CAUSAL RELATIONSHIP BETWEEN GOVERNMENT EXPENDITURE AND ECONOMIC GROWTH IN ETHIOPIA: AN ECONOMETRICS ANALYSIS.

A Thesis Submitted To The School Of Postgraduate Studies Of Jimma University In Partial Fulfilment Of The Requirements For The Degree Of Master Of Science In Economics (Economic Policy Analysis)

BY:

DESU ABDISSA

JIMMA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

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This is to certify that the thesis entitles "*Causal Relationship between Government Expenditure and Economic Growth in Ethiopia: An Econometric Analysis*", submitted to Jimma University for the award of the degree of Master of Science in Economics (Economic Policy Analysis) (MSc) and is a record of confide research work carried out by Mr. Desu Abdissa under our guidance and supervision.

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DECLARATION

I hereby declare that this thesis entitled "*Causal Relationship between Government Expenditure and Economic Growth in Ethiopia: An Econometric Analysis*", has been carried out by me under the guidance and supervision of Dr. Wondaferaw Mulugeta and Ato Haile Ademe.

The thesis is original and has not been submitted for the award of any degree or diploma to any university or institutions.

Researcher's Name Date Signature

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ACRONYMS

- ADF Augmented Dickey-Fuller Test
- AIC Akaike Information criterion
- AR Auto regression
- CUSUM Cumulative sum
- ECM Error correction model
- ECT Error correction term
- FPE Final prediction error
- GDP Growth Domestic product
- GTP Growth and transformation program
- HQ Hannn-Quin Information criterion
- IMF International monetary fund
- MDG Millennium Development Goal
- MoFED Ministry of Finance and Economic Development
- OECD Organization for Economic Cooperation and Development
- ODA Official development assistance
- OLS Ordinary Least square
- PP Philip-Perron Test
- RGDP Real growth domestic product
- NBE National bank of Ethiopia
- SAP Structural adjustment program
- SC Schwartz Information criteria
- TFP Total factor productivity
- UN United Nation
- VAR Vector Auto Regression Model
- VECM Vector Error Correction Model
- WB World Bank

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abstract

The main objective of this study is to investigate causality relationship between government expenditures and economic growth in Ethiopia. To achieve the objective of the study, time series data for the period 1974/75 to 2013/14 was collected for various macroeconomic variables. Unit root tests were conducted to test the stationarity level of the data which was found to be integrated of order one. The data was also tested for Johansson Cointegration test approach found government expenditure components and economic growth to be cointegrated and found that there exists long run relationship between economic growth and its independent variables. Granger causality test shows unidirectional causality running from economic growth to government expenditure in validation of Wagner's Law. The study showed that government expenditure on total capital expenditure, trade openness and school of enrollment has positive and significant on economic growth while government expenditure on recurrent expenditure has negative and significant impact in the long run. The study also tried to explore the short run effect of components of government expenditure on economic growth using vector error correction model and found that capital expenditure has positive and significant impact on economic growth and recurrent expenditure has positive sign but insignificant in short run. On other hand, private investment has positive and significant impact on economic growth in short run. Hence, the government should increase its capital expenditure in areas that are beneficial to the private sector and eschew from those that compete with or crowd it out. It should increase its expenditures on those items that enter private production functions as productive public inputs that enhance economic growth. Such productive government capital expenditure includes expenditure on infrastructures, plant and machinery all of which generate positive externalities that raise private investment and thus economic growth. The increase in investment would increase economic growth.

CHAPTER ONE

INTRODUCTION

The relationship between government expenditure components and economic growth is a critical subject of analysis as the two are interrelated (Stieglitz, 2000). One of the objectives of governments in developing countries is to bring about economic growth, and fiscal policy is the basic tools being used to stabilize and bring about growth in the economy in a desired way through enforcing monitoring mechanisms. The components of fiscal policy includes government expenditure, tax, and public debt (Premchand, 1983).

Government expenditure is just like barometer which measures the course of economic growth as well as administrative skill of the government. It is one major process by which the welfare of the people is examined and is also a vital aspect of a government‘s budget. Government undertakes expenditures to pursue a variety of goals only one of them is an increase in GDP growth (Aryal and Prasad, 2006).

According to the Ethiopian Ministry of Finance and Economic Development Annual Report (2012/13), the main development purpose of Ethiopia is to reduce poverty in a relatively short period of time. This can be proficient with application of broad based development policies that would not only enhance economic growth but would also be governed by the principles of ensuring equitable distribution of the benefits from such growth and using government expenditure as a tool to boost economic growth and also improve the life of the population, Ethiopia has set down both medium and long-term plans. Its medium term plan is to attain the Millennium Development Goals at the end of the implementation of the five-year plan the Growth and Transformation Plan. The planning period for the GTP covers the period 2010/11-2014/15. Its long term plan, on the other hand, is to build on the achievements of the middle-income country in the coming ten years.

Therefore, to improve and develop social, economic and political conditions of a country, the Ethiopian government has taken different measures of spending on different sectors. As to Adams (1898), public expenditure is supposed to perform four major functions: under

development function's education, public recreation, maintaining equitable conditions for the execution of public business, and public investigation are included; in protective functions such as defense, police, court and protection against social diseases are considered; in commercial functions such as setting of commercial establishments under state control (public sector undertakings) are incorporated; and last in infrastructure functions such as dam, public works, transport and communication, energy, irrigations, etc. are included.

Although, government expenditure may directly or indirectly increase total output through its interaction with the private sector. Lin (1994) examined some of the ways in which government expenditure can increase growth. These included the provision of public goods and infrastructure, social services and targeted intervention such as export subsidies.

Currently, it is important to study that examining the government spending affects economic growth in Ethiopia. Even if there is marvelous growth in the literature on public expenditure and economic growth, there are several gaps. There is no universal agreement on which composition of the expenditure has direct effect on economic growth. Therefore, the objective of this study is to analyze the compositions of public expenditure to the growth of the Ethiopian economy. This will provide important information for the usages of limited public financial resources.

1.2. Problem Statement

There have been several studies on the role components of government spending in the long term growth of economies (Aschauer, 1989; Barro, 1990; Maingi, 2010). These study reported conflicting results about the effects of government spending on economic growth. Nijkamp and Poot (2004) conducted a meta-analysis of past empirical studies of public expenditure and growth and found that in a sample of 41 studies, 29% indicated a negative relationship between public expenditure and economic growth, 17% a positive one, and 54% an inconclusive relationship. The relationship between government expenditure and economic growth has continued to generate series of controversies among scholars in economic literature. On other hand, some authors believed that the impact of government expenditure on economic growth is negative or non-significant (Taban, 2010; Vu Le and Suruga, 2005). Other authors on

their studies shows that the impact is positive and significant (Alexiou, 2009; Belgrave and Craigwell, 1995).

The same studies has also been conducted in Ethiopia regarding the relationship between components of government expenditure and economic growth (Tashome, 2006; Abdu and Melesse, 2014) found a mixed results of effect of government spending on economic growth.

This study investigated the causal relationship between government expenditure and economic growth and affirm whether public expenditure components enhance, deter or indeterminate economic growth in Ethiopia. Finally, the study answers the following research questions emerged.

1.2. Research questions

Study seriously investigated the following research questions regarding the causal relationship between public expenditure and economic growth in Ethiopia in an attempt to meet the long run and short run policy objectives:

- What is the trend of government expenditure in two consecutive regimes in Ethiopia?
- What is the long and short run causality between public expenditure and economic growth in Ethiopia?
- What is the relationship between the components of government expenditure and economic growth in Ethiopia?
- What is the effects components of governments of expenditure on economic growth in Ethiopia?

1.3. Objectives of the study

The general objective of the study is to identify the direction of causality between components of government expenditure and economic growth and the specific objectives are identified below:

- To review the government expenditure trends in consecutive two regimes in Ethiopia
- To investigate the relationship between the components of government expenditure and economic growth in Ethiopia.
- To examine the effects of the components of government expenditure on economic growth.
- To examine the long run and short run causality between components of government expenditure and economic growth in Ethiopia.

1.4. Significant of study

The purpose of this study is to develop an empirical framework for determining differential causality relation between components of government expenditures and economic growth to ensure the existence of causal relationship between the variables and to avoid spurious regressions found in this regard. This assists policy makers to determine allocation of public funds and avoid intuition in making expenditure decisions which mostly lead to disastrous economic consequences. It is also important if they actively use public expenditure policies to correct externalities and ensure a satisfactory provision of public goods and services. This study sought to contribute to the body of knowledge which exists now by providing empirical evidence specifically on impact of government expenditure components on economic growth in Ethiopia.

One of the major advantages of this study is that it incorporates the most recent data and a more advanced econometric techniques like co-integration test and Granger causality to study the causality relationship between government expenditure and economic growth.

1.5. Scope of the study

This study discusses about the causality relationship between public expenditure and economic growth in Ethiopia and aimed to provide a better understanding of the short run and long run causal relationship between public expenditure and economic growth. It has tried to use the data from 1974/75 to 2013/2014 to examine relationship between composition of government expenditure and economic growth in Ethiopia. Moreover, the study focuses on the macroeconomic variables like real GDP, capital expenditure, recurrent expenditure, trade openness, private investment and school of enrolment as endogenous variables.

1.6. Organization of the Study

The study is organized into six chapters. Chapter one deals with the introductory part of the topic whereas chapter two is devoted to both the theoretical and empirical review on the Causal relationship between the government expenditure and economic growth. The data and methodology to be employed in the study are deal with under chapter three. The review of Ethiopian economy and government expenditure is explained under chapter four and the econometric results and discussions given in chapter five. Finally, the conclusions and policy recommendations were drawn in chapter six, depending on the findings of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

In this chapter, both theoretical and empirical literature on government expenditure and economic growth is reviewed. The first section reviews the theory and exposes the theoretical foundations that underlie the effects of government expenditure on economic growth. The theoretical representations of the models are described. The second section empirical literatures.

2.2. Theoretical Literature

The vast amount of literature analyzing the growth of government expenditure in itself shows the extent to which the subject has caught the interest of economists. Nevertheless, the subject of the government expenditure growth has reached beyond the domain of economics and spilled over into politics. Economic issues belong not only to economists; they have become both social and political issues. In predicting the impact of his theory, Keynes was right when he said that: "When my new theory has been duly assimilated and mixed with politics and feelings and passions, the study cannot predict what the final upshot will be ...." That is exactly what took place. As usual, it is rather difficult to categorically classify any subject without unfairly distorting it. Furthermore, any attempt towards categorization and classification might result in certain category or class cannot fit into one single heading only (Lonik, 1998).

Often enough that the argument put forward to justify the provision of public goods by the government was done on the ground of market failure in the provision of such goods. Frequently, the reasons cited for such failure is market inefficiency. When a public good is provided privately, it is feared that the private sector providing such goods will gain monopolistic power means that market economy is considered incapable of arriving at a pareto-optimal outcome in the provision of public goods. Beside the efficiency question, other arguments for market failure are the inability of the market economy to secure efficient resource allocation and income distribution. When the public sector provides such goods, the inefficiency will be passed on to the public sector. Nevertheless, this was deemed acceptable. Other reasons normally cited for the

public provision of public goods are externality and the problem associated with free-riders. The nature of public goods is that its consumption is non-rivalries and non-excludable. The former means that one person's consumption of the public goods will not affect the other person's consumption. The latter means that no one can be excluded from consuming such goods when they are made available (Mueller, 1989).

As macroeconomics of Unbalanced Growth: The Anatomy of Urban Crises was an attempt to identify the sources of unbalanced growth between two different economic sectors the technologically progressive and the technologically non-progressive sector (Baumol, 1967). Underlying Baumol's treatment is what Baumol termed 'cost disease'. The model was extended to identify the reason for the decline in the quality of life *vis.-a -vis.* quality of services provided by the government (see also Baumol and Oates, 1975). The cost disease has two main consequences. First, it leads to a rising comparative cost between the two, progressive and non-progressive, sectors. Second, it results in rising consumption costs as a result of increasing comparative cost in the supply side of the equation. Instrumental in the differences between these two, productive and non-productive sectors are the labour force. Labour is either the instrument or the end product. Labour is described here as capable of being affecting neither the price nor the quality of the product. It is also contended that often the quality improves where labour is replaced by machinery (Bell et al., 1968) and (Bacon at el., 1976, 1979). The manufacturing sector is the example cited for the former whereas the service sector is the latter. In broader sense this implies a private against a public sector. Some of the examples given are services provided by the government such as hospital and education. Between these two sectors, the differences is in the productivity level, which result in the productivity in one sector rising faster than in another sector. Brown and Jackson (1990) stressed that often it is assumed that productivity does not increase in the non-progressive sector.

Assuming that wages increase in both sectors, the productivity rise in one sector the progressive sector will offset the wage rise in that sector. The same did not happen in the non-progressive sector, or, if happening, the off-setting process is small. Consequently, the rise in wage in the unproductive sector which was not offset by the same amount of increase in productivity will eventually increase the cost in the unproductive sector. The manufacturing sector which more productive, will continue to decline in relative cost. Accordingly, it will

absorb a lesser amount of work force. In the non-productive sector, i.e. the service sector, some industry may survive if the demand is inelastic. However, some other industries identified i.e. health services and education, may be forced to leave the market unless financed greatly by the public. This means that, public expenditure will increase to finance these activities (Lonik, 1998).

Mass migration of population from rural to the urban areas, attracted by job prospect, flooded the urban neighborhood creating an urban slum and resulting in a deterioration in the quality of urban life. To fight these increasing social ills, greater financial pressure was put on the cities; pressure arises from the services to be channeled to the "relatively no progressive sector of the economy" (Baumol, 1967: 423) so much so that "the municipality will have to be expanded if standards of city life are to be maintained" (Baumol, 1967: 426). Baumol argued that productivity in most of the government activities are inherently difficult to increase; activities like teaching or medicine, which cannot be replaced by machine. In a modified model, Baumol, et al. (1985) contended that "The 'rising share of services' turns out to be somewhat illusionry" (p. 816). Nevertheless this does not reject the unbalanced growth theory for the reason that although the output share of the progressive and non- progressive sectors remains constant, but, with the rising prices, the share of total expenditure and labour force in the non-progressive sector has increased extremely which leads again to the unbalanced growth between the two sectors.

Unbalanced growth theory has been extended further (see for example Bacon and Eltis (1976, 1979) its critics by Hadjimatheou and Skouras (1979) refuted by Hadjimatheou, et al (1982) to encompass the market and non-market sector. One the critics on Baumol's thesis revolve around Baumol's failure to recognise the absence of competitive forces in the public sector (Bradford, et al., 1969). It is meant to show the unbalanced growth particularly in the non-market sector compared to the market sector.

Bacon and Eltis (1976) argued that Britain's main economic problem the unsteady growth arose because of the growth of the public sector defined as a non-market sector economy. They argued that in Britain, the growth in the non-market sector eventually crowded-out market sector investment (Bacon and Eltis, 1979). Bacon and Eltis proposition was strongly refuted by Hadjimatheao and Skouras (1979). Among others, Bacon and Eltis (1976: 28) argued

that "all investment are marketed" a proposition. Gemmell (1982: 369) provides "a framework in which international comparisons of the macroeconomic implications of different market and non-market sector growth rates can be identified". He also cautioned that for a government which emphasized employment, the expansion of the non-market sector may have adverse repercussions on the economy than the expansion of market sector.

Socio economic factors are contributes to the increased demand for public goods by the citizen-voters. The changes in socio-economic environment pose such a threat that the government will have to spend more money to rectify this problem. This either comes about from a direct provision of social services or from transfer payments. The socio-economic environment can be classified into three headings. First, is the demographic factor (Peltzman, 1980). This includes the number of dependent populations in the society i.e. the composition of age groups in term of the proportion of the school age children and the elderly. At the lower end of the age group, a higher proportion of school age children require certain type of public goods. In particular, governments have to spend more on education - schools, teachers, educational facilities etc (Goffman and Maher, 1968).

At the upper end of the age group, government expenditure includes nursing homes and medical aid. Another form of demographic factor is the increasing independence associated with demographic trends in the society (Ermish, 1977).

Demographic factors also include population density brings with health, environmental and hygienic expenditure. In such a situation, government expenditure has to be increased to care for these factors (Pye, 1960; Thorn, 1967; Bird, 1970). Second, is the urbanisation factor (Pye, 1960; Thom, 1967; Bird, 1970) which requires higher provision and better quality of public goods and services.

Borcherding (1977) argued that urbanization also leads to congestion in the demand of public goods. The urbanization process requires government to ensure the provision of certain types of public goods. It require not only expenditure on environmental, health and hygiene but include also expenditure on infra-structure such as road, street light, etc., policing and pollution control.

The third factor is distribution (Meltzer and Richard, 1978, 1981). Economists have recognized the distributive function of the government (see Musgrave, 1969). The distributive function require the usage of government machinery to redistribute the wealth of the nation in order to reduce, if not eliminate, inequality in the economy. This may take the form of an increase in the

number of tax offices and the tax inspectorate and an efficient public finance management. Niskanen (1981) argued that these socio economic requirements will increase the demand for transfer and social services from the citizen-voters. However, Borcherding (1977) rejected the notion that urbanization will put a pressure on the level of public spending while accepting that population increase does and he also believed that urbanization is a result of a higher income which should reduce not only economic interdependence but also the level of government interference.

As stabilizer factor the government role in the economy which gives rise to an increase in government expenditure. This is done in the light of Keynesian policy implications of government expenditure, the various development theories that require government involvement and the international factors that affect the stabilization of the domestic economy which in turn require government's active participation in the economy (Lukin,1998).

In development approach, development is defined as "the process of economic and social transformation within countries" (Thirlwall, 1994). This implies a transformation of the economic dependency i.e. structural transformation of a country from an agricultural-based economy to an industrial-based economy. World Development Report World Bank (2004) defined development in the following way: The challenge of development.... is to improve the quality of life. Especially in the world's poor countries, a better quality of life generally calls for higher incomes - but it involves much more. It encompasses as ends in themselves better education, higher standards of health and nutrition, less poverty, a cleaner environment, more equality of opportunity, greater individual freedom, and a richer cultural life.

The main focus here is that to evaluate how development theory contributes to the growth of government expenditure. The particular area that the financing of such development projects and activities. Economists have identified two main sources for financing economic development projects. First is from domestic resources. Second, development expenditure can also be financed from foreign assistance and debts. One important question on the choice of development finance is the cost of such financing. For instance, the cost of debt financing is the interest payable on such loans. There are identified three mode of financing from domestic sources. These are the prior savings approach, the Keynesian approach and the quantity theory approach. We will briefly discuss these modes of financing development projects, in turn. The prior saving

approach to financing development concentrates on accumulating enough savings in the economy. In other word, saving is treated as a prerequisite to investment, where saving equals to investment that is all money saved will be invested and normally assumed that for developing countries, private saving is very limited. Therefore, the pressure is on the government to invest in development projects. This will eventually increase the level of government expenditure. According to the Keynesian approach there are three aspects. First, when the economy is below capacity, investment will increase income and hence will increase savings. Second, increased income will increase transfers from income earners with high propensity to consume to profit earners with high propensity to save, which will eventually increase savings and investment. Third, the inflationary effect of investment will increase the nominal rate of return on investment and reduce the real rate of interest; this again will induce savings and investments. However, for most developing countries, domestic investment i.e. domestic capital formation is very low. This requires the government to invest in the economy. The government does this by running a deficit budget and hence injecting into the economy i.e. into the circular flow, a huge amount of government expenditure to stimulate the economy and the other mode of financing approach is quantity theory approach, the theory "stressed the effect of inflation as tax on real money balances". The government is required to finance development by increasing the money supply which will produce an inflationary effect. This inflationary effect will then reduce the desire to hold real balance by reducing the purchasing power of money and therefore will encourage savings in the economy (Thirlwall, 1994).

