

UNIVERSITY OF CAPE COAST

GROWTH IMPACT OF GOVERNMENT CONSUMPTION, TRANSFER
AND INTEREST PAYMENTS IN GHANA

BY

EDMUND ADINKRA DARKO

Thesis submitted to the Department of Economics of the College of
Humanities and Legal Studies, University of Cape Coast, in partial fulfilment
of the requirements for award of Master of Philosophy Degree in Economics.

DECEMBER 2016

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DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original work and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Name: Edmund Adinkra Darko

Signature: Date:

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's Name: Dr. William G. Brafu-Insaidoo

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Signature: Date:

ABSTRACT

The study examined the growth impact of government consumption, interest and transfer payments in Ghana. A quarterly time series data from 1984 to 2015 was utilised. The maximum likelihood estimation (MLE) technique was employed, and cointegration among the variables was established within the framework of autoregressive distributed lag (ARDL). A Pair-wise Granger-causality test was adopted to explore the direction of causality between government expenditure components (consumption, transfer and interest payments) and economic growth.

The ARDL results revealed that government interest payments and consumption expenditure negatively impact economic growth in both long run and short run. However, government transfers indicated a positive significant relationship with growth of output. The results of the Granger causality test established a bi-directional causality between government interest payment and economic growth. Unidirectional causalities running from government consumption expenditure and transfer payment to economic growth were also established.

Considering the findings, the following recommendations are offered: Government must ensure that loans taken are properly utilised so that returns from such use will be used to cater for the loans and the associated interest. Government should cut down its consumption. Lastly, government through the Department of Social Welfare should increase and regularize its general transfer payment in order to elevate the vulnerable groups from extreme poverty.

KEY WORDS

Growth impact

Government consumption expenditure

Government transfer payment

Government interest payment

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DEDICATION

To my mother and my siblings for their support and encouragement.

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LIST OF ACRONYMS

AD	Aggregate Demand
ADF	Augmented Dickey-Fuller
AIC	Akaike Information Criterion
ARDL	Autoregressive Distributed Lag
ARMA	Autoregressive Moving Average
AS	Aggregate Supply
CPI	Consumer Price Index
CUSUM	Cumulative Sum of Recursive Residuals
CUSUMSQ	Cumulative Sum of Squares of Recursive Residual
CXP	Government Consumption Expenditure
DW	Durbin Watson
ECM	Error Correction Model
ECT	Error Correction Term
ERP	Economic Recovery Programme
EU	European Union
FMOLS	Fully Modified Ordinary Least Squares
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
GSS	Ghana Statistical Service
GXP	Aggregate Government Expenditure
HIPC	Highly Indebted Poor Country
IMF	International Monetary Fund
IP	Interest Payment

LEAP	Livelihood Empowerment Against Poverty
LM	Lagrange Multiplier
MLE	Maximum Likelihood Estimation
MoFEP	Ministry of Finance and Economic Planning
NX	Net Expotrs
OECD	Organisation for Economic and Cooperative Development
OLS	Ordinary Least Square
P P	Phillip-Perron
RESET	Regression Specification Error Test
RGDP	Real Gross Domestic Product
SAP	Structural Adjustment Programme
SBC	Schwarz Bayesian Criterion
SEE	South Eastern Europe
SIC	Swartz Information Criterion
TFP	Total Factor Productivity
TP	Transfer Payment
TR	Tax Revenue
UECM	Unrestricted Error Correction Model
VAR	Vector Autoregressive
VEC	Vector Error Correction
WDI	World Development Indicators

CHAPTER ONE

INTRODUCTION

Background to the Study

The relationship between government expenditure and economic growth has attracted the concerns of many economists and other researchers for a considerable period of time globally, theoretically and empirically (Nurudeen & Usman, 2010). In the 19th century, economists generally advocated a state with minimal economic functions, or the so-called *Laissez-Faire*. This was a response to failures in the 18th century due to heavy government distortions (Tanzi & Zee, 1997).

After World War I, the perception about the role of government changed again due to the influence of Keynes (1936) who argued that the government still had many things to do that were not being done. During the 1980s and 1990s, skepticism about the large size of the government grew increasingly over time due to government failures to use public spending to achieve higher growth and better income distribution outcome (Fan & Saurkar, 2008).

Most economists and policy makers across the world have expressed a keen and sustained interest in the role of public spending in promoting economic growth and development. It can also be realized that while all the developing countries are striving towards sustained growth and development, government expenditure seems to be progressively increasing alongside. Thus, trends in governments spending have been receiving upward projections over the years, particularly in these countries. The reasons behind such increasing trends have been rapid rates of population growth and the government's desire

to meet the general demand for improvements in living standards of the populace (Twumasi, 2012).

Government makes several expenditures in areas such as national defence, agriculture, health, education, communication, transport, energy, social services, national debts servicing, capital investment, and its own maintenance as well as on other countries and governments (Chinweoke, Ray, & Paschal, 2014; Bhunia, 2012). The authors, therefore, established that government expenditure constitutes the spending of the government for its own maintenance, on the society and the economy as a whole. Recently, governments are progressively involving themselves in economic activities and transfer payments to other governments or countries. As a result, public expenditure has assumed an upward trend patterns over the years virtually in all the countries of the world (Maku, 2009).

After the economic downturn of the 1970s and early 1980s, Ghana has been experiencing fairly strong growth over the past three to four decades, although there are some fluctuations in the growth rates. For instance during the 1980s, Ghana's economy registered strong growth of approximately 6 percent per year because of a reversal in the steadily declining production of the previous decade (Aryeetey & Baah-Boateng, 2007). The authors indicated Ghana's worst years were 1982 and 1983, when the country was hit with the worst drought in fifty years, bush fires that destroyed crops, and the lowest cocoa prices of the postwar period. Growth throughout the remainder of the decade reflected the pace of the economic recovery, but output remained weak in comparison with 1970 production levels. The same was true of

consumption, minimum wages, and social services; this amounted to increases in government expenditure.

Economic growth fell off considerably in 1990 when another drought caused real Gross Domestic Product (GDP) growth to decline by nearly two percentage points. Available data claim that real GDP growth in 1993 was 6.1 percent, which reflected a recovery in cocoa output and an increase in gold production. At the same time, gross domestic fixed investment rose from 3.5 percent of the total in 1982 to 12.9 percent in 1992. The share of public consumption in GDP fell from a peak of 11.1 percent in 1986 to 9.9 percent in 1988, but appeared to have risen again to 13.3 percent in 1992 (Fosu & Aryeetey, 2008).

Since 2005, the Ghanaian economy has undergone several changes and available data show that the GDP recorded a growth ranging from 4.0 percent and 15.0 percent between 2005 and 2013, whilst the size of government's expenditure in nominal terms increased from GH¢2,970.62 million to GH¢26,277.17 million (GSS, 2014). Thus, Government of Ghana over the years has endeavored to ensure sustained growth of the economy. This can be seen in the efforts of the government to improve infrastructure, sanitation, health care, education, defence, energy supply, among others (Yearbook, 2013). The increase in both government expenditure and GDP growth over the period was not proportional. Whereas government witnessed continuous increase in its expenditure, the annual GDP growth rates were fluctuating. For instance within the period 2005 and 2013, as the government total expenditure in nominal terms increased from GH¢2,970.62 million to GH¢26,277.17 million, the GDP growth rates ranged between 4.0 percent and 15.0 percent

with the highest growth rate recorded in 2011 and the least in 2009 (GSS, 2014).

The average annual growth rate recorded for the same period was 7.8 percent. Also, available data suggest that the GDP per capita in constant 2006 prices grew from GH¢824.0 million in 2005 to GH¢1,173.0 million in 2012 and further to GH¢1,227.7 million in 2013 (GSS, 2014). This puts the average annual growth rate of GDP per capita in constant 2006 prices at 5.2 percent for the period 2005-2012.

Ghana's economy has been strengthened by a quarter century of relatively sound management, a competitive business environment, and sustained reductions in poverty levels. In late 2010, Ghana was recategorized as a lower middle-income country (Yearbook, 2013).

Figure 1 shows the trend of real GDP for Ghana for the period 1984 to 2015.

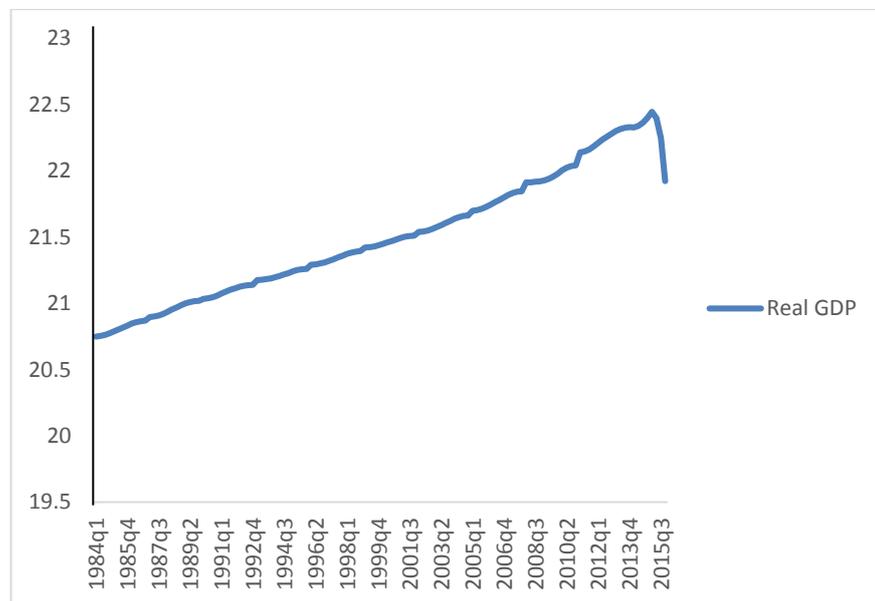


Figure 1: Trend of Real GDP

Source: World Bank (2014)

It can be observed from Figure 1 that Real GDP rises steadily from the first quarter of 1984 through to the first quarter of 2014 and thereafter falls

sharply. This means that real GDP has seen a consistent improvement over the years until 2014 where it suddenly deteriorated.

Figure 2 highlights the trend of government interest payment for from 1984 to 2015.

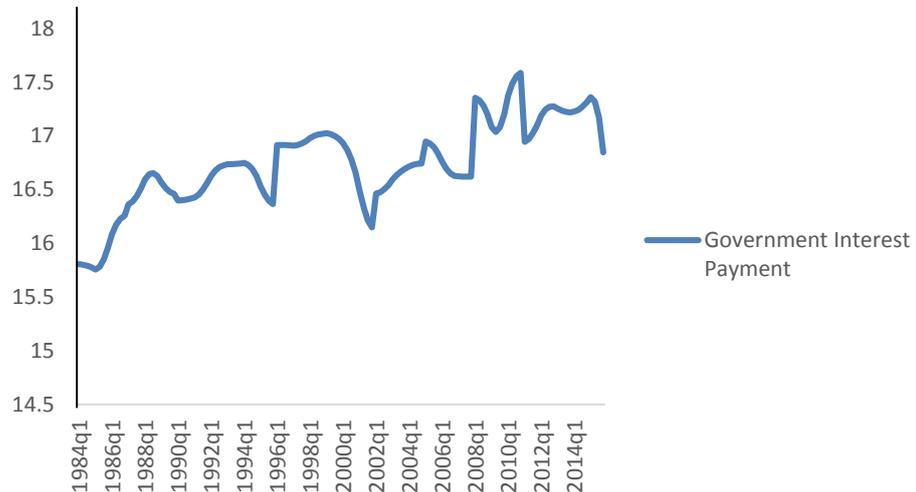


Figure 2: Trend of Government Interest Payment

Source: World Bank (2014)

It can be inferred from Figure 2 that, government interest payment has been very unstable, i.e. it has been fluctuating consistently over the study period. From 1985 second quarter, it increased significantly until the first quarter of 1989. Thereafter, the country experienced alternate rise and fall in interest payment. There was an astronomic rise and fall between 2006 and 2010. It increased afterwards and drops marginally in 2011 quarter 3 before rising and a sharp fall from 2014 quarter 1.

Figure 3 depicts the trend of government transfer payment for Ghana for the period 1984 to 2015. From Figure 3, it be seen that government transfer payment has been increasing consistently over the study period. Around late 1990s and early 2000, the country witnessed some rise and fall in transfer payment although such fluctuations are not significant. However,

transfers were found to be relatively stable from the year 2010 to 2014 where it began to rise slightly.

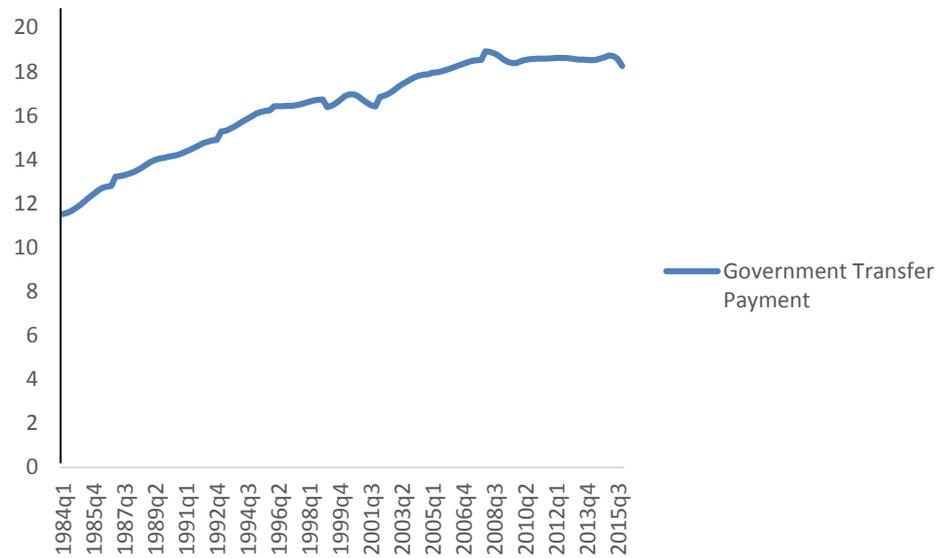


Figure 3: Trend of Government Transfer Payment

Source: MoFEP (2014) Fiscal Data

Figure 4 presents the trend of government consumption expenditure (% of GDP) from 1984 to 2015 for Ghana.

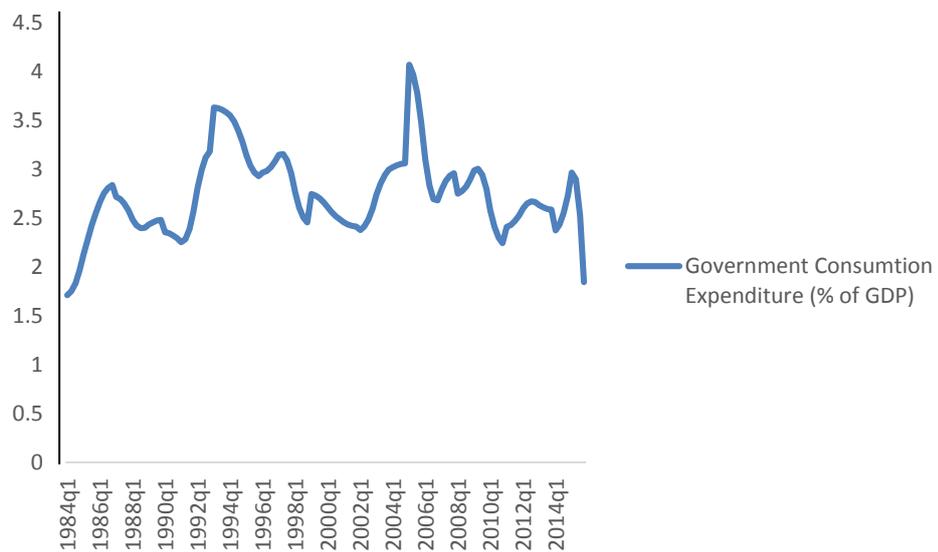


Figure 4: Trend of Government Consumption Expenditure (% of GDP)

Source: World Bank (2014)

Government consumption payment (% of GDP) has been inconsistent throughout the period under review. Consumption payment rises from 1984 quarter 1 to 1986 quarter 3 and falls until 1991 quarter 3 and rises again. Consumption payment hits its highest record in 2005 quarter 2.

Nevertheless, Ghana's economy is expected to slow down for the fourth consecutive year to an estimated 3.9% growth rate in 2015, owing to a severe energy crisis, unsustainable domestic and external debt burdens, and deteriorated macroeconomic and financial imbalances. Provisional GDP figures issued by Ghana Statistical Services further suggest that the economy would expand by 4.2% in 2014, less than the growth of 7.3% recorded in 2013 (Yearbook, 2013).

In the same manner, Abdelal, Blyth and Parsons (2015) revealed that despite the projected slight improvement in economic growth in the global economy in 2015 and 2016, Ghana's GDP growth rate is projected to decline in 2015 but then rise in 2016. It was further indicated that this projection is not only peculiar to Ghana but a projected pattern for the Sub-Sahara African countries in general.

Statement of the Problem

Government activities, particularly expenditure, play an active role in promoting macroeconomic performance of a country (Chude & Chude, 2013; Ebaidalla, 2013). Barro and Redlick (2009) established that economic or GDP growth responds positively to changes in each component of government spending more importantly current defense spending of the government. Therefore, growth of government expenditure leads to economic growth.

Accordingly, many empirical studies including Aregbeyen (2006); Ebaidalla (2013); Kamasa and Ofori-Abebrese (2015) have focused on the relationship between government expenditure and economic growth. The debate on the topic is ongoing with diverse focus. While Ebaidalla (2013) indicated that government expenditure influences economic growth positively, Appiah (2014), and Kamasa and Ofori-Abebrese (2015) highlighted that economic growth drives government expenditure growth in Ghana. Saiyed (2012) asserted that both government expenditure and economic growth influence each other in India.

Thus, all these findings failed to reach a definite answer for the question of direction of causality between the two variables. In other words, some empirical results confirm the Wagner view rather than the Keynesian hypothesis, while other findings advocate the Keynesian view. Such differences in the results on the connection between government expenditure and economic growth can be attributed to different specifications, different sample periods, and data from different countries.

According to the Keynesian perspective, government policy could reverse economic recession via various government spending programmes such as infrastructural development. Keynes (1936) is of the view that increased government consumption has a high potential of increasing employment, profitability and investment through its multiplier effects on aggregate demand. Hence, economic growth can be influenced positively by government expenditure, both recurrent and capital expenditures. But, endogenous growth models predict that only those productive government

expenditure components will positively affect the long run growth rate (Barro, 1990).

However, Wagner's hypothesis presupposes that government expenditure has no impact on growth of the economic, but rather economic growth impacts government spending positively. For instance, Yackovlev, Lledo and Gadenne (2009) established that government expenditure growth is the outcome of economic growth in sub-Saharan African and other developing countries.

Fan and Saurkar (2008) studied trends of government spending in developing countries. Their results indicated that in Africa and Asia, government expenditures in agriculture and education were particularly robust in promoting economic growth, but in Latin America, spending in agriculture, infrastructure and social security had positive growth-promoting effects. Their results further revealed that Structural Adjustment Programmes (SAPs) had a negative effect on growth in Africa, but no statistically significant effects in Asia and Latin America. Moreover, Saad and Kalakech (2009) indicated that public expenditure on education has positive effect on economic growth only in the long-run but not in the short run. Hence, various types of government spending have differential impacts on economic growth. However, their findings contradict with the works of Landau (1986); Devarajan, Swaroop and Zou (1996); Miller and Russek (1997) who found insignificant positive relationship between public expenditure on education and economic growth of developing economies.

In Ghana, well-known empirical studies in this area include Kamasa and Ofori-Abebrese (2015), Appiah, (2014); Twumasi (2012); and Nketiah-

Amponsah (2009); and Frimpong and Oteng-Abayie (2006). Whilst Appiah (2014) used the Maximum Likelihood Estimation and cointegration techniques among the variables within the framework of Autoregressive Distributed Lag (ARDL) model, Kamasa and Ofori-Abebrese (2015) employed the Vector Autoregressive (VAR) model but found different results.

Again, Appiah (2014) decomposed government expenditure into capital expenditure and recurrent expenditure; Nketiah-Amponsah (2009) disaggregated government expenditure into health expenditure, infrastructure expenditure and expenditure on education; Twumasi (2012) disaggregated government expenditure into government consumption expenditure, government investment and general government transfers, whereas Kamasa and Ofori-Abebrese (2015) proxied government expenditure by general government final consumption expenditure and expenditure on national defence and security but excludes government military expenditures.

