXPORT		0.52099	0.6005
DEFENCE does not Granger Cause HEALTH	29	3.79738	0.0369
HEALTH does not Granger Cause DEFENCE		5.85528	0.0085
PUB does not Granger Cause HEALTH	29	0.44705	0.6447
HEALTH does not Granger Cause PUB		0.70101	0.5060
DEFENCE does not Granger Cause EXPORT	29	0.68449	0.5139
EXPORT does not Granger Cause DEFENCE		0.87255	0.4307
PUB does not Granger Cause EXPORT	29	1.58058	0.2265
EXPORT does not Granger Cause PUB		0.13140	0.8775
PUB does not Granger Cause DEFENCE	29	0.43222	0.6540
DEFENCE does not Granger Cause PUB		2.97448	0.0701