The international explanations to the growth of government expenditure associate the reason for the growth of government expenditure to international factors. These expenditures arise mainly through the introduction and implementation of trade barriers that restrict free trade.

According to Cameron (1978), the international explanations to the growth of government expenditure can be viewed from two perspectives. First, following Lindbeck (1975), Cameron argued that this expansion arises through international macroeconomics fluctuations and influences as a result of open economic policy and the "nations are not wholly autonomous" (P.293). Nation tends to be dependent on international economies for market of export goods as well as sources of capital investment. This is normally defined as openness in economic activities. Openness is defined by Lindbeck (1976), in term of the substitutability of domestic

and foreign goods whereby domestic price, labour and capital are determined by its supply and demand in the international market. Cameron noted that openness can be looked upon as trade dependence especially in the context of smaller nations.

Following Krasner (1976), Cameron argued that openness impairs macroeconomics policies; the view that was echoed earlier by Dahl and Tufte (1973:116) that is "....economies of scale tends to erode the independence and autonomous of the smaller democracy, making it independent ....On the actions of people outside the country".

The international influences in term of the fluctuations that affect the behavior of domestic economy that is to say the international business cycles that determine the domestic cycles and that since price for exports are set internationally, i.e. in the international market, the economy can do little which makes the domestic economy uncontrollable and exposes it to fluctuations. This is divided in to two sides. First, low profitability may arise if international demand and price fail to match domestic costs and hence "destabilize the economy" (P.1250). This may produce a chain effect: low profitability leads to lower funds for capital investment which will reduce the growth rate. Second, effects arise as a result of high profitability when international demand and price increase is greater than domestic costs. Inflation may creep in by way of higher wages in the export industries, which may spread into the rest of the economy. The inability of the government to resist these international influences on the domestic economy especially when the degree of openness is high and the economy or nation is small. This includes the inability to make decisions to determine domestic requirements, to control inflation and balance of payment deficit (Cameron, 1978).

Gilpin (1975), who suggested a mercantilist approach whereby the state, intervenes between the domestic and international economy. The same was suggested also by Myrdal (1960) to protect national economic stability from international forces and Lehmbruch (1977) who suggested that governments take a "more direct attempts at influencing the economic behavior of business and labour". This can be done through increasing the scope of the public economy. Government, it was suggested by Lindbeck (1975), can smoothen the effect of international business cycle fluctuation by way of extensive labour market policies i.e. through unemployment compensation, increasing public employment and capital funds provision for private sector.

The German economist Adolf Wagner (1835-1917) advanced a law of rising public expenditure by analyzing trends in the growth of public expenditure and in the size of public sector in many countries of the world. Wagner predicted an increasing scope of government activities which would result in an increase in government expenditure as the economy developed. Most interpretations argued that Wagner envisage government expenditure growth as a consequence of economic growth and the development of modern industrial society would give rise to increase political pressure for social progress and call for increased allowance for social consideration in the conduct of industry and He argued that this arose because of 'the pressure for social progresses,the conventional government activities "protection and social welfare in which expansion is foreseen in education, law and order, economic and general administration as well as the expansion in public enterprises." This pressure for social progress will increase the demand for public goods by the citizen-voters (Musgrave, 1969). Consequently, to meet this increased demand for public goods, government expenditure will increase.

The relationship between public expenditure and economic growth has been examined by many authors in both developed and developing countries of the world. However the results derived from many researchers have shown various conclusions and have created serious debate among scholars. Adolph Wagner formulated the law of increasing public expenditures in 1893 which is popularly known as Wagner's hypothesis or Wagner's law. The law suggests that the share of the public sector in the economy will rise as economic growth proceeds, owing to the intensification of existing activities and extension of new activities. Wagner observed the existence of relationship between economic growth and public expenditure. The primary idea behind this relationship is that the growth in public expenditure is a natural consequence of economic growth. Accordingly, public expenditure is an endogenous factor that is driven by the growth of national income. Further, Wagner's hypothesis emphasizes that, in the process of economic development, government economic activity increases relative to private economic activity. Wagner offered three reasons why this would be the case. First, with economic growth industrialization and modernization would take place which will diminish the role of public sector for private one. This continuous diminishing share of the public sector in economic activity leads to more government expenditure for regulating the private sector. Second, the rise in real income would lead to more demand for basic infrastructure particularly education and health facilities. Wagner asserts that it is the government who provides these facilities more

efficiently than private sector. And third, to remove monopolistic tendencies in a country and to enhance economic efficiency in that sector where large amount of investment is required, government should come forward and invest in that particular area which will again increase public expenditure (Bird,1971). Moreover it states that in the process of economic development, government economic activity increases relative to private economic activity (Wagner, 1883).

Accordingly, this expansion is due to the expansion "of fiscal requirement' of the state and "even more so, local authorities" of government of "progressive countries" as a result of the "pressure for social progress". The "pressure for social progress" and "the desires for development" will eventually" overcomes these financial difficulties" to finance such expansion. This clearly put Wagner's view into perspective. It explains, from Wagner's point of view, the reasons and causes for government expenditure growth in industrialized countries.

Wagner was referring to the "pressure for social progress". This pressure existed in the context of "progressive countries". Clearly, Wagner was referring to a particular stage of development, for; a progressive country is not a developed country. Taking in to consideration that Wagner was writing somewhere between 1883 and 1893 clearly shows that industrialized countries were far from fully developed as they are today. Nevertheless, this is not to deny that they were far ahead of others in development. They were undergoing and were reaping the fruits of the industrial revolution. Two questions emerge from this; first, is the growth of government expenditure limited only to that specific time where a country is in the process of progressing? In describing the stages of growth, Rostow (1960) described this period as a "take-off" stage preceding the developed stage. If that was the case, it seems that Wagner's Law phenomenon i.e. the increase in government expenditure, is only applicable for that specific time-period and will cease to exist once the economy has managed to progress beyond that "take-off" stage. This means that the Wagner's Law phenomenon is a phenomenon of developing countries and not the developed countries.

The second aspect of Wagner's Law relates to the functions of government. Functions of government or in other words, the scope of government activities is directly related with the level of government expenditure. Wagner argued that government requirements grow and the increase in requirement means an increase in the scope of government's functions and activities. Bird (1971) associated this expansion to the increase in administrative and protective functions, cultural and welfare expenditure, changes in technology and an increase in investment in the

private sector which gave rise to a large number of monopolies that require greater government regulation. This is considered as a natural consequence of economic growth and development (Singh and Sahni, 1984). In an attempt to theories this phenomenon, Beck (1979) associated the expansion not to an increase in the traditional government activities but to the increased in transfer payments. However, Beck's explanation was refuted by Ram (1986) arguing that it was not consistent with what Wagner believed it to be when considering the scope of government expenditure. Although not really related to the increasing scope of government activities, Baumol (1967) argued that one major factor that contributes to such expansion is the productivity lag arising from the low productivity of the public sector which is mainly a service sector.

Wagner's only consideration was that the "expansion of fiscal requirement" leads to the increasing of government expenditure. Nevertheless, Wagner also argued that this expansion was due to three main reasons: the expansion in "especially public economy"; "when administration is decentralized and local government well organized"; and finally the expansion of urban expenditure. Following this, the discussion in the "Three Extracts of Public Finance" concentrated on the increasing role of the government in the provision of the public goods. In other words, this implied that Wagner saw the failure of the market economy in the provision of public goods which forced the public sector to provide such goods and services. Wagner seemed to believe that market failure forced the public sector to replace the market economy in providing the public goods. Following this line of argument, several studies have been undertaken to test the elasticity of public goods (see, Ganti and Kolluri, 1979; Pryor, 1968; Gandhi, 1971; Goff man, 1968; Chrystal and Alt, 1971; Gupta, 1967). The purpose of all these tests was to show that the income elasticity of the public goods is positive or indeed greater than unity. Ganti and Kolluri (1979) summed up this by concluding that government outputs are both normal goods (elasticity is positive) as well as superior goods (elasticity is greater than unity) One difficulty in testing for the elasticity of government expenditure is how one should define elasticity of government expenditure. Pryor (1968) tested for the elasticity of government expenditure by only testing the ratio of government expenditure with respect to the gross domestic product. More generally, Gandhi (1971) argued that the elasticity of government expenditure depends on many factors which includes income elasticity of tax revenues, the level and income elasticity of non-tax government receipts.

Wiseman and Peacock carried out a study of public spending in the United Kingdom during 1890-1955. “The main resent of the theory is that public expenditure does not increase in a smooth and continuous manner, but in jerks or step like fashion.”

Adesoye et al. (2010) indicated that public expenditure increases and makes the inadequacy of the present revenue quite clear to everyone. The movement from the older level of expenditure and taxation to a new and higher level is the displacement effect. The insufficiency of the revenue as compared with the required public expenditure creates an inspection effect. The government and the people review the revenue position and the need to find a solution to the important problems that have come up and agree to the required adjustments to finance the increased expenditure. In other words, there is a concentration effect. The concentration effect also refers to the apparent tendency for central government economic activity to grow faster than that of the state and local-level governments.

The Peacock and Wiseman’s study centered on a time-pattern analysis of the government expenditure growths. There are two basic premises of Peacock and Wiseman’s analysis. First, they argued that government expenditure growth exhibits a gradual growth pattern. This gradual growth pattern, constrained by ‘a tolerable burden of taxation’ on the part of the citizen-voters, follows the gradual growth pattern of GDP. Second, their analysis revolved around the behavior of government expenditure following a period of social upheaval. They discovered that during this period of social upheaval, government expenditure growth will tend to deviate from its original and gradual growth path. Working on the public expenditure data for the United Kingdom between 1890 -1955, the Peacock and Wiseman hypothesis was acknowledged for its supply-side approach; taking into account the financing aspect of government expenditure that is government’s financial constraints. Their notion of a tolerable burden of taxation addressed the ability of government to raise taxes to finance the expansion of its activities. During the ‘stable’ period, government’s ability to raise taxes to finance its expenditure is limited because of the constraint imposed by the tolerable burden of taxation of the citizen voters. This means that government expenditure is constrained by tax revenues. From here, we can proceed by identifying two aspects of Peacock and Wiseman hypothesis. First, a social-upheaval be fallen the economy. In their study, this social upheaval was the two world wars fought by Britain. The social upheaval i.e. the war changed the public perception of a tolerable burden of taxation. The public comes to realize the need for an increase in government expenditure to finance these wars.

With this altered perception, the public will be willing to pay a higher tax rate to finance such expansion. Note that as a result of the war, an increase in military expenditure is therefore inevitable. As a consequence of this, total government expenditure will also increase (Brown and Jackson, 1990).

This constitutes a displacement of the original growth path of the total government expenditure. This is to say that war related expenditure displaced the original growth pattern of government expenditure to a new higher level. In addition, though theoretically not necessary, the share of civilian expenditure will fall to allow the government to spend more on the social upheaval, in this case military expenditure. The second aspect is concerned with what will happen after the social-upheaval or after the war. In other words, how long will the displacement last. Brown and Jackson (1990) presented three possible post-war outcomes. First, as suggested by Peacock and Wiseman itself, the relative size of total government expenditure will not fall to its prewar growth path. Instead, still constrained by the new tolerable burden of taxation but at a higher tax level, the total government expenditure will continue with its war period growth pattern. Since war has ended, this will allow the civilian mix of the government expenditure to increase. Second, following Musgrave (1969) and Bird (1970), both the civilian public expenditure and the total public expenditure will fall but only in the long-run. This allows the government to slowly adjust their spending habits. The pressure from citizen-voters will eventually force the government to reduce its spending level back to the original growth pattern. Third, post-war civilian public expenditure and total public expenditure will immediately fall to follow the original growth path after the war.

During period of social upheaval such as war, famine or some large-scale social disaster, the gradual upward trend in government expenditure would be distorted (displaced upward). In order to finance the increase in government expenditure, the government may be forced to raise taxation level, a policy which would be regarded as acceptable to the electorate during period of crises. This is called the displacement effect. Besides, there is also the inspection effect. This arises from people's keener awareness of social problems during the period of upheaval. The government, therefore, expands its scope of services to improve these conditions, since people's perception of tolerable levels of taxation does not return to its former level, the government is able to finance these higher levels of expenditure originating in the expanded scope of government and debt charges. The net result of these

two effect s is occasional short-term jumps in government expenditure within a rising long-term trend (Peacock and Wiseman, 1961).

Keynesian Theories is based on Keynes (1936). Keynesian economics promoted a mixed economy in which both the state and the private sector were considered to play an important role. Keynesian economics sought to provide solutions to what economists believed to be the failure of laissez-faire economic liberalism, which advocated that markets and the private sector operated best without state intervention (Trotman, 1997).

In Keynesian theory, macroeconomic trends could overwhelm the micro-level behavior of individuals. The theory is based on the assumptions of: The economy is operating in the short-run, wages and prices are fixed, money market is not important, taxation is in form of lump-sum taxes only and planned consumption and planned saving are both related to income. Keynes asserted the importance of aggregate demand for goods as the driving factor of the economy, especially in periods of downturn. The theory argued that government policies could be used to promote demand at a macro level and to fight high unemployment and deflation (Branson, 1989).

Keynesian economics has reference to a set of theoretical explanations for persistent unemployment and to specific governmental employment policies. The general notion behind Keynesian economics is that persistent unemployment derives from decreases in total private sector spending. According to Keynesian economists, the government can alleviate unemployment by increasing the total amount of spending in the economy. Keynes assumes that causality runs from public expenditure to economic growth in times of recessions. The Keynesian theory postulates that expansion of government spending accelerates economic growth (Mackenzie, 2008).

Regarding the link between public expenditure and economic growth, the theory of Keynesian macro economy assumed that high public spending leads to increase aggregate demand and in turn, increase the growth of the economy. On the other hand, the theory of Wagner inclined towards the opposite view. The second theory argues that an increase in the national income cause more public spending (Dandan, 2011). To Keynes, public expenditure is an exogenous factor and a policy instrument for increasing national income. In contrast, Wagner's law proposes that there is a long-run tendency for public expenditure to grow relative to some national income aggregates such as the Gross Domestic Product.

Most ideas regarding economic growth starts from the aggregate production function where factors of production determine the national output. According to the Neo-classical theories as advanced by Solow-Swan (1956), growth comes about in three ways if land is held fixed: increase in the labour supply; increase in the capital stock; and increase in productivity. Increasing labour supply generate a larger output. Real output rises if more people take part in a country‟s production, that is through immigration, or if people who are not a part of labour force begin working. Capital increase can be divided into two parts; increase in physical and human capital. Physical capital increases output because it enhances the production of labour and provides valuable services directly. A productive increase can for instance take place when there is investment in equipment like computers and machinery which can for example reduce labour hours.

Human capital promotes economic growth because people with skills are more productive than those without them. Investment in human capital is made through university studies and on the job training. Productivity increases explain the increase in output that can be explained by the input increases (labour and capital). This is called the productivity of input and can be affected by a number of factors: By either financing or supplying directly the investments that the private sector would not supply in adequate quantities because of various market failure in certain kind of infrastructure projects and basic education and health expenditure, which could directly boost private sector productivity; by efficiently supplying certain basic public services that were necessary to provide basic conditions for entrepreneur activity and long term investment; and by financing its own activities in the manner that minimizes distortions to private sector savings and investment decision and to economic activities more generally (Burda and Wyplosz, 2001). Within this framework, government expenditure could in principle impact growth by affecting capital and/or labour as well as the generation and/or assimilation of technological progress reflected in total factor productivity (TFP). However, since it is assumed in the model that the long-run growth rate is driven by the growth and the rate of technical progress, which is considered to be exogenous, the effect of government expenditure on growth through production factors is considered to be only transitional. The theory has some short comings which include the following. First, it provides an inadequate explanation of economic growth. Second, the theory does not give clear

understanding of differences among nations-why some are rich and some remain poor and why some grew rapidly while others stagnate.

According to Romer and Lucas (1990), endogenous growth theory highlights the fact that if productivity is to increase, the labour force must continuously be provided with more resources. Resources in this case include physical capital, human capital and knowledge capital (technology). Therefore, growth is driven by accumulation of the factors of production while accumulation in turn is the result of investment in the private sector. This implies that the only way a government can affect economic growth, at least in the long-run, is via its impact on investment in capital, education and research and development. The approach makes improved education (any kind of training or research that adds to human knowledge in any country) the key to achieving economic growth.

2.2. Empirical Literature

Singh & Sahni (1984) used the Granger causality test to determine the causality direction between national income and public expenditures in India. Aggregate as well as disaggregate expenditure data for the period of 1950-1981 was used. Data used in the study were annual and deflated by using implicit national income deflator. The study finds no causal relationship confirming the Wagnerian law or the opposite view.

Devarajan et al. (1993) used functional categories of public expenditure in their economic growth regressions. The study found out that public expenditure had a negative impact on developing countries but had a positive impact on developed countries. The study had categorized expenditure into productive and non-productive categories by taking into account the level of resources invested and output produced by different programs. For instance the study reported that government expenditure on health and transport and communications to be growth promoting but found no positive impact of education and military spending on economic growth.

Smith (1995) examined focusing on the role of government finance in economic development depending on the effects of various kinds of public spending and revenue (mainly taxes) in 56 developing countries. The findings suggest that government finance has played a positive role, refuting the conclusion advanced by some economists that there has been a government failure in development. However, current government expenditure displays a negative but statistically

insignificant relationship with output. Labour force growth also has a negative but insignificant effect.

Belgrave and Craigwell (1995) examined the impact of government expenditure on economic growth disaggregating the level of government on economic growth into functional and economic categories of Barbados for the period 1969-1992 and employed Augmented Dickey Fuller and Engle and Granger cointegration technique. Their results revealed that there is a positive relationship between capital expenditure, agriculture, housing and community, road, communication and health expenditures on economic growth respectively. However, the effects of education and current expenditure are negative.

Deverajan *et al.* (1996) shed light on the composition of public expenditure and economic growth for the panel of 43 developing countries from 1970 to 1990 and applied Ordinary Least Squares. The findings suggests that increase in the share of current expenditure has positive and statistically significant growth effects. By contrast, capital as a component of public expenditure has a negative impact on economic growth. These results implies that developing countries governments' have been misallocating public expenditure in favor of capital expenditures at the expense of current expenditures.

Ghali (1999) did a study on the effect of government expenditure on economic growth. The study used time-series data for OECD countries from 1970 to 1995. The variables were government investment, exports and imports. The results were that government expenditure Granger-causes growth directly for most of the countries. The study only considered the Granger- Causality test but not the effects of government expenditure on economic growth.

