The Impact of public sector spending on the economic growth

A particular focus on Road and Electric Power sector

(The Case of Ethiopia)

By

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Assessing Public Institutions Capacity For The Successful Implementation of Their Mandates: The case of Ethiopian Ministry of Trade.

By: Bayew Kebede

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Declaration

I, hereby declare that the study contended in this thesis is my original work, that, I have carried out independently with the guidance and support of the research advisor Dr. Fenta Manderfo. The study has not previously been submitted entirely or partly to any other university or institution for a degree, masters or PhD fulfillment. All references in the thesis have been duly acknowledged and cited in the reference list. I have understood that non-adherence to the principles of academic honesty and integrity, misrepresentation will constitute sufficient ground for disciplinary action by the university and can also evoke penal action from the sources which have not been properly cited or acknowledged.

Name: Bayew Kebed

Signature

_____

Date:- August, 2015

Statement of Certification

This is to certify that Ato Bayew Kebede has carried out his research work on the topic entitled "The Impact of public sector spending on the economic growth; A particular focus on Road and Electric Power sector: The Case of Ethiopia"

The work is original in nature and is suitable for submission for the award of Master's Degree in Public Management and Policy (MPA)

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Advisor – Fenta Mandefro (PhD)

Date:-_____

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Acronyms

CSA – Central Statistics Agency

EEPCO- Ethiopian Electric Power Corporation

ERA – Ethiopian Roads Authority

ETB – Ethiopian Birr

GDP – Gross Domestic Product

GTP – Growth and Transformation Plan

IMF – International Monetary Fund

MoFED– Ministry of Finance and Economic Development

MDGs – Millennium Development Goals

NB -- National Bank of Ethiopia

OLS – Ordinary Least Squares

PASDEP – A Plan for Accelerated and Sustained Development to End Poverty

PCI- Per Capita Income

RSDP- Road Sector Development Program

SDPRP – Sustainable Development and Poverty Reduction Program

Abstract

The government of Ethiopia for the past ten years is exercising an expansionary fiscal policy with the aim of providing major public infrastructure services in the country. With regard to this, the government have increased the level of total public expenditure by more than hundred percent in GTP periods.

Taking in to account the shortage of capital to finance public expenditures in Ethiopia, both the short run and long run effects of this government spending have to be measured to determine whether the expenditure is creating the intended economic growth. Short run economic outburst can misled governments that the existing public expenditure will have a positive outcome also in the long run while it may not. On the other hand, the increase in public expenditure can result in resource absorption from the productive private sector, which most scholars argue to be more efficient, to public sector.

The objective of this paper is to analyze the impact of government spending on economic growth in Ethiopia. In doing so, considering the complexity of the link between government spending and economic growth, both descriptive explanations and econometric analysis were applied in the study. In addition, key informant interview was made in order to triangulate the empirical results obtained.

The descriptive analysis found that the trend of public spending in Ethiopia and the deficit level is growing adjacently in recent years. However, the level of accumulated public debt borrowed to finance the deficit is at low risk according to IMF standard of high risk dept level. The empirical analysis found that public spending on social sectors has positive long run effect on the growth of real percapita income while spending on general services is suppressing its growth. From the selected infrastructure sector components, while public expenditure on electric power sector has significant positive effect, road sector development has insignificant effect on the growth of real percapita income growth.

Chapter One

Introduction

1.1 Background

The level of economic growth, which is measured as the annual rate of increase in a nation‟s GDP, is the main prerequisite for development in a country. An economy‟s output of goods and services called GDP depends on two things the first is on the quantity or availability of inputs, called the factors of production, mainly capital and labor second with the efficiency to change the two inputs into output called production function(Ebert, Afonso, & Schuknecht, 2005).

In developing countries of which Ethiopia is not an exception, among the factors of production capital is a scarcely available resource that its distribution and allocation needs high consideration in order to attain the desired level of economic growth. Now a day‟s, allocating this resource to public sectors and a government providing goods and services by participating in production is becoming a common phenomenon in developing countries.

One major concern of public finance studies is directed towards gauging the impact that the growing of public sector will result on the country‟s economy. The role of the government in a country‟s economy will mount with the increase in the level of public spending and this role of government in providing infrastructure development, improvement of health and education, social welfare and economic growth are important issues in public economics and public finance (Marjit & Sasmal, 2012).

The literatures on public finance depict that the performance of Public sector specifically public finance can affect the economic growth of a country in different ways. These influences revolve mainly around four channels; the institutional framework in the country, the tax system, the macroeconomic stability and the fourth is government spending. From the above four channels, the government spending or public spending is the major concern of the paper(Ebert et al., 2005).

Considering the importance of economic growth to alleviate poverty, in GTP period, the Ethiopian government have planned to maintain on average at least 11.2 percent real GDP growth and attain MDG"s. One major strategy of the government to achieve the intended economic growth is through increased public spending in infrastructure and various economic areas where the private sector does not have the required capacity to participation (GTP Report, 2012).