It can be observed that none of the studies disaggregated government expenditure to include government interest payments. But government of Ghana is always borrowing to meet her expenditure and each of these loans is contracted with interest. Hence, there is the need to investigate the relationship between economic growth and government expenditure components such as government consumption expenditure, general government transfer and government interest payments-which is the second largest expenditure component of government after compensation of employees. This study therefore seeks to re-examine the relationship between government expenditure and economic growth in Ghana by disaggregating government

expenditure to capture government consumption expenditure, general government transfers and government interest payments.

Purpose of the study

Generally, the study aims at examining the growth impact of government consumption, interest and transfer payments in Ghana for the period 1984 to 2015.

Specifically, the study seeks to:

1. examine the short run and the long run relationship between government consumption expenditure and economic growth;
2. explore the short run and the long run relationship between government interest payment and economic growth; and
3. investigate the short run and the long run relationship between general government transfer payment and economic growth; and
4. identify the direction of causality between government expenditure components (interest payment, consumption expenditure and general transfers) and economic growth.

Research Hypotheses

1. H_0 : There is no short run and long run relationship between government consumption expenditure and economic growth.
 H_1 : There is a short run and long run relationship between government consumption expenditure and economic growth.
2. H_0 : There is no short run and long run relationship between government interest payment and economic growth.

H₁: There is a short run and long run relationship between government interest payment and economic growth.

3. H₀: There is no short run and long run relationship between general government transfer payment and economic growth.

H₁: There is a short run and long run relationship between general government transfer payment and economic growth.

4. H₀: There is no causal relationship between economic growth and government expenditure components.

H₁: There is a causal relationship between economic growth and government expenditure components.

Significance of the study

Government spending plays a key role in the economic growth of a country through its multiplier effects on the aggregate demand. Therefore, exploring the growth impact of government consumption, interest and transfer payments in a developing economy like Ghana is critically important.

Against this background, it is hoped that the findings of the study would provide better insight for economists and policy makers to identify which component(s) of the government expenditure will stimulate growth of output more in Ghana. In effect, it will guide policymakers regarding how the limited resources of the country will be allocated among the government expenditure components.

Lastly, the direction of causality between the government expenditure components and economic growth will be established.

Scope of the study

This study aimed to critically examine the growth impact of government consumption, interest and transfer payments in Ghana. A quarterly time series dataset for the period 1984 to 2015 was used. The study employed the Autoregressive Distributed Lag (ARDL) model otherwise known as the bounds testing approach to cointegration developed by Pesaran and Shin (1998); Pesaran, Shin and Smith (2001).

Organization of the study

The study is organized under five chapters. Chapter one comprises the background to the study, statement of the problem, objectives of the study, research hypotheses, significance of the study, scope and organization of the study. The chapter two presents the review of related literature covering both theoretical and empirical review. Chapter three will discuss the methodology adopted for the study. Specifically, it highlights the research design, theoretical and empirical model specifications as well as description and sources of data. Chapter four covers results and discussion. The final chapter, five summarizes the main findings of the study, discusses the policy implications and recommendations for economists and policy makers in Ghana, and finally acknowledges the limitations of the study.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

This chapter is devoted to the review of literature related to government expenditure and economic growth nexus. The chapter is organized under three main sections—one, theoretical literature review; two, review of trend of government expenditure and economic growth in Ghana; and three, empirical literature review.

Theoretical Literature Review

This section of the literature review focuses on the review of the theoretical background of government expenditure and economic growth nexus, some theories of economic growth with specific emphasis on the neoclassical (Solow-Swan, Peacock-Shaw) growth model, and endogenous growth model including Afonso-Alegre growth theory, the role of the government in economic growth, and some theories of government expenditure growth.

Theoretical Background of Government Expenditure and Economic Growth Nexus

The relationship between public expenditure and economic growth has been extensively researched and has been an issue which has attracted considerable debate among the various economic schools of thought including Keynes. Oyinlola and Akinnibosun (2013) indicated that, the theoretical underpinning of this relationship can be traced to the time of Wagner (1883) to

Keynes (1936), Peacock and Wiseman (1961), and later to Musgrave (1969). Mainly, two schools of thought emerged on the direction of causality between public expenditure and economic growth.

The first school of thought is that, public expenditure is a consequence of economic growth as postulated by Wagner (1883). Thus, the Wagner's hypothesis argues that expansion in government spending is the outcome of economic growth since growth of the economy widens the role and the activities of the government, and eventually escalates public expenditure.

The other school of thought is by Keynes (1936) who affirmed that public expenditure is a tool adopted by the government to turn around economic downturns through various spending programmes. Hence, economic growth is an outcome of public expenditure. Keynesian theory maintains that an active role of government spending policy can be effective in managing the economic growth of a country. Keynesian theory sees government spending as a variable which could be employed as a policy instrument for growth. With regards to the Keynesian macroeconomic thoughts, government spending can influence economic growth positively via aggregate demand. Thus, when government increases its spending without crowding-out private consumption then aggregate demand would grow, as well as output and employment.

Therefore, an increase in government spending is highly probable to result in an increase in the levels of employment, profitability and investments through the multiplier effect on aggregate demand. Keynesian macroeconomics, therefore, suggests increases in government spending to circumvent economic downturns in an economy and vice versa. This view of

Keynes was in contrast with those of classical and neoclassical economic analysis of government spending.

The classical and the neoclassical economists, on the other hand, consider government spending to be unconnected when it comes to economic growth. The classical theories argue that stimulations in government expenditure crowds out private investments, impedes growth of the economy in the short run and diminishes capital accumulation in the long run (Blanchard, Diamond, Hall, & Yellen, 1989). Actually, the classical economists postulate that expansions in government expenditure, in most cases, culminate in upward changes in prices and temporal increases in the level of output and economic growth. The reason is that the classical theories assume that the economy regulates itself to variations from long-run equilibrium which is essentially due to the supply-determined nature of output and employment.

Considering the framework of the neoclassical growth theories, government activities, particularly public spending, play no vital role in stimulating the long-run economic growth rate of an economy. This is because economic growth is determined by the exogenous variables such as population growth and technological progress rates (Todaro & Smith, 2003). Evident in the Solow neoclassical growth model is that the long-run or the steady-state growth rate of a country is not affected by government policies, but by the exogenous changes in population growth, savings and technological progress. The performance of the neoclassical growth models in explaining the sources of long-run economic growth was adjudged inadequate and this stimulated the development of the endogenous growth models.

The endogenous growth models present a theoretical framework for analyzing endogenous growth and seek to explain the factors that determine the size and the rate of economic growth that is left unexplained and exogenously determined in the neoclassical growth models (Todaro & Smith, 2003). In the endogenous growth models, economic growth is the outcome of capital accumulation, human capital (including education, training and health), knowledge or research and development (improved technology) among others. Reungsri (2010) emphasized that these variables depend on government policies and actions on taxation, law and order, provision of infrastructure services, financial markets and other aspects of the economy. In that sense, government directs long-run economic growth.

Government Expenditure and Economic Growth: Aggregate Demand and Aggregate Supply Framework

It is meaningful to analyze the mechanism through which government expenditure may lead to economic growth. The analysis is carried out within the aggregate demand-aggregate supply (AD-AS) framework. Aggregate demand refers the quantity of all goods and services demanded in the economy at any given price level whereas aggregate supply refers to the total quantity of goods and services that firms produce and sell at any given price level. Unlike the aggregate-demand curve, which is always downward sloping, the aggregate-supply curve shows a relationship that depends crucially on the time horizon examined. In the long run, the aggregate-supply curve is vertical, whereas in the short run, the aggregate-supply curve is upward sloping.

A conceptual picture of the Wagner's law and Keynesian hypothesis can be analytically depicted by AD-AS framework. The national income identity is given as:

$$Y = C + I + G + NE \quad (1)$$

where Y represents GDP (national income), C denotes consumption, I represents investment, G is government expenditure, and NE is net exports (exports minus imports). Clearly, G is defined as a component of GDP that an increase in G will simultaneously cause higher Y depending on domination of the multiplier or the crowding out effects. The inter-relationships between Y and G can be depicted from AD-AS framework in which the shift of AD curve is affected by the expenditure components such as C, I, G, and NE.

$$AD \equiv Y = C + I + G + NE \quad (2)$$

From the Keynesian point of view, an expansionary fiscal policy (increasing G) shift the AD curve to the right, this moves the existing market equilibrium to a new equilibrium in the short-run resulting a higher level of output (Y, real GDP), and a higher price level (P). Over time, the short-run AS curve will shift to the left in order to restore equilibrium.

Likewise, the AD-AS framework illustrates the mechanism rationalized in Wagner's law. An increase in Y (real GDP) raises C (as the households use part of the additional income for buying goods and services) and I increases as well through accelerator effect. The government spending (G) is exogenously determined by the government. Wagner's law views government spending as an endogenous factor that is driven by the growth of national income.

However, as policy variable government expenditure may cause a reallocation of resources among the components of government expenditure. i.e increasing the expenditure on a particular component may lower the allocation on other components and this mechanism determines what the actual output will be. Thus, the ultimate result of Keynesian hypothesis or Wagner's law is ambiguous. For instance, increasing expenditure on wages and salaries may increase consumption expenditure as the civil servants will spend part of the income for purchasing goods and services, thus real GDP increases—Keynesian hypothesis, while higher defence spending may increase imports and hence reduce net exports. Consequently real GDP decreases. This is because a fall in net exports will reduce aggregate demand and output.

Review of some Growth Models

Neoclassical Growth Theories

Appiah (2014) emphasised that much of the basic components that appear in modern theories of economic growth were developed by the Classical economists such as Adam Smith (1776), David Ricardo (1817) and Thomas Malthus (1798) and much later, Frank Ramsey (1928), Allyn Young (1928), Frank Knight (1944) and Joseph Schumpeter (1934). Such thoughts comprise the basic approaches of competitive behaviour and equilibrium dynamics, the role of diminishing returns and its implication to the accumulation of physical and human capital, the interplay between per capita income and the growth rate of population, the effects of technological progress such as increased specialization of labour and discoveries of new goods;

methods of production and lastly, the role of monopoly power as an incentive for technological advance.

Neoclassical theory was purposefully micro-oriented with much emphasis on the utility-maximizing behaviour of individuals and the profit-maximizing actions of perfectly competitive firms. The macroeconomic perspective inherent in a concern for economic growth and in the distribution of income among classes that had motivated the classical economists gave way to a narrower interest in the conditions required for equilibrium prices and quantities in individual markets.

Sequentially, the modern growth theory began with the classic work of Ramsey (1928). From Ramsey (1928) through to the late 1950s, Harrod (1939) and Domar (1946) (popularly known today as the Harrod-Domar model) attempted to integrate Keynesian analysis with essentials of economic growth. This model employed production functions with little substitutability among the inputs and maintain that the free-market system is naturally unstable. Their opinions were embraced compassionately by many economists during the time in the sense that they wrote shortly after the Great Depression. Despite the fact that very little of this analysis plays a role in our thinking today, their contributions generated a lot of research at the time.

Peacock-Shaw (1971) Model

Peacock and Shaw (1971) demonstrated how fiscal policy affects economic growth in their effort to extend the Harrod-Domar growth model. The Peacock-Shaw model assumes that on the supply side output capacity Y_t^c

in period t is given by private investment I_t and government expenditure G_t in the past period. Thus:

$$\Delta Y_t^c = \beta(I_{t-1} + \rho G_{t-1}) \quad (3)$$

Where β is the output-capital ratio and ρ is the proportion of government expenditure that consists of investment. The Peacock-Shaw model assumes the demand side equation to be:

$$Y_t = C_t + I_t + G_t \quad (4)$$

where consumption C_t , private investment I_t and government expenditure G_t are given by:

$$C_t = bY_t(1 - T_y) \quad (5)$$

$$I_t = I_{t-1} = I_{0t} \quad (6)$$

$$G_t = gY_t \quad (7)$$

T_y is the given rate of income tax, b is the marginal propensity to consume and g represents the ratio of current government expenditure to the level of total output.

Solving the equations (3) to (7) by routine procedures, Peacock and Shaw (1971) further specified the relationship between the fiscal variables and economic growth as:

$$\frac{\Delta Y_t}{Y_{t-1}} = \beta(1 - b + bT_y - g + \rho g) = \frac{\Delta I_t}{I_{t-1}} \quad (8)$$

Equation (8) shows that, in order to utilize capital stock fully, the necessary growth demand must be equal to the required investment growth which in itself is functionally related to changes in both taxes and public expenditures. Thus, changes in taxes or public expenditures would

considerably influence economic growth rate. Equation (8) in terms of the Harrod-Dormar model suggests that $(1 - b + bT_y - g + \rho g)$ in the model represents the savings rate (s) while β which is output-capital ratio represents the $\frac{1}{k}$; where k is defined in the Harrod-Dormar model as capital-output ratio.

For the Harrod-Dormar model:

$$\frac{\Delta Y_t}{Y_{t-1}} = \frac{s}{k} \quad (9)$$

Where $\frac{\Delta Y_t}{Y_{t-1}}$ represents growth rate, $k = \frac{1}{\beta}$ and

$$s = (1 - b + bT_y - g + \rho g) \quad (10)$$

The equation (10) above helps the government to predict the required savings rate once the target growth rate and capital-output ratio are given or estimated through its budget policies. Total savings in the economy is equal to the sum of government or public sector savings and private domestic savings. Government savings basically comprises budgetary savings that arises from any excess of government's revenues over government's current expenditures (Gillis et al, 1983; as cited in Twumasi, 2012). Hence for a higher rate of economic growth, the ratio of current expenditures to the level of total output g must be reduced while increasing the ratio that consist of investment ρ . Nevertheless, the Peacock-Shaw model argues that, increasing revenues particularly taxes as suggested in equation (10) will help improve the budgetary savings s and ultimately enhance economic growth.

Solow (1956) Model

A typical illustration of the neoclassical ideology on growth was developed by Solow (1956) and Swan (1956). This model is referred to as Solow or Solow-Swan model and made more important contributions to growth theories. The model was formulated by expanding the Harrod-Dornar model to include labour and technology which the authors assumed to be an independent variable to the growth equation (and that, its progress is determined exogenously). In this model, Solow used a Cobb-Douglas production function which is assumed to be characterized by constant returns to scale. Thus, the key aspect of the Solow model is the neoclassical form of the production function, a specification that assumes constant returns to scale, diminishing returns to each input, and some positive and smooth elasticity of substitution between the inputs. This production function is combined with a constant saving rate rule to generate an extremely simple general equilibrium model of the economy.

Solow (1956) believes that if production activity takes place under neoclassical production conditions of variable proportions and constant returns to scale, then there would be no resistance between natural and unwarranted growth rates. The system is self-adjusting to any given rate of growth of labour force and ultimately approaches a state of steady proportional expansion. According to Van den Berg (2001), to make distinction between the Solow and the Harrod-Dornar growth models and its fixed capital-output ratio, Solow specified a production function that allows factors to be constantly substituted for each other. The implication of such constant substitution is that, the marginal product of each factor is variable, and

depends on how much of the factor that is already used in production and how many other factors it is combined with it.

The Solow growth model importantly assumed that each factor of production is subject to diminishing returns. Moreover, the production function suits the properties that: the marginal products of inputs get closer to infinity as inputs are reduced to zero and approach zero as inputs are increased infinitely. In fact the inherent weakness, in the Harrod-Domar model, that a constant rate of saving and investment could bring perpetual economic growth is evidently revealed by Solow model.

Accordingly, Solow argued that the reality of diminishing returns in the production process and constant investment by itself could not generate permanent growth of an economy, in the sense that diminishing returns would eventually cause the gains in output from investment to approach zero. Consequently, Solow (1956) contributed tremendously to the theory of economic growth by laying emphasis on long-run growth. Solow again hypothesized that long-run growth is in essence influenced by technological change and not by savings or investment. They noted that saving only determines short-run growth of the economy, since the economy will run into diminishing returns as the ratio of capital per labour increases. In response to this, Perman and Stern (2003) indicated that the absence of constant improvement in technology, per capita growth will eventually cease and vice versa.

Solow's model primarily assumes that, economic growth is the outcome of the combination of capital and labour. As a result, the following question emerged: how much of output growth can be attributed to other

factors of production apart from labour and capital? In order to address the question, Solow classified the growth in output into three components, each identifiable as contribution of one factor of production, that is labour, capital, and total factor productivity. This implied that in the Solow model, long term economic growth is explained by labour augmenting technological change and by the increase of capital per labour.

The total factor productivity (TFP) is usually termed as the Solow residual. The term residual is appropriate, because the estimate denotes the part of measured GDP growth that may not be explained by labour and capital. The residual refers to the difference between the rate of growth of output and the weighted average of the rates of growth of capital and labour, with factor income shares as weights. The TFP is calculated under the assumption of perfect competition in the labour and capital market as well as the product and service markets.

Endogenous Growth Models

In the late 1980s, quite a lot of models of endogenous growth began to emerge in the economics literature and as a result, economic growth theory experienced a remarkable revival and became once more a very active area of macroeconomic research. According to D'Agata and Freni (2003), the goal of the endogenous growth theory was twofold: one was to rise above the shortfalls of the Solow and Ramsey models which failed to address persistent growth; and lastly, was to develop a more robust model in which all variables - which matter for growth such as savings, investment, and technical knowledge- are the outcome of rational decisions.

Unlike neoclassical growth theories, endogenous growth theories do not assume that physical capital accumulation is the dominant factor that mainly determines economic growth nor explains the differences in income levels among nations. Again, Cypher and Dietz (2004) maintain that the endogenous models failed to accept the neoclassical and classical assumption of diminishing returns as applying to any of the reproducible inputs of production such as capital and labour, but also technology, effectively turning a nation's short-run production function into a long-run, dynamic relationship that can be constantly evolving. Although diminishing returns operates in any production process, the introduction of high pace of technological progress has claimed superiority over it in the long run. This means that the classical and neoclassical economists did not take into consideration the relationship between technological progress and the phenomena of diminishing returns.

Endogenous growth models maintain that a higher level of investment may not only increase per capita income, as the neoclassical models say, but also higher investment rates can generate greater rates of growth of per capita income in the future.

This is, however, not possible within the conventional neoclassical growth model, which posits that a steady-state income level, determined by the rate of saving and the population growth rate, is the equilibrium outcome of the growth process. Given that population growth is a constant, higher levels of income simply are not attainable in the neoclassical model without either an increase in the rate of saving or an exogenous advancement in the level of technology. The endogenous growth models hold different view with respect to this. These models argue that it is possible for countries to continue

to grow rapidly for long periods, even when they already have achieved relatively high incomes. This sustaining of growth rates can occur without an increase in the rate of savings.

Cypher and Dietz (2004) highlight that when the link between the rate of economic growth and the law of diminishing returns is suppressed, and the ceiling on income per person for any particular rate of savings and investment is eliminated, endogenous growth models can easily elucidate the existence of widening income gap between poorer and richer countries.

In most endogenous growth models, one of the most important factors of production contributing to higher and continuous growth has been found to be both the rate of accumulation, as well as the initial stock, of human capital. While these models share some similarities with the capital and saving-centered neoclassical growth models in their form, the endogenous growth models do not envisage the convergence of income levels, even among countries with similar rates of saving, investment and population growth rates.

Indeed, these models demonstrate how it is possible for some countries to continue to grow faster than others far into the future, with both the absolute and relative income gap growing. Endogenous growth models in addition lay a diverse emphasis on what is required to enhance a nation's economic growth and development possibilities compared to the recommendations derived from the capital-and saving-centered neoclassical-type models.

It must be noted at this point that, the foremost conceptual disparity between the Solow's neoclassical growth models and the endogenous growth models is that the endogenous models do not assume any diminishing returns to the reproducible inputs, K - the stock of physical capital, to H - the stock of

human capital or to technology. Rather it is presumed that constant, or even increasing marginal returns are possible. The endogenous growth models assume that, there are likely to be significant positive externalities to human capital accumulation and, possibly to some physical capital accumulation to the degree that new capital embodies new technology, so that the classical and neoclassical result of diminishing returns to K and H are avoided through such society-wide spill-over effects.