Tanninen (1999) used panel data of 52 countries for the period 1970-92. The method of estimation employed by the study was General Methods Moments (GMM). The variables used were investment, categories of government expenditure and income inequality. The study found that government expenditure and consumption had negative impact on economic growth, public spending on public goods was growth retarding for large government expenditure but not for small government expenditure, while social security spending was positively related to economic growth.

Islam and Nazemzadeh (2001) examined the causal relationship between government size and economic growth using long annual data of the United States. They indicated that the causal linkage was running from economic growth to relative government size.

Dar and Khalkali (2002) determined how government size affected the economic growth by looking at OECD countries in the period 1970 – 1999. The study using panel data alluded to the fact that the government size had a negative and statistically significant impact on economic growth. The only countries which did not fall under the above conclusion were USA, Sweden and Norway with their coefficients turning out to be statistically insignificant.

Dilrukshini (2002) analyzed the relationship between public expenditure and economic growth in Sri Lanka over the period 1952 to 2002 and applied Johansen cointegration technique and Granger causality test. The findings suggest that the growth of public expenditure in Sri Lanka is not directly dependent and determined by economic growth.

Yasin (2003) examined the relationship between government spending and economic growth using panel data from the Sub Saharan Africa. He used neo classical production function as the basis for specifying his empirical model of the study. Government spending on capital formation, private investment, and foreign assistance for development, population growth and trade openness are explicitly specified as inputs which affect national output. Two alternative methods of estimation- fixed effect and random effect methods have been used to estimate the model. The results of both the estimation technique show that government spending on capital formation has positive effect on economic growth and significant. Trade openness also has a positive impact on growth and significance. Private investment spending positively influences government spending and significant in the random effects and fixed effect model. Foreign development assistance and population growth are insignificant in both the models. The results of the study imply that sufficient increase in government spending in capital formation in these countries will boost private investment and create a favorable environment for economic growth.

Bagdin et al. (2003) studied the causality between public spending and economic growth taking the data for Turkey over the period 1965-2000. They used Engel Granger cointegration test to test the long run relationship between public spending and GDP and found that these two variables were not cointegrated. On the basis of Granger causality test, they found that neither

growth in national income had an effect on government expenditure had a significant impact over the growth.

Bose *et al.* (2003) also examined the effects of government expenditure for a panel of 30 developing countries over the decades of 1970s and 1970s with a particular focus on sectoral expenditures and employed Seemingly Unrelated Regression technique. Their results revealed that the share of government capital expenditure in GDP is positively and significantly correlated with economic growth with the exception of current expenditure which is insignificant.

Muhlis and Hakan (2003) investigated the long-run relationship between public expenditure and GDP for the Turkish economy. The study used the natural log of annual data from 1965-2000. They employed co-integration and Granger Causality tests on the following variables: Gross Domestic Product (GDP), Total Government Consumption (GC), Total Public expenditure (EXP), and Mid-year Annual Population. The data in nominal values were converted to real values using the Wholesale Price Index (WPI). They discovered that neither Wagner's Law nor Keynes' hypothesis was valid in Turkey.

Wondaferahu (2003) made an econometric analysis about the impact of capital and current government spending on economic growth for the period 1960/1961 to 2002/2003 by using Johanson Maximum Likelihood estimation technique. The result states that capital expenditure has a positive and significant effect on economic growth while current spending deteriorates growth in the short-run.

Chang et al. (2004) found unidirectional Granger causality running from income to government spending for the newly industrialized countries of South Korea and Taiwan, and the industrialized countries of Japan, the United Kingdom, and the United States, supporting Wagner's hypothesis for those countries but for the other five countries in their study: Australia, Canada, New Zealand, South Africa, and Thailand, they found no causal relationship between income and government spending.

Vu Le and Suruga (2005) investigated the simultaneous impact of public expenditure foreign direct investment (FDI) on economic growth from a panel of 105 developing and developed countries for the period 1970 to 2001 and applied fixed effects model and threshold regression techniques. Their main findings were categorized into three: FDI, public capital and

private investment play roles in promoting economic growth. Secondly, public non-capital expenditure has a negative impact on economic growth and finally, excessive spending in public capital expenditure can hinder the beneficial effects of FDI.

Tashome (2006) examined the impact of government spending on economic growth in the case of Ethiopia for the period 1960/61-2003/04. He used econometric analysis to see the impact of various compositions of government spending on the growth of real GDP using Johanson Maximum Likelihood Estimation procedure and found that only expenditure on human capital has a long-run significant positive impact. Productive government expenditure shows the negative and insignificant impact on growth of real GDP, which indicates the inefficiency and poor quality of public expenditure. He found that in the short run, all compositions of government expenditure do not have significant meaning in explaining economic growth.

Dogan and Tang (2006) examined the direction of causality between national income and government expenditure for five south East Asian Countries (Indonesia, Malaysia, Philippines, Singapore, and Thailand). Using Granger causality test, a unidirectional causality runs from government expenditures to national income has been found only in the case of Philippines. Whereas, for the other countries, their results rejected the hypothesis of causality from government expenditure to national income and vice versa.

Jiranyakul and Brahmasrene (2007) investigated the relationship between government expenditures and economic growth in Thailand for the period 1993 to 2006 and employed Standard Granger Causality test and Ordinary Least Square (OLS) method. The results showed a unidirectional causality from government to economic growth without feedback. Furthermore, estimation from the ordinary least square confirmed the strong positive impact of government expenditure on economic growth during the period of investigation.

Bose et al. (2007) examined the growth effects of government spending with a particular focuses on disaggregated government expenditures for a panel of 30 developing countries between 1970s and 1980s. They found that the share of government capital expenditure in GDP is positively and significantly correlated with economic growth, but current expenditure is insignificant. In the disaggregated level, government expenditure in education and total expenditures in education are the only spending that is significantly associated with growth.

Ranjan & Sharma (2008) examined the effect of public expenditure on economic growth during the period 1 950-2007 in India. They found a significant positive impact of public expenditure on economic growth. They also reported an existence of co-integration among the variables.

Alexiou (2009) using pooled time series and cross-section data for 7 countries in the South Eastern Europe (SSE) spanning from 1995 to 2005. The results indicates that out of five variables used in the estimation, government spending as dependent variable on capital formation, development assistance, private investment and a proxy for trade-openness all have positive and significant effect on economic growth, in contr contrast of population growth whose found to be statistically insignificant.

Olukayode (2009) investigated the impacts of government expenditure on economic growth in Nigeria using time series data from 1977 to 2006 and adapting Ram (1986) model in which government expenditure is disaggregated in private investment, human capital investment, government investment and consumption spending at absolute levels. The results showed that all the expenditures have positive effect on economic growth.

Omoke (2009) investigated the direction of causality between Government expenditure (GE) and National Income (NI) in Nigeria using annual data. He employed the co-integration and Granger Causality tests for the period 1970-2005. His result showed that no long-run relationship existed between government expenditure and national income in Nigeria. The Granger causality test revealed that causality ran from government expenditure to national income thus concluding that government expenditure plays a significant role in promoting economic growth in the country.

Saad and Kalakech (2009) investigate using time series data for the period 1962 to 2007 in Lebanon and applied Johansen cointegration technique to examined the nature of government expenditure and its impact on economic growth, they found that government spending on education has a positive impact in the short run. While, expenditure on defence and health are negatively correlated in the long run and insignificant in the short run. Finally, expenditure on agriculture is found to be insignificant in both cases.

Nurudeen and Usman (2010) used disaggregated analysis to investigate the effect of government expenditure on economic growth In Nigeria, for the period 1970-2008. The result explored that total recurrent expenditures, total capital, and expenditure on education have negative effect on

economic growth. However, increasing government expenditure in the areas of transport, communication and health will results with economic growth.

Ogundipe and Oluwatobi (2010) investigated 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.

Jamshaid et *al.* (2010) examined the nature and the direction of causality in Pakistan between public expenditure and national income alongside with various selected components of public expenditure: development expenditures (DE), administration expenditures (AE), debt services (DS), defense services (DF) Applying the Toda-Yamamoto causality test for annual data within the period of 1971-2006, the study concluded that there was a unidirectional causality running from GDP to government expenditure, which supports Wagner's Law. Furthermore, at a disaggregated level, results showed that GDP only caused administrative expenditure while no causality was found in development expenditures, debt servicing and defense expenditures.

Taban (2010) re-examine the government spending-economic growth nexus for the Turkish economy with limits and test Granger-causality by using quarterly data from 1987: Q1 to 2006: Q4. The results show that the share of government spending and the share of public investment in GDP have a significant and negative effect on the growth of real per capita in the long run. On the other hand, the government consumption expenditure relative to GDP insignificant effect on the per capita growth. The results also show that there is bidirectional causality between government spending and economic growth Toal, unidirectional relationship running from per capita growth in public investment to GDP ratio.

Loto (2011) investigated the impact of sectoral government expenditure on economic growth in Nigeria for the period 1980-2008 and applied Johansen cointegration technique and error correction model. The results inferred that in the short run expenditures on agricultures 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 statistically insignificant.

Olabisi et al. (2012) empirically analyzed the composition of public expenditure and economic growth in Nigeria from 1960 to 2008 used the vector Autoregressive models (VAR). The result revealed that expenditure on transport; agriculture and health are positive and significantly related with economic growth. However, expenditure on Education is both negative and insignificant to economic growth.

Sevitenyi (2012) investigated the relationship between government expenditure and economic growth in Nigeria using annual data from 1961-2009 both at the bivariate (aggregated) and the multivariate (disaggregated) systems. The econometric investigation was based on a cointegration approach and Granger Causality test. The results of Johansen bivariate/multivariate cointegration revealed that there was no long-run relationship among the stationary variables. Further results from a causality test showed that, government's expenditure causes economic growth at a bivariate level supporting Keynes's hypothesis that increased government expenditure amplifies economic growth. At the multivariate level, total capital expenditure, administration, social and community service, economic service and transfers cause economic growth and the findings of the study do not support the Wagner's law in that economic growth causes government expenditure.

Mudaki (2012) investigated the effect of the composition of public expenditure on economic growth using data from 1972 to 2008 for Kenya. He concluded that expenditure on education was a highly significant determinant of economic growth while expenditure on economic affairs, transport and communication were also weakly significant to economic growth. On the other hand, expenditure on agriculture was negatively significant on economic growth and expenditure on health is insignificant determinants of economic growth.

Mudaki and Masaviru (2012) investigated the impact of public spending on education, health, economic affairs, defense, agriculture, transport and communication on economic growth with data spanning from 1972 to 2008 in Kenya. The findings showed that expenditure on education was a highly significant determinant of economic growth while expenditure on economic affairs, transport and communication were also significant albeit weakly. In contrast, expenditure on agriculture was found to have a significant though negative impact on economic growth. Outlays on health and Defence were all found to be insignificant determinants of economic growth.

Nasiru (2012) investigated the relationship between government expenditure (disaggregated into capital and recurrent) and economic growth in Nigeria over the period (1961-2010). He employed the Bounds Test approach to co-integration based on unrestricted Error Correction Model and Pair wise Granger Causality tests. The results from the Bounds Test indicate that there exists no long-run relationship between government expenditure and economic growth in Nigeria only when real GDP is taken as dependent variable. In addition, the causality results reveal that government capital expenditure granger causes economic growth. While no causal relationship was observed between government recurrent expenditure and economic growth.

Tofik (2012) investigated the relation between Official development assistance, public spending and Economic growth from 1971 to 2011 in Ethiopia. The results public spending on physical investment and human capital development have positive contributions on economic growth while spending on consumption affects growth negatively. Besides, as opposed to those who argue that ODA is detrimental to the growth of the recipient country, the study found a positive contribution in Ethiopia's growth.

Menyah and Wolde-Rufael (2013) investigated the relationship between government expenditure and economic growth in Ethiopia to test Wagner's Law which postulates that as real income increases there is a tendency for the share of public expenditure to increase relative to national income and they used the bounds test approach to cointegration and Granger causality test. They found that a unidirectional causality running only from GDP to government expenditure thus supporting the Wagnerian hypothesis of an expanding public sector.

Abdu and Melesse (2014) designed to address the relationship that can be revealed between real gross domestic product and various composition of government expenditure like: agriculture, education, health, transport and communication, urban development and housing, total capital expenditure and total recurrent expenditure in Ethiopia from 975-2011 by using Co integration error correction model. The output of this research showed that expenditure on health and total capital expenditure are both positive and statistically significant in explain the growth of Ethiopian economy. However, Expenditure on agriculture, education, health, transport and communication, urban development and housing, and total recurrent expenditure are statically insignificant.

Frank,,et al (2014) investigated the impact of government expenditure on economic growth, test the existence of the Wagnerian hypothesis in Ghana as well as to provide evidence on whether government expenditure plays any catalytic role for the growth of private investment by employing the ARDL model and Granger causality test with data spanning from 1970 to 2010. The study concluded that, in the long run government expenditure has a significant positive impact on economic growth but has a negative impact on economic growth in the short run and also indicates that government expenditure does not play any supporting role for private investment in Ghana and lastly it was that the Wagnerian hypothesis is valid for Ghana.

CHAPTER THREE

DATA AND METHODOLOGY

The study uses two econometrics methods namely the Johansen multivariate Cointegration model and Granger causality test to examine the effect of government expenditure on economic growth and direction of causality between government expenditure and economic growth in Ethiopia. The Johansen multivariate Cointegration model shall predict the cumulative effects taking into account the dynamic response among components of government expenditure variables (capital and recurrent expenditure) and other control variables.

3.1. Data type and sources

The data used in this study were annual time series data covering the period from 1974/75 to 2013/14 for Ethiopia concerning 2010/11 as a base year1.The data were collected from the Ministry of Finance and Economic Development (MoFED) and National Bank of Ethiopia (NBE).

3.2. Model Specification

This study aimed at establishing the causal relationship and effects of government expenditure on economic growth in Ethiopia. A time series data were used in the study to answer the research questions posed in chapter one and used data for the period 1974/75 to 2013/14 for the components of government expenditure (capital expenditure and recurrent expenditure) and trade openness, secondary school of enrolment and private investment were included as control variables. The multivariate vector autoregressive (VAR) model was used for estimation after undergoing time-series property tests.

In an attempt to determine the relationship between government expenditure and economic growth in Ethiopia, it is ideal to develop a model to justify the relationship that exists between the variables. The framework for this study has its basis on the Wagner's law and Keynesian approach. Furthermore, the analysis incorporate components of government expenditure namely:

1 Fiscal year in Ethiopia begins July 1 and ends June 31

total recurrent, total capital and three other independent variable. The study employs the aggregate production function below:

$Y_t = A_t K_t^{\alpha} L_t^{\beta}$ ……3.1

The aggregate production function links real (GDP) Y in period t to two factors of production, the capital K_t^{α} and the size of the labor force L_t,as well as to total factor productivity A_t.Whereas β is a parameter of the total factor productivity.

Following augment it to include a vector of other independent variables and Bloom and Canning (2000, 2001), Gokal and Hanif (2004), Nketia-Amponsah (2009), Sakyi (2011), Sakyi and Adams (2012), Ahortor et al. (2012), Frank, A, et al. (2014) the model output to be a function of capital , labour proxied by secondary school of enrollment, capital expenditure, recurrent expenditure, openness of an economy.

$RGDP$ =f(K, SSE, TCE, TRE,OP)……3.2

Here, the economic growth hypothesized to depend on the aforementioned variables. Moreover, for estimating the relative elasticity, the natural logarithms of all the variables will be utilized. An advantage of grouping the above variables in natural logarithmic form is to achieve stationarity in the lower order of integration in case the logs of these variables are non-stationary at levels. The log linear multiple regression models will formulate as follows:

$$LNRGDP = \beta_0 + \beta_1 LNK_t + \beta_2 LNSSE_t + \beta_3 LNTCE_t + \beta_4 LNTRE_t + \beta_5 LNOP_t + \epsilon_t$$

…… (3.3)

Where $LNRGDP, LNK, LNSSE, LNTCE, LNTRE, \ LNOP$ are the natural logarithm of real GDP, capital, secondary school of enrollment, total capital expenditure, total recurrent expenditure, trade openness while β_i and e_t indicate is parameter estimates and random error term, respectively. The six variables used in equation (3.3) are described as follows:

Real GDP (RGDP): This is the proxy for economic growth. It is obtained by dividing nominal GDP to consumer price index.

Total Capital Expenditure (TCE): It is the government expenditure on capital overheads. It was measured as development expenditure on transportation, communication, electricity and all permanent assets. It refers to expenditure, which creates wealth in the future. It was measured as

the ratio of total government expenditure used by (Devarajan et al., 1996). They found that capital expenditure has negative and significant impact on economic growth in developing countries. However, Wondefarew (2003), Tofik (2013), and Abdu and Melese (2014) all found a positive and significant impact on economic growth in Ethiopia. Hence, the expected sign of capital expenditure on economic growth in Ethiopia is positive (i.e $\beta_3 > 0$).

Total recurrent expenditure (TRE): Recurrent expenditure is expenditure of government that occurs regularly throughout the year. It constitutes of wages and salaries, administration, transfers payment, debt repayment and welfare services. It was measured as the ratio of total government expenditure as used by (Akitoby, 2013, and Devarajan et al., 1996). They revealed positive sign with economic growth. However, in Ethiopia the study conducted by Wondefarew (2003) and Tofik (2013) revealed that recurrent expenditure on economic growth has negative sign and Abdu and Melese (2013) found that recurrent expenditure has positive sign on economic growth. Hence, the expected sign from this variable is ambiguous.

Trade openness (OP): Trade openness is measured as the sum ratio of exports and imports of goods and services as used by (Frank et al., 2014). Trade openness is expected to raise productivity through increased competition and transmission of technology from the rest of the world (Edwards, 1993, and Levine and Zervos, 1998). Thus, its expected sign is positive (i.e. $\beta_5 > 0$).

Private investment is used as a proxy for capital (K) in the model developed. However, most study prefers gross capital formation, it is not suitable for this study because it takes into account both public and private investment. Since public expenditure is inherent in gross capital formation the econometric problem of multicollinearity will be best avoided if private investment proxy by capital. The decomposition is supported by (Barro, 1989; Ghura ,1997 and Frank, et al., 2014). This private investment affects economic growth positively and the expected sign is positive (i.e $\beta_1 > 0$).

Gross secondary school enrollment (SSGE): is used as proxy for labour force in the model developed supported by (Amanja and Morrissey, 2005). Theoretically, labor force is a major element for sustainable rate of economic expansion and engine of growth for labor intensive economies like Ethiopia. But due to the problem of high rate of unemployment it is not efficient and less productive (Kidanemariam, 2014).

Hence, gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education. Secondary education completes the provision of basic education that began at the primary level, and aims at laying the foundations for lifelong learning and human development, by offering more subject or skill-oriented instruction using more specialized teachers.