Expenditure policy does not have a theory of optimal allocation seen in other policies like tax policy that could provide comparably well defined rules for government spending. Commonly literatures in public spending suggest that expenditure on the development of infrastructures such as road and railways, power generation, irrigation, telecommunication etc may have a significant effect on economic growth. On the other hand expenditures on health and education may not significantly affect the economic growth. It is also in literatures that expense expenditures on pension, subsidies interest, wages and allowances are growth retarding (Busatto, 2011).

Taking in to account the shortage of capital to finance public expenditures in Ethiopia, both the short run and long run effects of this government spending have to be measured to determine whether the expenditure is creating the intended economic growth. Short run economic outburst can misled governments that the existing public expenditure will have a positive outcome also in the long run while it may not.

The adequate or correct empirical measurement of public policy or public sector efficiency, particularly measuring services provision is a difficult issue. Indirect measurements such as evaluating the outcome of public spending on the economic growth there by assessing the productivity and efficiency of the public sector is one method used in many studies(Ebert et al., 2005). This study has tried to assess the productivity and efficiency of the public sector using this indirect measure.

1.2 Statement of the problem

The first phase of the growth and transformation program (GTP) of Ethiopia has planned to increase the overall public expenditure by more than 100% (to 690.9 billion ETB) in five years as compared to the former PASDEP program. The main focus of this public expenditure is towards financing on growth enhancing pro poor sectors and covering recurrent expenditure from domestic resources. Expecting positive outcome from the current expenditure, in long run the policy also aim to cover the capital spending from the domestic resources (GTP report, 2012).

With an increased public spending in Ethiopia in the past few years and the plan to increase this spending on various sectors of the economy in the coming years, determining the relationship between public spending and economic growth remains to be policy level issue. While addressing this issue, it is important to consider not only the effect of public spending on short and long run growth as a whole but also the level and composition of expenditure on each public sector.

The urgent need to alleviate poverty in Ethiopia in face of scarce availability of capital resources justifies the vitality of establishing sufficient evidence on the relationship between the effect of increased public sector spending and economic growth in the country.

Theoretical literatures on public spending and its effect on economic growth have different views. Keynes‟s theory and Wagner‟s law are the two main contrasting theories related to the interactions between public expenditure and economic growth. Endogenous growth theorists like Wagner and Barro (1999) accept government expenditure is an endogenous factor that economic growth will result in increase in government expenditure. Wagner argues growth in a countries economy will lead to a raise in government‟s income enabling them increase in public expenditure. However according to Wagner, government expenditure will result economic growth only if the composition of the expenditure goes towards productive areas (Patricia & Izuchukwu, 2013).

Contrary to this, Keynes supports the increase in public expenditure, considering it as an exogenous factor that induces economic growth. According to Keynes governments can accelerate economic growth or reverse economic downturn by borrowing money from the private sector and returning it back to the private through public spending. Through multiplier effects on aggregate income, the public spending will trigger employment, profitability and private investment. Thus, government expenditure even are current expenditure, can contribute significantly to economic growth (Patricia & Izuchukwu, 2013).

The other theory on public expenditure and economic growth is the neo-classical growth model of Solow and Swan (1956). In the model, if expansionary fiscal policy is maintained in developing countries, then in long run this could result in a lower level of steady state growth. According to Solow in developing economies budget deficit is prevalent whenever there is a plan to increase public expenditure. In order to finance the deficit, governments may either engage in leaving higher tax or borrow both from domestic and foreign sources. The increased budget deficit if it is financed by borrowing from domestic saving will cause the interest rate to increase and investment to decrease. This act of governments will block the economic link between private saving and private investment and the consequence will be a lower capital stock and lower steady state GDP(Busatto, 2011).

In countries with high public spending government directly provide many services such as education, health and infrastructure. The effect of such increased public spending on economic growth is a debating issue among various scholars. Scholars like Mitchell (2005) and Mahet (2013) associate public sector spending with inefficiency. They argue public sector spending is a less effective way to deliver services. According to these scholars, the private sector has the capacity to deliver these services in a more efficient way with higher quality and lower cost (Mitchell 2005; Mahet.al. 2013).

On the other hand scholars such as Ditimi (2011), Alfonso and Alessandro (2008) have different approach on public spending and economic growth. They argue increased, government expenditure will enhance economic growth by providing infrastructural and other services that

the private sector doesn‟t have the required capacity to provide the service especially in developing countries.

Empirical studies on the relationship of public spending and economic growth also found contrasting results. Studies on public spending in developing countries point out expenditures may not have their intended salutary effect on economic growthSugataet.al. (2012). According to these studies, the existence of malfunctioning public sector administration, the prevalence of corruption and the high and often unstable level of public debt in the countries will hinder the performance of the public sectors the resulting effect on economic growth. A study by Vedder and Gallway (1998) have found the same result, increased government spending in developing countries will crowd out private investment, dampens economic stimulus in short run and reduces capital accumulation in the long run (Vedder and Gallway 1998).