When the social benefits from human capital accumulation exceed the private benefits, there will be positive secondary and tertiary effects from, say, an increase in a country's average education level or enrollment ratios that reverberate through the economy.

More educated and presumably more productive workers not only produce more at their own tasks, but they also interact synergistically with their workmates so that the productivity of other workers also rises, even though their level of education may have remained unchanged. Higher average levels of education among a population also can contribute to learning-by-doing effects. That is, the capacity of labour to build upon its past education and training, so that the same level of human capital input actually is able to improve its productivity over time in the process of producing goods and services on the shop floor, or wherever production takes place.

Learning-by-doing contributes to increases in the potential level of total output without the need for an increase in any additional inputs and with no increase in investment. Learning-by-doing effects increase the productivity and effectiveness of labour. The presumption is that the higher the level of human capital accumulation in an economy, the stronger will be such effects,

again breaking the link between growth in labour and human capital accumulation and diminishing returns.

Based on the endogenous growth theory, the ability to use technology, the ability to develop it and the skills of the labour force available to complement technological knowledge are all formed in and shaped by each particular economy. In other words, growth is an endogenous process, coming from within each particular economy, with each having a different production function indicating diverse quantities and qualities of its inputs.

Afonso-Alegre (2008) Growth Model

Afonso-Alegre's growth model expanded a simple endogenous growth model to demonstrate the system through which the different types of public expenditures and taxes affect economic growth. The model assumes an economy with four types of public expenditures and three types of taxes in an extended Cobb-Douglas type model with constant returns to scale. The types of the public expenditures in the model are: the expenditures on public input in the production function (G_1); the capital-enhancing type of public expenditure (G_2); the labour-enhancing type public expenditure (G_3) and; the publicly provided consumption good (G_4). Tax components comprise taxes on consumption (τ_c), taxes on corporate profits (τ_π) and taxes on labour income (τ_l). The production function can be written as:

$$Y_t = AK_t^\alpha L_t^\gamma G_{1,t}^\delta$$

(11)

where K_t and L_t denote private capital and labour supply respectively and G_1 denotes the public input in production which is taken as a separate input in the production function. For simplicity, the capital-enhancing type expenditure G_2 is assumed to be a subsidy to the purchase of private capital (Deverajan *et al.* 1996; Afonso & Alegre, 2008; Twumasi, 2012). The subsidized private capital paid through the capital-enhancing type of public expenditure is assumed to be given by:

$$G_{2,t} = (1-s_t)K_t \quad (12)$$

Based on the theory that G_2 provides an incentive to private investment and where $1-s_t$ is the subsidized share of private capital.

Assuming a labour supply that depends on the level of government expenditure on labour G_3 , the level of population growth Nt and the equilibrium real wage w :

$$L_t = w_t^\mu G_{3,t}^\nu N_t^\eta \quad (13)$$

The parameters μ and η are assumed to lie in the interval $(0,1)$ but vis accepted to be between -1 and 1 since public policies that create disincentives to labour supply on the labour market can exist (Afonso & Alegre, 2008; Twumasi, 2012).

Assuming further a Cobb-Douglas type utility function for the household agent(s) who live for an infinite number of years, the utility function is considered as:

$$U_j = \sum_{t=j}^{\infty} \beta^t C_t^\theta G_{4,t}^{(1-\theta)} \quad (14)$$

Where C_t represents household consumption, G_4 represents the public type of spending that is directly consumed by households and therefore

entering the utility function as G_4 . Average consumption for household agents as in line with economic theory is assumed not to change during their life time but there can be temporal fluctuations.

The household agents are considered to be the owners of capital and firms, and supplies labour. For the budget constraint, the household agent will have to choose the share of their income that they want to consume or invest in additional capital for the next period and in addition pay taxes on labour, on corporate profits and on consumption. The household's constraint can be shown as:

$$(1 + \tau_c)C_t + s_{t+1}K_{t+1} = (1 - \tau_l)wL_t + (1 - \tau_\pi)\pi_t + r_tK_t \quad (15)$$

where τ_c , τ_l and τ_π are the previously defined tax types, π_t and r_t represent corporate profits and the equilibrium rate price of capital paid by firms to households respectively. Also, household agents are assumed to take the decisions of the government concerning taxes and public expenditures as exogenous and also decide on their own how to distribute their income between private capital investment and current consumption. The household agents consume to maximize their utility (14) subject to the budget constraint (15). When we log-linearise and substitute the equations for labour and capital in (11), the effect of permanent increases in any of the proposed fiscal variables can further be specified in the form of growth as:

$$\frac{\partial y_t}{\partial g_{1t}} = \frac{\delta(1 + \mu)}{\phi} > 0 \quad (16)$$

$$\frac{\partial y_t}{\partial g_{2t}} = \frac{\alpha(1 + \mu)(1 - s_t)}{\phi s} > 0 \quad (17)$$

$$\frac{\partial y_t}{\partial g_{3t}} = \frac{\nu\gamma}{\phi} > 0 \quad (18)$$

$$\frac{\partial y_t}{\partial g_{4t}} = \frac{(1-\theta)(1+\mu)\alpha}{\phi} \geq 0 \quad (19)$$

Where $\phi = (1-\alpha)(1+\mu) - \alpha\mu$ and the elements represented by small letters denote their growth rates. And in much the same way, that of taxes can also be shown as:

$$\frac{\partial y_t}{\partial(1-\tau_{i,t})} = \frac{\alpha(1+\mu)}{\phi} \frac{\gamma}{\lambda} + \frac{\gamma\mu}{\theta(1-\tau_{i,t})} < 0 \quad (20)$$

$$\frac{\partial y_t}{\partial(1-\tau_{\pi,t})} = \frac{\alpha(1+\mu)}{\phi} \frac{\delta}{\lambda} < 0 \quad (21)$$

Where $\lambda = (1-\tau_{\pi,t})\delta + (1-\tau_{i,t})\gamma + \alpha$

The derivations above show that changes in the levels public input in production (G_1), capital enhancing public-expenditure (G_2) and labour-enhancing public expenditure (G_3) will all have permanent and positive effects on growth whereas changes in both labour income tax (τ_l) and corporate income tax ($\tau_{\pi,t}$) will also have permanent and negative effects on growth. And since government expenditure on consumption G_4 and consumption tax (τ_c) affect the economy through consumption, both would affect growth temporarily based on the theory that consumers would not change their consumption pattern in the long run.

The Role of Government in Economic Growth

The Minimal Government Argument

Hindriks and Myle (2006) observe that the very basic motivation for the existence of the government follows from the experience that an entirely unregulated economic activity could not operate smoothly in a very sophisticated way. Thus, an economy will not function effectively if there were no property rights (the rules governing the ownership of property) or contract laws (the rules defining the conduct of trade). The reason here is that without property rights, satisfactory exchange of commodities could not happen in the face of mistrust that would exist between contracting parties. Property rights, therefore, ensure that the participants in a trade obtain what they expect and if they are not satisfied, it opens an avenue to seek redress. Examples of contract laws include the formalization of weights and measures and the obligation to offer product warranties. These laws give confidence to trade by checking some of the risks and uncertainties in transactions.

The minimal state argument can be traced back to Hobbes in the 17th century, who perceived the government as a social contract that enabled people to escape from the anarchic “state of nature” where their competition in pursuit of self-interest would lead to a destructive “war of all against all”.

The authors, particularly Hindriks and Myles (2006), maintain that the institution of property rights is the first step away from this anarchy but property rights and contract laws are not sufficient in themselves. Unless they can be regulated and upheld in law, they are of limited importance. However, such law enforcement cannot be provided free of cost. Enforcement officers must be employed and courts must be provided where redress can be sought. In addition, a society would also face a need for the enforcement of more general criminal laws. Moving beyond this, a country needs to defend it

territories against any external aggression. This implies the provision of defence for the nation.

In sum, the minimal-state concern offers contract laws, supervises it and protects the economy against any external hostility. This is exactly what the minimal state does. However, without it any meaningful economic activity cannot be achieved. This therefore justifies the need for a government (Appiah, 2014).

The Market versus the Government

Hindriks and Myles (2006) are of the view that aside the essential prerequisites for a well-structured economic activity, there are other instances in which government interventions in the economy can meaningfully enhance welfare. The situations where government intervention may be deemed appropriate can be categorized into two: i.e those that are associated with market failure and those that do not involve any market failure.

Leach (2004) believes that in the existence of market failure, the argument for considering whether intervention would be beneficial is compelling. Consider a situation where an economic activity produces externalities (effects that one economic agent imposes on another without their consent), so that there is a divergence between private and social costs and the competitive outcome is not efficient, it will be indispensable for the government to intervene to check the inefficiency that emanates from such economic activity . The last argument can also be extended to other cases of market failure, such as those connected to the existence of public goods and

imperfect competition. Hence government intervention in such market failures on efficiency grounds justified.

It must however be emphasized at this point that this line of argument does not imply that government intervention will always be necessarily beneficial and welfare enhancing. In every case, it must be demonstrated that the government actually has the ability to improve upon what the unregulated economy can achieve. This cannot be achieved if the policy tool adopted is limited or government information is restricted. It will also be undesirable if the government is not benevolent. While some useful insights follow from the assumption of an omnipotent, omniscient and benevolent policy maker, in reality it can give us very misleading ideas about the possibilities of beneficial policy intervention. It must be recognized that the actions of the government and the feasible policies that it can choose are often restricted by the same features of the economy that make the market outcome inefficient.

Moreover, Stiglitz (1989) emphasized that a government managed by non-benevolent officials and subject to political constraints may fail to correct these market failures and may instead introduce new costs for its own operation. He added that it is imperative to appreciate the fact that this potential for government failure is as important as market failure. Nonetheless, the very power to coerce raises the possibility of its misuse (Stiglitz, Heertje, & de Beaufort, 1989). Although the intention of creating this power is that its force should serve the general interest, nothing can guarantee that once public officials are given this monopoly power, they will not try to abuse this power in their own interest (Hindriks & Myles, 2006).

Some Theories of Government Expenditure Growth

Musgrave and Rostow's Development Model

The basis of the development model of public expenditure growth is that the economy develops; its structure and needs change over time. Accordingly, by following the nature of the development process from the beginning of industrialization through to the completion of the development process, a story of why government expenditure rises can be told. Aladejare (2013) highlights the stages of development as postulated by Musgrave and Rostow to include the following:

The early phase of development is considered as the period of industrialization during which the population moves from the countryside to the urban areas. Therefore in order to meet the needs that result from this movement, there is a requirement for a significant infrastructural expenditure in the development of cities. The typically rapid growth experienced in this stage of development results in a substantial increase in expenditure and the dominant role of infrastructure determines the nature of expenditure.

During the middle stage of development, the infrastructural expenditure of the public sector becomes increasingly complementary with expenditure from the private sector. Developments by the private sector, such as factory construction, are supported by investments from the public sector, e.g. the building of connecting roads. As urbanization proceeds and cities increase in size, so does population density. This generates a range of externalities such as pollution and crime. An increasing proportion of public expenditure is then diverted away from spending upon infrastructure to the control of these externalities.

Finally, in the developed phase of the economy, there is less need for infrastructural expenditure or for the correction of market failure. Instead, expenditure is driven by the desire to react to issues of equity. This results in transfer payments, such as social security, health and education, becoming the main items of expenditure. Of course, once such forms of expenditure become established, they are difficult to ever reduce. They also increase with heightened expectations and through the effect of an ageing population.

Although this theory of the growth of expenditure coincides broadly with the facts, it has a number of weaknesses. Most importantly, it is primarily a description rather than a theoretical explanation. Hence from an economic perspective, the theory is lacking in the sense that it does not have any behavioral basis but is essentially mechanistic. Thus in the development model, the change is just driven by the exogenous process of economic progress.

The Wagner's Law

Adolph Wagner (1883), in his model book the *Grundlegung der Politischen Ökonomie*, formulated a law known as "The Law of Increasing State Activity which states that, as the economy develops over time, the activities and functions of the government increase". The conclusion is that it is the growth of national income that causes government expenditure growth. Wagner meant that as a nation develops, it begins to experience high levels of complexity in legal relationships and communications, rise in the levels of urbanization as well as increase in population density and cultural and welfare expenditures (Kamasa & Ofori-Abebrese, 2015; Lamartina & Zaghini, 2011).

The content of Wagner's Law was an elucidation of this trend and a prediction that it would continue. Contrary to the basic developments models, Wagner's investigation resulted in a theory rather than just a description and an economic justification for the predictions. He argued that public expenditure is a consequence of economic growth (Oyinlola & Akinnibosun, 2013).

However, the fundamentals of the Wagner's theory comprised three dissimilar components (Permana & Wika, 2013). In the first place, it was observed that the growth of the economy led to an increase in convolution in the society. The effect is the continuous introduction of new laws and development of the legal structure which implied continuing increases in public sector expenditure. Secondly, there was the process of urbanization and this increased the externalities associated with it. Last and the final component underlying the Wagner's Law is what distinguishes it from the development model. Wagner posited that the goods supplied by the government have a high income elasticity of demand.

This proposition seems logical, for example education, recreation and health care. On the assumption that, economic growth which raised incomes would lead to an increase in demand for these products. In fact, the high elasticity implies that government expenditure would escalate as a proportion of income goes up. Its concentration solely on the demand for public sector services constitutes its main flaw.

The Classical versus the Keynesian Argument

The classical economists such as Adam Smith (1776), David Ricardo (1817), and Thomas Malthus (1798) believe that government intervention

brings more harm than good and that, the market alone should carry out most of the economic activities. Adam Smith (1776), in his 'Welfare of Nations', advocated for the "laissez-faire" economy where the profit motive was to be the main cause of economic development.

The classical economists assumed that if the economy was perfect, it is always at full employment level, wage rate and rate of interest is self-adjusting and as a matter of fact, the budget should always balance as savings is always equal to investment. Since they believe that the economy was always at its full employment level, their objective was certainly not growth.

Owing to the Great Depression, the classical economists argued that strong trade unions prevented wage flexibility which resulted in high unemployment. On the contrary, the Keynesians, led by John Maynard Keynes (1883-1946) championed government intervention in order to correct the market failures. Keynes (1936) in his work, "General Theory of Employment, Interest and Money", strongly criticized the classical economists for placing so much emphasis on the long run. He believed that, the depression required government intervention as a short term cure hence emphasized increased government spending. This implies that expansionary government spending policy is a tool that brings stability in the short run but this need to be done cautiously as too much of public expenditure lead to inflationary situations while too little of it leads to unemployment.

This "pump priming" concept did not necessarily mean that government should be excessively big. Instead, Keynesian theory emphasized that government expenditure - especially deficit spending - could provide short-term stimulus to help end a recession or depression. The Keynesians

even argued that policymakers should be prepared to reduce spending once the economy recovered in order to prevent inflation, which they believed would result from too much economic growth (Mitchell, 2005)

Peacock and Wiseman Hypothesis

Peacock and Wiseman (1961) conducted a study on the nature of increase in government expenditure in England. They suggested that the growth in public expenditure does not occur in the same way as Wagner hypothesized. The duo chose the political propositions instead of the organic state where it is deemed that government like to spend money, people do not like increasing taxation and the population voting for ever-increasing social services.

Peacock and Wiseman argued that government spending tends to evolve in a step-like pattern, coinciding with social upheavals, particularly wars (Aladejare, 2013). They adopted a clearly inductive approach to explaining the growth of government expenditure. Henry and Olekalns (2002) asserted that when Peacock-Wiseman observed that expenditure over time appeared to outline a series of plateaus separated by peaks, and that these peaks coincided with periods of war and preparation for war they were led to expound the “displacement effect” hypothesis.

Peacock and Wiseman viewed the period of displacement as reducing barriers that protect local autonomy and increasing the concentration power over public expenditure to the central government. During the process of public expenditure centralization, the role of state activities tend to grew larger

and larger. This can be referred to the concentration process of increasing public sector activities.

Government Expenditure and Economic Growth in Ghana

The economy of Ghana has experienced series of fluctuations in her growth process over several decades since late 1950s. Once Ghana recorded moderate growth rate shortly after independence (at the early stages of independence), it was expected that such high rates of growth were going to be sustained to usher the country into a high-income country by the end of the twentieth century, however, the economy started to slow down in the growth of GDP up to 1965.

The growth rate during the early years after the implementation of the ERP (1984-89) was around 5.7 percent, which was far better than the -3.4 percent growth rate which was recorded from the period 1979-83. Budget deficits were slashed down from 2.7 percent of GDP in 1983 to a surplus of 0.7 percent of GDP in 1989. The economy responded positively to the economic reforms as it recovered from its negative growth rate of 5% in 1983 to an immense positive economic growth rate of about 8% in the following year (Aryeetey, Fosu, & Bawumia, 2002). World Bank (2013) highlighted that after the implementation of the ERP and SAP, Ghana has observed consistent, stable, and positive economic growth, with annual growth rates averaging 5.4%.

The gap between government expenditures and government revenues became wide while growth rate remained fairly steady during this period. Growth rates ranged between 3.3 percent and 5.6 percent within the period of

1987 and 2000. Prior to the adoption of the ERP, total expenditures declined from 18.8 to 16.2 percent of GDP during 1983-91. This decline was as a result of the fall in transfer payments and government consumption expenditures by 2.0 and 6.6 percent of GDP respectively while investment expenditures progressively received an upward projection from 3.3 percent to 5.1 percent of GDP (MoFEP, 2012). As a proportion of GDP, deficit for the period was around 1.6 percent and has since been widening. This was principally a reflection of the rocketing nature of government expenditures at that time – total expenditure escalated from 14.3 in 1986 to around 28 percent of GDP in 2000. The average total government revenue as a share of GDP increased sluggishly from 11.5 percent during the ERP-1986 period to about 17.5 percent from the period 1986 to 2000.

The growth in government revenue was not matched by economic growth due to the fact that much of it was spent on consumption rather than investment. Consumption spending for the period 1986-2000 increased approximately by 20 percent of GDP, but that of investment spending shot up by 2.5 percent of GDP.

Fosu and Aryeetey (2008) are of the view that while the nation continues to enjoy high economic growth rates, average economic growth of 5.4% is seen as woefully inadequate given that the country in 1993 targeted to becoming an upper middle income country by the year 2020. It was indicated that, for this target to be achieved, it was estimated using a Harrod-Domar model that the economy needed to grow, on average, at 8% to achieve set target. The country failed to demonstrate the capacity to achieve this goal in

five years after the targets were set (Institute of Economic Affairs, 1992 cited in Fosu and Aryeetey, 2008).

The economic and growth performance of the country had been characterized by the non-attainment of macroeconomic targets. Particularly, while GDP was expected to grow between 7.1% and 8.3% in the period 1996-2000, actual growth was between 4.2% and 5.0% (Fosu & Aryeetey, 2008). The situation of significant divergence between actual and targeted macroeconomic figures is best reflected by developments in 1999. In 1999 for instance, according to the Centre for Policy Analysis (2003), real GDP growth of 4.4% was 1.1% less than the targeted growth rate; end-of-period inflation was 4.3% higher than targeted, and budget deficit was 3% higher than what was targeted. This failure to achieve macroeconomic targets continued until to 2002.

After the successful implementation of the Highly Indebted Poor Country (HIPC) initiative, Ghana experienced massive debt relief. Also, following the discovery of oil in commercial quantities the country has been seen making a lot of progress towards a becoming an upper middle income country. GDP growth accelerated from 4% in 2001 to a 14.4% in 2011 while per capita GDP growth has increased from U.S. \$270.43 in 2001 to U.S. \$1570.13 in 2011 (World Bank, 2013). On the other hand, the country needs to put in more efforts to become an upper middle income by the year 2020, given that the average growth rate of the economy is still less than 8% and the fact that the economy is still hugely dependent on primary commodities as its major exports.

The report of Ghana Statistical Service's (GSS) first quarter GDP for 2015 revealed that the economy of Ghana dropped from \$48.6 billion in 2013 to \$38.3 billion in 2014 at market exchange rates. The decline in the size of the economy in 2014 (over \$10 billion), in dollar terms, was as a result of the exchange rate depreciation, which saw the cedi fall in value by approximately more than 30% against the dollar in the previous year. Economists believe that such situation would have serious ramifications on the import-dominated economy, lamenting that declining economic growth is not favourable for incomes and job-creation. This retardation in economic growth is quite disturbing, since when the country witnessed a high growth in GDP, there was high level of unemployment. Currently, the country is on a low growth trajectory and it will continue to record increasing rate of unemployment since layoffs are expected in the coming years in the country's public sector, occasioned by the new \$918 million IMF bailout programme.