Amanja and Morrissey (2005) noted that gross secondary school enrollment is a total labour force indicator and it obviously affects economic growth through accumulation of knowledge, learning ability, and generally increase productivity of resources. Lucas (1993) argued that a better educated population augments a country's ability to absorb and adopt new technologies and to innovate; therefore, it is an important factor of growth. Hence the expected sign of secondary school enrollment on economic growth is positive (i.e. $\beta_2 > 0$).

3.3. Estimation technique

This section deals with the estimation procedures followed sequentially in this study in order to estimate the Cointegration VAR models. Sub section 3.3.1 defines stationary and son-stationarity and outlines the procedures for the estimation of unit root of the variables. On the other hand, sub section 3.3.2 defines Cointegration, discusses the different methods of Cointegration, provides justification for choosing the Johansen maximum likelihood method, and outlines the vector autoregressive (VAR) model used in this study. Since the long-run equilibrium may rarely be observed, the procedure for short-run dynamics of the variables under consideration is presented. Finally, the Granger causality test aiming at examining the direction of causation between government expenditure and economic growth using E-views program version 6.

3.3.1. Stationarity Test

Empirical research in economics is based on time series. Therefore, it is standard to view time series as the realization of a stochastic process. Model builders can use statistical inference in constructing and testing the equations that characterize relationships between economic variables. The two central properties of many economic time series are non-stationarity and time-volatility (Wei, 2006).

Recent development in econometrics has shown that there are problems associated with time series analysis due to non-stationarity2. Non-stationarity is a property common to many applied time series. This means that a variable has no clear tendency to return to a constant value or linear trend. It is generally correct to assume that economic processes have been generated by a non-stationary process and follow stochastic trends. One major objective of empirical research in economics it to test hypotheses and estimate relationships derived from economic theory, among other such aggregated variables. It can originate from various sources but the most important one is the unit root (Pfaff, 2006).

With regards to stationary time series data, Harris (1995:15) noted that "… a data series is said to be stationary if its error term has zero mean, constant variance, and the covariance between any two-time periods depends only on the distance or lag between the two periods and not on the actual time at which it is computed." The classical statistical methods used in building and testing large simultaneous equation models, such as Ordinary Least Squares (OLS), were based on the assumption that the variables involved are stationary. The problem is that the statistical inference associated with stationary processes is no longer valid if time series are a realization of non-stationary processes. If time series are non-stationary it is not possible to use OLS to estimate their long-run linear relationships because it would lead to spurious or nonsensical regression.

Spurious regression is a situation in which there appears to be a statistically significant relationship between variables but the variables are unrelated. A Spurious or nonsensical relationship may result when one non-stationary time series is regressed against one or more non-stationary time series. A few decades ago the difficulty of non-stationarity was not well understood by econometricians. However, this is no longer the case because the technique of cointegration has been introduced according to which models containing non-stationary stochastic variables can be constructed in such a way that the results are both statistically and economically meaningful (Gujarati, 1995).

The best way to guard against spurious regressions is to check for cointegration of the variables used in time series modeling. Hence, prior to the estimation of the long run models the time

2*The problem associated with non-stationary series is that all conventional techniques and statistical tests are spurious. Spurious in a sense the regression estimation will yield high R^2, statistically significant coefficients, and low Durbin-Watson'd' statistics (Gujarati, 1995:724).*

series properties of the variables concerned should be distinguished between stationary and non-stationary variables.

3.3.1.1. Unit root

Any sequence that contains one or more characteristic roots that are equal to one is called a unit root process. The simplest model that may contain a unit root is the AR(1) model. Consider the autoregressive process of order one, AR (1), below:

$Y_t = \phi Y_{t-1} + \varepsilon_t$ ---------- (3.4)

Where ε_t denotes a serially uncorrected white noise error term with a mean of zero and a constant variance. If $\phi = 1$, equation 3.3 becomes a random walk without drift model, that is, a non-stationary process. When this happens, we face what is known as the unit root problem. This means that we are faced with a situation of non-stationarity in the series. If, however, $\phi < 1$, then the series Y_t is stationary. The stationarity of the series is important because correlation could persist in non-stationary time series even if the sample is very large and may result in what is called spurious (or nonsense) regression (Gujarati, 2004). The unit root problem can be solved, or stationarity can be achieved, by differencing the data set.

3.3.1.2. The augmented Dickey-Fuller (ADF) test

In section 3.3.1.1, it was stated that, if $\phi = 1$, equation 3.9 becomes a random walk model without drift, which is known as a non-stationary process. The basic idea behind the ADF unit root test for non-stationarity is to simply regress Y_t on its (one period) lagged value Y_{t-1} and find out if the estimated ϕ is statistically equal to 1 or not. Equation 3.9 can be manipulated by subtracting Y_{t-1} from both sides to obtain:

$Y_t - Y_{t-1} = (\phi - 1)Y_{t-1} + \varepsilon_t$ ---------- (3.5)

which can be written as

$\Delta Y_t = \varpi Y_{t-1} + \varepsilon_t$ ---------- (3.6)

where $\varpi = (\phi - 1)$, and Δ is the first difference operator.

In practice, instead of estimating equation 3.10, we shall estimate equation 3.12 and test for the null hypothesis of $\varpi = 0$ against the alternative of $\varpi \neq 0$. If $\varpi = 0$, then $\phi = 1$, meaning that we have a unit root problem and the series under consideration is non-stationary. It should be noted

that under the null hypothesis $\varpi = 0$, the t-value of the estimated coefficient of Y_{t-1} does not follow the t-distribution even in large samples. This means that the t-value does not have an asymptotic normal distribution. The decision to reject or not to reject the null hypothesis of $\varpi = 0$ is based on the Dickey-Fuller (DF) critical values of the τ (tau) statistic. The DF test is based on an assumption that the errors of term ε_t are uncorrelated.

However, in practice, the errors of the term in the DF test usually show evidence of serial correlation. To solve this problem, Dickey and Fuller have developed a test know as the Augmented Dickey-Fuller (ADF) test. In the ADF test, the lags of the first difference are included in the regression equation in order to make the error term ε_t white noise and, therefore, the regression equation is presented in the following form:

$$\Delta Y_t = \varpi Y_{t-1} + \alpha_i \sum_{i=1}^{m} \Delta Y_{t-1} + \varepsilon_t \text{ ---------- (3.7)}$$

To be more specific, the intercept may be included, as well as a time trend t, after which the model becomes:

$$\Delta Y_t = \beta_1 + \beta_2 t + \varpi Y_{t-1} + \alpha_i \sum_{i=1}^{m} \Delta Y_{t-1} + \varepsilon_t \text{ ---------- (3.8)}$$

The testing procedure for the ADF unit root test is applied to the following model

$$\Delta y_t = \alpha + \beta t + \delta y_{t-1} + \alpha_i \sum_{j=1}^{p} \varpi_j \Delta y_{t-j} + \varepsilon_{it} \text{ ---------- (3.9)}$$

Where α is a constant, β the coefficient on a time trend series, δ the coefficient of Y_{t-1}, ρ is the lag order of the autoregressive process, $\Delta y_t = y_t - y_{t-1}$ are first differences of y_t, y_{t-1} are lagged values of order one of y_t, y_{t-1} are changes in lagged values, and ε_{it} is the white noise.

The ADF test can be tested on at least three possible models:

(i) A pure random walk without a drift. This is defined by using the constraint $\alpha = 0, \beta = 0, \& \delta = 0$ in equation 3.14. This leads to the equation

$$\Delta y_t = \Delta y_{t-1} + \varepsilon_t \text{ ---------- (3.10)}$$

Equation 3.11 is a non-stationary series because its variance grows with time (Wei, 2006).

(ii) A random walk with a drift. This is obtained by imposing the constraint $\beta = 0, \& \delta = 0$ in equation 3.14, which yields to the equation

$$\Delta y_t = \alpha + \Delta y_{t-1} + \varepsilon_{it} \text{ ---------- (3.11)}$$

(iii) A deterministic trend with a drift. For $\beta \neq 0$, equation 3.9 becomes the following deterministic trend with a drift model

$$\Delta y_t = \alpha + \beta t + \Delta y_{t-1} + \varepsilon_{it} \text{ ---------- (3.12)}$$

The sign of the drift parameter (α) causes the series to wander upward if positive and downward if negative, whereas the size of the absolute value affects the steepness of the series (Pfaff, 2006).

Therefore, the discussion above entails that the pre-requisite of cointegration test is the stationarity of each individual time series over the sample period. Ever since the seminal paper by Engle and Granger (1987), cointegration analysis has increasingly become the favored methodological approach for analyzing time series data containing stochastic trends. Hence, before turning to the analysis of the long-run relationships between the variables the unit root properties of the single series is checked, as non-stationary behavior is a prerequisite for including them in the cointegration analysis. The modelling procedure of unit root test of the series at their level is described as follows:

$$\Delta Y_t = \alpha_0 + \alpha_2 Y_{t-1} + \sum_{i=1}^{p} \delta_i \Delta Y_{t-i} + \varepsilon_t \text{ ---------- (3.13a)}$$

Where Y is the variable of choice; Δ is the first- difference operator; α_i (for i = 1 and 2) and δ_i (for $i = 1,2,..., p$) are constant parameters; and ε_t is a stationary stochastic process. p is the number of lagged terms chosen by Information Criterion (IC) to ensure that ε_t is white noise. The hypotheses of the above equation form are:

$H_0 : \alpha_2 = 0$, i.e., there is a unit root – the time series is non-stationary.

$H_1 : \alpha_2 \neq 0$, i.e., there is no unit root – the time series is stationary.

If the calculated ADF test statistic is higher than McKinnon's critical values, then the null hypothesis (H_0) is accepted this means that a unit root exists in Y_{t-1} and ΔY_{t-1}, implying that the series are non-stationary or not integrated of order zero, i.e., I (0). Alternatively, the rejection of

the null hypothesis implies stationarity of the underlying time series. Failure to reject the null hypothesis leads to conducting the test on the difference of the time series, so further differencing is conducted until stationarity is achieved and the null hypothesis is rejected (Harris, 1995). Hence, in order to determine the order of integration of a particular series, equation (3.13a) has to be modified to include second differences on lagged first and k lags of second differences. This is as follows:

$$\Delta^2 Y_t = \psi_1 \Delta Y_{t-1} + \sum_{i=1}^{p} \theta_i \Delta^2 Y_{t-i} + \xi_t \text{ ---------- (3.13b)}$$

In this case, the hypotheses to be tested are:

$H_0 = \psi_1 = 0$, i.e., there is a unit root – the time series is non-stationary.

$H_1 = \psi_1 \neq 0$, i.e., there is no unit root – the time series is stationary.

If the time series are stationary in their first differences(that is $\psi_1 \neq 0$), then they can be said integrated of order one, i.e., I (1); if stationary in their second differences, then they are integrated of order two, i.e., I(2). The order of integration of the variables in equations (3.13a) and (3.13b) is investigated using the standard Augmented-Dickey-Fuller (ADF) [Dickey and Fuller, 1981] and Phillips-Perron (PP) [Phillips and Perron, 1988] unit-root tests for the presence of unit roots.

An important aspect of empirical research based on VAR is the choice of the lag order, since all inference in the VAR model depends on the correct model specification. Hence, the optimal lags required in the cointegration test were chosen using the most common traditional information criteria being the Akaike Information Criteria (AIC), Schwarz Criterion (SC), Hannan and Quinn's (HQ) and the likelihood ratio (LR).

3.3.2. Cointegration Test

The necessary criterion for stationarity among non-stationary variables is called cointegration. Testing for cointegration is the necessary step to check whether the empirical modelling has meaningful relationships (Gutierrez et.al, 2007). In economics, two variables are said cointegrated when they have long-term or equilibrium relationship between them (Engle and Granger, 1987).

Cointegration is an econometric concept which economics the existence of a long-run equilibrium among economic time series. If two or more series are themselves non-stationary,

but a linear combination of them is stationary, then they are said to be cointegrated (Wei, 2006). In applied econometrics analysis researchers are concerned about cointegration because it is a possible solution to non-stationarity found in many economic time series, and if time series are non-stationary the assumptions upon which OLS estimation rest are violated, rendering its application inappropriate.

Previously, the usual procedure for testing hypotheses concerning the relationship between non-stationary variables was to run OLS regressions on data which had initially been differenced. Data are differenced in order to reduce non-stationary series to stationarity. Although this method is correct in large samples, it may give rise to misleading inferences or spurious regressions in small samples. Moreover, estimation of a single equation framework with integrated or non-stationary variables tends to create the following problems: non-standard distribution of the coefficient estimates generated by the process not being stationary, explanatory variables generated by the process that display autocorrelation, the existence of more than one cointegrated vector and tendency to weak exogeneity.

On the basis of the theory that integrated variables of order one, I(1), may have a cointegration relationship, it is crucial to test for the existence of such a relationship. If a group of variables are individually integrated of the same order and there is at least one linear combination of these variables that is stationary, then the variables are said to be cointegrated. The cointegrated variables will never move far apart, and will be attracted to their long-run relationship. Testing for cointegration implies testing for the existence of such a long-run relationship between economic variables.

The remedy for problematic regressions with integrated variables using OLS is to test for the Johansen multivariate cointegration approach and to estimate a vector error-correction model to distinguish between short-run and long-run responses, since cointegration provides more powerful tools when the data sets are of limited length.

In economic literature there are three types of cointegration tests, namely the Engle-Granger method commonly known as the two-step estimation procedure, the Phillips-Ouliaris methods and the Johansen's procedure. These cointegration tests are described briefly below.

3.3.2.1. Engle-Granger method

As stated earlier, the regression of non-stationary series on other series may produce spurious regression. If each variable of the time series data is subjected to unit root analysis and it is found

that all the variables are integrated of order one, I(1), then they contain a unit root. There is a possibility that the regression can still be meaningful (i.e. not spurious) provided that the variables cointegrate. In order to find out whether the variables cointegrate, the least squares regression equation is estimated and the residuals (the error term) of the regression equation are subjected to unit root analysis. If the residuals are stationary, that is I(0), it means that the variables under study cointegrate and have a long-term or equilibrium relationship. In the two-step estimation procedure, Engle-Granger considered the problem of testing the null hypothesis of no cointegration between a set of variables by estimating the coefficient of a statistic relationship between economic variables using the OLS and applying well-known unit root tests to the residuals to test for stationarity. Rejecting the null hypothesis of a unit root is evidence in favour of cointegration.

3.3.2.2. Phillips-Ouliaris Methods

Phillips-Ouliaris introduced two residual-based tests namely: the variance ratio test and the multivariate trace statistics. These residual-based tests are used in the same way as the unit root tests, but the data are the residuals from the cointegrating regression. These tests seek to test a null hypothesis of no cointegration against the alternative of the presence of cointegration using scalar unit root tests applied to the residuals. Phillips-Ouliaris methods are based on residuals (differences between the observed and expected values) of the first order autoregression, AR (1), equation.

The multivariate trace statistics has the advantage over the variance ratio test in that it is invariant to normalisation, that is, whichever variable is taken to be the dependent variable the test will yield the same results (Pfaff, 2006).In the literature, there are no studies directly linked to the application of the Phillips-Ouliaris cointegration test only. However, there are only few studies in which cointegration have been tested using other techniques including the Phillips-Ouliaris methods.

3.3.2.3 Johansen's procedure

Johansen's procedure builds cointegrated variables directly on maximum likelihood estimation instead of relying on OLS estimation. This procedure relies heavily on the relationship between the rank of a matrix and its characteristic roots. Johansen derived the maximum likelihood estimation using sequential tests for determining the number of cointegrating vectors. His

method can be seen as a secondary generation approach in the sense that it builds directly on maximum likelihood instead of partly relying on least squares. In fact, Johansen's procedure is nothing more than a multivariate generalisation of the Dickey-Fuller test. Consequently, he proposes two different likelihood ratio tests namely the trace test and the maximum eigenvalue test.

The Johansen procedure is a vector cointegration test method. The use of Johansen's method has the advantage over the Engle-Granger and the Phillips-Ouliaris methods in that it is able to detect more than one cointegration relationship, if the data set contains two or more time series.

Despite the above mentioned advantage over the Engle-Granger method and Phillips-Ouliaris methods, the Johansen procedure is not without limitation. The method assumes that the cointegrating vector remains constant during the period of study. In reality, it is possible that the long-run relationships between the underlying variables change.

Thus, next to the stationarity test, the Johansen maximum likelihood, which nested the original Engel-Granger (1987)3 procedure, is adopted for the cointegration tests and estimation of the long-run and short-run relationship between bank credit and economic growth in Ethiopia. The choice for this method is that because it helps us to test whether integrated variables sharing common stochastic trend are cointegrated so that a meaningful long run relationship can be established. The unrestricted vector autoregressive (VAR) model considered in this study to estimate the long run relationship among jointly endogenous variables is:

$$Y_t = A_1 Y_{t-1} + A_2 Y_{t-2} + ... + A_p Y_{t-p} + BX_t + \varepsilon_t \text{ ---------- (3.14)}$$

Where Y_t is a k -vector of non-stationary I(1) endogenous variables; X_t is a d -vector of exogenous deterministic variables; $A_1 ... A_p$ and B are matrices of coefficients to be estimated and ε_t is a vector of innovations that may be contemporaneously correlated but are uncorrelated with their own lagged values and uncorrelated with all of the right hand side variables. Since most economic time series are non-stationary, the above stated VAR model is generally estimated in its first-difference form as:

3 .The original Engle-Granger has the following weaknesses among others. 1) this test for coitegration is likely to have lower order against alternatives; 2)its finite samples of long run relationships are potentially biased; and 3)inference cannot be drown using standard t-statistics about the significance of the parameters of the static long run model.

$$\Delta Y_t = \Pi Y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta Y_{t-i} + BX_t + \varepsilon_t \text{ ---------- (3.15)}$$

Where, $\Pi = \sum_{i=1}^{p} A_i$ and $\Gamma_i = -\sum_{j=i+1}^{k} A_j$

In the Johansen procedure, determining the rank of Π (i.e., the maximum number of linearly independent stationery columns in Π) provides the number of cointegrating vector between the elements in z. In this connection, there are three cases worth mentioning. (i) If the rank of Π is zero it points that the matrix is null which means that the variables are not cointegrated. In such case the above model (equation 3.15) is used in first difference, void of long run information. (ii) If the rank of Π equals the number of variables in the system (say n) then Π has full rank which implies that the vector process is stationary. Therefore, the VAR can be tested in levels. (iii) If Π has a reduced rank (i.e., $1 < r(\Pi) < n$) it suggests that there exists $r \leq (n-1)$ cointegrating vector where r is the number of cointegration (or the co-integrating rank) in the system.

Therefore, the Granger's representation theorem asserts that if the coefficient matrix Π has reduced rank $r < n$, then there exists nxr matrices of α and β each with rank r such that $\Pi = \alpha\beta'$ and $\beta' Y_t$ is $I(0)$ where each column of β' is the co-integrating vector (cointegration parameters) with α showing their corresponding feedback (error correction parameters) that measures the speed of adjustment in ΔY_t to equilibrium (i.e., it shows the speed with which disequilibrium from the long run path is adjusted).