Though much work has not been done, studies were also made in Ethiopia on the relationship of public spending and the countries‟ economic growth. Recently a study was made by Wondesen (2012) on the impact of sect-oral public spending on human capital and agriculture, on economic growth; using a time serious data of GDP and government expenditure for the period 1960/61-2010/11. The study found that education sector expenditure has both short-run and long-run positively significant effect on growth where as health sector spending has negative impact on economic growth though the impact is insignificant. Another researcher Jibril Haji made similar study 2012 and found that expenditure on human capital resulted in GDP growth where as expenditure on agriculture doesn‟t have significant impact.

Alemayehu Geda and Dawit Birhanu conducted a study in 2011 on the reasons for the low performance of the agricultural sector despite the high public spending to the sector. They found that the composition of the budget were allocated to the sector was not based on long run output and lacks integration with other national plans. This shows there is a need to gauge the impact of the overall government expenditures on the sectors so as to compare the relationship of each sect-oral spending with economic growth. The result of these study contradict with the aforementioned study which depict public spending to agricultural sector has significant impact on economic growth of Ethiopia.

Ukah, O.C also made a study on the relationship between public expenditure and growth in Ethiopia for the period 1990 to 2003. The study found that government expenditure was higher than the revenue acquired by the government which Ukah described it as public expenditure is not meeting its intended objective in Ethiopia.

The above Studies made in Ethiopia on the impact of public spending on economic growth however lack certain important points. First they didn‟t give emphasis to other macro economic variables that may be affected with the increased public expenditure. Since the impact of public spending on economic growth depends also on the source of the finance, emphasis should be given also to the performance macro economic variables with relation to the fiscal policy. Second, they lack comprehensiveness in measuring the performance of public sectors that they separately measure the performance of specific sector without having a glimpse on other public sectors. However, the weak performance of one sector can hinder the performance of other sector and may lead to wrong conclusion that the sector under study has poor performance. Third, much of the studies available on the area are out dated and didn‟t indicate current scenario of the public sector expansion.

In general, the dearth of up to date literature on the area and the existence of wide variation or contrasting result between the findings of available studies provide a room for further empirical investigation.

1.3. Objective of the paper

The objective of this study is to examine the scale and composition of public spending in Ethiopia and its relationship with economic growth of the country. Accordingly, the effect of government spending in various sectors on the overall economic growth was analyzed.

In particular, the study tried to point out which specific component of government‟s sectoral expenditure significantly affects the economic growth.

In doing so the paper provided explanations for the following research questions;

1. What effects does fiscal expansion with increased public spending has on other macro economic variables?
2. What kind of relationship exists between the scale and composition of public spending on various sectors of the economy and economic growth in Ethiopia?
3. Will the observed relationship between public spending and economic growth be persistent in the long run?
4. What effect does public spending on road and electric power sector have on short and long run economic growth of Ethiopia?

1.4 Methodology

As discussed above, the main objective of the paper is to measure the effect of increased public expenditure on the short and long run economic growth of Ethiopia. Hence the paper is a descriptive research and employs both quantitative and qualitative methods of analysis. The qualitative analysis is based on the data obtained from secondary sources such as MoFED, National Bank, IMF and World Bank. The quantitative analysis was done using key informant interview.

The descriptive part of the analysis emphasized on the trend of public financing in Ethiopia for the period 1983 – 2005 EFY. This part also assessed the performance of electric power and road sector in the period under study.

The study also applied econometric method to analyze the relationship between economic growth and different components of public spending. Based on its relevance to Ethiopia and the availability of data, the econometric model of (Devarjan et al. 1996) is preferred for this study.

1.5 Significance of the paper

Increasing public spending towards pro poor and development enhancing sectors is among the major economic policy directions in Ethiopia during the GTP period. However, there is limited literature in Ethiopia regarding the outcome of such public expenditures on the countries short and long run economic growth. In addition, the studies available are outdated and lack comprehensiveness to illustrate the current performance of public spending.

One of the major relevance of this study is that it applied both qualitative and quantitative methods of analysis and incorporated a much recent data. Furthermore, the study applied a modern econometric method used by different scholars for related studies in other developing countries including Nigeria, Kenya, and Brazil.

Hence, the findings of this study can be used as a guide for policy makers and provide important information on the current performance of the public sectors for budget allocation. In addition the study can be a useful resource for further research on the area.

1.6 Scope and Limitation of the study

The impact of public expenditure on growth is determined by three major factors, the level and composition and productivity of the spending, the effectiveness of public policies and source of the finance or the way that government finances the spending. From the above three factors, the

paper only focuses on analyzing the level and composition of public expenditure and its effect on economic growth in Ethiopia.

Due to difficulty to directly measure the effectiveness of public policies and lack of data to measure the source of finance for the spending, the paper is limited in directly explaining the quality of public expenditure. Resource and time constraints are expected to have limitation on the study.

1.7 Organization of the study

The study is organized into five chapters. Following the introductory chapter, chapter two presents review of literature including both theoretical and empirical literatures on the public expenditure and economic growth. Chapter three is descriptive analysis on the performance of Ethiopian economy with relation to increased public expenditure. Chapter four deals with model estimation and interpretation of results including key informant interview results. Finally, Chapter five presents the conclusions and policy implications of the study.