According to the World Bank, interest payments are actual amounts of interest paid by the borrower in currency, goods, or services in the year specified. The interest payment is the price you pay for obtaining loans from domestic and foreign sources, which is usually calculated as a fraction of the amount borrowed. The government of Ghana was to spend about GH¢9.5 billion (about \$2.5bn) in the year 2015 as interest payments on the huge loans it has contracted. Out of the figure, GH¢8 billion would be used to pay interest on domestic loans, with the remaining GH¢1.5 billion earmarked for external creditors. In the 2014 fiscal year, GH¢6.6 billion was issued as interest payments on loans by the government. This amount was more than three times the total budget for six ministries put together, as captured in the 2015 budget.

The increase in the country's debt has culminated in gigantic financial weight on public finances as a result of interest payments on the debt. Interest payments on domestic and external debt declined from 7.5% of GDP in 2000 to 2.3 percent by the end of 2008. Thereafter, interest payment escalated to 5.1% of GDP in 2013, and in 2014 interest payment was around 6.2% of GDP. The increase in interest payments by 2.8% of GDP, between 2008 and 2013, has taken away critical fiscal space that was available to the government, and that was created as a matter of deliberate strategy and policy choices.

According to the 2015 budget statement, out of the budgeted GH¢30.86 billion total domestic revenue about GH¢9.58 billion will go to settle interest on loans, constituting approximately 31% of total domestic revenue. The budget for interest payment of GH¢9.58 billion is more than what Ghana could possibly raise from total external loans and grants of GH¢6.75 billion and GH¢1.55 billion respectively. All the loans and grants anticipated (GH¢8.30 billion) for 2015 would not be enough to service the total interest payments. The implication is that country is borrowing to refinance interest repayments, which is not sustainable in the medium to long term.

Ghana's interest burden was the highest among its rated sub-Saharan African countries while other analysts have expressed worry over the escalating interest on the country's debts (Fitch Ratings, 2015)

The situation is also alarming because very soon the country will have to use nearly one-third of domestic revenue it generates to pay interest on loans. This necessitates the need to slowdown public borrowing unless such debts are used to finance projects that can generate income within a reasonable

period to pay off the debts. The decision to implement an interest rate hedging to allow for enhanced predictability of debt service is long overdue. Interest Payments are to absorb 29 percent of revenue Interest payment was projected to absorb about 28.8 percent of total domestic revenue. This implication is that for every GH¢1.00 to be collected as domestic revenue, GH¢0.29 would go into interest payment, leaving the rest for other recurrent expenditures, including wages and salaries, other statutory demands such as transfers to government units and the much needed capital expenditure (Fitch Ratings, 2015).

The 6.2 percent of GDP interest payments in 2014, the projected 7.0 percent in 2015 and 6.6 percent in 2016 are three successive years since 2000 that total interest payments are found to be larger than total capital expenditure. Interest payments for the first five months of 2015 totaled GH¢3.3 billion, reflecting 8.7 percent lower than the budget estimate of GH¢3.6 billion. According to government, the lower interest payment was partly due to lower than projected domestic borrowing to finance the budget (Fitch Ratings, 2015).

In the 2016 budget, interest payment are projected at GH¢10.5 billion compared to the projected GH¢11.7 billion wages and salaries costs. The estimated interest payments in 2016 are equal to 28.8 percent of projected domestic revenue in the year, 24.1 percent of total expenditure and 57.1 percent more than the projected capital expenditure which is at the centre of economic growth and development (MoFEP, 2015).

General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for

purchases of goods and services (including compensation of employees). It also includes most expenditure on national defence and security, but excludes government military expenditures that are part of government capital formation. The value for general government final consumption expenditure in Ghana was Gh¢4,807,847,000 as of 2013. Over the past several years, this indicator reached a maximum value of Gh¢5,220,300,000 in 2012 and a minimum value of Gh¢2,114,399,000 in 2006. Its recorded value as a percentage of growth was -7.90% in the year 2013 which is a reduction from and 49.75% in 2011.

Empirical Literature Review

Many empirical works have been conducted with the view to exploring or establishing the connection between government expenditure and economic growth. Nonetheless, these studies have found mixed and diverse results. While some studies found no significant relationship between government expenditure and economic growth, some have shown that government expenditure has a significant positive relationship with economic growth and others have found a strong negative relationship.

To add to this, while other studies indicated a bi-directional relationship between government expenditure and economic growth, others established a unidirectional relationship confirming either Keynesian Hypothesis or Wagner's Law. Again, studies on disaggregated government expenditure have also produced some conflicting findings. Lastly, empirical literature also provides evidence that highlights the existence of short and long run relationship between government expenditure and economic growth. Some

examples of such studies are by Kamasa and Ofori-Abebrese (2015), Appiah (2014), and Nketiah–Amponsah (2009) using data from Ghana, Saiyed (2012) using data from India and Barro (1989) using panel data of 98 countries. Abu-Bader and Abu-Qarn (2003) used data from Egypt, Syria and Israel; and Ramayandi (2003) used data from Indonesia. Ogbonna and Ebimobowei (2012), Anastassiou and Dritsaki (2005) used data from Greece. Afonso and Alegre (2008) used a combined cross-section time-series data; Saad and Kalakech (2009) used data from Lebanon, while (Chinweoke et al., 2014); Aladejare (2013); Ogbonna and Ebimobowei (2012); and Adefeso, Hakeem and Salawu (2010) used data from Nigeria.

To start with, Barro (1989) was among the early writers who empirically focused on the relationship between government expenditure and economic growth. With a panel of 98 countries (including both developing and developed countries) for the period 1960 to 1985, he found a negative significant relationship between government consumption expenditure and economic growth. The major flaw of his studies lies in the sample of countries used for the study as the sample comprised both high and low income countries with different economic characteristics. As a result, the findings leave unexplained a good deal of the relatively weak growth performance of countries in sub-Saharan Africa and Latin America. Thus, the study was not able to fully capture the characteristics of a typical country on these continents that lead to below-average economic growth.

Yustika and Maskie (2015) investigated the effect of local government expenditure on economic growth and the effects of local government expenditure and economic growth on income inequality over the period (2008-

2013). The study used cross-sectional and time series data (pooled data) in 24 cities in South Sulawesi. The study again employed simultaneous equations with recursive model. The results suggest that the local government expenditure has a positive and significant effect on economic growth and income inequality. While, economic growth has a negative and significant effect on income inequality. It is therefore recommended that government should direct its expenditure towards the productive sectors such as agricultural sector because this sector absorbs more labour than other sectors.

On the contrary, Carter, Craigwell, and Lowe (2013) examined the relationship between the components of government expenditure and economic growth in Barbados. They employed the Dynamic Ordinary Least Squares and the Unrestricted Error Correction Model (UECM) to analyse time series data for the period 1976-2011. Their findings generally indicate that total government spending produces a drag on economic growth, particularly in the short-run, with a much smaller impact over time. Specifically, the results suggest that while expenditures on health and social security have less impact on per capita economic growth; government expenditure on education typically has a significant and negative impact on growth, in both short run and long run. In addition, reallocations of government spending from one component to another may have growth-enhancing effects without having to change the level of government spending.

Also, Tan (2001) and Adnan (2014) used the Vector Error Correction (VEC) technique to estimate both short and long run models in Malaysia and Ethiopia respectively. The empirical findings suggest that government final consumption spending has a negative effect on economic growth in the long

run. Hence, an increase in government consumption expenditure retards the growth of the economies of both countries for the period under investigation.

Pina (2014) explored the effects of public spending in stimulating economic growth in Cape Verde. The study employed the vector autoregressive (VAR) approach to cointegration. Among the findings is that an increase in government expenditure does not create any change in the total output of the economy, rather it results in high rates of inflation.

Yasin (2003) used a panel data set to analyze the effects of government spending on economic growth in Sub-Saharan Africa. He applied the fixed-effects and random-effects estimation techniques on an endogenous growth model. The results from both estimation indicated that government spending on capital formation has positive and significant impact on economic growth in Sub-Saharan Africa. Even though the author contributes to knowledge by looking at the disaggregated government expenditure, the main limitation of this study is the fact that the author did not consider the effect of government interest payments, consumption expenditure and transfer payments on economic growth.

In the same context, Bose, Haque and Osborn (2007) examined the growth effects of government expenditure for a panel of 30 developing countries over the 1970s and 1980s. They found that: one, the share of government capital expenditure in GDP is positively and significantly correlated with economic growth, but recurrent expenditure is insignificant. Secondly, at a more disaggregated level, government investment in education and total expenditures in education are the only outlays that are significantly associated with growth once the budget constraint and omitted variables are

taken into consideration. However, Bose et al, (2007) failed to capture interest payment, consumption expenditure and transfer payments in their disaggregation of government expenditure when modeling the relationship between government expenditure and economic growth.

Chinweoke et al., (2014) examined the nature and impact of Federal Government Expenditure on Nigeria's economic growth for the period 1992 – 2011. Time series data for the twenty year period were sourced from secondary sources and Ordinary Least Square (OLS) multiple regression technique was used to estimate the hypothesis formulated in line with the objectives of this study. Real Gross Domestic Product, proxy for economic growth is adopted as the dependent variable while Total Recurrent Expenditure and Total Capital Expenditure constitute the independent variables. The results of this study show that the Federal Government Expenditure has a positive and insignificant impact on the economic growth of Nigeria for the period under study. In view of this, it is recommended amongst others that government should allocate more of its resources to the priority sectors of the economy such as agriculture and industry as well as to infrastructural development, in order to encourage growth of the economy.

Afonso and Alegre (2008) explored the relationship between the budgetary components and economic growth using a panel dataset. Data from 27 countries in the European Union for period 1970-2006 were used. They used three different dependent variables in their growth regression (economic growth, total factor productivity and labour productivity) and established the long-term relationships between the components of the budget and economic growth by employing the GMM estimation method. Their finding indicated

that there is negative and a significant relationship between public consumption, social security contributions, health and social protection expenditures and economic growth. The result again showed a positive and a significant relationship between public investment and expenditure on education and economic growth, but the aggregate impact of public revenues on economic growth was found to be negative. The most important limitation of this study is the fact that it is limited to only European countries; hence, the findings will not be applicable in developing countries like Ghana.

Afonso and Furceri (2010) explored the effects in terms of size and volatility of government revenue and spending on growth in the Organisation for Economic and Cooperative Development (OECD) and the European Union (EU) countries. With the aid of a combined cross-section time-series regressions based on an endogenous growth model, the overall results of the paper suggested that total government revenue and total government expenditure appear to impinge negatively on economic growth both for the OECD and the EU countries. Breaking up total revenue into direct taxes, indirect taxes and social contributions, their results suggested that among total revenue, the variables that are most detrimental to economic growth are indirect taxes and social contributions. The results also suggested that for both sets of countries, subsidies and government consumption had a significantly negative impact on economic growth while government investment was not significant to economic growth. However, transfers had a positive and a significant effect on economic growth only for the EU countries.

Furthermore, within an endogenous framework, Chamorro (2010) cited in Twumasi (2012) analysed the effects of government spending and its

different components on the economic growth rate in a set of low and middle-income countries across the world over the period 1975-2000. He used the (Arellano & Bond, 1991) GMM technique to evaluate that the growth effects of the different expenditure components. The effects of government expenditures on education, transport and communication were found to be positive and that of economic affairs was negative. Spending on health and defence however exhibited no significant relationship with economic growth.

Saad and Kalakech (2009) analysed the economic growth effects of government expenditure in Lebanon using a disaggregated analysis based on sectoral expenditures. In doing so, the authors employed the Vector Auto Regression (VAR) analysis on annual data from 1962 to 2007. Using an endogenous model, the paper found out that government spending on education has a positive effect on economic growth in the long run and a negative impact in the short run while the expenditure on agriculture was shown not to affect economic growth in both time periods. On the other hand, expenditures on both defence and health were shown to be negatively related to economic growth only in the long run.

Using pooled time series and cross-section data for 7 countries in the South Eastern Europe (SEE) spanning from 1995 to 2005, Alexiou (2009) investigated the relationship between government expenditure and economic growth. The results indicate that, government spending on capital formation has positive and significant effect on economic growth, in contrast to population growth which was found to be statistically insignificant.

A study was conducted to demonstrate the impact of defence expenditure on economic growth by employing a three sector Feder-Ram

model for an annual data set for 85 countries over the period 1988 to 2002. Using fixed and random effects, the study suggested no consistent relation between defence expenditure and economic growth across the countries studied. The regressions also illustrated a significant and a positive impact of labour and capital investments on economic growth (Wilkins, 2004). Frimpong and Oteng-Abayie (2006) explored the impact of FDI inflows and trade on economic growth in Ghana for the period 1970 – 2002. The method they employed for the analysis was the bound testing procedure. The results revealed that labour force is significant in explaining output growth of Ghana in the long run.

Appiah (2014) carried out a study to explore the relationship between government expenditure and economic growth in Ghana. The study employed the maximum likelihood estimation (MLE) technique and cointegration among the variables was established within the framework of autoregressive distributed lag (ARDL). The results revealed that aggregate government expenditure adversely affects economic growth in the long run, however, the relationship was found to be positive in the short run. The findings of the disaggregated analysis indicated that capital expenditure stimulates growth. Recurrent expenditure, on the other hand, was found to be negatively related to economic growth for the study period.

Antwi, Mills and Zhao (2013) examined the key macroeconomic factors that would influence the growth of Ghanaian economy by employing the Johansen approach to cointegration which is more suitable and efficient for examining the number of cointegrating vectors without relying on an arbitrary normalization. The study covered a period of 1980 to 2010. They found that

labour force, physical capital and inflation positively impact output growth in the long run in Ghana.

Moreover, Ocran (2011) explored the relationship between government fiscal policy variables and output growth in South Africa. The study period spanned from 1990 to 2004. Quarterly data was utilised in the estimation with the aid of vector regressive modeling technique and impulse response functions. The results indicated that government consumption expenditure, physical capital stock and tax revenue have significant and positive effect on economic growth. Something worthy to note here is that, the size of the impact of capital stock was found to be less than that of government consumption expenditure on economic growth.

Ramayandi (2003) studied the impact of government size on economic growth using time series data over a period of thirty years in Indonesia. In an endogenous growth model, the author categorized the expenditures as either productive or unproductive. The result revealed that the share of government's unproductive expenditure affected economic growth negatively. Again, conflicting with economic theory, the results also indicated that the share of productive government expenditure in Indonesia has a negative impact on economic growth. The author attributed this to the existence of inefficiencies in the overall management of government budget in Indonesia during the period of study.

In similar vein, García, Herrera and Restpro (2006) provided quantitative evidence supporting the hypothesis that government investment spending propels long-run economic growth using data sets from Chile during the period 1981-2001. Their study aimed at observing the impact of alternative

fiscal variables on economic growth using an adjusted overlapping generation model which was developed by Glomm and Rioja (2004). The outcome of their estimations confirmed a positive and a significant relationship between long-run economic growth and expenditures on both infrastructure and education. On the other hand, the outcome illustrated that social security and interest payments impact on long-run economic growth negatively due to their crowding-out effects on other productive expenditures.

Nketiah-Amponsah (2009) carried out a study on the relationship between public spending and economic growth in Ghana over the period 1970-2004. Both aggregated and disaggregated data on government expenditure were used. The result of the study indicated that aggregate government spending retards economic growth. Again, the study highlighted that health and infrastructure expenditures promote economic growth while education has no significant impact on growth in the short run. He added that, nature of governance (democracy) and political instability (years of change in government and military dictatorship) are significant in explaining Ghana's economic growth over the period under consideration. The study however made no attempt to examine the how government interest payments, consumption expenditure and transfer payments impact on economic growth.

Loto (2011) investigated the impact of government expenditures on different sectors on the Nigerian economy for the period 1980-2008 and applied Johansen cointegration technique and error correction model. The results showed that in the short run expenditures on agriculture and education were negatively related to economic growth. However, expenditures on health,

national security, transportation, and communication were positively related to economic growth, though the impacts were not statistically significant.

Georgantopoulos and Tsamis (2012) investigated the short run and the long run relationships between money supply, inflation, government expenditure and economic growth by employing the Error Correction Model (ECM) and Johansen co-integration test respectively for Cyprus using annual data from 1980 to 2009. Their findings reveal that public spending promotes economic development in Cyprus. However, deficit financing by the government causes more liquidity effects but also inflationary pressure in the economy. The results showed that inflation negatively affects economic growth probably due to adverse supply shock. Georgantopoulos and Tsamis argued that money supply should be allowed to grow according to the real output of the economy but excess growth of money causes inflationary pressure in case of Cyprus.

Bhunia (2012) explored the growth effect of government expenditure on economic growth in India over a period from 1991 to 2010, with a particular focus on sectorial expenditures. Five key sectors were employed (security, health, education, transportation and communication and agriculture). Johansen approach to co-integration and error-correction test were employed. The result indicated that in the short-run, expenditure on agriculture was found to be negatively related to economic growth. The impact of education, though also negative was not significant. The impact of expenditure on health was found to be positively related to economic growth. However, expenditures on national security transportation and communication

were positively related to economic growth, the impacts were not statistically significant.

The relationship between tax revenue and economic growth has been studied by Mullen and Williams (1994), using data from US states from 1969 to 1986, examined the impact of state and local tax structures on the economic performance of states. They concluded that, lowering marginal tax rates can have a considerable positive impact on growth and that, creating a less complex tax structure, while maintaining the same average level of taxation, enables sub-national governments to spur economic growth.

Similarly, Ogbonna and Ebimobowei (2012) examined the impact of tax reforms and economic growth of Nigeria using relevant descriptive statistics and econometric analysis and concluded that the various test shows that tax reforms is positively and significantly related to economic growth and that tax reforms granger cause economic growth. Also, that tax reforms improves the revenue generating machinery of government to undertake socially desirable expenditure that will translate into economic growth in real output and per capita basis.

Aladejare (2013) investigated the relationships and dynamic interactions between government capital and recurrent expenditures and economic growth in Nigeria over the period 1961 to 2010. Real Gross Domestic Product (RGDP) was used as a proxy for economic growth in the study. The analytical technique of Vector Error Correction Model and Granger Causality were exploited. Based on the result findings, it is evident that the Wagnerian and Rostow-Musgrave hypotheses were applicable to the relationship between the fiscal variables used in this study in Nigeria.

Okoro (2013) investigated the impact of government spending on the Nigerian economic growth using time series data for the period 1980 to 2011. The ordinary least square multiple regression analysis was employed to estimate the model specified. Real Gross Domestic Product (RGDP) was adopted as the dependent variable while government capital expenditure and government recurrent expenditure represents the independent variables. With the application of Granger Causality test, Johansen Cointegration Test and Error Correction Model, the result shows that there exists a long-run equilibrium relationship between government spending and economic growth in Nigeria. The short-run dynamics adjusts to the long-run equilibrium at the rate of 60% per annum.

Ogundipe and Oluwatobi (2013) examined the impact of both government recurrent and capital expenditure on growth performance using an econometric analysis based on Johansen technique for the period of 1970-2009. The study found the component of total expenditure impacting negatively (except education and health) and insignificantly on growth rate; further diagnosis test reveals capital expenditure may likely induce significant impact on growth rate in the long-run. Notable recommendations include, proper management of capital and recurrent expenditure, proper surveillance and quantification of capital spending in order to boost social and human capital, and development of sound institutions void of political influences.

Chude and Chude (2013) investigated the effects of public expenditure on education on economic growth in Nigeria over a period from 1977 to 2012, with particular focus on disaggregated and sectoral expenditures analysis. The study used ex-post facto research design and applied time series econometrics

technique to examine the long and short run effects of public expenditure on economic growth in Nigeria. The results indicated that total expenditure on education is highly and statistically significant and have positive relationship on economic growth in Nigeria in the long run. The result has an important implication in terms of policy and budget implementation in Nigeria. They concluded that economic growth is clearly impacted by factors both exogenous and endogenous to the public expenditure in Nigeria.

Hence, the study recommended that there is need for government to reduce its budgetary allocation to recurrent expenditure on education and place more emphasis on the capital expenditures so as to accelerate economic growth of Nigeria and that Government should direct its expenditure towards the productive sectors like education as it would reduce the cost of doing business as well as raise the standard living of poor ones in the country.