In identifying the number of cointegrating vectors, the Johansen procedure provides n eigenvalues denoted by λ (also called characteristics roots) whose magnitude measures the extent of correlation of the cointegration relations with the stationery elements in the model. In general, to identify the number of cointegrating vectors in the system, the Johansen approach to cointegration test is based on two test statistics, viz., the trace test statistic (λ_{trace}) and the maximum eigenvalue test statistic ($\lambda_{\max}$) as suggested by Johansen (1988) and Oseterwald-Lenum (1992). They are obtained from the following formulas.

Trace Test Statistic: The likelihood ratio statistic (LR) for the trace test (λ_{trace}) can be specified as:

$$\lambda_{trace}(r) = -T \sum_{i=r+1}^{k} \log(1 - \hat{\lambda}_i) \text{ ---------- (3.16a)}$$

Where, $\hat{\lambda}_i$ is the i^{th} largest eigenvalue of matrix Π and T is the number of observations. In the trace test, the null hypothesis is that the number of distinct cointegrating vector(s) is less than or equal to the number of cointegration relations (r). In this statistic λ_{trace} will be small when the values of the characteristic roots are closer to zero.

Maximum Eigenvalue Test: The maximum eigenvalue test ($\lambda_{\max}$) examines the null hypothesis of exactly r cointegrating relations against the alternative of $r+1$ cointegrating relations with the test statistic:

$$\lambda_{\max}(r, r+1) = -T\ln(1-\hat{\lambda}_{r+1}) \text{ ---------- (3.16b)}$$

Where $\hat{\lambda}_{r+1}$ is the $(r+1)^{th}$ largest squared eigenvalue. In the trace test, the null hypothesis of $r=0$ is tested against the alternative of $r+1$ cointegrating vectors. If the estimated value of the characteristic root is close to zero, then the λ_{trace} will be small.

After detecting the number of cointegration, the normalized co-integration coefficients of growth and domestic capital models along with the test of significance of the variables is examined by imposing a general restriction on each variable($\beta_i = 0$) in the regression models. Finally, the Wald test is applied is applied to examine the joint significance of the financial variables coefficients in the growth and domestic capital accumulation models.

3.3.3. The Short-run Vector Error Correction Model (VECM)

If two time series are co-integrated then the VECM will represent them most efficiently. If cointegration has been identified between series we know that there exists a long-term equilibrium relationship between them so we apply VECM in order to evaluate the short run properties of the cointegrated series. In case of no cointegration VECM is no longer required and we directly precede to Granger causality tests to establish causal links between variables (Engle-Granger, 1987).

The dynamic relationship includes the lagged value of the residual from the cointegrating regression (ECT_{t-1}) in addition to the first difference of variables which appear in the right hand side of the long-run relationship in model (3.7). The inclusion of the variables from the long-run relationship would capture short-run dynamics. For this reason, an ECM is extended to the multivariate scenario by defining all the variables to be potentially endogenous. In order to arrive

at the short-run final preferred model, a one period lag of the cointegration vector saved from the long run estimation enters in ECM estimation using OLS.

An error correction model is defined as a dynamic model in which the movement of a variable in any period is related to the previous period's gap from the long-run equilibrium. Although it may be possible to estimate the long-run or cointegrating relationship, $y_t = \beta x_t + \varepsilon_t$ economic systems are rarely in equilibrium, as they are affected by institutional and/or structural changes that might be temporary or permanent. For example, extra income in the form of a birthday bonus may raise someone's expenditure pattern in one or two months and then his/her expenditure gradually goes back to equilibrium. Since equilibrium is rarely observed, the short-run evolution of variables (short-run dynamic adjustment) is important. A simple dynamic model of a short-run adjustment model is given by

$$y_t = \alpha_0 + \delta_0 x_t + \delta_1 x_{t-1} + \alpha_1 y_{t-1} + \varepsilon_t \text{ ---------- (3.17)}$$

where y_t is the dependent variable, x_t is the independent variable, y_{t-1} and x_{t-1} are lagged values of y_t and x_t respectively, $\alpha_0, \alpha_1, \delta_0, \& \delta_1$ are parameters, and ε_t is the error term assumed to be $\varepsilon_t \sim iN(0, \sigma^2)$.

The next step is to specify and estimate a vector error correction model (VECM) including the error correction term to investigate dynamic behaviour of the model. Once the equilibrium conditions are imposed, the VECM describes how the examined model is adjusting in each time period towards its long-run equilibrium state. The dynamic specification of the model allows the deletion of the insignificant variables, while the error correction term is retained. The final form of the vector error-correction model (VECM) was selected according to the general to specific methodology suggested by Harris (1995).The size of the error correction term indicates the speed of adjustment of any disequilibrium towards a long-run equilibrium state (Engle and Granger, 1987). The general form of the vector error correction model (VECM) for the model is specified as follows:

$$\Delta LNRGDP = \beta_0 + \sum_{i-1}^{k} \beta_1 \Delta LNRGDP_{t-1} + \sum_{i-1}^{k} \beta_2 \Delta LNTCE_t + \sum_{i-1}^{k} \beta_3 \Delta LNTRE_t +$$

$$\sum_{i-1}^{k} \beta_4 \Delta LNK_t + \sum_{i-1}^{k} \beta_5 \Delta\ LNSSE_t + \sum_{i-1}^{k} \beta_6 \Delta LNOP_t + \gamma ECT_{t-1} + \epsilon_t \ldots\ldots\ldots\ldots \quad (3.18)$$

*W*here Δ is the first difference operator, ECT_{t-1} is the error correction term lagged one period, γ is the short-run coefficient of the error correction term $(-1 < \gamma < 0)$, ε_t and are the white noise terms of respective models. At the end of each short-run models the stability of the parameters is examined using recursive estimate (OLS only).

3.4. The Granger Causality Test

In economics, systematic testing and determination of causal direction only became possi-ble after an operation framework was developed by Granger (1969) and Sims (1972).Their approach is simply based on the axiom that the past and present may cause the future but the future cannot cause the past (Granger 1980). In econometrics the most widely used opera-tional definition of causality is the Granger definition of causality: '… X is a Granger cause of Y (denoted as X → Y), if present Y can be predicted with better accuracy by using past values of X rather than by not doing so, other information being identical …' (Granger, 1980).
There are a number of causality studies in the field of public expenditure and economic growth. However, only a few of them (Ansari et al., 1997; Demirbas, 1999; Jackson et al., 1998; Khundrakpam, 2001, and Yamah and Wald Refael, 2013) have checked for the time series properties of stationary and cointergration of the time series involved.

The deterministic components are selected using the Pantula principle suggested by (Johansen, 1992). The Pantula principle select the co-integration equation with linear deterministic trend. Lag lengths in vector auto regression is selected using likelihood ratio test. Before testing the causality of the VECM, first Granger causality test between government expenditure which used the components of government expenditure and economic growth which use real GDP as proxy variable is examined to determine the long run in VAR context and then short run causality has been estimated using VECM. The Granger causality test or well known as 'joint F-test' between government expenditure and economic growth is used in order to check the direction of causality between two variables in Ethiopia: The Granger

procedure is selected because it consists more powerful but simpler way of testing causal relationship (Granger, 1986).

$$\Delta GE_t = \sum_{i=1}^{n} \alpha_i GE_{t-i} + \sum_{j=1}^{n} \beta_j \Delta RGDP_{t-j} + \phi\gamma_{t-1} + \mu_t \quad ----------3.19$$

Equation (3.19) postulates that changes in government expenditure level is related to past values of itself as well as that of growth and a certain proportion of equilibrating error.

The null and alternate hypotheses in this case are

H_0 : Economic growth does not granger cause government expenditure.

H_1 : Economic growth cause government expenditure.

The above way of formulating the null and alternative hypotheses is called the government expenditure lead economic growth. For testing long-run, the above hypotheses are tested in the context of the VAR of the form:

$$\Delta RGDP_t = \sum_{i=1}^{n} \lambda_i \Delta GE_{t-i} + \sum_{j=1}^{n} \delta_j \Delta RGDP_{t-j} + \theta\gamma_{t-1} + \epsilon_t \quad ----------(3.20)$$

Equation (3.20) postulates that changes in growth level is related to past values of itself as well as that of government expenditure and a certain proportion of equilibrating error.

The null and alternate hypotheses in this case are

H_0: Government expenditure doesn't granger cause economic growth.

H_A: Government expenditure granger cause economic growth.

Therefore, the above models are estimated in anticipation of yielding four distinct cases

- Unidirectional causality from $\Delta GE\ to\ \Delta RGDP$ is indicated if the estimated coefficients on the lagged ΔGE in equation (3.19) are statistically different from zero as a group (i.e.,$\alpha i \neq 0$) and the set of estimated coefficients on the lagged $\Delta RGDP$ in (3.20) is not statistically different from zero (i.e.,$\delta j = 0$).

- Conversely, unidirectional causality from $\Delta RGDP\ to\ \Delta GE$ exist if the set of lagged ΔGE coefficient in (3.19) is not statistically different from zero (i.e., $\alpha i = 0$) and the set of the lagged $\Delta RGDP$ coefficients in (3.20) is statistically different from zero (i.e., $\delta j \neq 0$).
- Response, or bilateral causality is suggested when the set of $\Delta GE\ and\ \Delta RGDP$ coefficients are statistically significantly different from zero in both regressions.
- Finally, independence is suggested when the set of $\Delta GE\ and\ \Delta RGDP$ coefficients are not statistically significant in both cases.

There may also be indirect channels of causation from x to y, which VAR modeling could uncover. Accordingly, government expenditure is decomposed in a capital expenditure and recurrent expenditure context to government expenditure and their causality with RGDP is examined.

CHAPTER FOUR

OVERVIEW OF THE ETHIOPIA ECONOMYAND GOVERNMENT EXPENDITURE

Before addressing the causality between government expenditure and economic growth, the study first traces the macroeconomic performance in Ethiopia and the major trends in government expenditure and its structure over time by looking at multi-dimensional relationship between government expenditure and economic growth.

4.1. Macroeconomic Performance in Ethiopia

Now days sources of information demonstrate beginning from the recent two decades, the performance of Ethiopian economy has been showing a positive change. National, regional and international sources recognize the change in terms of GDP growth, change in the Sectoral structure of the economy, poverty reduction and a change in socioeconomic and political affairs. Even the face of the country is changed in the international stage from a place of drought, political instability and low economic growth into one of the fastest growing economies in the world, more attractive for foreign direct investment and above all a country with a vision to be middle income in near future (MoFED, 2010/11).

The Ministry of Finance and Economic Development (MoFED) annual report (2010/11) shows that, the Ethiopian economy witnessed an era of sustained and double digit growth rates over the period spanning between 2003/04 and 2010/11 setting the pace for African countries and making the nation a force again in Africa. The report further pointed out, it is through the formulation of policies and implementation of programmes and appropriate institutional arrangements that country to register such a sustained and fast growth (MoFED, 2010/11). National Bank of Ethiopia annual report (2013/14) shows that the Ethiopia Economy continued to register double digit growth rate. This economic growth has also been impressive compared with the 5.4 percent growth estimated for sub-Saharan Africa in 2014 (World Economic outlook update, 2014). Having said this about the current progress of Ethiopian economy, the descriptive result from the data collected from MOFED and national bank of Ethiopia is elaborated as follows.

Table 4.1. Overview of Ethiopian Economy

		1990/91-2000/01	2001/02-2005/06	2006/07-2010/11	2011/12-2013/14
Year					
Growth in RGDP		4.3	7.2	11.4	9.6
Growth in RGDP per capta		3.4	6.2	8.1	6.9
Share of GDP	Agriculture	48.9	47.1	43.4	41.5
	Industry	10.5	10.2	10.2	12.9
	Service	35.5	35.4	42.4	45.6
Growth of GDP by major sector	Agriculture	9.8	8.1	8	5.8
	Industry	8.1	10.7	11.2	21.6
	Service	12.5	6.2	15.2	10.2

Source: Own computations based on MoFED data

The above table shows that average annual growth rate of RGDP and RGDP per capita during the period 1990/91 to 2000/01 was 4.3 and 3.4, respectively. In recent years the Ethiopian economy has registered encouraging but mixed results with negative RGDP growth rate of 3.3% in 2002/03 as a result of drought, followed by positive performance during all the subsequent years. Consequently, during the 2006/07-2010/11, annual real GDP growth averaged 11.4% and the RGDP grew by 9.7 percent in 2012/13 against the target of 11.3 percent set for the fiscal year. The registered RGDP growth rate, in comparison with the population growth rate of an average of 2.5%, implies that the annual average RGDP per capita growth rate was 7%. From the above table we can also look at the sectoral shares composition. The steadily rise of the share of service sector and the decline in share of agricultural sector while there is no notable change in the share of industry sector are the major story lines here. The agricultural sector holds the leading role in its contribution to GDP for a long time in the above three span of periods while it is declining steadily. Between the periods 1991/92-2000/01 and 2001/02-2005/06, on average the agricultural sector contributes 48.9% and 47.1% followed by service sector which contributes 35.5% and 35.4% in the respective period. However in recent years the service sector has taken the leading position in terms of its share in GDP. It accounted 45.6% followed by agriculture 431.5% and industry 12.9% on average during the last four years growth and transformation plan i.e. 2011/12-2013/14). The contribution of the industrial sector to the total GDP is limited, which is below 15% through the review period.

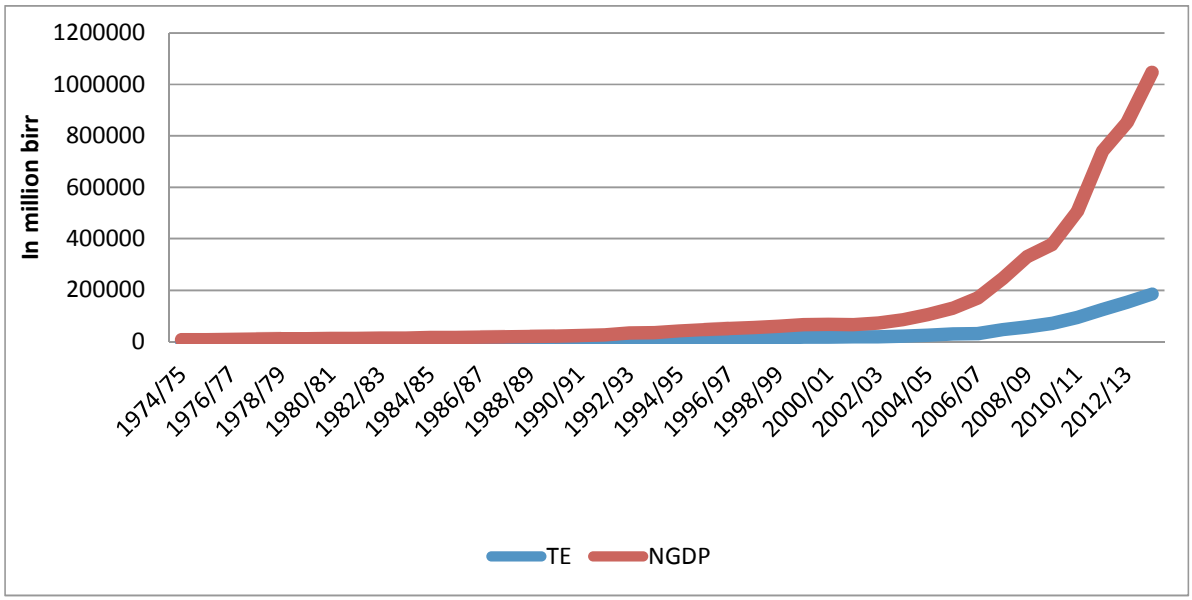
The structure of the economy has been evolving but slower than target. In 2012/13 agriculture accounted for 42.9 percent of GDP compared to 46.5 percent in 2009/10. The share of the

industrial sector in GDP increased to 12.4 percent in 2012/13 from 10.3 percent in 2009/10, while the service sector accounted for 45.2 percent in 2012/13 compared to 44.1 percent in 2009/10. . Thus although the composition of the economy has changed in favor of industry and service sectors over the last three years, the process need to be accelerated to bring about a significant shift in the structure of the economy. Particularly to set the economy on a rapid process of industrialization and structural transformation, the growth of the industrial sector and particularly the manufacturing industry has to be accelerated even further. This in turn entails extensively promoting investment in the industrial sector, particularly in manufacturing, and enhancing productivity of agriculture so as to support the process of industrialization and export development (MOFED, 12/13).

4.2. Trends in Total Government Spending and GDP

During the last four decades, public expenditures, not surprisingly, have risen vastly in absolute terms (cash spending). But this is not a meaningful way of looking at expenditure growth as it does not take inflation into consideration. It is also worthwhile to note that there has been increase in productivity over time. Although it is better alternative to look at the expenditure trends in real terms than nominal, this approach has also series limitations as there is no reliable price index which can serve as deflator.

Figure 4.1. Trends in nominal GDP and Total Government Spending



Thus, in discussing the trends of government spending, choice is made to consider rising in public expenditures in terms of rising public sector share. In this case, the path of overall government expenditure is demonstrated by considering the ratio of total government expenditure to GDP, which measures the amount of government spending relative to the size of its economy.

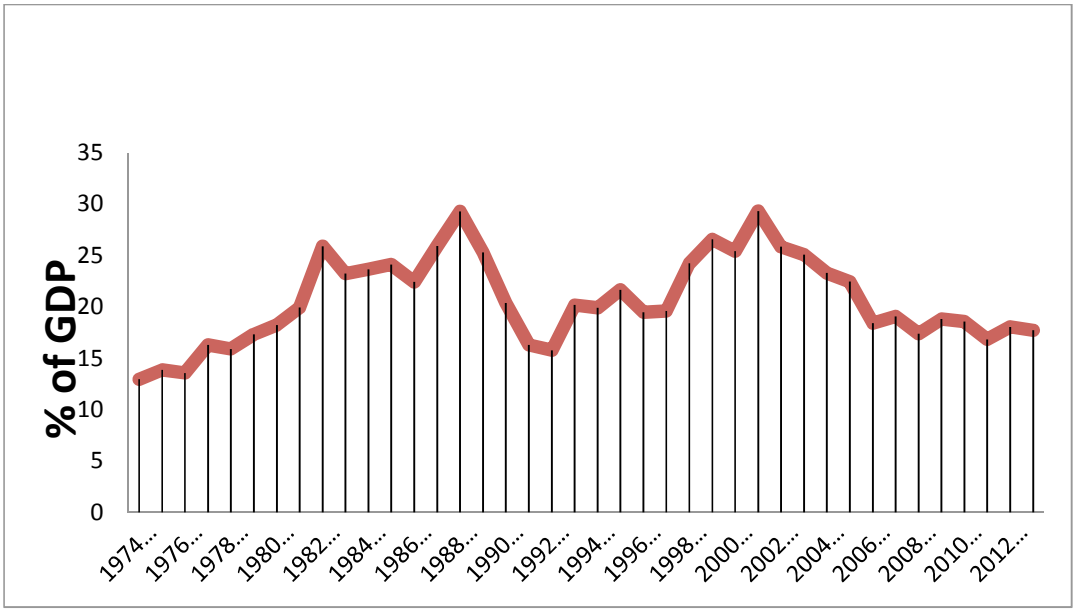
After the down fall of the derg regime, the new government has taken policy measures on the expenditure side which mainly focuses on controlling the growth and rationalizing its use. In controlling the growth of expenditure, the government takes measure to withdraw from direct involvement in production and service delivery while opening the door for private sector participation. Because of this, there was a sharp decline in the relative size of government during the early post-1991 periods. Up to 1995/96, the share of government expenditure in economy (as measured by % of GDP) was generally found to be lesser compared to last decade of the derg regime. However, starting from 1995/96, the share has been rising steadily. On the other hand, in rationalizing expenditure, the government needs to reorient its capital and recurrent expenditure (reduce recurrent expenditure) in order to reallocate resources to basic social services (education and health) and economic infrastructure at the larger scale. It is believed that these are areas where public investment is expected to facilitate overall economic performances including private sector participation. As will be elucidated in the next section, growing capital expenditure on such sectors largely contributed to steady growth in relative size of government in later periods of the current regime.