Chapter Two

Literature Review

The review of literature in this study have two sections, the first section reviewed growth and public expenditure theories and models. The Second section assessed available empirical works on the relationship between public expenditure and economic growth.

2.1. Theoretical literature

2.1.1. Economic Growth Theories

Neoclassical Growth theory

The neoclassical theory of economic growth is the earliest economic growth theory and it is the starting point for any study of economic growth. The idea of an economic system growing exclusively as a result of exogenous factors has variously been put forward by neoclassical or „marginalist" theorist(Aghion & Howitt, 2009).

The pioneers of these theory, Solow (1956) and Swan (1956) constructed a model that shows how economic policy of a country raises the economic growth rate by inducing people to save. The model emphasizes the role of capital accumulation in countries economic growth rate and depicts production function that expressed it as current flow of output of goods, is the function of current capital stock and current labor stock. This neoclassical model ignores population growth and technological progress that the only force that can create economic growth is accumulation of capital. Thus the model supports saving, hence increase in a countries stock of capital due to increased saving will enhance production (Daron Acemoglu, 2009).

However the model also points such an increase in production or economic growth cannot go steadily in the long run. The existence of diminishing marginal productivity to capital, which is the diminishing rate of change in return with an increase in stock of capital to constant labor, is the main factor for slowing in growth rate in long run. Thus according to Solow and Swan long run steady state growth depends solely on two exogenous factors, growth of population and technological progress (Daron Acemoglu, 2009).

The Neoclassical model of exogenous economic growth or production function is based on the assumption of production function exhibiting constant returns scale in labour and reproducible capital. The crucial property of the productive capital in the aggregate production function is that there is diminishing return for the additional capital invested in the production. Hence exogenous growth theory proposes continues technological advancement in the form of new goods, new markets, or new process in order to alleviate the diminishing return to capital and sustain positive per capita output growth (Aghion & Howitt, 2009).

The proposition of exogenous economic growth was clearly stated by the neoclassical growth model of Solow and Swan (1956) which demonstrates that with the absence of technological progress, the economic performance of a country would eventually cease to change. In the Solow and Swan model, population growth or supply of labour is constant taking the value one. Thus the aggregate production function can be written as a function of only capital Y= F (K). This production function determines how much output Y can be produced with the given aggregate capital stock K, under a given technology where technological progress is determined exogenously(Alfonso Arpaia, 2008).

Classical Economic theory

The neoclassical idea of an economic system growing exclusively because some exogenous factors make it grow is not accepted by classical economic theory. The pioneer of classical economic theory, Adam Smith explains economic growth as endogenous phenomena having a self re- enforcing character that exhibit economies of scale. According to Adam Smith technological improvement endogenously affects economic growth and diminishing returns to capital is remunerated by productivity of labor (Mullard, 2005).

The issue of economic growth is one of the major concerns of policy makers, economists and politicians in classical times. Classical economists such as Adam Smith and David Ricardo consider production involves the integration of labour, means of production or capital and natural resources. This view of classical economists is not ignored by modern economic growth theorists (Daron Acemoglu, 2009).

Adam smith in his book „The Wealth of Nations" (1776), wrote that the key to the growth of an economy is the growth in the productivity of labor. Smith asserted the important condition to increase labour productivity is division of labour that in turn will depend on the market condition thus on capital accumulation.

The view of David Ricardo on economic growth is similar with Smith that accumulation of capital or saving for investment would largely generated from profits; however wages and rents have little contribution to investment. Hence considering the importance of profit to the economy, much attention should be given to profit maximization. Ricardo saw the rate of accumulation as endogenous factor for growth (Shenggen Fan, et.al 2008).

2.1.2. Public expenditure theories

Several theories exist in literatures that explain the relationship between public expenditure and economic growth, among these theories Wagner"s (1883) low of expanding state activity is one

of the earliest and most important. The German economist and social scientist Adolf Wagner, was the first to recognize as there is a positive relationship between public sector expansion and economic development. Wagner propounds a low called „the low of increasing state activity" which states that as the economy develops over time, the activities and functions of the government increases". He argued that government expenditure must increase with a faster rate than output hence to enable economic development (Toye, 2008).

Wagner"s theory emphasized two main reasons for the expansion in of public services and increase in role of central and local governments in a progressive society. The first reason is „the restructuring society" that states as the economy of a country grow, societal transformation from primary backward economic activities to industrial developed society will occur. These social transformations result in an increase in the demand for public goods such as health, education security, thus the expansion of public sector will be vital. Secondly, Wagner recognized public goods are income elastic that as the income of the society increases as a result of economic development, the demand for public goods will shift to those goods with higher utility, hence there needs to be expanded public sector to meet these demand (Brian Dollery & Sukhvinder Singh, 1999)

According to Wagner, due to the above stated reasons, the growth in government activities will be of large scale and extensive. Hence the expansion and intensification of public services pushes for an increase in government expenditure of the country.