Musaba, Chilonda and Matchaya (2013) examined the impact of government sectorial expenditure on economic growth in Malawi by using time series data from 1980 to 2007. Cointegration analysis in the context of an error correction model was employed to estimate the growth effects of government expenditures on agriculture, education, health, defence, social protection and transport and communication. The short run results showed no significant relationship between government sectorial expenditure and economic growth. The long run results showed a significant positive effect of expenditures on agriculture and defence on economic growth. The expenditures on education, health, social protection and transportation and communication were negatively related to economic growth. To boost

economic growth efficient management of resources allocated to all sectors should be emphasized.

On the direction of causality between government expenditure growth and economic growth, Kamasa and Ofori-Abebrese (2015) empirically analysed the causal relationship between government expenditure growth and GDP growth in Ghana for the period 1980–2010. They employed vector autoregressive (VAR)/Granger causality analysis developed by Sims (1980) and Granger (1969). Granger causality test conducted provided a unidirectional causality running from GDP growth to government expenditure growth. This finding provides support for the Wagner's law of expanding state activities for Ghana. The result also suggests that government must focus on policies that would create the enabling environment for growth to thrive rather than increasing its expenditure with the aim of increasing GDP growth. However, the study did not make clear which specific policies could be adopted to create the needed enabling environment for economic growth to occur.

Again, Al-Faris (2002) explored the relationship between government expenditure and economic growth in the Gulf Cooperation Council (GCC) countries: Saudi Arabia, the United Arab Emirates, Kuwait, Oman, Bahrain and Qatar using time series annual data from 1970-1997. Multivariate cointegration approach was used. The results revealed a unidirectional causality between government expenditure and economic growth with the causality running from GDP growth to public expenditure, which supports Wagner's law as in the case of Kamasa and Ofori-Abebrese (2015) and Appiah (2014) for Ghana. It must be emphasized at this point that, though

these findings provide support for the Wagner's law, conclusions drawn from the Al-Faris (2002) cannot be applied to Ghana. The reason is that the countries involved in his study are a set of countries experienced in oil exploration hence government expenditure and its components may be totally different from what pertains to Ghana.

Kunofiwa and Odhiambo (2013) investigated the dynamic causal relationship between government expenditure and economic growth using data from Zimbabwe. The study employed the newly proposed ARDL-bounds testing approach to examine this linkage. In order to address the omission of variable bias, the study incorporated unemployment as an intermittent variable between economic growth and government spending—thereby creating a simple multivariate model. The empirical findings of this study showed that, although both government expenditure and economic growth Granger-causes each other in the short run, in the long run, it is economic growth that Granger-causes government expenditure. Other results indicated that there is a short-run unidirectional causality from both economic growth and government expenditure to unemployment. The study did not try to consider any form of government expenditure disaggregation and economic growth relationship.

Furthermore, Rehman, Iqbal and Siddiqi (2010) examined the nature and direction of causality in Pakistan between public expenditure and national income along with various selected components of public expenditure by applying Toda-Yamamoto causality test to Pakistan for the period of 1971 to 2006. The study finds a unidirectional causality running from GDP to government expenditure, which supports the Wagner's law.

However, Ebaidalla (2013) investigated the nature and direction of causality between government expenditure and national income in Sudan using Granger causality test and Error Correction Model (ECM) for the period 1970-2008. The result of cointegration test suggested a long-run relationship between government expenditure and national income in Sudan. The causality test indicated a unidirectional causality running from government expenditure to national income, both in the short and long-run. Thus, the results support the Keynesian proposition, which states that public spending is an important exogenous factor for stimulating national income. Moreover, the study concludes that fiscal policy in Sudan plays a vital role in stabilizing the economy and achieving economic goals.

To add to this, Al-Fawwaz and Al-Sawai'e (2013) examined the relationship between real gross domestic product and government expenditures in Jordan for the period 1990-2010 by using vector autoregressive model (VAR). The empirical results indicated that there is a unidirectional effect from real government expenditures to real gross domestic product. This result does not support Wagner's law, but support the Keynesian's hypothesis, which indicated that expenditure is a part of the effective demand, which affects the gross domestic product.

On the same platform, Saiyed (2012) investigated the bi-directional causal relationship between economic growth and growth of public expenditure in India during the Post Economic Reforms period from 1992 to 2012. First, impact of economic growth on public expenditure is investigated and then influence of public expenditure on economic growth is examined during 1992 to 2012. Cross-sectional analysis of data from 21 years during

1992 to 2012 of India showed significant bi-directional causal relationship between year-wise number of national income (GDP) and public expenditure.

Also, Abu-Bader and Abu-Qarn (2003) used data from Egypt, Israel and Syria. They employed the multivariate cointegration and the variance decomposition approach to examine the connection between government expenditure, military spending and economic growth for the periods 1975-1998 in Egypt, 1967-1998 in Israel and 1973-1998 in Syria. The result indicated a bi-directional and a long-run negative relationship between government spending and economic growth when variables were tested within a bivariate framework. Also, the causality test within a trivariate system (where government spending was broken down into share of government civilian expenditures in GDP and military expenditure) showed that military expenditure has a negative impact on economic growth in all the three countries, but civilian government expenditures exhibited a positive impact on economic growth for both Israel and Egypt.

Again, Oyinlola and Akinnibosun (2013) examined the relationship between public expenditure and economic growth in Nigeria during the period 1970-2009. A disaggregated public expenditure level was employed using the Gregory-Hansen structural breaks cointegration technique. The result confirms Wagner's law in two models in the long run; there was a break in 1993 in which the political crisis that engulfed the nation was accountable. The result also shows that economic growth and development are the main objectives of government expenditure, especially investment in infrastructure and human resources all of which falls under social and community services. They

suggested based on the result that, there should be efforts to maintain adequate levels of investment in social and economic infrastructure.

Summary of the Literature Review

This chapter reviewed comprehensively the theoretical and empirical literature relevant to the study. The theoretical review covered the following areas: theoretical background of government expenditure and economic growth nexus; theories of growth with specific emphasis on the neoclassical (Solow-Swan, Peacock-Shaw) growth models and endogenous growth model including Afonso-Alegre growth theory; the role of the government in economic growth; and some theories of government expenditure growth. Whiles the empirical review considered empirical works on the government expenditure growth and economic growth relationship.

The review revealed that, government played a crucial role in enhancing the growth of the economy through its spending policies. However, if the government size becomes excessively large the pace of economic growth will slow down.

The review found no theoretical justification for disaggregating government expenditure. However, a lot of empirical studies have indicated that different government expenditure components have different impact on the growth of an economy. Therefore, studying the relationship between government expenditure components and economic growth in Ghana is deemed appropriate so that policy makers will be informed as to which government expenditure components should be given much consideration if the focus is to achieve economic growth.

Lastly, many empirical studies have basically laid emphasis on either aggregated or disaggregated data on government expenditure and found mixed and dissimilar findings on the relationship between government expenditure and economic growth. This study will therefore focus on relationship between government interest payments, transfer payments and consumption expenditure, and economic growth in Ghana.

CHAPTER THREE

METHODOLOGY

Introduction

This chapter highlights the methodological framework suitable for carrying out this research with explicit emphasis on the research design, model specification, justification and measurement of the variables, nature and source of data, estimation techniques and, post estimation tests.

Research Design

Considering the objectives of the study, the positivist philosophy was deemed suitable and was employed for the study. The reason for the adoption of this paradigm is that, the positivists maintain that the reality is stable and can be observed and described from an impartial standpoint without interfering with the phenomena under investigation (Levin, 1988). It makes it possible for the researcher to examine social processes in a more objective manner so as to describe relationships between variables being investigated. Again, this paradigm allows the use of quantitative approach to research which makes it appropriate for the development of mathematical models in order to explore the relationship between quantitative measurements.

On the basis of the positivist philosophy, the quantitative approach is considered appropriate and was accordingly adopted for the study. Moreover, the quantitative approach allows the investigator to put the social world into a structure of causality and dissolves the role of human effect through the use of a quantitative instrument such as multivariate statistical analysis in analysing data as used in this study. More importantly, because what the study seeks to

achieve is explanatory in nature, it adopted the explanatory research under the quantitative approach.

Theoretical Model Specification

The study adopted the neoclassical growth model which argues that economic growth can be achieved when capital and labour are augmented by additional factors of production in the production function.

The Solow (1956) growth model describes economic growth as emanating from the combination of two inputs capital (K) and labour (L)

$$Y_t = f(K_t, L_t) \quad (1)$$

The critical question that emanates from equation (1) is how much of the increase in output can be assigned solely to variations in capital and labour. The reason is that there is a possibility of other factors, aside labour and capital, which can influence output. Solow (1956), in order to address this challenge, disintegrates change in output into three components namely: physical capital accumulation, growth of labour force and growth of total factor productivity (TFP). The growth of TFP reflects the adjustment in output that is not explained by variation in physical inputs such as labour and capital in the model. As a result, the TFP may be interpreted as the effect of exogenous technological progress that can equally be observed in increasing productive efficiency. Solow, to be able to explain this, employed the Cobb-Douglas production function expressed as:

$$Y_t = f(A_t, K_t, L_t, \ell) \quad (2)$$

where Y is output at time t, A is total factor productivity, K is capital stock, L is labour stock and ℓ represents e-base of natural log. By applying the Cobb-Douglas production function, Solow stated the equation

$$Y_t = A_t K_t^\alpha L_t^\beta \ell_t^\varepsilon \quad (3)$$

It must be emphasised at this point that A is not fixed, but rather changes with different production functions based on the factors being considered.

Empirical Model Specification

The neoclassical production function demonstrated above serves as the foundation for specifying the empirical model for the study. This is augmented with an error term. It is imperative to indicate that, literature on economic growth reveals that, there are many potential variables that can influence the total factor productivity (A). Following Devarajan et al., (1996); Bose et al., (2007); Herath (2012) and Appiah, (2014), the TFP is given as:

$$A_t = f(GXP, CPI, TR) \quad (4)$$

where GXP denotes total/aggregate government expenditure, CPI represents consumer price index, and TR represents tax revenue. The implication is that:

$$A_t = GXP_t^{\beta_1}, CPI_t^{\beta_2}, TR_t^{\beta_3} \quad (5)$$

By substituting (5) into (3), representing Y by RGDP and specifying an extended Cobb-Douglas production function to represent the production of technology of an economy, the study obtains;

$$RGDP_t = \eta K_t^\alpha, GXP_t^{\beta_1}, CPI_t^{\beta_2}, TR_t^{\beta_3}, L_t^{\beta_4}, \ell_t^\varepsilon \quad (6)$$

But aggregate government expenditure (GXP) will be disaggregated into government interest payments (IP), general government transfers (TP) and

general government final consumption expenditure (CXP). Thus,

$$GXP = IP + TP + CXP \quad (7)$$

By substituting (7) into (6), (8) is obtained;

$$RGDP_t = \eta K_t^\alpha, IP_t^{\beta_1}, TP_t^{\beta_2}, CXP_t^{\beta_3}, CPI_t^{\beta_4}, TR_t^{\beta_5}, L_t^{\beta_6}, \ell_t^\varepsilon \quad (8)$$

By taking the logarithm of the some of the variables (RGDP, IP, TP, CPI and K) in equation (8), (9) is obtained. The other variables such as CXP, TR and L are not logged because they are measured in percentages.

$$\begin{aligned} \ln GDP_t = & \ln \eta + \alpha \ln K_t + \beta_1 \ln IP_t + \beta_2 \ln TP_t + \beta_3 CXP \\ & + \beta_4 \ln CPI_t + \beta_5 TR_t + \beta_6 L_t + \varepsilon_t \ln \ell_t \end{aligned} \quad (9)$$

Letting $\ln \eta = \beta_0$ and $\ln \ell_t = 1$, equation (9) can be written as

$$\begin{aligned} \ln RGDP_t = & \beta_0 + \alpha \ln K_t + \beta_1 \ln IP_t + \beta_2 \ln TP_t + \beta_3 CXP_t \\ & + \beta_4 \ln CPI_t + \beta_5 TR_t + \beta_6 L_t + \varepsilon_t \end{aligned} \quad (10)$$

To be able to estimate the growth of the economy, we difference equation (10) to obtain,

$$\begin{aligned} \ln RGDP_t - \ln RGDP_{t-1} = & \beta_0 + \alpha(\ln K_t - \ln K_{t-1}) + \beta_1(\ln IP_t - \ln IP_{t-1}) + \beta_2(\ln TP_t - \ln TP_{t-1}) \\ & + \beta_3(CXP_t - CXP_{t-1}) + \beta_4(\ln CPI_t - \ln CPI_{t-1}) + \beta_5(TR_t - TR_{t-1}) \\ & + \beta_6(L_t - L_{t-1}) + \varepsilon_t \end{aligned} \quad (11)$$

Equation (11) above can be re-written as

$$\begin{aligned} \Delta \ln RGDP_t = & \beta_0 + \alpha \Delta \ln K_t + \beta_1 \Delta \ln IP_t + \beta_2 \Delta \ln TP_t + \beta_3 \Delta CXP_t \\ & + \beta_4 \Delta \ln CPI_t + \beta_5 \Delta TR_t + \beta_6 \Delta L_t + \varepsilon_t \end{aligned} \quad (12)$$

Definition and Measurement of Variables

Economic growth can be explained as the continuous or sustained increase in the real gross domestic product (GDP) or national product of an economy overtime. Nonetheless, this study uses real GDP (RGDP) to proxy for economic growth. The reason behind this is that other researchers (Aladejare, 2013; Okoro, 2013; Al-Fawwaz & Al-Sawai'e, 2013; Chinweoke et al, 2014) have used it in their work as dependent variable. Real GDP is the nominal GDP adjusted for inflation.

Gross fixed capital formation is used to proxy capital stock (K). Gross fixed capital formation is defined as the total value of additions to fixed assets by domestic enterprises, less disposals of fixed assets during the year, plus additions to the value of non-produced assets such as discoveries of mineral deposits, plants, machinery and equipment purchases; and the construction of infrastructure and commercial and industrial buildings (Baafi, 2010; Barro, 1996). Gross fixed capital formation has generally been considered as the engine of growth of the Ghanaian economy as in most other economies due the additions it makes to capital stock. It is an important factor in the determination of aggregate output. All other things being equal, an increase in the level of capital formation will improve the economy's productivity potential and therefore economic growth. It contributes to economic growth not only through the additions it makes to the stock of capital but also it offers many potential advantages as both a source of financial capital and a source of skills and technology transfer (Amoako-Gyampah & Acquaaah, 2008). The size of physical capital stock positively affects the level of aggregate demand and also determines the productive capacity of the economy. It is important to

emphasize that high rate of capital formation (investment) results in high economic growth (Barro, Mankiw & Sala-i-Martin, 1992). Therefore, the coefficient of physical capital stock is expected to be positive.

Government interest payments (IP) refer to interest payments on government debt. This consists of interest payments on long-term bonds, long-term loans, and other debt instruments to domestic and foreign residents. Government payments on long-term debt are actually the amounts of interest paid by the borrower in foreign currency, goods, or services in the year specified. Oyinlola and Akinnibosun (2013) argue that total debt outstanding (domestic plus external debt) is inversely related to economic growth. But total debt comprises the principal borrowed and its associated interest. It is known that, loans themselves are not detrimental to growth if properly put to use. Hence, it is expected that the estimate of growth is negative for government interest payments (Garcia, Herrera & Restpro, 2006).

Government transfer payments (TP) are the expenditures made by government that do not represent purchases of goods or services but simply transfer of income from taxpayers to program recipients (DeLong, 2002, cited in Twumasi, 2012). Transfer payments unlike government purchases of goods and services represent government outlays for which no direct products or services are obtained. Transfers consist of the issuance of income to the private sector and they include social security, gratuities and pension payments. It is therefore an important component of household income, especially for the poor, and plays an important role in reducing poverty. It is thus, expected to result in direct increases in households' disposable income. Hence, high levels of spending on transfers are expected to lead to increases in

households' disposable income and therefore consumption, which will in turn positively affect aggregate demand and economic growth.

Again, general government final consumption expenditure (CXP) - formerly general government consumption - includes all government current expenditures for purchases of goods and services (including compensation of employees) as percentage of GDP. It also includes most expenditures on national defense and security, but excludes government military expenditures that are part of government capital formation. Barro (1990) regarded government consumption payments as that part of government expenditures that enter into the household utility functions. As a result, Barro argues that such expenditures do not affect production opportunities and consequently do not affect the social rate of return on investment. Increases in such expenditures must be accompanied by a proportional increase in taxes or borrowing or some amount of both to finance the increased expenditures. If however the government finances the additional expenses through borrowing, then it can have a crowding-out effect on private investments which may cause output to fall accordingly. This is because government borrowing may draw resources from the private sector and also may drive up interest rates which can also adversely affect private investments.

On the other hand, if the government decides to finance these expenses with taxes, then an increase in government's recurrent expenditures will bring about rises in taxes which will cause households consumption to fall. According to Barro and Sala-i-Martin (1992), it will also lower private rate of return on investments. This follows that an increase in government recurrent expenditures lowers the economy's steady-state growth rate (Barro & Sala-I-

Martin, 1992). Therefore, the impact of government consumption spending on economic growth is expected to be negative.

Consumer Price Index (CPI) is a measure that captures the changes in the price level of a market basket of consumer goods and services purchased by the household. In this study, the CPI is employed to control for the effect of high oil price on domestic goods and services. Rapid increases in the general price level of the economy may result in uncertainty about the future profitability of investment projects. This is because, higher prices of consumer goods and services may dampen demand for goods and services in the economy and for this reason, investors may resort to more conservative investment strategies than would otherwise be the case, eventually leading to lower levels of investment and economic growth. As a result, the coefficient of CPI is expected to be negative (Georgantopoulos & Tsamis, 2012).

Tax revenue (TR) refers to compulsory transfers from individuals, firms and organizations to the central government for public purposes. Certain compulsory transfers such as fines, penalties and most social security contributions are excluded. Refunds and corrections of erroneously collected tax revenue are treated as negative revenue. It is measured as tax revenue as a percentage of GDP. Taxes are mandatory payments, ruled by laws. Tax revenue is collected from the whole society with differentiated intensity, inspired by considerations of justice, efficiency and effectiveness. The total tax revenue is the sum of the revenues of different kind of taxes, depending on what is taxed. These may include revenue of personal and company income (direct taxes); wealth and assets as real estates and houses; the domestic economic transactions (indirect taxes); international trade, typically through

import duties; custom duties; revenue from export. The coefficient of tax revenue is expected to be positive.

Labour force (L) consists of the proportion of the population that is economically active. In this study, it comprises persons aged 15 years to 64 years, who could potentially be economically active, as a percentage of the total population. A major source of economic growth in the modern economy has been the size of labour force in the economy. Jayaraman and Singh (2007) maintained that, there cannot be growth without the involvement of labour. Solow (1956) and Swan (1956) asserted that labour force should be incorporated in the growth model because of its impact on the work force, hence the inclusion of labour force in the study. All things being equal, the higher the labour force the higher the supply of labour and hence output. It is therefore expected that an increase in labour force will lead to an increase in total employment and its coefficient is expected to be positive.

However, the positive relationship will be achieved depending on the ability of the economic system to absorb and productively employ these added workers, an ability largely associated with the rate and type of capital accumulation and the availability of related factors such as managerial and administrative skills (Amoako-Gyampah & Acquah, 2008)

Nature and Sources of Data

A quarterly time series data for Ghana from 1984 to 2015 were used for the study. The original data were obtained in an annual. The data on real GDP, government consumption expenditure, government interest payment, gross fixed capital formation, tax revenue, consumer price index and labour

force were obtained from the World Bank (2014), but data on government general transfers was sourced from the Ministry of Finance and Economic Planning Fiscal Data (MoFEP, 2014). Extrapolation was used to expand the original datasets from 2013 to 2015. The quarterly data were generated from the annual datasets through interpolation using Gandolfo (1981) algorithm.

Estimation Technique

The study utilized the Maximum Likelihood Estimation (MLE) technique to examine the relationship between government expenditure components and economic growth. The MLE technique is a statistical method for estimating population parameters (such as the mean and variance) from sample data, which selects as estimates, those parameter values maximizing the probability of obtaining the observed data. The major advantages associated with this estimation technique are that: the MLE procedure can be applied to a number of models and it commonly generates estimators with excellent asymptotic properties (Davidson & MacKinnon, 2004). Moreover, several statistical software packages provide excellent algorithms for maximum likelihood estimates and for many commonly used distributions. This helps to alleviate the computational complexity of the MLE.