Table 4.2. Growth of Total Government Expenditure and GDP.

Year	1974/75-1990/91	1991/92-1995/96	1996/97-2000/01	2001/02-2004/05	2005/06-2009/10	2010/11-2013/14
Total Government expenditure (in million birr)	3153.8	6222.7	13407	21064	47333	139412.2
GDP at market price(in million of birr)	14584	36626	60190	82453	251529	78696
RGDP at constant price(in million of birr)	112348	142825	185967	236742	373580	572175
Total Government Expenditure(as % of GDP)	20.5	18.8	23.1	25.2	18.4	17.8
Growth rate of Real Government Expenditure	10.5	15.2	11.7	9.4	18.8	17.9
Growth rate of RGDP	2	5	6	6.2	11	8.5

Source: Own computation from data of NBE

Figure 4.2. Trends in Total Government Spending as the share of GDP



Source: own computation

4.3. Structure of Government Expenditure

4.3.1. Capital and Recurrent Expenditure

In order to explain the overall government expenditure, it is helpful to consider its breakdown by expenditure categories. The expenditure can be broadly classified in terms of purpose as recurrent and capital expenditure. Even though, recurrent expenditure refers to expenditure of recurrent expenses that are less discretionary and made on ongoing programs or activities. It constitutes of wages and salaries, administration, transfers payment, debt repayment and welfare services and also recurrent expenditure may affect economic growth through its effects on people's ability and willingness to work, save and invest.

Capital expenditure refers to expenditure that is generally more discretionary and is made on new programs and activities that are yet to reach their final desired state of completion. It constitutes of investment in such schemes as construction of railways, roadways and communication systems, irrigation and power projects, which raise economic growth both directly and indirectly through encouragement of further private investment (Ag'enor, 2007).

Table 4.3. Government Capital and Recurrent Expenditures as Percentage of GDP and Total Government Expenditure

Year	1974/75-1984/85	1985/86-1990/91	1991/92 1995/96	1996/97-2000/01	2001/02 2004/05	2005/06-2009/10	2010/11-2013/14
	25	31	34.5	31.5	37	50.5	58
Capital Expenditure	4.71	7.66	6.37	7.07	9.49	9.68	10.34
	75	69	65.5	68.5	63	49.5	42
Recurrent Expenditure	13.56	16.93	11.96	15.96	16.42	9.55	7.45
	100	100	100	100	100	100	100
Total Expenditure	18.27	24.59	18.33	23.06	25.91	19.23	17.79

Source: Own computation from data of NBE

Note

The first raw of each year (the shaded raw) shows capital and recurrent expenditures as percentage of total government expenditure while the second row shows expenditures as percentage of GDP.

In the above table -reveals that capital expenditure has been lower than the recurrent expenditure in most of the years since in the derg regime. During this regime high percent of total expenditure has been expending on defense. This is large number when we have been compared expenditure on other sectors. The share of capital expenditure was increasing starting from 2007/08, reaching 51 percent compared to 23 percent in 1991/92. Much of the increase in capital expenditure was accounted for by spending on roads, energy, education and health sectors. It is worth mentioning that during these periods there is significant reduction in government spending on defense. The ratio of capital expenditure to total expenditure during the Growth Transformation Plan (GTP) period (2010/11-2013/14) was reached to 58 percent to financing of ongoing projects and investments on pro-poor sectors such as agricultural development, food security, water, road, rural electrification, education and health that would help realize development policies and strategies seated by the government.

Recurrent expenditure showed a declining trend starting from 2004/05 to 49.5 percent from 63 percent of total expenditure in 2001/02 -2004/05 period but the recurrent expenditure on social sector had the largest share from total recurrent expenditure that was 35% and also in 2010/11-

2013/14 is 41 persent of total recurrent expenditure, followed by administrative and general services 39 percent and economic expenditures.

4.4. Sectoral classification

The better way looking at change in the composition of expenditure is by classifying government expenditure by 'sector'. The government expenditure can further be classified into various categories: economic sector, social sector, general services sector and other sector which include debt services, subsidies and other miscellaneous expenses. The expenditure composition of the two characteristic regimes differs vastly on the basis of development objectives and priorities set by respective government.

In the derg regime, expenditure on defense not only constituted the largest share 73 percent in the total general service expenditures but also registered the highest share 30 percent in total expenditure compared to the current regime.

Table 4.4. Summary of sectoral composition of Government Expenditure as % of Total Expenditure

	1974/75-1990/91	*1991/92-1995/96*	*1996/97-2000/01*	*2001/02-2004/05*	*2005/06-2009/10*	*2010/11-2013/14*
Economic Sector	28	28.96	27.01	28.65	40.54	44.79
Agriture	13	6.97	8.24	11.18	17.39	16.79
Industry	3	4.64	1.15	1.39	1.58	2.63
Construction	6	6.97	8.24	11.18	17.39	21.86
Social Sector	16	22.57	19.86	27.64	31.73	32.34
Education	10.3	13.56	12.9	18.64	22.64	23.56
Health	4	4.84	4.72	4.4	5.65	6.9
General Servicce sector	40	22.57	36.59	29.64	22.91	19.92
Defence	30	10.77	21.27	12.99	7.95	4.63
Justice & Public Security	7.09	3.3	3.94	4.74	5.53	5.01

Source: Own computation from data of NBE

After the downfall of the military regime in 1990/91, among the economic sector expenditures, the share of expenditures on agriculture and construction was greater and share of industrial expenditure was increasing. The new government committed itself to follow market-based economic policy. To this end, the transitional government began the implementation of a comprehensive macro-economic and structural reform with the support of the International

Monetary Fund and the World Bank as well as other multilateral and bilateral donors.

The above table indicates that first structural and economic reform program was undertaken during 1992/93- 1994/95 with the aim of progressively liberalizing the economy and reducing the role of the public sector. During this period government expenditure as a ratio of GDP was reduced owing to a significant reduction in general service sector expenditure, particularly defense expenditure. On the other hand, expenditure on economic and social sector showed an increasing trend where increase in the later expenditure was greater than that of the former. Another new development in this period was the increase in the share of debt servicing as a result of relatively larger loan secured from bilateral and multilateral donors.

However, during the period 1994/95-1996/97 the government gave priority to labour intensive development. Moreover, emphasis was given to private sector development. The long term development strategy of Agricultural Development Led Industrialization (ADLI) was designed so as to prepare fertile ground to accomplish the above priorities. In order to rehabilitate and reconstruct economic and social infrastructure, mobilizing external resource was taken as a prime means. The share of agricultural and infrastructural expenditure increased while the share of expenditure on industry declined as a result of this development.

In 1996, although Ethiopia entered a three year ESAF (Enhanced Structural Adjustment Facility) with IMF in which the government committed itself to reducing poverty by achieving broad based economic growth in a stable macro-economic environment, the program could not implemented due to lack of consensus on policy package between Ethiopian government and IMF. However, in early 1998, government reached agreement with IMF to resume the program under the ESAF arrangement to be implemented in the context of a medium-term strategy for the period 1998/99-2000/01. In this program high priority is accorded to capacity building in public and private sectors.

According to the policy framework paper of economic reforms for 1998/99 – 2000/01, the overriding objective of the government was to attain relatively fast, broad based, and more equitable economic growth with macroeconomic stabilities. The government remains committed to avoiding domestic bank borrowing for the financing of budgetary deficit in order to minimize inflationary pressures. Thus, the bulk of financing was expected to emerge from external

concessional sources. Owing to the needs in the priority sectors of roads, education and health that are addressed under Sectoral Investment Programs (SIP), public sector capital outlays in such sectors were expected to increase as percentage of GDP.

However, the reality on ground displayed different phenomena. As shown in Table 4, starting from 1991/92, Economic and Social Services was the major player and consumed the highest percentage of the Total Government Expenditures. Economic and Social Services have grown to 29% and 22.56% respectively in the period 1991/92-1995/96. Despite these, the overall government expenditure increased substantially in the year 1996/97-2000/01 which was driven primarily by increase in military spending during Ethio-Eritrean war (1998-2000). The increase in total spending was financed by increased domestic borrowing in this period, against what had been planned, as donors' inflows were suspended. It had been increasing to 28.65% by Economic sector and 27.64% by social sector in the period of 2001/02-2004/05; to 40.54% and 31.74% in the period of 2005/06-2009/10.

In the periods 2001/02-2003/04, expenditure on general services sector (mainly defense spending) declined, but spending in social and economic sectors has been increased leaving total spending as percentage of GDP high. The implementation of consecutive five year education and health sector development program has made expenditure on these sectors to rise faster than others. The increase in expenditure in these years was financed by external sources.

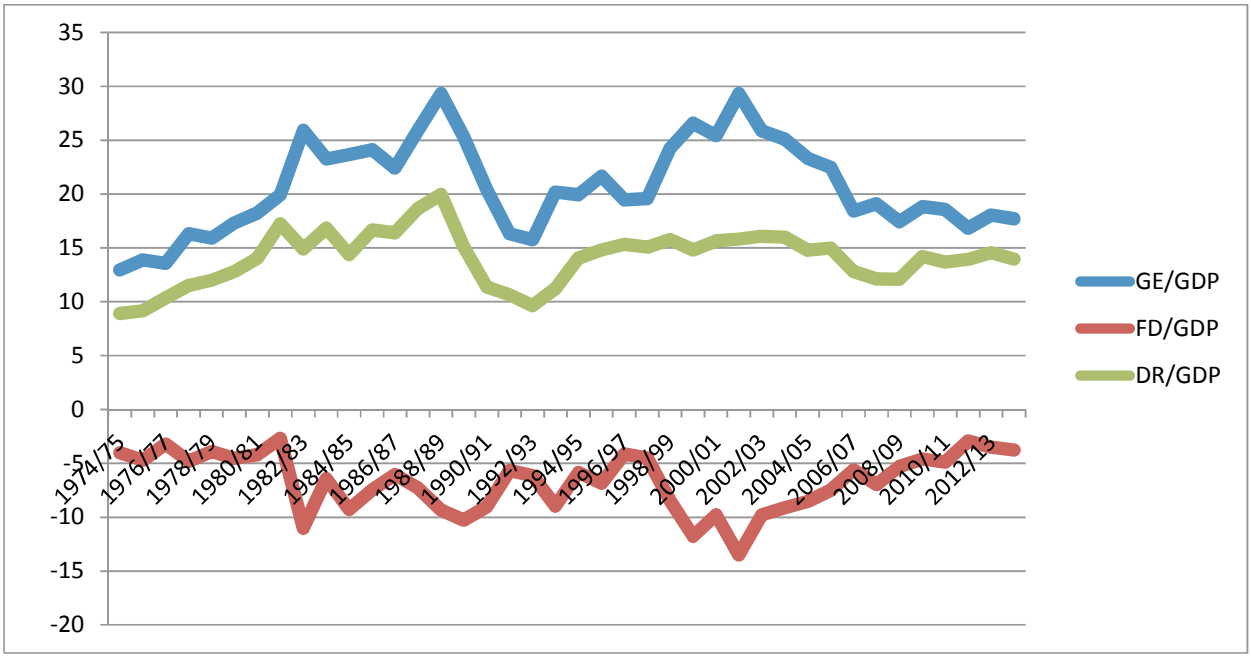
During the period 2010/11-2013/14 total government expenditure has been increasing. Out of this total expenditure 45 percent is spent on economic sector, 33 percent on social sectors and followed by general service sector. The increasing government expenditure was because to achieve five year Growth and Transformation Plan in the country.

4.5. Financing of government expenditures

There is a very real treat that tax and spending may deliver negative macroeconomic consequences with little or no microeconomic improvement in public services. On the other hand, in developing countries such as Ethiopia government spending is an inevitable means for accelerated economic growth if it results in a crowed-in effect. Therefore, there are inherent costs and benefits associated with government spending, which usually assessed by means of financing.

As it can be shown from the below figure, government domestic revenue as share of GDP and government expenditure as share of GDP fluctuate in the study period between the range of 10% to 30% as a share of GDP. Moreover, government revenue as share of GDP and government expenditure as share of GDP tend to move in the same direction despite them at the initial stage the government domestic revenue is below government expenditure. While the budget deficit is negative and fluctuates between the ranges 0% and - 15%.

Figure 4.3. Government Budget Deficit



Source: Own computation

In the derg regime, however, large budgetary deficits were sustained due to excessive growth in government spending relative to its revenue. The relative share of foreign trade taxes, which contributed the major share in the total domestic revenue, felled due to protective policy and import substitution strategy pursued. In general, regular government revenues failed to cover even recurrent expenditure, let alone pay for economic expansion and new investment. Deficit as a ratio of GDP reached 10.23 percent in the period 2004/05 from 5.35 percent of the periods of the derg regime. Such growing deficit, as shown in Table 4-4, was financed by and large through borrowing from the central bank and external loan which had nearly equal share in deficit financing. Loans were flowing from Eastern Europe, the country's main trading partners.

Compared to current regimes, government borrowing from the domestic banking system constitutes the most important means to finance government deficit in the derg regime. Government was hard pressed for cash to cover its ever growing levels of deficits and resorted to an extensive use of the borrowing provisions of the banking laws (i.e. simply applying money and banking proclamation without considering its rationale) .This was because sources of revenue from taxes levied on private sectors and foreign trade were intentionally abridged. Besides, the revenue from state enterprises was not satisfactory as most of them were operating under loss. In sum, such persistent and widening fiscal deficit had led to macroeconomic instability. The mode of expenditure finance pursued by the government also resulted in a further monetization of these deficits and accentuation of the inflationary state of the economy (Teshome, 1993).

Soon after the downfall of the derg regime in 1991/92, the new government has committed itself to subsequently reduce fiscal deficit as percentage of GDP. Regarding the financing of deficit, government's policy has been aimed at a gradual elimination of inflationary financing through borrowing from the banking system. More reliance was therefore made on external finances for deficits. The intent of such policy measures was to maintain macroeconomic stability on the one hand, and foster private sectors access to financial resources, on other.

The Ethiopian government envisages that growth in spending should be mainly accommodated by an increase in government revenue. The adoption of a prudent fiscal policy, and improvements in tax administration and tax collection systems have led to the decline in government budget deficit during the fiscal year under overview. Fiscal deficit was recorded to be about 2 percent of GDP in 2013/14. About 95% of the deficit was financed by foreign net borrowing, while the remaining has been covered by domestic sources. The four years average fiscal deficit has been 3.76 percent of GDP. Thus not only the magnitude of the deficit, but also its financing mechanism demonstrates Ethiopia's prudent fiscal policy.

Table 4.5. Summary of Government Fiscal Deficits and Its Financing (percent of GDP)

	Derg regime		Post Derg Period				
Expenditure	*1974/75-1984/85*	*1985/86-1990/91*	*1991/92-1995/96*	*1996/97-2000/01*	*2001/02-2004/05*	*2005/06-2009/10*	*2010/11-2013/14*
Revenue	12.92	16.35	12.07	15.33	15.67	13.24	14.03
Expenditure	18.27	24.59	18.77	23.06	23.91	19.24	17.79
Deficit	**-5.35**	**-8.24**	**-6.7**	**-7.73**	**-10.23**	**-6**	**-3.76**
External Finance							
Grants	1.6	2.5	2.3	3	3.5	3.8	1.9
Borrowing	1.8	3	3	3	5.8	1.2	1.7
Total External finance	**3.4**	**5.5**	**5.3**	**6**	**9.3**	**5**	**3.6**

Source: Own computation from NBE

In general, Ethiopian government is not different from these governments in the sense that the government runes budget deficit each year. Moreover, the study analysis of fiscal policy it refers to the government revenue, expenditure and the budget deficit.

Initially, from 1996/97 to 2000/01 government revenue ratio shows steady increase while budget deficits declined during that period even though it turns to grow in the later stages during that period span. From 2005/06 to 2009/10 government revenue as share of GDP declines and budget deficits does the same thing by declining during that time. During 2010/11 to 2013/14 government revenue seems to be stable and budget deficits is stable.

Looking at the trend of budget deficit and government domestic revenue, the budget deficit shows increasing trend during the period 1974/75 to 1991/92 while the domestic revenue turns to fluctuate during that time span. During the period ranging 2010/11 to 2013/14 budget deficit ratio indicates a decreasing sign and reached near zero in 2013/14. During the same period of time the government revenue fluctuates around 20% as share of GDP.

Unlike the derg regime, the major sources of economic aid are western donors and UN system and the bulk of investment finance is expected from the World Bank and the International Monetary Fund (IMF). In earlier years, negotiations with these institutions were based adjustment program (SAP) which embraced various conditionalities such as retrenchment, privatization and liberalizing financial institutions. However, the early monetary disbursements within the framework of 'Economic Restructuring and Re construction Program (ERRP)' do not have a sizable investment component (Teshome, 1993).

In 1990/91, about 25 percent of the deficit (including grants) was financed from external borrowing (net) and the proportion of deficits financed by external borrowing rose to as high as 79 and 94 percent in 1993/94 and 1994/95. In 1995/96 and 1997/98, however, net inflow of external borrowing covered 65 and 44 percent of the deficit including grants respectively. Again, after Ethio-Eritrean war periods (in 2001/2-2003/4), foreign inflows resumed and the overall deficit were financed by these resources. Deficit financed through domestic sources sharply declined from 75 percent in 1991/92 to 6 percent in 1994/95 and then increased to average of 54 percent during 1996/97-2000/01 and again dropped as a means of financing deficit in later periods. Grants constituted 8% of GDP in 2002/03, which contributed the higher share for unprecedented increase in foreign resource inflow in the years 2001/02-2003/04.

The overall development of fiscal deficit and its mode of financing reveal that both external assistance and loan had significant role in reducing and financing the deficit during the post-derg periods. The role of external sources in the economy will remain significant in the future too. To achieve growth and transformation plan (GTP), the needs assessment synthesis Report of Ministry of Finance and Economic Development also underlined the decisive role of external resources.

CHAPTER FIVE

EMPIRICAL RESULTS AND DISCUSION

5.1 Descriptive Statistics

Before estimating the models, we examined the descriptive statistics of the variables to enable us unravel the nature of the distribution from which the data emanate. The Jaeque-Bera statistic was used to consider the normality and this was fortified by the values of the skewness and kurtosis of the variables. The skewness is a measure of the symmetry of the histogram while the kurtosis is a measure of the tail shape of the histogram. For a symmetrical distribution such as a distribution, the skewness should be zero while the kurtosis should be three and all those statistical results has been elaborate below.