The Wagner"s theory of increased public expenditure has been tested on different developed countries expenditure records and show a consistent result with the Wagner theory. Though Wagner theory has got wide acceptance among economic theorists, it didn"t fully escaped from critics. The theory missed to conceptualize the effect of raising per capita income as independent variable that result in raise in state"s expenditure. Wagner"s theory has also failed to consider the effects of war social unrest and depressions, factors which will result in high public spending (Aghion & Howitt, 2009).

Peacock and Wiseman also wrote important theory based on Wagner"s low. The two professors conducted a study on the growth of public expenditure in U.K. from the years 1891 to 1955.

Peacock and Wiseman validated Wagner‟s low that the rise in public expenditure depends on the revenue collected by the government. Since economic growth results in rise of government revenue, public services will be able to expand as a result of increase in public expenditure (S.Fan, et al 2008).

However, Peacock and Wiseman also point out another reason for increase in public expenditure in addition to economical reason that political reasons such as war and social upheavals urge the expansion in public spending. During times of war, government expenditure on defense will increase. Hence to generate more funds and be able meet the increase in public expenditure, governments enlarge their tax structure and increase their tax rate. According to them most of the time, the new tax rate and structure will remain as it is after the war has ended. This results in an increase in government revenue that will be allocated in other public sectors in peace time (Dollery& Singh, 1999).

Neoclassical economists such as Professor Samuelson have also theorized about public expenditure. The theories approach public expenditure from two perspectives, from micro and macroeconomic perspective. The microeconomic perspective was mainly derived from the concept of „public good‟ that deals with the existence of market failure and the mechanism of maximizing social welfare when market failure exists on certain goods(Dollery& Singh, 1999).

2.1.3 Theories on the Impact of public spending on economic growth

Keynes in his book “The General Theory of Employment, Interest and Money” illustrates the positive role that fiscal policy through increased public expenditure can play in stabilizing the economy. Keynes argues that a stabilization policy should be such that it influences the variation in aggregate demand, which in turn gives to fiscal policy vital importance with regard to increasing aggregate demand of the country, given that is the main way of managing aggregate demand. In a country with economic recession, expansionary fiscal policy can lead to increased employment, and consequently increase household‟s disposable income, which will be able to increase consumption, thus investment which will recover the economic activity. According to

Keynes since a deficit in the public accounts can be a stimulus for economic recovery a balanced budget is no longer indispensable for the functioning of the economy, with higher employment and income, or a surplus caused by higher taxes can stimulate the economy rather than creating inflation (Keynes 1936).

Theories that are against increased public expenditure point out four major effects that increased public spending will result in the economy of one country;

1) Deficit: the imbalance between government revenue and planned budget due to increased public expenditure.
2) Inflation: the soaring in price of goods due with the fall in purchasing power of many as a result of increased many supply in to the market which intern is the result of the increased public expenditure.
3) Public Debt: the raise in the level of borrowing both from domestic and external sources acquired to finance the deficit caused by the raise in public expenditure.
4) Crowd Out effect: the shortage of financial resources (capital) for private sector investments taken away by the government to finance deficit.

The importance of fiscal policy in macroeconomic stabilization was questioned by monetarists. Milton Friedman (1982) argues that the effects of this policy on the economy as well as being very insignificant, are short termed or transitory. According to Friedman, even though fiscal policy can lead to increased employment and income, it will also result an increase in money demand for transactions, which requires an increase in the interest rate in order to restore equilibrium in the money market, thus causing a negative impact on investment, and ultimately have a negative influence on the aggregate production.

Although there are expenses that positively influence economic growth such as investment in education, health, the effects of public spending on economic growth is measured by analyzing the influence of the expenditure on major macroeconomic variables and by measuring its effect on influencing consumption and private investment.

Inflation causes and dynamics with regard to increased public spending are related with two main economic approaches monetary side and fiscal side. With the monetary side, the increment of government spending may affect inflation through aggregate demand in the country. Monetarists accept that Aggregate demand can be raised through increased public or private investment. Fiscal policy in favor of increased public investment can have some impact on the variation in aggregate demand at list in the short run, however if the deficit is financed by money creation inflation will probably arise at list short run. With the existence of shortage in aggregate supply in short run, an increase in aggregate demand may also lead to higher price. In terms of aggregate supply, if governments finance the public spending by borrowing, interest rate will rise reducing private consumption and investment and thus output. Thus the effect of fiscal expansion in the economy will be off sated due to the crowding out effect. Hence a fiscal policy financed by public borrowing is ineffective for monetarists in stabilizing the economy (Pina, 2013).

The fiscal policy approach views inflation as the result of poor fiscal policy performances. In developing countries, fiscal policies have different weaknesses. The level of taxation and the system of collection in these countries is very low. In addition developing countries governments doesn‟t find it politically acceptable to raise taxes to finance public investments. In times where governments have to increase their public expenditure to provide public investments or to purchase military equipments during war period, the level of public expenditure will exceed the acquired tax revenue. The desire to finance such spending with the existing tax rate and collection system can be the source of inflationary monetary policy. Meier argued that when financing government expenditure by seigniorage or many printing exceeds the non inflationary limit, total public spending will become greater than production valued at constant price (Aghion & Howitt, 2009).