To examine the direction of causality between government expenditure and economic growth, the study used the Granger causality test within the framework of cointegration and error-correction models. The testing procedure for this involves a number of steps which include:

One, the study explored the time series properties of the data by employing the Augmented Dickey-Fuller (ADF) and the Phillip-Perron (PP) test to check for the order of integration.

Two, the study proceeds to investigate the short-run and long run relationships between the variables using the maximum likelihood based approach - Autoregressive Distributed Lag (ARDL) approach to cointegration proposed by Pesaran and Shin (1998). The ARDL approach to cointegration is argued to be the single equation equivalence of the maximum likelihood approach of Phillips and Hansen (1990) fully modified ordinary least squares procedure (Pesaran & Shin, 1998).

Three, the stability and diagnostic test statistics of the ARDL model is observed to ensure the reliability and the goodness of fit of the model. Fourth and last, the study applied Granger-causality to test for the causality between government expenditure and economic growth. The causality test is preceded by cointegration testing since the presence of cointegrated relationships has implications for the way in which causality testing is carried out.

Unit Root Tests

In order to avoid the generation of spurious regression normally associated with time series data, the growth model specified above requires the test for the existence of unit root for each of the variables. Thus, it is crucial to test for the statistical properties of variables when dealing with time series data. The reason is that time series data are seldom stationary at level forms. A time series is said to be stationary if its mean, variance and autocovariances are independent of time. Generally, regression associated with non-stationary

time series produces spurious results or regression. This is the situation when the regression results show a high and significant relationship among variables when no relationship actually exist. Again, with spurious results, the usual test statistics (t, F, DW, and R^2) will not have standard distributions if some of the variables in the model have unit roots (Stock & Watson, 1988).

A wide range of unit root tests can be used to determine the stationarity of the series. The purpose of the test is to ensure generation of a reliable result due to the inherent individual weaknesses of the various techniques. Against this background, the study employed both the Phillip Perron (PP) and the Augmented Dickey-Fuller (ADF) tests.

Even though these tests have common features, they differ regarding the way they correct for autocorrelation in the residuals. The PP non-parametric test generalises the ADF procedure, by allowing for less restrictive assumptions for the time series being studied.

The lag-length is chosen using the Akaike Information Criteria (AIC) and Swartz Bayesian Criterion (SBC) for both the ADF and PP test. The sensitivity of ADF tests to lag selection makes the PP test an important additional tool for making inferences about unit roots. The basic formulation of the ADF is:

$$\Delta X_t = \alpha + \delta t + \rho X_{t-1} + \sum_{i=1}^p \lambda_i \Delta X_{t-1} + \varepsilon_t \quad (13)$$

Where X_t represents the series at time t , Δ is the first difference operator, α , δ , ρ , and λ are parameters to be estimated and ε is the stochastic random disturbance term. Accordingly, the ADF and the PP test the null

hypothesis that a series contains unit root (non-stationary) against the alternative hypothesis of no unit root (stationary). That is:

$$H_0 : \rho = 0$$

$$H_1 : \rho \neq 0$$

If the tau value or t-statistic is more negative than the critical values, the null hypothesis is rejected and we conclude that the series is stationary. On the contrary, if the tau statistic is less negative than the critical values, the null hypothesis is accepted and the conclusion is that the series is non-stationary.

Cointegration Test

Quite a number of techniques exist for testing the existence of equilibrium long-run relationship among time series variables. Most time series studies have employed the Engle and Granger (1987), the Fully Modified Ordinary Least Squares (FMOLS) procedures of Phillips and Hansen (1990); the Johansen (1988); or the Johansen and Juselius (1990); and the Autoregressive Distributed Lag (ARDL) approach by Pesaran and Shin (1998); and Pesaran et al., (2001) to establish the long-run relationship in bivariate and multivariate frameworks.

The study adopted the currently developed Bounds Test approach to cointegration by Pesaran and Pesaran (1997), Pesaran and Shin (1998) which was further expanded by Pesaran *et al.* (2001). The bounds test approach to cointegration is adopted for this study due to its advantages over the Johansen approach to cointegration.

To begin with, the bounds test approach to cointegration produces more robust results in small samples than the Johansen approach. Thus, ARDL technique is more suitable and efficient for small and finite samples compared with the Johansen approach that requires large data samples for one to get a valid result (Pesaran & Shin, 1998).

Also, the ARDL approach to cointegration is most appropriate compared to the other cointegration procedures in the sense that, the other approaches to cointegration require that all regressors be integrated of the same order, but the ARDL approach can be used whether the regressors are integrated of order one or order zero (.i.e. $I(1)$ or $I(0)$ variables). This implies that the ARDL technique rules out the pre-testing problems related to standard cointegration, which requires that the variables be classified into $I(0)$ or $I(1)$ (Pesaran, Shin, & Smith, 2001). For example, if we are not certain about the stationarity properties of the data, then using the ARDL technique is the most appropriate model for empirical work.

The first and foremost step in any cointegration procedure is to identify the degree of integration of each variable in the model. Nevertheless, this depends on which unit roots test one employs and different unit root tests could lead to contradictory results (Bahmani-Oskooee, 2002). Employing conventional unit roots tests such as the Augmented Dickey Fuller and the Phillips-Perron tests for instance, may lead to an erroneous conclusion that unit root is present in a series that is actually stationary around a one-time structural break (Perron, 1991). The ARDL approach is appropriate due to its inherent ability to mitigate these problems.

One complexity associated with the Johansen cointegration technique is that the ARDL approach to cointegration shuns what pertains to the large number of choices that must be made. These include choices such as the number of endogenous and exogenous variables to be included in the model, the treatment of deterministic elements, as well as the order of VAR and the optimal number of lags to be used. The estimation procedures are quite responsive to the method used to make these choices and decisions (Pesaran & Shin, 1999).

Finally, with the ARDL technique, it is possible that different variables have different optimal lags lengths, whereas in Johansen-type models this is not allowed.

Pesaran and Pesaran (1997) maintain that, the ARDL technique comprise basic two steps. One, the existence of any long-term relationship between the variables of interest is determined using an F-test. Two, the analysis is to estimate the coefficients of the long-run relationship and determine their values, followed by the estimation of the short-run elasticity of the variables with the error correction representation of the ARDL model. By employing the ECM version of ARDL, the speed of adjustment to equilibrium will be determined.

The study advanced to estimate the short run and long run elasticities by employing the Unrestricted Error Correction Model (UECM) that has unrestricted intercepts and no trends based on the assumption made by Pesaran et al. (2001). Based the analysis, equation (12) can be specified in ARDL framework as:

$$\begin{aligned} \Delta \ln RGDP_t = & \alpha_0 + \sum_{i=1}^p \alpha_{1i} \Delta \ln RGDP_{t-i} + \sum_{i=1}^p \alpha_{2i} \Delta \ln K_{t-i} + \sum_{i=1}^p \alpha_{3i} \Delta \ln IP_{t-i} + \sum_{i=1}^p \alpha_{4i} \Delta \ln TP_{t-i} \\ & + \sum_{i=1}^p \alpha_{5i} \Delta CXP_{t-i} + \sum_{i=1}^p \alpha_{6i} \Delta \ln CPI_{t-i} + \sum_{i=1}^p \alpha_{7i} \Delta TR_{t-i} + \sum_{i=1}^p \alpha_{8i} \Delta L_{t-i} + \\ & \delta_1 \ln RGDP_{t-1} + \delta_2 \ln K_{t-1} + \delta_3 \ln IP_{t-1} + \delta_4 \ln TP_{t-1} + \delta_5 CXP_{t-1} + \delta_6 \ln CPI_{t-1} + \\ & \delta_7 TR_{t-1} + \delta_8 L_{t-1} + \nu_t \dots \dots \dots (14) \end{aligned}$$

Where Δ represents the first difference operator, P is the lag order selected by the Schwarz Bayesian Criterion (SBC), α_0 is the drift parameter, and ν_t is the error term which is $N(0, \delta^2)$. The parameters α_{ij} are short-run parameters and δ_{ij} are the long-run multipliers.

The examination of the relationship between government expenditure components and economic growth commences by estimating equation (14) with the bounds test using the OLS method, which is generally the first and foremost procedure in the ARDL model. The F-test or Wald test is employed for the examination of the existence of long-run relationship among the variables in equations (13) given as follows: The null hypotheses of no long-run relationship among the variables in equations (14) is tested against the alternative hypotheses of a long-run relationship as follows:

$$H_0 : \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = \delta_6 = \delta_7 = \delta_8 = 0$$

$$H_1 : \delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \delta_5 \neq \delta_6 \neq \delta_7 \neq \delta_8 \neq 0$$

The presence of cointegration among the variables under investigation is tested based on the F-statistics or Wald statistics. Given that, the asymptotic distribution of the F-statistic is non-standard without taking into account the independent variables being $I(0)$ or $I(1)$, Pesaran and Pesaran (1997) have provided two sets of critical values for the different numbers of regressors (k), and whether the ARDL model contains an intercept and/or trend. As a result,

the calculated F-statistic is compared with these sets of critical values developed on the basis that the independent variables are $I(d)$ (where $0 \leq d \leq 1$)

The lower critical bound presupposes that all the variables are $I(0)$, meaning that there is no cointegration among the variables, but the upper bound presumes that all the variables are $I(1)$. Hence, if the calculated F-statistic falls outside the upper critical value, then a null hypothesis of no cointegration will be rejected irrespective of whether the variables are $I(0)$ or $I(1)$ indicating a long-run relationship among the variables being studied.

On the other hand, if the F-statistic falls below the lower bound, then the null hypothesis of no cointegration cannot be rejected. In the same way, if the F-statistic lies within the lower critical and upper critical bounds, then the test is inconclusive and it depends on whether the variables under examination are $I(0)$ or $I(1)$. In the face of this circumstance, the test for unit roots on the variables being studied becomes imperative (Pesaran & Pesaran, 1997).

To be able to identify the optimal lag length for each variable, the ARDL procedure estimates $(P+1)^{k+1}$ the number of variables, where P is the maximum number of lags to be used, and k is the number of regressors in the equation (Shrestha & Chowdhury, 2005). The optimal lag length of the ARDL model is chosen based on the Schwarz-Bayesian Criterion (SBC) or the Akaike Information Criterion (AIC). The SBC adopts the smallest possible lag length and it is therefore described as the parsimonious model compared to the AIC which makes use of the maximum relevant lag length (Jalil, Ma, & Naveed, 2008).

Given that cointegration has been established from the ARDL model, the long run and error correction estimates of the ARDL and their asymptotic standard errors are then obtained.

$$\ln RGDP_t = \alpha_0 + \sum_{i=1}^p \delta_1 \ln RGDP_{t-i} + \sum_{i=0}^p \delta_2 \ln K_{t-i} + \sum_{i=0}^p \delta_3 \ln IP_{t-i} + \sum_{i=0}^p \delta_4 \ln TP_{t-i} + \sum_{i=0}^p \delta_5 CXP_{t-i} + \sum_{i=0}^p \delta_6 \ln CPI_{t-i} + \sum_{i=0}^p \delta_7 TR_{t-i} + \sum_{i=0}^p \delta_8 L_{t-i} + \mu_t \dots \dots \dots (15)$$

This is followed by the estimation of the short- run elasticities of the variables with the error correction representation of the ARDL model. By using the error side of the ARDL, we are able to determine the speed of adjustment to equilibrium. The presence of long-run relationship among the variables requires the estimation of the unrestricted ARDL error correction representation as follows:

$$\Delta \ln RGDP_t = \alpha_0 + \sum_{i=1}^p \alpha_{1i} \Delta \ln RGDP_{t-1} + \sum_{i=0}^p \alpha_{2i} \Delta \ln K_{t-i} + \sum_{i=0}^p \alpha_{3i} \Delta \ln IP_{t-i} + \sum_{i=0}^p \alpha_{4i} \Delta \ln TP_{t-i} + \sum_{i=0}^p \alpha_{5i} \Delta CXP_{t-i} + \sum_{i=0}^p \alpha_{6i} \Delta \ln CPI_{t-i} + \sum_{i=0}^p \alpha_{7i} \Delta TR_{t-i} + \sum_{i=0}^p \alpha_{8i} \Delta L_{t-i} + \xi ECM_{t-1} + \mu_t \dots \dots \dots (16)$$

Where ξ is the speed of adjustment of the parameter to long-run equilibrium following a shock to the system and ECM_{t-1} is the residuals obtained from equations (14). The coefficient of the lagged error correction term, ξ , is expected to be negative and statistically significant to further validate the presence of a cointegrating relationship among the variables in the model.

Post Estimation/Diagnostics Test

A number of post estimation tests were carried out to ascertain the robustness and goodness of fit of the model adopted for the study. In order to be able to validate that the estimates obtained from the model are efficient, the study carried out a serial correlation test. The study employed the Lagrange Multiplier (LM), Test of Breusch (1978) and Godfrey (1978). The LM serial correlation test has some advantages over the Durbin-Watson (DW) test for serial correlation. Contrary to the DW statistic, the LM test could be used to test for higher order autoregressive moving average (ARMA) errors, and is applicable whether or not there are lagged dependent variables. The LM tests the null hypothesis of no serial correlation up to the chosen maximum lag length.

Again, the study applied the Regression Specification Error Test (RESET) suggested by Ramsey (1969) to verify whether the functional form of the model employed in the study is correctly specified. The RESET is a general test for; omitted variables, incorrect functional form as well as the correlation between regressors and the error term (Hall, Lilien, & Johnston, 1995). The RESET tests the null hypothesis that the correct specification of the model is linear against the alternative hypothesis that the correct specification is non-linear.

To be able to establish the normality properties of the error term, the study used the Kurtosis test of normality. Furthermore, the heteroscedasticity test was conducted to confirm that the estimated coefficients are efficient.

To determine whether the coefficients of the estimated model are stable over the study period, the structural stability test was also carried out

using the Cumulative Sum (CUSUM) of recursive residuals and the Cumulative Sum of Squares (CUSUMSQ) of recursive residuals as suggested by Pesaran and Pesaran (1997).

Granger Causality Test

One of the major objectives of empirical econometrics has been the examination of causal relationships among economic variables. Engle and Granger (1987) are of the view that, cointegrated variables must have an error correction representation. According to Gujarati and Porter (1999), among the implications of Granger representation theorem is that, if non-stationary series are cointegrated, then one of the series must granger cause the other. To identify the direction of causality in the existence of cointegrating vectors, Granger causality was carried out based on the following:

$$Y_t = \alpha_0 + \sum_{i=1}^p \alpha_{1i} \Delta Y_{t-1} + \sum_{i=1}^p \alpha_{2i} \Delta X_{t-1} + \nu_t \quad (17)$$

$$X_t = \beta_0 + \sum_{i=1}^p \beta_{1i} \Delta X_{t-1} + \sum_{i=1}^p \beta_{2i} \Delta Y_{t-1} + \eta_t \quad (18)$$

The assumption here is that the error terms satisfy the criteria $E(\mu_t) = E(\eta_t) = E(\mu_t \mu_s) = E(\eta_t \eta_s) = 0$ and $E(\mu_t \mu_t) = \sigma_\mu^2, E(\eta_t \eta_t) = \sigma_\eta^2$.

The causality in equation (17) should run from X_t to Y_t on condition that the estimated coefficients on the lagged variable X_t are significantly different from zero. In other words, the coefficients of α_i are different from zero (i.e. $\alpha_i \neq 0$).

In much the same way, the causality in equation (18) runs from Y_t to X_t on condition that the estimated coefficients on Y_t as a group are significantly different from zero (i.e. $\beta_i \neq 0$).

Bidirectional causality results when X_t causes Y_t and Y_t causes X_t . Thus, the lagged values of both X_t and Y_t as a group in equations (17) and (18) are significantly different from zero (i.e. $\alpha_i = \beta_i \neq 0$).

Summary of the Methodology

The chapter began with brief theoretical background of the relationship between government expenditure and economic growth. The research design adopted for the study was the positivist philosophy within the framework of neoclassical economics. Both theoretical and empirical models were formulated. The Solow (1956) growth model within the framework of neoclassical economics was employed as the theoretical model for the study. This model was augmented with government expenditure, and inflation (CPI), and tax revenue serving as control variables. The government expenditure was further disaggregated into general government consumption expenditure, government interest payments and general government transfers.

The empirical model was formulated by taking natural logarithms of some of the variables (real GDP, IP, TP, CPI and K) whereas TR, CXP and L are measured in percentages. This provided the possibility of a smoothed data series. The nature and sources of the data used for the study, as well as the description of the variables used were provided.

The chapter again examined the estimation techniques in which the ARDL approach to cointegration has been expounded on and considered the appropriate technique for conducting a study of this kind due to its advantages over the other estimation techniques. Unit roots test was conducted on the variable series to ensure that the variables are not integrated of an order higher than one that would render the ARDL modelling inappropriate.

The unrestricted error correction models of the empirical model specifications were formed to estimate the short-run adjustment to equilibrium in the ARDL model. A number of post estimation tests were carried out to ascertain the robustness and goodness of fit of the model adopted for the study. Lastly, the Granger causality test was also conducted to establish if there exists any causal relationship between government expenditure components and economic growth in Ghana.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

The focus of this chapter is to present a comprehensive analysis and a detailed discussion of the findings of the study. Thus, the results of the descriptive statistics of the relevant variables, the results of both ADF and PP unit root tests, the results of the analysis of the relationship between government expenditure components and economic growth using the Autoregressive Distributed Lag (ARDL) approach to cointegration, and finally the results of the Granger causality test are presented and discussed thoroughly. These results are discussed in relation to the stated hypotheses of the study.

Descriptive Statistics

The computed descriptive statistics of the relevant variables involved are presented in Table 1. It can be seen from Table 1 that all the variables have positive average values (means). The minimal deviation of the variables from their means as shown by the standard deviation gives indication of slow growth rate (fluctuation) of these variables over the period. Most of the variables were positively skewed implying that the majority of the values are less than their means. It can be observed from Table 1 that only variables such as government interest payments and government transfer payments are negatively skewed implying that majority of the values are greater than their means.

Table 1: Summary Statistics of the Variables

	LNRGDP	LNIP	LNTP	CXP	LNCPI	LNK	TR	L
Mean	21.45	16.74	16.37	2.73	17.64	19.96	3.80	13.79
Median	21.44	16.73	16.70	2.68	8.64	19.73	3.78	13.82
Maximum	22.45	17.59	18.93	4.07	55.05	21.56	5.86	16.76
Minimum	20.75	15.76	11.52	1.71	0.23	18.06	2.53	10.35
Std. Dev.	0.47	0.40	2.12	0.41	18.25	0.97	0.66	0.68
Skewness	0.31	-0.37	-0.66	0.57	0.68	0.14	0.66	0.03
Kurtosis	2.03	2.99	2.29	4.05	1.92	1.97	3.59	10.06
Sum	2752	2142	2095	349.9	2258	2555	487	1766
Sum Sq.Dev.	28.32	20.59	570	21.88	42301	118	55	59.38
Obs.	128	128	128	128	128	128	128	128

Note: Std. Dev. represents Standard Deviation while Sum Sq. Dev. represents Sum of Squared Deviation.

Source: Computed by the author using Eviews 9.0 Package

Unit Root Test

Although the bounds test (ARDL) approach to cointegration does not necessitate the pretesting of the variables for unit roots, it is however vital to perform this test to verify that the variables are not integrated of an order higher than one. The aim is to ascertain the absence or otherwise of $I(2)$ variables to extricate the result from spurious regression. Since the computed F-statistics provided by Pesaran et al. (2001) will not be valid when the $I(2)$ variables exist. Thus, in order to ensure that some variables are not integrated at higher order, there is the need to complement the estimation process with unit root tests.

For this reason, all the variables were examined by first inspecting their trends graphically. From the graphs in Appendix A, all the variables are non-stationary in levels. Nonetheless, the plots of all the variables in their first differences show that the variables are stationary (Appendix B).

Moreover, the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests were applied to all variables in levels and in first difference in order to formally establish their order of integration. In order to be sure of the order of integration of the variables, the test was conducted with intercept and time trend in the model. The optimal number of lags included in the test was based on automatic selection by Schwarz-Bayesian Criterion (SBC) and Akaike Information Criterion (AIC). The study used the P-values in the parenthesis to make the unit root decision, (that is, rejection or acceptance of the null hypothesis that the series contain unit root) which arrived at similar conclusion with the critical values.