The descriptive result considers all the variables for 40 observations which are from year 1974/75 to 2013/14 with no missing data for each variables.

The mean for LNRGDP is 12.07747 with the maximum of 13.34800 and minimum of 11.48916 and the standard deviation is 0.545747. The skewness of LNGDP is 0.918958 which demonstrates that the curve is skewed to right. The Jarque-Bera statistic is 5.794740 with the p-value of 0.055168 which means the null hypothesis cannot be rejected and concluded that LNGDP is normally distributed.

Generally, all six variables were normally distributed with the Jarque-Bera p-values above 0.05 level of significance. The result also shows that LNRGDP, LNTCE, LNK, LNOP and LNSSE are skewed to right while only LNTRE is skewed to left. On the other hand, LNTRE also has smallest standard deviation compared to other variables while LNOP has the largest standard deviation meaning it has smaller volatility compared to other variables while LNOP is the variable that has the largest volatility.

Table 5. 1: Results of the Descriptive Statistics

	LNRGDP	LNCE	LNTRE	LNOP	LNK	LNSSE
Mean	12.07747	3.528068	4.139822	4.818799	8.227021	2.753084
Median	11.87348	3.519382	4.193227	4.505807	8.132487	2.574082
Maximum	13.34800	4.081548	4.389368	8.369469	12.08629	3.670283
Minimum	11.48916	2.965817	3.707772	2.654765	5.848531	1.791759
Std. Dev.	0.545747	0.334549	0.205820	1.774323	1.479897	0.515397
Skewness	0.918958	0.101296	-0.786777	0.548241	0.778386	0.457054
Kurtosis	2.685503	1.935410	2.422053	2.012488	3.270120	2.165355
Jarque-Bera	5.794740	1.957325	4.683487	3.629090	4.160837	2.553712
Probability	0.055168	0.375813	0.096160	0.162912	0.124878	0.278913
Sum	483.0986	141.1227	165.5929	192.7520	329.0808	110.1234
Sum Sq. Dev.	11.61574	4.364991	1.652111	122.7806	85.41377	10.35973
Observations	40	40	40	40	40	40

Source: Own Computation

5.2. Time Series Tests Results

Before applying the unit root tests, the logarithm of variables are taken because log variables give us elasticises and reduce the impact of outliers and smoothes out the time series (Maddala, 1992).

Since this study deals with time series macroeconomic variables, there is need to test for unit root in each of the variables employed. The importance of this drives from the fact that estimation in the presence of non-stationarity in variables usually leads to unbiased and inconsistent estimates of the standard errors of the coefficients, and this could lead to misleading inference if appropriate technique is not applied to overcome the problem. Hence, prior to conducting the long run estimation among variables concerned, the time series characteristics of the data is examined using ADF test and PP test to all the variables in levels and in first difference. The results are summarized in Table 5.2A and 5.2B.

Table 5.2A: Unit Root Tests of variables at level

Variables		t-statistic	ADF test			PP test				Decision
			Critical Values			t-statistic	Critical value			
			1%	5%	10%		1%	5%	10%	
LNRGDP	Constant	3.3768	3.6104	2.9389	2.6079	6.4537	3.6104	2.9389	2.6079	Non-stationary
	Constant and trend	0.23068	4.2118	3.5297	3.1964	0.63908	4.2118	3.5297	3.1964	
LNTCE	constant	1.2802	3.6104	2.9389	2.6079	1.2184	3.6104	2.9389	2.6079	Non-stationary
	Constant and trend	2.9240	4.2118	3.5297	3.1964	2.9240	4.2118	3.5297	3.1964	
LNTRE	Constant	0.3887	3.6104	2.9389	2.6079	0.4125	3.6104	2.9389	2.6079	Non-stationary
	Constant and trend	2.0219	4.2118	3.5297	3.1964	2.0993	4.2186	3.5297	3.1964	
LNOP	Constant	1.2484	3.6156	2.9411	2.6091	1.9207	3.6104	2.9389	2.6079	Non-stationary
	Constant and trend	1.2969	4.2191	3.5331	3.1983	1.0351	4.2118	3.5297	3.1961	
LNK	Constant	1.6603	3.6156	2.9411	2.6091	0.9323	3.6104	2.9389	2.6079	Non-stationary
	Constant and trend	0.8945	4.2191	3.5331	3.1983	2.8588	2.2118	3.5297	3.1964	
LNSSE	Constant	0.6927	3.6104	2.9389	2.6079	2.8579	3.6104	2.9389	2.6079	Non-stationary
	Constant and trend	1.4178	4.2118	3.5297	3.1964	1.7554	4.2118	3.5297	3.1964	

Source: own computation.

Table 5.2B: Unit Root Tests of variables at first difference

Variables		t-statistic	ADF test			PP test				Decision
			Critical Values			t-statistic	Critical value			
			1%	5%	10%		1%	5%	10%	
ΔLNRGDP	Constant	4.3296	3.6155	2.9411	2.6091	4.3017	3.6155	2.9411	2.6091	I(1)
	Constant and trend	6.2350	4.2268	3.5366	3.2003	5.8229	4.2119	35330	3.1983	
ΔLNTCE	constant	6.2567	3.6155	2.9411	2.6091	6.4509	3.6155	2.9411	2.6090	I(1)
	Constant and trend	6.1809	4.2192	3.5331	3.1983	6.3585	4.2191	3.5331	3.1983	
ΔLNTRE	Constant	5.9245	3.6115	2.9411	2.6090	5.9183	3.6155	2.9411	2.6091	I(1)
	Constant and trend	5.9376	4.2191	3.5330	3.1980	5.9363	4.2191	3.5331	3.1983	
ΔLNOP	Constant	4.2968	3.6156	2.9411	2.6091	3.2651	3.6156	2.9411	2.6091	I(1)
	Constant and trend	4.7209	4.2191	3.5331	3.1983	4.6673	4.2191	3.5331	3.1983	
ΔLNK	Constant	10.7234	3.6155	2.9411	2.6091	10.7234	3.6155	2.9411	2.6091	I(1)
	Constant and trend	11.5445	4.2191	3.5331	3.1983	12.3856	4.2191	3.5330	3.1981	
ΔLNSSE	Constant	2.9563	3.6210	2.9434	2.6102	6.5236	3.6155	2.9411	2.6091	I(1)
	Constant and trend	3.8917	4.2268	3.5366	3.2003	6.4694	4.2191	3.5331	3.1983	

Source: own computation.

The Augmented Dickey Fuller and PP test results shown above indicates that, for none of the series in levels the null hypothesis of a unit root can be rejected at the all per cent level significance (see Table 5.2A). However, the ADF and PP statistics result in Table 5.2B shows that the null hypothesis of a unit root is rejected for all the variables with a constant term and constant and trend term included. Thus, we can conclude that all the variables are integrated of order one I (1) with a constant, and constant and trend term.

Then, since all the variables are *I*(1), then Johansen multivariate co-integration test is used to find out whether there exist a long-run relationship between the variables or not. The linear combination of *I*(1) variables will be stationary if variables are co-integrated (Harris, 1995). Based on the results in the table, it can be inferred that a constant and trend should be included in the test of co-integration for the models.

5.3. Lag length Selection

It is well known that Johansen's co-integration tests are very sensitive to the choice of lag length. Firstly, a VAR model is fitted to the time series data in order to find an appropriate lag structure. The results of the lag length selection criteria and the selected lag lengths are reported in Table 5.3. While, checking up to lag two Order the 5% significance level suggest that lag 1 would be the correct lag length.

Table 5.3: Lag length Selection

VAR Lag Order Selection Criteria

Endogenous variables: LNRGDP LNTCE LNTRE LNOP LNK LNSSE

Exogenous variables: C

Sample: 1 40

Included observations: 38

Lag	LogL	LR	FPE	AIC	SC	HQ
0	57.09142	NA	2.74e-09	-2.689022	-2.430456	-2.597026
1	258.4394	328.5151*	4.67e-13*	-11.39155*	-9.581584*	-10.74758*
2	277.3461	24.87722	1.33e-12	-10.49190	-7.130538	-9.295953

Source: Own computation

*Note: * denotes rejection of the hypothesis at the 5% level. Lag length is selected as 1 based on LR, FPE, AIC, SC and HQ.*

5.4. The Long-run Relationship

The main hypothetical argument of co-integration analysis is that even if individual variable is non-stationary, the group of variables may drift together. This suggests that a linear combination of two or more can be stationary, even if are not individually. Since the variables under study are integrated at the same order, there is the need to test for co-integration relationships using Johansen approach. This approach is preferred to the Engle and Granger two step procedure

because the later conceals information on the coefficients of the explanatory variables in the co-integrating vector, hence makes it in appropriate for this study.

Having detected the non-stationary behavior of all the series and chosen the optimal lag length, the test of co-integration was conducted for six variables in the model. Table 5.4A show the results obtained from applying the Johansen (1988) and Johansen and Juselius (1998) reduced rank co-integration tests for the model. To determine the number of co-integrating vectors, two test statistics called the maximum eigenvalue (λ_{max}) and trace statistics (λ_{trace}) are computed.

From the Johansen maximum trace statistics perspective, the result suggests that the null hypothesis of one co-integration vector can be rejected at the 5 per cent significant level, while the null hypothesis of at least one cointegrating vector cannot be rejected at the 1 per cent level for the models. However, maximum eigenvalue test makes the confirmation of this result and hence we conclude that the rank is one, i.e. a co-integration relationship for the model implying the variables included in the model have long-run or equilibrium relationship among the variables.

Table 5.4A: Unrestricted Co-integration Rank Tests (VAR=1)

Sample (adjusted): 3 40

Included observations: 38 after adjustments

Trend assumption: Linear deterministic trend (restricted)

Series: LNRGDP LNTCE LNTRE LNOP LNK LNSSE

Lags interval (in first differences): 1 to 1

Unrestricted Co-integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.754011	140.4764	117.7082	0.0009
At most 1	0.612960	87.18254	88.80380	0.0651
At most 2	0.413436	51.11191	63.87610	0.3657
At most 3	0.368341	30.83995	42.91525	0.4531
At most 4	0.229258	13.38254	25.87211	0.7079
At most 5	0.087685	3.487259	12.51798	0.8143

Source: Own computation.

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 5.4B.Unrestricted Co-integration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.754011	53.29386	44.49720	0.0044
At most 1	0.612960	36.07063	38.33101	0.0888
At most 2	0.413436	20.27196	32.11832	0.6305
At most 3	0.368341	17.45741	25.82321	0.4200
At most 4	0.229258	9.895278	19.38704	0.6301
At most 5	0.087685	3.487259	12.51798	0.8143

Source: Own computation

Max-eigenvalue test indicates 1 co-integrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

5.4.1. The long run impact of variables on economic growth

Subsequently knowing the level of co-integration rank order, in order to identify how the variables encourage or discourage economic growth in Ethiopia VAR is estimated using OLS. The following model regression is run with constant, linear trend.

The estimate of components of government expenditure on economic growth and control variables were presented in Table 5.4.1A. In the total government expenditure is decomposed into total capital and recurrent expenditure whether or not it has an impact on economic growth is estimated. The normalized co-integration coefficient (standard error in parenthesis) is as follows.

Table 5.4.1A Normalized co-integrating coefficients (standard error in parentheses)

Normalized co-integrating coefficients (standard error in parentheses)

LNRGDP	LNTCE	LNTRE	LNOP	LNK	LNSSE	@TREND(2)
1.000000	1.223364	2.842953	0.008444	0.072339	0.131239	-0.020762
	(0.08475)	(0.17945)	(0.02184)	(0.01599)	(0.03397)	(0.00234)

Source: own computation

The normalized co-integration results readily available from the Johansen technique (Table 5.4.1A) above indicates that the variables components of government expenditure and the other control variables have positive impacts.

The result in the table 5.4.1B below shows the long run relationship among real GDP and government expenditure components (total capital expenditure and recurrent expenditure) and other control variables such that trade openness, private investment and secondary school enrollment in Ethiopia over the period under investigation. The VAR estimation coefficient for the model has been indicated by table 5.4.1B below.

Table 5.4.1B. VAR estimation of coefficient for the model
Dependent Variable: LNRGDP
Method: Least Squares
Sample (adjusted): 2 40
Included observations: 39 after adjustments
LNRGDP=C(1)*LNRGDP(-1)+C(2)*LNTCE(-1) + C(3)*LNTRE(-1) + C(4)
*LNOP (-1) + C(5)*LNK(-1) + C(6)*LNSSE(-1) + C(7)

	Coefficient	Std. Error	t-Statistic	Prob.
LNRGDP(-1)	0.570253	0.141014	4.043945	0.0003***
LNTCE(-1)	0.319268	0.130277	2.450690	0.0199**
LNTRE(-1)	-0.730309	0.287529	-2.539953	0.0161**
LNOP (-1)	0.088770	0.030994	2.864136	0.0073***
LNK(-1)	0.010491	0.017916	0.585540	0.5623
LNSSE(-1)	0.095154	0.052502	1.812392	0.0793*
CONSTANT	8.612136	2.928338	2.940963	0.0060***

R-squared	0.724225	Durbin-Watson stat	1.87
		F-statistic	918.23 [0.000***]

Source: Own computation
*Note: ***,** and * indicate statistical significance at 1%,5% and 10% respectively.*

The results indicated on (Table 5.4.1B) showed that independent variables and other control variables all together accounted 72.4% percentage changes in economic growth and according to Mudaki and Masaviru (2012), Durbin Watson statistic is usually recommended if its value is 2.0

or pointed towards the probability of serial correlation among the variables. The probability value of serial correlation LM test of this study indicates that the null hypothesis cannot rejected, hence the model is free from the problem of serial correlation. On the other hand, the model F-statistic p-value also shows that all variables are jointly significantly at 1 percent significance level.

The previous one year lag of real GDP are statistically significant; meaning in the long run the impact on current economic growth is observed from the previous one year lag of real GDP. In elasticity concept it can be explained that 1% increase in the previous one year real GDP increases the current real GDP growth by 0.57%.

The result in the above Table 5.4.1B indicates that capital expenditure has positive impact and statistically significant in explaining changes on economic growth. The results suggest that a one percent increase in total capital expenditure leads to the increase real GDP by 0.32 percent. However, recurrent expenditure has negative and significant impact on economic growth at 5 per cent significance level. The result indicated that a one per cent increase in total recurrent expenditure leads to the decrease in real GDP by 0.73 percent and statistically significant in explaining changes on economic growth. Both two findings are consistent with Tofik (2012) which states that expenditure on physical investment has positive and significant impact and expenditure on consumption has a long-run negative impact and statistically significant on economic growth and also Tashome (2006) found that expenditure on human capital has a long-run significant positive impact and productive government expenditure shows the negative and insignificant impact on economic growth.

The result also revealed that openness to trade measured as the sum the ratio of exports and imports, has significant positive impact in long-run economic growth in Ethiopia. The estimated coefficient suggests that a one per cent increase in trade openness leads to the increase in real GDP by 0.9 percent. So trade openness is an important stimulus to rapid long-run economic growth in Ethiopia.

Finally, the coefficient of gross secondary enrollment has positive and significant impact; implying that human capital accumulation affects long-run economic growth of Ethiopia accumulation of knowledge, learning ability and generally increases productivity of resources.

The study has also conducted the wald test on the various null hypotheses involving sets of regression coefficients, however measuring the statistical significance of two independent

variables and the three other control variables are very important in order to clearly say whether two independent variables at a given lag length are jointly significant or not. To do this Wald test of coefficient restriction is examined with null hypothesis of two coefficients can't jointly influence dependent variable, against the alternative hypothesis of joint influence dependent variable. The following table shows Wald test of coefficient restriction.

Table 5.4.1C. Wald coefficient restriction.

Wald-coefficient restriction	Year effect	Prob (chi2)
C(1)=C(2)=0	1	0.000***
C(2)=C(3)=0	1	0.0389**
C(3)=C(4)=0	1	0.0095***
C(4)=C(5)=0	1	0.0048***
C(5)=C(6)=0	1	0.1896

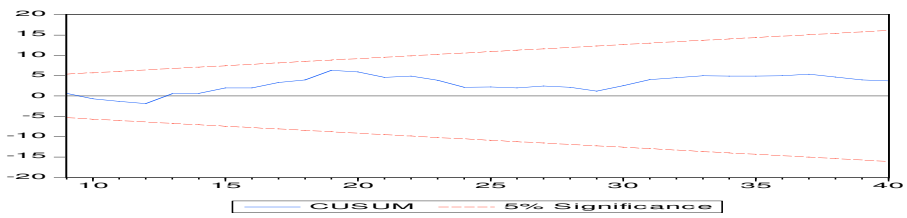
Source: Own computation

*Note: *** and ** indicate statistical significance at 1% and 5% respectively.*

According to the result from the above table (table 5.4.1C) the P-value indicates that we reject the null hypothesis meaning regression coefficients of all the variables in the real GDP equation are equal to zero. The null hypothesis that regression coefficients in each equation are equal to zero is also rejected as shown by the p-values except the private investment and secondary school of enrollment. The test without the indicated variable coefficient results confirm joint significance of the components of government expenditure and other control variables.

In addition, the independent variables are significant most of the time individually and jointly examining the stability of regression coefficient have a vital importance. Unless, the model can be proved by its ability to justify a maintained hypothesis that the coefficients of the model are stable over a sample interval, a shift from one regression scheme to another cannot be located easily as shown on Figure 5.1 below.

Figure 5.1. Parameter stability test for the model



Source: own computation

According to the above figure, the null hypothesis of parameter stability cannot be rejected since the plot bounds within the 95% critical boundaries and shows that the parameters are stable at 5 percent level of significance.

Symmetrically, the diagnostic test of residuals show that the model has desirable properties of OLS. Residual test of normality, serial correlation LM test, heteroskedasticity were conducted and the result has been presented under appendixes 1.