The public finance perspective explains inflation as a result of increased public investment resulting in a fiscal deficit to finance the investment. Hence developing countries with low level of tax revenue, the more governments spend on public investment the higher the amount of government revenue from raising monetary base or inflation.

The fiscal policy approach argue the impact of public investment on economic growth depends on both the allocation of spending and the way the expenditure is financed that is the level of taxation and debt (TCFR). Hence appropriate public spending strategy depends on that particular countries‟ fiscal performance. For instance, if a country with low tax rates engaged increased public investment financing through increased taxation, this may result in long run economic growth. Also increased public investment with high public borrowing will have a negative effect on the long run economic growth of the country (Pina, 2013).

Classical economists and Austrian economists argue public expenditure have a contracting effect on the economy by shifting resources from private sector to the ineffective government sector. Literatures identify two variants of crowd out effect caused by increased in public expenditure in an economy, real crowd out and financial crowd out effect. The real or direct crowd effect occurs when the increase in public investment displaces private capital formation broadly on a dollar-for- dollar basis irrespective of the mode of financing the fiscal deficit. The financial crowd out is the result of loss of private capital formation, with the increase in the interest rates caused by the pre-emption of financial resources either by borrowing from banks or issuing bonds to finance deficit(Blinder and Solow,1973).

Vedder and Gallaway (1998) view increased government spending by relating it with the law of diminishing marginal returns. They argue that as governments grow, the law of diminishing returns for public expenditure will start to operate. Initially the construction of roads will clearly result in output expansion. While the construction of secondary roads or upgrading of primary roads will start to have lesser impact on the economy as compared with the primary roads. The tax rate levied to finance these government expenditures will increase, new tax structures will be applied, government borrowing will increase, and then additional government spending will no longer benefit the economy (Vedder & Gallaway, 1998).

In addition to the above listed major effects of public spending, Mitchell (2005) point out among the reasons for the negative relationship increased government spending with economic growth.

The extraction cost: Government spending have high opportunity cost. Since the government has to spend money by taking it from someone the choice has adverse consequence.

The displacement cost: Increased government spending displaces private sector activity. Hence every penny that the government spends means lesser capital in the private sector of the economy. According to him this dampens economic growth since production is efficient more in private sector than in public.

The stagnation cost: increased government spending inhibits innovation. Competition and the desire of increasing income is the driving force to search for opportunities and new methods for the private sector. These is absent in public sectors since they are inherently inflexible to motivate and test new ideas.

The inefficiency cost: Public sectors are inefficient and are less effective methods of providing services. Government provides services such as education housing communication, however the private sector have the ability to provide all this with lower cost and higher quality.

The market distortion cost: competitive market determines the allocation and price of resources efficiently. However government spending to subsidize the price of certain resources will distort market.

The behavioral penalty cost: Increased government spending on retirement housing and education discourage economically desirable decisions such as saving and self employment and creates dependency.

2.1.4 The Rationale for Government Expenditures

Theoretical and empirical literatures in modern times widely accept economic growth a necessary condition but alone it is not a sufficient one for development. These literatures suggest three interdependent policy requirements as a condition to make growth a sufficient condition for development. First, growth has to be broad and inclusive benefiting the entire population equitably regardless of their vulnerability to benefit from the changing economy. Second, poor households have to be empowered with education, have to b provided with health services and

have to gate accesses to credit, so that they will develop capacity to participate in the growth process. Thirdly, the consumption level of poor households have to be enhanced with short-term public transfers until they become involved in productive employment opportunities and gate full benefit from the growth(S. Fan et al 2008).

Public spending plays a key role to achieve the above conditions. However, the scale of public spending with its allocation and utilization determines the impact it will result. The allocation of public spending that is the question of haw, where and when a government should allocate its expenditure depends on the goal of the government intended to acquire through the intervention. There are two approaches; the welfare approach and the social approach, in allocating public spending. Welfare approach recognizes two conditions that governments should intervene in the economy through public spending. First, governments should correct market failures by providing and allocating scarce resources that are in short of supply. Here the existence of market failure due to lack of perfect information, undersupply of public goods, lack of coordination, are conditions that necessitate government intervention. Second, for distributing resources with equity and reduce poverty. Second, governments should assist the fair distribution of resources among the poor(Vedder & Gallaway, 1998).

The other approach that is the social need approach views government intervention through public sector expansion as a means to create social justice. This approach is mainly based on two main social approaches, the basic needs approach and the capabilities approach. The two approaches view income as a "means" or an "end" that state interventions have the capacity to create a just society in which peoples have the right to accesses basic needs or capabilities. The basic needs approach emphasizes access to specific human needs such as health service, food, education, drinking water, shelter. The approach considers these specific commodities as having public good character that the private sector has no capacity or intention to adequately supply especially to poor societies(Vedder & Gallaway, 1998).