The results of ADF test for unit root with intercept and trend in the model for all the variables are presented in Table 2. The null hypothesis is that the series is non-stationary, or contains a unit root. The rejection of the null hypothesis for the test is based on the MacKinnon (1991) critical values as well as the probability values.

The unit root test results in Table 2 indicate that, the null hypothesis of the presence of unit root for all the variables in their levels cannot be rejected since the P-values of the ADF statistic are not statistically significant at any of three conventional levels of significance. But, at first difference, all the variables are stationary. This is because the null hypothesis of the presence of

unit root (non-stationary) is rejected because the P-values of the ADF statistic are statistically significant at 1 percent significant levels for all the estimates.

Table 2: Results of Unit Root Test with constant and trend: ADF Test

Levels			First Difference			
Variables	ADF-Statistic	Lag	Variables	ADF-Statistic	Lag	$I(O)$
LNRGDP	-1.6893 [0.5046]	1	Δ LNRGDP	-6.1476 [0.0000]***	0	$I(1)$
LNIP	-1.8650 [0.4654]	1	Δ LNIP	-5.3624 [0.0000]***	0	$I(1)$
LNTP	-0.7467 [0.9668]	1	Δ LNTP	-8.4668 [0.0000]***	0	$I(1)$
CXP	-3.1427 [0.1011]	1	Δ CXP	-6.5768 [0.0000]***	0	$I(1)$
LNCPI	-1.5833 [0.7942]	5	Δ LNCPI	-4.1322 [0.0007]***	0	$I(1)$
LNK	-2.0555 [0.5651]	3	Δ LNK	-7.4102 [0.0000]***	0	$I(1)$
TR	-2.6345 [0.7540]	0	Δ TR	-5.2714 [0.0000]***	2	$I(1)$
L	-0.8273[0.9595]	1	Δ L	-8.8566 [0.0000]***	1	$I(1)$

Note: *** indicates the rejection of the null hypothesis of non-stationary at 1% level of significance, Δ denotes first difference, and $I(O)$ is the order of integration. The values in parenthesis are the P-values.

Source: Computed by the author using Eviews 9.0 Package

The results of PP test for unit root with intercept and trend in the model for all the variables are also presented in Table 3. The results in Table 3 show that the series are non-stationary at levels. This is because the P-values of the PP statistic are not statistically significant at any of the conventional levels of significance. However, at first difference, all the variables are stationary since the null hypothesis of the presence of unit root (non-stationary) is rejected at 1 percent significance level for all the series.

Table 3: Results of Unit Root Test with intercept and trend: PP Test

Levels			First Difference			
Variables	PP-Statistic	Bw	Variables	PP-Statistic	Bw	$I(O)$
LNRGDP	-1.3127 [0.8803]	1	Δ LNRGDP	-8.2562 [0.0000]***	2	$I(1)$
LNIP	-2.8844 [0.1711]	1	Δ LNIP	-9.0427 [0.0000]***	2	$I(1)$
LNTP	-0.6133 [0.9763]	4	Δ LNTP	-8.2518 [0.0000]***	6	$I(1)$
CXP	-2.7476 [0.2197]	2	Δ CXP	-5.9310 [0.0000]***	2	$I(1)$
LNCPI	-1.6964 [0.7474]	5	Δ LNCPI	-9.4520 [0.0000]***	2	$I(1)$
LNK	-1.7196 [0.7370]	5	Δ LNK	-7.3257 [0.0000]***	5	$I(1)$
TR	-2.0092 [0.5904]	4	Δ TR	-11.6112 [0.0000]***	9	$I(1)$
L	-0.6604 [0.9996]	4	Δ F	-4.0649 [0.0019]***	2	$I(1)$

Note: *** indicates the rejection of the null hypothesis of non-stationary at 1% significance level, Δ denotes first difference, Bw is the Band Width, and $I(O)$ is the order of integration. The values in parenthesis are the P-values.

Source: Computed by the author using Eviews 9.0 Package

It can be seen that the PP unit root test results in Table 3 are in line with the results obtained from the ADF test in Table 2, suggesting that all the variables are integrated of order one, $I(1)$, when intercept and trend are in the model.

It is therefore obvious from all the unit test results discussed above that all the variables are integrated of order one $I(1)$. Since the test results have confirmed the absence of $I(2)$ variables, ARDL methodology is now used for the estimation. The subsequent sections discuss the results of cointegration test, long-run and short-run results as well as Granger causality test results.

Bounds Test for Cointegration

In the first step of the ARDL analysis, the presence of long-run relationships in equation (14) is tested. Given that the study employed quarterly data, a maximum lag length of 4 is used in the bounds test. Pesaran and Pesaran (1997) suggest a maximum lag length of 4 for quarterly data in the bounds testing approach to cointegration. After the lag length was determined, the F-test statistic computed within the bounds test framework is compared with the upper and lower critical values in Pesaran and Pesaran (1997). The results of the bound test procedure for cointegration analysis for some government expenditure components and economic growth are presented in Table 4.

As shown in Table 4, the joint null hypothesis of lagged level variables (that is, variable addition test) of the coefficients being zero (no cointegration) is rejected at 1 percent significance level. This is because the calculated F-statistic value of 4.664 ($F_{LNRGDP(.)} = 4.664$) exceeds the upper bound critical value of 4.540 at 99% level. This means there exist a long run relationship between government expenditure components and economic growth.

Table 4: Results of Bounds Tests for the Existence of Cointegration

	90% Level		95% Level		99% Level	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
K						
7	2.141	3.250	2.476	3.646	3.267	4.540
Dependent Variable						F-Statistic
$F_{(LNRGDP)} = F(LNRGDP LNIP, LNTP, CXP, LNCPI, LNK, TR, L)$						4.664

Note: Critical values were obtained from Pesaran and Pesaran (1997), Appendix C, Table F, pp. 478, and K is the number of regressors.

Source: Computed by the author using Microfit 4.1 package.

The results in Table 4 indicate that there is a unique cointegration relationship among the variables when economic growth is normalized. Hence, there is a long-run relationship between economic growth and the explanatory variables in Ghana.

Having established the existence of long-run relationship between the explanatory variables and economic growth in the model and an error correction mechanism exists, the ARDL cointegration method is used to estimate the long-run coefficients and the short-run parameters of equation (14).

Long Run Relationship

This section highlights the long-run estimation results which addressed the study's objective of a long-run relationship between government expenditure components and economic growth in Ghana. The analysis tests the null hypothesis of no long run relationship between government expenditure components and economic growth as against the alternative hypothesis of a long run relationship between government expenditure components and economic growth. Based on the results, the null hypothesis of no long-run relationship between the variables was rejected.

In view of the fact that government expenditure components and economic growth are cointegrated, the long-run parameters of the ARDL model are estimated and the results are presented in the Table 5. The long-run ARDL model was estimated based on the Schwarz Bayesian Criterion (SBC) in order to ensure that the results are parsimonious.

Table 5: Estimated Long-Run Coefficients using the ARDL Approach

ARDL(2, 0, 2, 0, 2, 0, 0, 2) selected based on SBC

Dependent Variable: LNRGDP

Regressor	Coefficient	Standard Error	T-Ratio	P-value
Constant	-1.4460	0.26255	-5.5075	[0.015] ***
LNIP	-0.007172	0.004121	-1.7404	[0.085] *
LNTP	0.053757	0.009008	5.9677	[0.000] ***
CXP	-0.028190	0.009754	-3.0394	[0.003] ***
LNCPI	-0.026767	0.002378	-11.2580	[0.000] ***
LNK	0.089980	0.009809	9.1732	[0.000] ***
TR	0.003500	0.0017836	1.9623	[0.052] *
L	0.045226	0.010107	4.4747	[0.000] ***

Note: *** and * denote significance level at 1% and 10% respectively

Source: Computed by the author using Microfit 4.1 package.

As shown in Table 5, all the estimated coefficients have their a priori expected signs. That is, the results in Table 5 indicate that IP, CXP and CPI have negative impact on the economic growth whilst TP, K, TR and L show a positive relationship with economic growth.

From the Table 5, the coefficient of government interest payments is statistically significant at 10 percent, indicating that if the country's interest payments increase by 1 percent, economic growth, measured by growth real GDP will decrease by approximately 0.01 percent. This means that increase in government interest payments has the potential of influencing economic growth negatively in Ghana at the aggregate level over the study period. This negative effect of interest payments on economic growth lends support to the argument raised by García et al., (2006) which claims that interest payments

impact on long-run economic growth negatively due to their crowding-out effects on other productive expenditures. Hence, high interest payments are associated with changes in economic growth which has the potential of decreasing economic activities of both public and private sectors of the economy. The implication is that, resources which could have been used to acquire capital assets are used to defray interest burden which adversely impacts the growth of output. The impact of interest payments on growth becomes more severe when government has to pay the interest through taxes. Thus, increase in taxes could reduce households' disposable income and returns on investment; increase cost of production and eventually increase general price levels. All these ultimately result in a fall in aggregate demand and output.

Furthermore, the coefficient of government transfer payments carried the expected positive sign and is statistically significant at 1 percent significance level. This indicates that, if the government transfer payments increases by 1 percent, then real gross domestic product (economic growth) will increase by approximately 0.054 percent in the long-run (as indicated in Table 5). This result is in line with the Keynesian hypothesis which argues that government transfer payments are crucial for economic growth and that high transfer payments improve long-term economic growth of a country.

Moreover, the result also confirms most findings of empirical studies in the literature. Particularly, it agrees with studies by Twumasi (2012); Afonso and Furceri (2008) who found a positive effect of government transfer payments on economic growth for the EU countries. Such long-run positive impact of government transfer payments on economic growth could be

attributed to the positive impact of transfer payments on households' disposable incomes which increases their purchasing power and the ability to develop their human resource.

Additionally, it can be observed from Table 5 that, the coefficient of government consumption expenditure in the long-run estimation results is negative (-0.02819) and statistically significant at 1 percent significance level. The implication of the coefficient is that, a 1 percentage increase in the general government final consumption expenditure as a percentage of GDP will cause real GDP (economic growth) to decrease by approximately 0.03 percent in the long-run. The negative sign associated with the government consumption expenditure confirms the theoretical thought that suggests that an increase in government consumption expenditure retards the economy's steady state growth. The negative impact could be justified by the crowding-out effect which is generally associated with government consumption expenditure and mainly how such expenditures are financed (taxes and borrowing).

In Ghana, despite the fact that government consumption expenditure has been essential to the welfare of the economy, it has not proven to be productive when economic growth is considered (Twumasi, 2012). The result further confirms the findings of empirical studies in the literature by Barro (1989) using 98 developed and developing countries; Afonso and Alegre (2008) using 27 EU countries; Afonso and Furceri (2008) with data from OECD and EU countries; (Agalega & Acheampong, n.d.) using data from Ghana. The results of these studies indicated a negative effect of government consumption expenditure on economic growth for the countries concerned. However, this finding contradicts that of Ocran (2011) who found a significant

positive relationship between government consumption expenditure and economic growth in South Africa.

In addition, the coefficient of consumer price index (CPI) is negative in sign and is statistically significant at 1 percent significance level. The coefficient indicates that a 1 percentage increase in the general price levels will induce economic growth to fall by approximately 0.027 percent in the long-run. The implication here is that, price stability of an economy is an indispensable element in achieving economic growth. The reason is that inflation impedes domestic demand and escalates the cost of production thereby decelerating the rate of growth of the economy. This result reaffirms the finding of Frimpong et al., (2006) who found a significant and negative connection between general price levels and economic growth in Ghana.

The result further supports that of Gokal and Hanif (2004); Ahmed and Mortaza (2005); Georgantopoulous and Tsamis (2012) who indicated a statistically significant long run inverse relationship between inflation and economic growth. On the contrary, Mallik and Chowdhury (2001) highlighted a positive relationship between economic growth and inflation for Bangladesh, India, Pakistan and Sri Lanka.

As expected, from Table 5, the coefficient of physical capital stock (as measured by gross fixed capital formation) is positive and statistically significant at 1 percent. This indicates that, if the country's stock of capital goes up by 1 percent, holding all other things constant, economic growth will increase by approximately 0.090 percent in the long run. This means that physical capital stock contributes positively to economic growth in the long-run in Ghana. This direct correlation is consistent with the classical economic

theory, and supports the claim made by Yasin (2003); Fosu and Aryeetey (2008) Alexiou (2009); Ocran (2011) that growth of gross fixed capital formation impacts output growth positively.

Further, the coefficient of tax revenue has the expected positive sign, and statistically significant at 10 percent. This means that when government tax revenue (as a percentage of GDP) increases by 1 percent, economic growth will increase by approximately 0.004 percent in the long run in Ghana. The justification for this positive relationship between tax revenue and economic growth is that, government revenue generated through taxation can be used to finance its capital expenditure and transfer payments which ultimately results in growth of output of the economy. This finding favours the argument by Mullen and Williams (1994); Ocran (2011); Ogbonna and Ebimobowei (2012) Antwi et al., (2013) who established significant and a positive relationship between economic growth and tax revenue.

The coefficient of labour force (Population aged 15-64 years as a percentage total population) also has its expected positive sign and is statistically significant at 1 percent significance level. This means that if labour force increases by 1 percent, economic growth will also increase by approximately 0.05 percent in the long run, holding all other things constant, in Ghana. What ought to be emphasized here is that, a mere increase in labour force could not lead to the desired growth of output hence the labour force must be equipped with the required skills and expertise to be able to make this positive relationship with output growth a reality. This result supports the view of Frimpong et al., (2006) who indicated that, labour is important in explaining economic growth in the long run in Ghana.

Again, the finding confirms the emphasis made by Wilkins (2004); Jayaraman and Singh (2007); Ogundipe and Oluwatobi (2013) who argued that there is a positive and significant relationship between labour force and economic growth since economic growth cannot be achieved without labour as an input of production. M'Amanja and Morrisey (2005) also highlighted a positive relationship between labour force and economic growth.

Short Run Relationship

This section presents the estimation results of the short-run relationship between economic growth and government expenditure components in Ghana. The analysis was meant to test the null hypothesis of no short-run relationship between economic growth and the government expenditure components as against the alternative hypothesis of a short-run relationship between economic growth and government expenditure components. The results in Table 6 indicate that all variables are statistically significant, therefore the null hypothesis of no short-run relationship between the variables was rejected.

Once the long-run cointegrating model has been estimated, the next step is to model the short-run dynamic relationship among the variables within the ARDL framework. Consequently, the lagged value of all level variables (a linear combination) is denoted by the error-correction term, ECM_{t-1} , is retained in the ARDL model.

Table 6 presents the results of the estimated error-correction model of economic growth for Ghana using the ARDL framework. The model is selected based on the SBC.

Table 6: Estimated Short-Run Coefficients

ARDL(2, 0, 2, 0, 2, 0, 0, 2) selected based on SBC

Dependent Variable: LNRGDP

Regressor	Coefficient	Standard Error	T-Ratio	P-values
Constant	-0.58304	0.26166	-2.2283	[0.029]**
Δ LNRGDP(-1)	0.75696	0.094273	8.0295	[0.000]***
Δ LNIP	-0.007168	0.004102	-1.7473	[0.083]*
Δ LNTP	0.053694	0.008947	6.0012	[0.000]***
Δ CXP	-0.003448	0.001609	-2.1429	[0.035]**
Δ LNCPI	-0.013732	0.001388	-9.8944	[0.000]***
Δ LNK	0.091857	0.005486	1.6744	[0.097]*
Δ TR	0.003566	0.001657	2.1519	[0.034]**
Δ F	0.045217	0.010061	4.4943	[0.000]***
ECM(-1)	-0.54920	0.05790	-9.4888	[0.000] ***

R-Squared	0.94807	R-Bar-Squared	0.94151
S.E .of Regression	0.00865	F-stat. F(9, 89)	9.2083 [0.000]***
Mean of Dep. Variable	0.00927	S.D. of Dep. Variable	0.03579
Residual Sum of Squares	1.74739	Equation Log-likelihood	27.6540
Akaike Info. Criterion	42.6544	Schwarz Bayesian Criterion	30.3819
DW-statistic	2.0850		

Note: ***, **, and * denote significance level at 1%, 5% and 10% respectively
 Source: Computed by the author using Microfit 4.1 package.

The short-run results indicate that any disequilibrium in the system as a result of a shock can be corrected in the long-run by the error correction term. Hence, the error correction term that estimated the short-run adjustments to equilibrium is generated as follows.

$$ECM = LNRGDP + 0.0072*LNIP - 0.0538*LNTP + 0.0282*CXP + 0.02677*LNCPI - 0.0900*LNK - 0.0035*TR + 0.0452*L + 1.4460*C$$

The results from the ARDL model as displayed in Table 6 suggest that the ultimate effect of previous period value of economic growth on current values of economic growth in the short-run is positive and statistically significant at 1 percent significant level. The implication is that current values of economic growth are affected by previous quarters' values of economic growth in Ghana. This is expected in that previous growth and expansion in the growth of the economy serves as an indication of prosperity and may attract more investment leading to more growth.

The results also showed the expected negative sign of error correction term lagged one period (ECM_{t-1}) and it is highly significant at 1 percent significance level. This confirms the existence of the cointegration relationship among the variables (that is economic growth and government expenditure components) in the model. The Error Correction Term (ECT) stands for the speed of adjustment to restore equilibrium in the dynamic model following a disturbance. The coefficient of the error correction term (ECM) is -0.54920. This suggests that, about 55 percent of the deviations from the long term output growth caused by previous quarter's shocks converge back to the long run equilibrium in the current quarter of the year. The rule of thumb is that, the larger the error correction coefficient (in absolute terms), the faster the variables equilibrate in the long-run when shocked in the previous period (Acheampong, 2007; Oyinlola & Akinnibosun, 2013).

Consistent with the long-run results, the coefficient of interest payments has the theorized negative impact on economic growth in the short-run. Thus, the coefficient is statistically significant at 10 percent. From the results in Table 6, a 1 percentage point increase in interest payments will cause

economic growth to decrease by approximately 0.007 percent in the short-run. This indicates the crucial role that interest payments on loans play in Ghana's growth process as its coefficient is negative in the dynamic model just as in the long run model. This result is in harmony with that of Garcia et al. (2006) who found a significant and negative relationship between government interest payments and economic growth in Chile. This relationship can be attributed to the crowding-out effects of interest payments on private investments and other productive spending.

Again, the coefficient of government transfer payments also maintained its positive sign and statistically significant at 1 percent significant level which is consistent with the long-run results. The result therefore implies that, if government transfer payments go up by 1 percent, economic growth accordingly will increase by approximately 0.054 percent in the short-run. Thus, the short-run and long-run results indicate that government transfer payments have been favourable for economic growth in Ghana over the period under study.

Furthermore, consistent with the long-run findings in Table 5, the coefficient of government consumption expenditure maintained its negative sign and statistically significant at 5 percent significance level in the short-run. This means that in the short-run, if the government consumption expenditure increases by 1 percent, economic growth will decrease by approximately 0.003 percent, which is less than the long-run coefficient of 0.028 percent. This shows how important it is to deal with high government consumption expenditure in relation to growth in the Ghanaian economy.

Also, the coefficient of consumer price index in the short-run dynamic equation maintained its expected negative sign. It is statistically significant at 1 percent significance level which is consistent with the long-run result. The result shows that a 1 percentage point increase in consumer price index in the short-run will decrease real GDP by approximately 0.014 percent. However, the negative effect of consumer price index on economic growth is less severe in short-run (-0.014) than in the long-run (-0.027). This result is similar to the finding of Asiedu (2006) who put forward that, a nation can reduce the level of price distortions in the economy if it desires to achieve high level of economic growth.

Again, consistent with the long-run estimate, the coefficient of gross fixed capital formation maintained its positive sign and statistically significant at 10 percent significant level in the short run. The results indicate that a 1 percent increase in gross fixed capital formation will induce an increase of 0.092 percent growth in real GDP in the short run. The result is again consistent with the empirical result of Ocran (2011) who found a positive and significant effect of gross fixed capital formation on output growth in South Africa.