5.4.2. Long run causality

Examining pair wise granger causality test is important for the model in order to infer the direction of causation between two variables. The following table shows Granger causality test for components of government expenditure and other control variables with economic growth in Ethiopia

Table5.4.2: Pairwise Granger Causality Tests

Sample: 1 40

Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
LNTCE does not Granger Cause LNRGDP	39	0.04023	0.8422
LNRGDP does not Granger Cause LNTCE		4.90318	0.0332**
LNTRE does not Granger Cause LNRGDP	39	0.13434	0.7161
LNRGDP does not Granger Cause LNTRE		5.60112	0.0234**
LNOP does not Granger Cause LNRGDP	39	3.92271	0.0553*
LNRGDP does not Granger Cause LNOP		0.46592	0.4992
LNK does not Granger Cause LNRGDP	39	0.44271	0.5101
LNRGDP does not Granger Cause LNK		26.8873	9.E-06
LNSSE does not Granger Cause LNRGDP	39	1.10499	0.3002
LNRGDP does not Granger Cause LNSSE		4.14789	0.0491**
LNTRE does not Granger Cause LNTCE	39	1.82223	0.1855
LNTCE does not Granger Cause LNTRE		1.36486	0.2504
LNOP does not Granger Cause LNTCE	39	5.83155	0.0209**
LNTCE does not Granger Cause LNOP		2.36136	0.1331

LNK does not Granger Cause LNTCE	39	2.45190	0.1261
LNTCE does not Granger Cause LNK		2.46395	0.1252
LNSSE does not Granger Cause LNTCE	39	7.66597	0.0088***
LNTCE does not Granger Cause LNSSE		0.20855	0.6507
LNOP does not Granger Cause LNTRE	39	5.29726	0.0273**
LNTRE does not Granger Cause LNOP		1.66605	0.2050
LNK does not Granger Cause LNTRE	39	1.29280	0.2630
LNTRE does not Granger Cause LNK		5.57905	0.0237**
LNSSE does not Granger Cause LNTRE	39	7.44200	0.0098***
LNTRE does not Granger Cause LNSSE		0.45965	0.5021
LNK does not Granger Cause LNOP	39	0.01409	0.9062
LNOP does not Granger Cause LNK		22.7421	3.E-05
LNSSE does not Granger Cause LNOP	39	0.48120	0.4923
LNOP does not Granger Cause LNSSE		8.09644	0.0073***
LNSSE does not Granger Cause LNK	39	4.67942	0.0372**
LNK does not Granger Cause LNSSE		2.06017	0.1598

Source: own computation

*Note: ***, ** and * indicates statistical significance at 1%, 5% and 10% respectively.*

The Granger causality in Table 5.4.2 above shows the direction of causality between the variables. Probability value was used to measure the causality at level of significance.

The results show the null hypothesis that unidirectional causality from real GDP does not Granger Cause total capital expenditure and real GDP does not Granger cause total recurrent expenditure has been rejected. However, the Granger causality test used in the study shows a unidirectional causality running from the real GDP (economic growth) to government expenditure variables (capital and recurrent expenditure). This finding is consistent with Menyah and Walde Rufael (2013) which states that there was a unidirectional causality running from GDP to government expenditure and also supports Wagner's law of ever increasing state activity. According to Wagner, public expenditure is endogenous to economic growth, i.e. growth in the economy causes public sector expenditure to increase, implying that causality runs from economic growth to public expenditure. In contrast, according to the Keynesian view, expansionary fiscal policies can promote economic growth and that causality runs from public

expenditure to economic growth. Thus, public expenditure can be used as an effective policy tool for fostering economic growth if causality runs from public expenditure to economic growth. The evidence presented in this study suggests that the growth of government expenditure, or the size of Ethiopia's public sector, was positively and significantly related to Ethiopia's economic growth, while the opposite relationship does not hold true. Therefore, the validity of the Keynesian hypothesis for Ethiopia seems to have been rejected.

On other hand, there is unidirectional causality between secondary school enrollment and economic growth which means secondary school enrollment granger cause economic growth, and unidirectional causality between trade openness and capital expenditure in that trade openness Granger cause capital expenditure. Symmetrically, there is unidirectional causality between recurrent expenditure and private investment which means recurrent expenditure granger cause private investment and there is unidirectional causality between secondary school enrollment and recurrent expenditure which means secondary school enrollment granger cause recurrent expenditure. The finding from granger causality test also shows there is unidirectional causality between trade openness and secondary school enrollment which trade openness granger cause secondary school enrollment. Finally, there is a unidirectional causality between secondary school enrollment and private investment which means school enrollment granger cause private investment.

5.5. The short run vector error correction model (VECM) models

If two series are integrated of order one, i.e., I (1) we could model their relationship by taking first difference of each series and including the difference in VAR. From the Johansson test of co-integration of Table 5.4A and 5.4B, we know that there exists a long-term equilibrium relationship between both components of government expenditure and other independent variables with real GDP, so we need to apply VECM in order to evaluate the short run properties of cointegrated series. The trace and maximum Eigen value test provide that one linearly independent combinations of the non-stationary variables will be stationary.

5.5.1. The short run impact of the variables on economic growth

The estimation below shows short run impact of components of government expenditure and other control variables on real GDP. In the estimation of the dynamic short-run model, a three

period autoregressive distributed lag as determined by the information criterion is imposed on all variables. The following table (table 5.5.1) shows the parameters coefficient estimation of ECM.

Table. 5.5.1 Modeling the dynamic the variables by OLS

Dependent Variable: D(LNRGDP)
Method: Least Squares
Sample (adjusted): 3 40
Included observations: 38 after adjustments
D(LNRGDP)=C(1)*(LNRGDP(-1) + 1.22336378599*LNTCE(-1) + 2.84295337613*LNTRE(-1) + .00844441350611*LNOP(-1) + 0.0723386529935*LNK(-1) + 0.131238749824*LNSSE(-1) - 0.0207617998614*@TREND(1) - 26.8186106412) + C(2)*D(LNRGDP(-1)) + C(3)*D(LNTCE(-1)) + C(4)*D(LNTRE(-1)) + C(5) *D(LNOP(-1)) + C(6)*D(LNK(-1)) + C(7)*D(LNSSE(-1)) + C(8)

	Coefficient	Std. Error	t-Statistic	Prob.
ECM_1	-0.790326	0.200200	-3.947686	0.0004***
D(LNRGDP(-1)	0.359661	0.163510	2.199635	0.0357**
D(LNTCE(-1)	0.226423	0.232060	2.175711	0.0347**
D(LNTRE(-1)	0.573051	0.539707	1.061780	0.2968
D(LNOP(-1)	0.020481	0.051080	0.400966	0.6913
D(LNK(-1)	0.027889	0.016147	1.727136	0.0944*
D(LNSSE(-1)	0.067333	0.087075	0.773276	0.4454
CONSTANT	0.033159	0.011565	2.867178	0.0075***
R-squared 0.495243		Durbin-Watson 2.01		
		F-statistic 4.205[0.00246***]		

Source: own compotation
*Note: ***, ** and * indicate level of significance at 1%, 5% and 10% respectively.*

The result from the above table 5.5.1 shows that, independent variables all together accounts 49.5 percentage changes in economic growth. Durbin Watson statistic was usually recommended value of 2.0 and pointed towards the probability of serial correlation LM test among the variables. Thus, the model is free from the problem of autocorrelation with a value 2.01.

On the other hand, the model F-statistic p-value also shows that all independent variables are jointly significantly at 1 percent significance level.

The speed of adjustment or the error correction term in the model Table 5.5.1 in line one come up with the expected sign and level of significance. In an empirical sense, it implies 79% of the

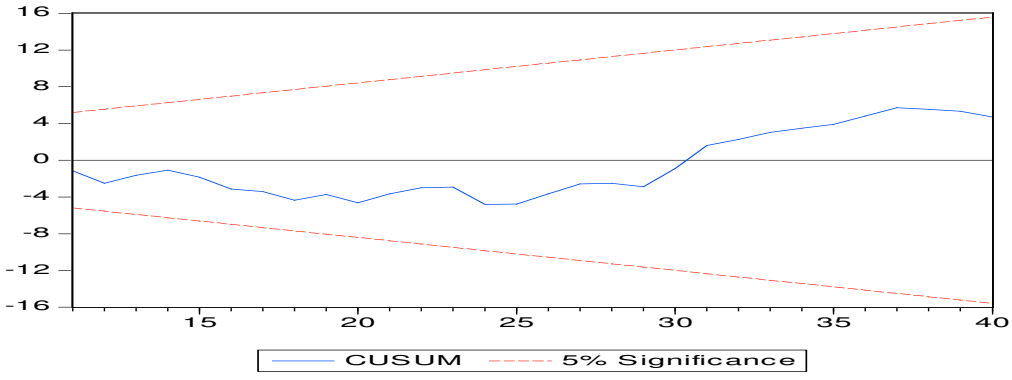
disturbance in the short run is corrected each year or adjust any disequilibrium towards long run equilibrium state.

The one period lagged value of in real GDP is significant in affecting current real GDP. Thus, the impact of real GDP can be explained in elasticity concept in the short run as, a 1% in real GDP of the lagged one year increases the current economic growth by 0.36%.

On the other hand, considering the compositions of government expenditure at 5% critical value expenditures on total capital expenditure are statistically positively significant in explaining changes in economic growth. It means that 1% increase in total capital expenditure in the previous one year increases economic growth by 0.23 percent. These result line with Wondaferahu (2003) which states that capital expenditure has positive and significant effect on economic growth and Abdu and Melesse (2013) which states expenditure on capital expenditure has significant positive impact and also they found expenditure on Health has significant positive impact. However, they found expenditure on agriculture, education, transport and communication, urban development and housing, and total recurrent expenditure are statically insignificant.

In order to strength the analysis, the stability of the estimated parameters in the model is examined using stability test of recursive residuals. The following figure (figure 5.2) affirms a maintained hypothesis that the coefficients of the model are stable over a sample interval.

Figure 5.2. Parameter stability test for model.



Source: own computation

Symmetrically, the model diagnostic test of residuals is examined and it shows that the model has desirable properties of OLS. Residual test of normality, serial correlation LM test and

heteroskedasticity test is conducted and the outcome shows the model is desirable. The result is presented under appendix 2.

5.5.2. Short run causality

The error correction term has negative sign and became statistical significance so we can test the short run causality between the components of government expenditure, and other independent variables and economic growth. To examine the short run causality the study used the Wald coefficient test.

Table 5.5.2. Wald coefficient restriction

Wald-coefficient restriction	Year effect	Prob (chi2)
C(2)=c(3)=0	1	0.0471**
C(3)=c(4)=0	1	0.1471
C(4)=c(5)=0	1	0.5273
C(5)=c(6)=0	1	0.1963

Source: own computation

*Note: ** indicate level of significance at 5%.*

The result of Table 5.5.1 shows whether independent variables jointly has short run causality or not. Performing the joint significance of coefficients provided that total capital expenditure in one previous year and one lag in real GDP jointly causes the current economic growth. Meaning there is short run causality running from one lag or one previous year capital expenditure and one lag of real GDP jointly to the current real GDP. The coefficients for real GDP and in total capital expenditure at lag one jointly cause current economic growth for the period under investigation. On other variable, the null can't be rejected at 0.05 level; meaning there is no short run causality running from the other insignificant variables to real GDP in the short run.

The diagnostic test of residuals show that, the model has desirable properties of OLS. Residual test of normality, serial correlation LM test, heteroskedasticity were conducted and the result is presented under appendix 2.

CHAPTER SIX

CONCLUSION AND RECOMMENDATION

6.1. Conclusion

The relationship between government expenditure and economic growth has continued to generate series of controversies among scholars in economic literature. Some authors believed that the impact of government expenditure on economic growth is negative or non-significant. Other authors on their studies shows that the impact is positive and significant.

This study was conducted to examine the relationship between government expenditure and economic growth from 1974/75 to 2013/14 in Ethiopia. The result shows that the components of government expenditure such as capital expenditure has long run positive and significant relationship, and recurrent expenditure has long run negative and significant relation with economic growth in Ethiopia while other control variable analyzed in the model like trade openness and secondary school of enrollment has a significant positive relationship with economic growth, and private investment has positive sign but insignificant relation with economic growth.

The study also tried to investigate short run relationship between components of government expenditure and economic growth and found that capital expenditure has positive and significant impact on economic growth in short run and recurrent expenditure has positive sign but insignificant. On other hands, other control variables like private investment has positive and significant impact on economic growth. However, trade openness and secondary school of enrollment have positive sign but insignificant short run impact on economic growth in Ethiopia.

Besides, this study also found unidirectional causal relationships between components of government expenditure and economic growth which means causality running from economic growth to government expenditure. On other hand, there is unidirectional causality between secondary school enrollment and economic growth which means secondary school enrollment granger cause economic growth, and unidirectional causality between trade openness and capital

expenditure in that trade openness Granger cause capital expenditure. Symmetrically, there is unidirectional causality between recurrent expenditure and private investment which means recurrent expenditure granger cause private investment and there is unidirectional causality between secondary school enrollment and recurrent expenditure which means secondary school enrollment granger cause recurrent expenditure. The finding from granger causality test also shows there is unidirectional causality between trade openness and secondary school enrollment which trade openness granger cause secondary school enrollment. Finally, there is a unidirectional causality between secondary school enrollment and private investment which means school enrollment granger cause private investment.

6.2. Recommendation

The study further concludes that the components of government expenditures considered in this study are important variables in explaining economic growth in Ethiopia. Based on findings from the empirical analysis, the study offers the following recommendations, among others:

The government should increase its capital expenditure in areas that are beneficial to the private sector and eschew from those that compete with or crowd it out. It should increase its expenditures on those items that enter private production functions as productive public inputs that enhance economic growth. Such productive government capital expenditure includes expenditure on infrastructures, plant and machinery all of which generate positive externalities that raise private investment and thus economic growth. The increase in investment would increase economic growth.

The role of the government in the economy should be improved further in terms of developing infrastructure. Particularly, more effort is needed to develop the capital expenditure of the country as it would reduce poverty as well as raise the standard living of poor ones in the country.

Government investment should be complimentary with private investment and has to create a more investment-friendly environment both for domestic and foreign investors so that the capital stock and the production capacity of the country will improve. This could also improve the efficiency of the country as a well as private investments.

Government should strive to create institutional capacity that increase school enrolment. This means, the policy makers should center on securing more resources and structures that are essential and appropriate for better school enrolment. Such measures should focus not only on creating new institutional capacity, but also on strengthening and changing the existing institutional setups of the education sectors of Ethiopia that produce quality manpower. In addition, the government should also continue its leadership role in creating enabling environment that encourage better investment in education by the private sector.

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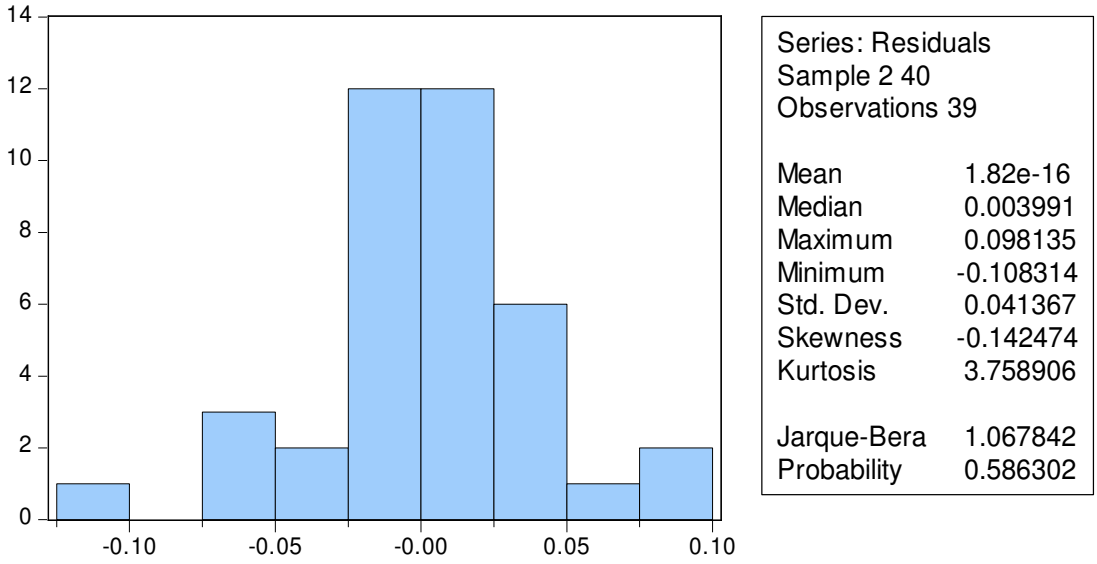
APPENDIX

1. Appendix 1: Diagnostics test for Long run model

Figure 1. Residual test normality



Source: Own computation

1.1.Serial Correlation Test

Table 1.1. Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.143247	Prob. F(1,31)	0.7077
Obs*R-squared	0.179385	Prob. Chi-Square(1)	0.6719

Source: Own computation

1.2.Heteroskedasticity test

Table.1.2. Heteroskedasticity Test: Breusch-Pagan-Godfrey

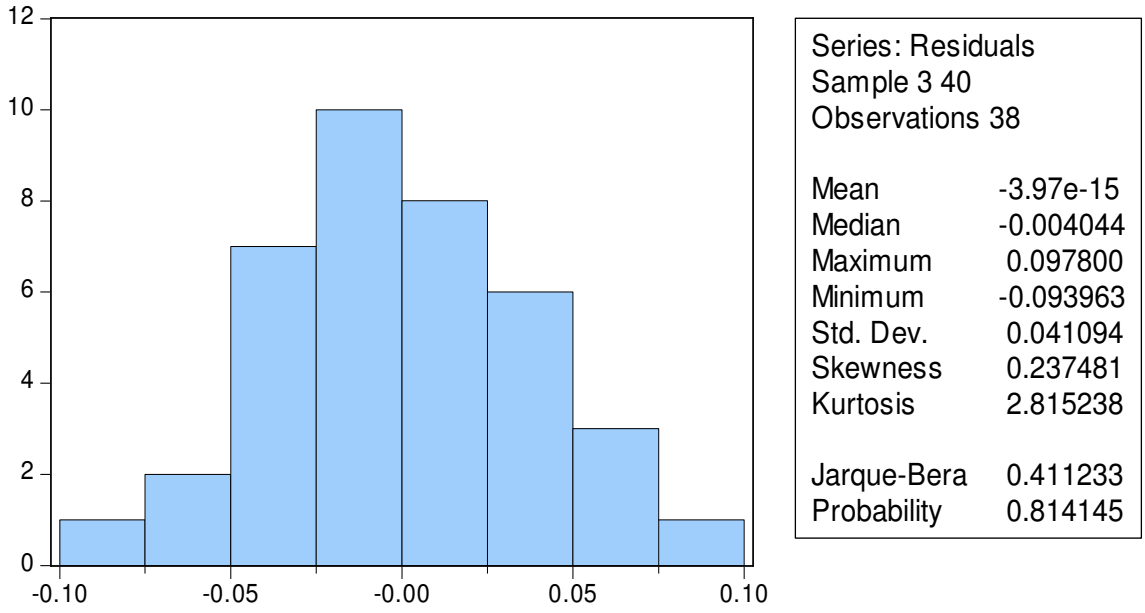
F-statistic	1.844934	Prob. F(6,32)	0.1216
Obs*R-squared	10.02365	Prob. Chi-Square(6)	0.1237
Scaled explained SS	9.309008	Prob. Chi-Square(6)	0.1569

*Source: Own computatio*n

2. Appendix 2: Diagnostic test for short run model

2.1. Normality test

Figure 2. Normality test



Source: Own computation

2.1. Serial Correlation Test

Table 2.1.Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.720415	Prob. F(1,29)	0.1999
Obs*R-squared	2.128089	Prob. Chi-Square(1)	0.1446

Source: Own computation

2.2. Hetrosckedasticiy

Table 2.2. Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.723233	Prob. F(12,25)	0.7162
Obs*R-squared	9.792337	Prob. Chi-Square(12)	0.6342
Scaled explained SS	5.539432	Prob. Chi-Square(12)	0.9375

Source: Own computation