The capabilities approach further views income as a means to build and expand the capability of a society to function in addition to obtaining direct utility from purchasing the goods. Here, not

only the actual achievement is valued the potential of the society will also but also one‟s potential to achieve is valued.

Generally both the welfare approach and the social justice approach support public intervention to enhance equity and correct market failure in the society. Hence successful development strategies are those that are able to enhance public institutions so that they can achieve the stated social objectives (S. Fan et al 2008).

Public spending is often discussed as it was a burden on a market economy that would be better and grow faster with smaller level of spending than larger share. The common debate over increasing public expenditure is the fear of countries gate fiscal crises due to budget deficit. However there are evidences according to OECD (1985) considerable number of countries grow faster having large public sector expenditure as a ratio to their GDP. According to Mullard, these countries achieved faster economic growth without any adverse effect on other sectors in the economy (Mullard, 2005).

Economic report of Greenwich University by Hall (2010) point out that the economic performance history of the last 150 years indicate the opposite. There was a steady state growth of increase in public expenditure over the years and it currently it have reached 40% of GDP in OECD countries and is expected to raise even higher farther in developing countries(Norman Gemmell, 2009).

Countries have used public spending to stimulate the private sector thus the economy to counter recessions and also to rescue private banks through public ownership. In times like this the economic crises may not be caused by government deficit but the governments can manage it through public spending. The report by Hall indicates that half of the jobs worldwide are supported by public spending. Public sectors have relatively has job security as compared with the private sector and supply with supports to unemployed population through various schemes. Effective public spending addresses inequality created by the market by redistributing resources to the low income portions of the population. Public health care‟s and education centers develop the stock of human capital in the countries thus supply effective labor to the private sector. In areas where there is little or no profit exist public investment will provide the needed finance for

instance Hall in his report revealed that about three-quarters of the global effort to mitigate global warming and climate change was funded by public finance (Hall 2010).

International Monetary Fund (IMF) and the European Union are two international organizations against the increased public spending. The IMF wants policy measures that will decrease public spending over 8%of the GDP an amount equivalent to half the world‟s total public spending.

2.1.5 Public Expenditure Classifications and Allocation

Since public resources are limitedly available and have opportunity cost, prioritization and optimal allocation and utilization of the expenditure to areas that maximize social welfare and have short and long run economic growth effect is critical. The optimum allocation of public spending across various public sectors will maximize the attainment of its intended development objectives. It is important to recognize that, unlike tax policy, where the theory of optimal taxation was developed; there is not a comparable theory of optimal expenditure policy that clearly shows the optimum well-defined expenditure allocation (Marjit & Sasmal, 2012).

As discussed earlier in this paper, the rational for public expenditure policy is the existence of market failure which created the need for efficiency enhancing intervention to provide public goods and correct the under provision of a product or service. Since there is lack of clear theoretical results, the various guidelines proposed and used to determine the optimum allocation of public expenditure, adaption of pragmatic experiences are mostly used as a guideline. These practical experiences suggest public expenditure policies should in first hand asses the existence of market failures and inefficiencies. Thus the necessity of public expenditure whether to address market failure or create equity has to be determine (Paternostro et al., 2007).

Once the area of intervention is assessed, public policies should determine and analyze the short and long run impacts the intervention will exert on the economy. However, most public spending policies doesn‟t distinguish the short versus the long term or the direct versus indirect impact on poverty and economic growth (Marjit & Sasmal, 2012).

There are different classifications of public expenditure in literatures which mainly pertain on the systematic arrangement of items that the government incurs expenditure. For the purpose of this paper, considering its importance, data availability in Ethiopia and its wide application in studies on the area, IMF‟s classification of public expenditure is used. IMF broadly groups public expenditure in to two, Functional classification and Economic classification. The economic classification expresses the economic characteristics of the spending that the government outlays to accomplish his functions. This classification shows the economic impact of government spending on the market of goods and services, or on the financial market or on income distribution. Economic classification indicates the macroeconomic effects of public sector spending by providing information on what will be purchased and its effect on the economy (S. Fan et al 2008).

Economic classification is divided in to two types of outlays namely capital expenditure and recurrent expenditure. Capital expenditure is government outlay on items that will last long and can be used again to create another capital or provide goods and services. Expenditures on public assets like hospitals, schools, roads, bridges etc are capital expenditures. Whereas expenditure on items that are used in the process of producing goods and services and last for a limited period of time are called current expenditures. Government spending on wages, salaries, pensions, interests, and other recurrent outlays are grouped as current expenditure (Leonardo 2011).

The functional classification examines the purpose or mission towards which the public expenditure targeted to achieve. The classification mainly shows the various areas of the public that the expenditure is intended to address and the trend of spending. The government performs various functions like defense, social welfare, agriculture, infrastructure and industrial development. The expenditure incurred on such functions fall under this classification. These functions are further divided into subsidiary functions. This kind of classification provides a clear idea about how the public funds are spent (Paternostro et al., 2007).