Moreover, the coefficient of tax revenue still had its expected positive sign, and statistically significant at 5 percent in the short run. This means that when government tax revenue increases by 1 percent, economic growth will increase by approximately 0.004 percent in the short run. What needs to be emphasized here is that tax revenue is a principal tool government uses to execute its expenditures and useful in achieving sustained growth targets. This result turns to support the long run results and the argument put forward by

Mullen and Williams (1994); Ocran (2011); Ogbonna and Ebimobowei (2012) that tax revenue has significant and a positive effect on real GDP. However, this result conflicts with that of Dackehag and Hansson (2012) who found a negative relationship between tax revenue and economic growth. This negative relationship is explained by the distortions that raising tax revenues cause on economic activities. Worlu and Nkoro (2012) also found no significant relationship between tax revenue and economic growth in Nigeria.

Labour force had the expected positive sign as in the long-run results. Thus, its coefficient is statistically significant at 1 percent significance level in the short run. This implies that as labour force in the country increases by 1 percent, holding all other things constant, economic growth will increase by 0.045 percent in the short run.

With the R-Square value of 0.94807 suggests that about 95 percent of the variations in economic growth are explained by the regressors in the model.

Lastly, on the differential effect of government expenditure components, the results in Table 5 indicates that, among government consumption expenditure, transfer and interest payments, only transfer payment was found to stimulate growth by 0.054% for every 1 percentage point increase in transfer payment. Government consumption and interest payments, on the other hand, were found to retard growth of output by 0.028% and 0.007% when each of these expenditure components increases by 1 percent respectively in the long run. These results are not significantly different from the short run results in Table 6.

Model Diagnostics and Stability Tests

In order to check for the estimated ARDL model, the significance of the variables and other diagnostic tests such as serial correlation, functional form, normality, heteroskedasticity and structural stability of the model are considered. As shown in Table 7, the model generally passes all diagnostic tests in the first stage. The diagnostic test shows that there is no evidence of autocorrelation and the model passes the normality and the test proved that the error term is normally distributed. Additionally, the model passes the white test for heteroskedasticity as well as the RESET test for correct specification of the model.

Table 7: Model Diagnostics

Diagnosics	Test Statistic(P-Value)
$F_{Auto} (4,80)$	1.6885 [0.158]
$X^2_{Auto} (4)$	7.5473 [0.110]
$X^2_{Reset} (1)$	0.1530 [0.696]
$X^2_{Norm} (2)$	1.5794 [0.404]
$X^2_{White} (1)$	8.3370 [0.842]

Note: X^2_{Auto} , X^2_{Reset} , X^2_{Norm} , and X^2_{White} are Lagrange multiplier statistics for test of serial correlation, functional form misspecification, non-normal errors and heteroskedasticity respectively. These statistics are distributed as Chi-square values with degree of freedom in parentheses. Values in parentheses [] are probability values.

Source: Computed by the author using Microfit 4.1 package.

Finally, when analyzing the stability of the coefficients, the Cumulative Sum (*CUSUM*) and Cumulative Sum of Squares (*CUSUMQ*) are applied. Following Pesaran and Pesaran (1997); Bahmani-Oskooee and Nasir, (2004), the stability of the regression coefficients is evaluated by stability tests

and they can show whether or not the parameter estimates are stable over time. These stability tests are appropriate in time series data, especially when one is uncertain about when structural change might have taken place.

The results for *CUSUM* and *CUSUMSQ* are shown in Figure 5 and Figure 6 respectively. The null hypothesis is that the coefficient vector is the same in every period and the alternative is that it is not (Bahmani-Oskooee & Nasir, 2004). The *CUSUM* and *CUSUMSQ* statistics are plotted against the critical bound of 5 percent significance level. According to Bahmani-Oskooee and Nasir (2004), if the plot of these statistics remains within the critical bound of the 5 percent significance level, the null hypothesis that all coefficients are stable cannot be rejected.

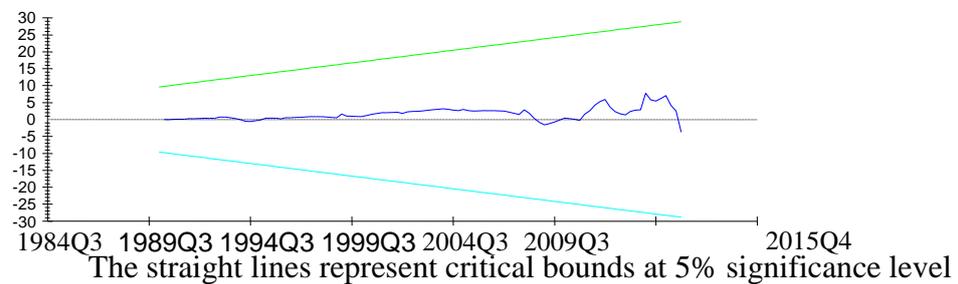


Figure 5: Plot of Cumulative Sum of Recursive Residuals

Note: The variable on the vertical axis is residuals while the variable on the horizontal axis is years in quarters.

Source: Generated by the author using Microfit 4.1 package.

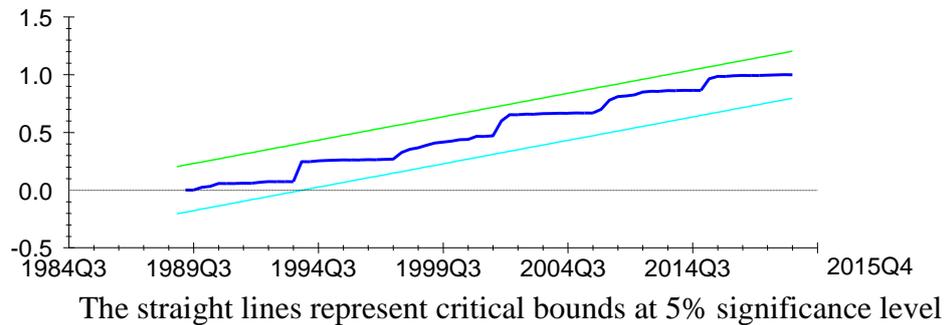


Figure 6: Plot of Cumulative Sum of Squares of Recursive Residuals

Note: Variable on the horizontal axis is years in quarters.

Source: Generated by the author using Microfit 4.1 package.

As shown in Figures 5 and 6, the plot of both the *CUSUM* and *CUSUMSQ* residuals are within the 5 percent critical bound (boundaries). That is to say that, the stability of the parameters has remained within its critical bounds of parameter stability. It is clear from both graphs in Figures 5 and 6 that both the *CUSUM* and *CUSUMSQ* tests confirm the stability of coefficients of the economic growth functions.

Granger Causality Tests

This section presents the results of the Granger Causality test. The test seeks to explore the direction of causality between government expenditure components (consumption expenditure, transfer and interest payments) and economic growth in Ghana. The analysis tests the null hypothesis of no causal relationship between government expenditure components and economic growth as against the alternative hypothesis of a causal relationship between government expenditure components and economic growth.

Having established cointegration among the variables, Granger causality test was then applied to measure the linear causation between government expenditure components and economic growth.

The results of the Pair-wise granger causality test is presented in Table 8. The results in Table 8 suggest that the null hypothesis that government interest payment does not granger-cause economic growth is rejected at 5 percent significance level. This means that government interest payment granger-causes economic growth in Ghana.

Moreover, the null hypothesis that economic growth does not granger-cause government interest payment is also rejected at 5 percent significance level implying that economic growth also granger-causes interest payment suggesting a bidirectional causality between government interest payment and economic growth in Ghana.

Table 8: Results of Pair-wise Granger Causality Tests

Null Hypothesis	F-Stat.	Prob.	Remarks
LNIP does not Granger Cause LNRGDP	3.36650	0.0355**	Reject H ₀
LNRGDP does not Granger Cause LNIP	4.72317	0.0106**	Reject H ₀
CXP does not Granger Cause LNRGDP	3.87459	0.0234**	Reject H ₀
LNRGDP does not Granger Cause CXP	0.65257	0.5225	Accept H ₀
LNTTP does not Granger Cause LNRGDP	4.98115	0.0083***	Reject H ₀
LNRGDP does not Granger Cause LNTTP	2.25144	0.1096	Accept H ₀

Note: *** and ** denote significance level at 1% and 5% respectively.

Source: Estimated by the author using E-views 9.0 package.

Furthermore, the results in Table 8 indicate that the null hypothesis that government consumption expenditure does not granger-cause economic growth is rejected at 5 percent significance level. This means that government consumption expenditure granger-causes economic growth in Ghana, but not economic growth granger-causing government consumption expenditure. This indicates a unidirectional causality running from government consumption expenditure to economic growth.

Lastly, it can be observed from Table 8 that the null hypothesis that government transfer payment does not granger-cause economic growth is rejected at 1 percent significance level. But the null hypothesis that economic growth granger-causes government transfer payment is accepted. This implies that government transfer payment granger-causes economic growth, and that there is a unidirectional causality running from government transfer payment to economic growth in Ghana.

Conclusion

This chapter examined the time series properties of the data used for estimation, presented and discussed the results. Unit root tests employing both the ADF and the PP techniques essentially show that all the series had to be differenced once to achieve stationarity. This means that all the series are integrated of order one, $I(1)$. The presence of non-stationary variables implied the possibility of the presence of a long-run relationship among the variables, which the study verified using ARDL bounds test approach. The results show the presence of long-run and short-run relationship between government expenditure components and economic growth in Ghana. Whereas

government transfer payment was found have a positive and statistically significant impact on economic growth, government interest payment and consumption expenditure indicated negative significant effect on output growth. The results further show that tax revenue, physical capital stock and labour force positively influence economic growth. Lastly, consumer price index exhibited a significant negative relationship with economic growth for the study period.

The results of the ARDL (2, 0, 2, 0, 2, 0, 0, 2) model selected based on SBC show that the error correction term (ECM_{t-1}) for economic growth carried the expected negative sign. Also, the results imply that the variables play a significant role in explaining economic growth in Ghana. The coefficients for all the explanatory variables were well behaved and had the expected signs and they were significant both in the long-run and short-run.

The diagnostic and parameter stability tests revealed that the model passes the tests of serial correlation, functional form misspecification, non-normal errors and heteroskedasticity at conventional levels of significance and the graphs of the CUSUM and CUSUMSQ indicate the absence of any instability of the coefficients because the plots of these graphs are confined within the 5 percent critical bounds of parameter stability suggesting that all the coefficients of the estimated ARDL (2, 0, 2, 0, 2, 0, 0, 2) model are stable over the study period.

The Granger causality test results revealed a bi-directional causality between economic growth and government interest payment in Ghana. The results further indicated a unidirectional causality running from both

government consumption expenditure and government transfer payment to economic growth in Ghana.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

The chapter presents the summary, conclusions and recommendations of the study. Whilst the summary presents a brief overview of the research problem, objectives, methodology and findings, the conclusions highlight the overall outcomes regarding the findings of the study in light of the hypotheses, and the recommendations provide specific remedies to be implemented by particular agencies. The chapter further provides the limitations of the study and direction for future research.

Summary

This study investigated the growth impact of government consumption, transfer and interest payments in Ghana using quarterly time series data from 1984-2015. The investigation was done by regressing economic growth, proxied by real GDP, government interest payments, government transfer payments, government consumption expenditure, tax revenue, consumer price index, capital stock and labour force in an Autoregressive Distributed Lag (ARDL) model. The study specifically examined the long-run and short-run relationships among the variables in Ghana. The ARDL approach to cointegration was employed to examine the long-run and short-run dynamics among the variables in the estimation. All tests and estimations were conducted using E-views 9.0 and Microfit 4.1 package.

The first step in the estimation process involved testing for the stationarity properties of the variables using both the Augmented-Dickey

Fuller (ADF) and Phillips-Perron (PP) test statistics. The unit roots results suggest that all the variables were stationary after taking the first difference. Secondly, the study proceeded to examine the long-run and short-run relationships between government expenditure components and economic growth using the maximum likelihood based approach within ARDL approach to cointegration proposed by Pesaran and Shin (1999). Third, the assessment of the diagnostic and stability test statistics revealed that the estimated model was satisfactory in line with the Lagrange multiplier and F-statistic. The plots of the cumulative sum of recursive residuals and the cumulative sum of squares of recursive residual stability test for the model indicated that all the parameters estimated were stable over the study period since they were found to be within the five percent critical bounds level. Lastly, the study further proceeded to examine the causal relationship between the government expenditure components considered and economic growth using the pair-wise Granger-causality test. The following are therefore the findings of the study:

The cointegration analysis revealed the presence of long-run relationship among economic growth, government interest payments, government transfer payments, government consumption expenditure, consumer price index, gross fixed capital formation, tax revenue and labour force.

The error correction model also revealed a short run relationship among the variables. It can be said that, the results in the short-run were consistent with the results in the long-run. The positive and negative effects of most of the variables on economic growth were bigger in magnitude in the long-run than in the short-run.

The results from the ARDL model estimation indicated that, among the government expenditure components considered, only government transfer payments was found to have a significant positive relationship with economic growth. Government interest payments and consumption expenditure revealed negative and significant impact on economic growth in both short-run and long-run. Consumer price index was found to have negative effect on growth. However, capital stock, tax revenue and labour force show positive and significant effect on economic growth. It must be noted that, the short run results confirm the long run results, but the magnitudes of the impact (coefficients) of the regressors in the long run are bigger than in the short run for the study period. Additionally, the existence of a long-run relationship among the variables was further confirmed by the negative and statistically significant coefficient of the lagged error correction term. The value of the coefficient suggests that about 55 percent of the disequilibrium caused by previous quarters' shocks converges back to the long-run equilibrium in the current quarter in each year. Statistically, any disequilibrium in the Ghanaian economy takes about seven months to restore to equilibrium.

The diagnostic tests results show that the model passes the test of serial correlation, functional form misspecification, non-normal errors and heteroscedasticity at conventional levels of significance. The graphs of the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) show that there is stability of the parameters.

Lastly, the Granger-causality test was carried on the government expenditure components (government consumption, transfer and interest payments) and economic growth.

Conclusions

The principal objective of this study was to investigate the growth impact of government consumption, transfer and interest payments in Ghana. Investigation of the relationship between government expenditure components and economic growth has become a subject of interest for many researchers.

The reason is the mounting evidence that indicates that stability of macroeconomic variables leads to economic growth. The analysis of government expenditure-economic growth nexus has captured the interest of development practitioners, finance experts, and researchers as well as policy makers in recent times given the turbulent experiences of the world economy and its accompanying consequences. The study therefore investigated the growth impact of government consumption, transfer and interest payments in Ghana. The study made emphasis on two key issues: the relationship between government expenditure components and economic growth; and the direction of causality between government expenditure components and economic growth. Considering the results of the study, the following conclusions were drawn.

The study in line with the empirical literature has shown that there exists a long-run and short-run relationship among variables of interest, particularly government transfer payments, physical capital stock, tax revenue

and labour force were found to have positive effects on the growth of output in both short run and long run in Ghana. The implication is that increase in the volume of transfer payments, capital stock and tax revenue together with growth of labour force will cause the Ghanaian economy to growth in both short run and long run.

Again, the results presented in this study imply that government interest payments, government consumption expenditure and consumer price index are also statistically important determinants of economic growth but have a negative relationship with output growth, both in the long-run and in the short-run.

Finally, the study found a bi-directional causality between economic growth and government interest payment. Unidirectional causalities running from government consumption expenditure and transfer payment to economic growth were also indicated.

Recommendations

Based on the findings from the study, the following recommendations are proposed.

Government of Ghana through the Ministry of finance has taken measures to mitigate the upsurge of interest payment in government expenditure. These measures include interest rate hedging through swap management, and government managing to pay its loan within the stipulated period. To ensure the effectiveness of these policies, the Ministry of Finance should ensure that the loans are used to finance projects that can generate income within a reasonable period to pay off the debts. Lastly, the Ministry of

Finance should establish an institution whose responsibility will be to track and ensure that any fund government releases is used for the intended project, and demand comprehensive account on each project.

Government through the Ministry of Finance should take measures toward reducing its consumption expenditures, more importantly on those that are likely to have crowding-out effects on the economy. That is, the consumption expenditures which are financed through domestic borrowing. Again, the Ministry of Finance should ensure that much of government consumption expenses are made on domestically produced goods in order to increase aggregate demand and output that will culminate in long term growth of the economy.

Moreover, the study recommends that government through the Livelihood Empowerment Against Poverty (LEAP) programme under the Department of Social Welfare should increase and regularize its transfer payments in order to elevate the vulnerable groups from extreme poverty.

Lastly, the study recommends that the Ministry of Finance should take measures that will bring about efficiency in the tax system in the country. Specifically, the ministry should ensure that the tax base is widened while keeping the tax rate low. The result of this is that tax evasion in the system will be minimised, tax revenue will improve and real GDP will grow.

Limitations of the Study

The main limitation of the study has to do with the quality and limited availability of quarterly data on key variables. To produce highly reliable

estimates particularly with cointegration variables that have their values already in quarters was needed. Accordingly, quarterly series were generated through interpolation for the purpose of the estimation. Nonetheless, there is no gain in the power of these tests by switching from low frequency to high frequency data and merely increasing the number of observations over a short time period (Campbell & Perron, 1991). The utilization of interpolated quarterly series did not, however, create danger to the reliability of the results for the reason that Acheampong (2007); Anaman and Osei-Amponsah (2007) used similar approach and arrived at reliable results.

The study examined the differential effects of government consumption expenditure, transfer payments and interest payments on economic growth. Some government expenditure components were not included because Appiah (2014) has considered government capital expenditure and recurrent expenditure, and others were due to data and time constraint.

The study did not include human capital in the model because among the focus was to ascertain the effect of the size of labour force on economic growth but not the quality of labour force on output growth.

However, none of these limitations was found to have any effect on the reliability of the results of the study as well as the conclusions and recommendations from the study.

Direction for Future Research

The study examined the growth impact of government consumption, transfer and interest payments in Ghana. The study could not consider the

connection between other government expenditure components (domestic interest payments, external interest payments and compensation to employees) and economic growth. Therefore, further study in this area can be carried to investigate this relationship.

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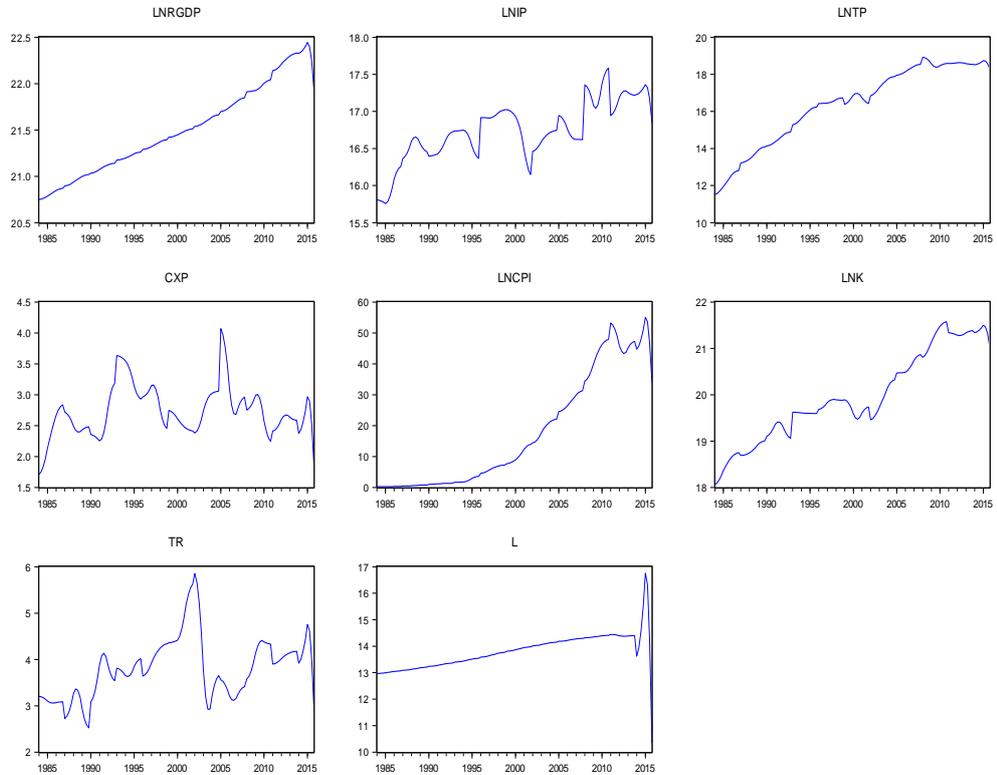
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APPENDICES

APPENDIX A

GRAPH OF VARIABLES AT LEVEL



APPENDIX B

GRAPH OF VARIABLES AT FIRST DIFFERENCE