2.1.6 Public Expenditure on Infrastructure

Endogenous growth occurs when the diminishing returns to capital and labour augmented by the provision of additional input in the production function. The link between public expenditure and economic growth can be easily understood when the additional input in the production function is public good or public infrastructure. The development of economic and social public infrastructure is the major determinants of economic growth. In countries where there is low level of public infrastructure, direct investment to enhance the provision of public infrastructure creates i) important production inputs and stimulates economic activities of the private sector ii) reduces transaction costs and trade costs for outputs improving competitiveness iii) creates employment opportunities. In contrast, the lack of public infrastructure is a great bottleneck for economic growth and poverty reduction. The aforementioned importance of public infrastructure resulted in a growth in the level of public expenditure enabling it to be a direct mechanism for governments to affect economic growth through public policy (Sahoo et al., 2010).

Distinguishing feature of Endogenous growth models is that they allow variations in physical policy parameters in measuring the long run economic growth. The endogenous growth model of productive public expenditure developed by Robert J. Barro in 1990 is the most recent and is the most widely applicable model in literatures. The model introduced government expenditure on public infrastructure or public good into the production function of the private sector. Due to the inclusion of productive public expenditure in the model, the rate of return to private capital will be increased exacerbating the level of investment and thus economic growth.

2.2 Empirical literature

2.2.1 Economic growth and public spending

Numerous studies on public finance have tried to assess the role of public expenditure on economic growth more importantly long run economic growth of a country. However there is no common ground or evidence to clearly state the relationship between public spending with economic growth.

S.Fan et al (2008) made a large study on the trend of public spending in developing countries and its impact on economic growth on 44 countries. The study included 22 years time serious data from three continents Africa, Asia, and Latin America where most of the developing countries of the world exist. More importantly, our country Ethiopia was included among the 17 African countries studied.

These large study found that over the twenty years examined, the level of public expenditure have increased 4.5% to 5.6% on average annually and reached 3,347 billion in 2000 which is four times greater than what it have been in 1980.The structural adjustment programs in developing countries in the 1980an 1990 are the major causes for the increase in public spending. The study also found that the effect of government spending on economic growth is not consistent or mixed. The study revealed that, in Africa and Asia, public spending in education and agriculture has significant positive impact on economic growth. In contrary, different scenario was found in Latin America, where public spending on infrastructure and social security strongly promotes economic growth (S.Fan et al 2008).

Another researchers Bayraktar and Moreno-Dodson (2010), made a comparative empirical study on the impact of government spending on economic growth by taking 14 countries using panel data for the period 1970 to 2005. The researchers grouped the fourteen countries in to two according to their economic performance. The first group contains developing countries that recorded fast economic growth. The second group consisted of seven developing countries with inconsistent and volatile economic growth trend.

The analysis found that the impact of public spending on economic growth differ between the two groups of countries. Even though the size of the government, measured as percentage of public expenditure in percent of GDP, is identical in the countries, there is a strong link between public spending and economic growth only for the first fast-growing group. These fast-growing countries have larger shares of productive and core public expenditures on average and are able to use public funds for efficiently this portions. The research also found that these countries have higher productivity ratios and better governance indexes (Bayraktar& Moreno-Dodson, 2010).

Gupta, Honjo, and Verhoeven (1997) made a study on the efficiency of government expenditure on two sectors, health and education, in 38 African countries for the period 1984-95.The study analyzed efficiency applying Free Disposal Hull (FDH) technique of analysis. The technique empirically assesses the efficiency of production in a market environment distinguishing those who produce the maximum output at a given level of input as standard frontier and comparing the performance of the production against this frontier. The researchers compared the efficiency of the 38 African countries including Ethiopia, with countries in Asia and Western Hemisphere.

The FDI analysis of the paper indicated there is wide range of differences in public expenditure efficiency among the countries studied. Compared with the standards established, Gambia, Guinea, Lesotho, and Ethiopia score relatively good efficiency level, whereas, Botswana, Cameron, Cote d'Ivoire, and Kenya score low efficiency level.

Compared with other countries, on average countries in Africa are less efficient than countries of the Western Hemisphere and Asia. Hence, the researchers suggest higher budgetary allocation to the sectors in the countries studied will not necessarily result in improved social out comes unless corrective measures to alleviate the inefficiency are implemented.

Okwa et al (2012) studied the effect of public expenditure in Nigeria using time serious data for the period 1970-2009. The major objective of the study is to empirically examine the causal relationship between public expenditure and economic growth using OLS method. The data analysis revealed the existence of significant relationship between public expenditure and economic growth. The relationship is mixed that some components have positive impact where as others exert a negative effect on economic growth. However, the aggregate effect of

government expenditure on economic growth is statistically significant supporting the Keynesian view of increased government intervention in the economy to stimulate growth.

Another team of researchers, Patricia and Izuchukwu (2013) made a study on the effect of educational public expenditure on economic growth in Nigeria. They applied Error Correction Model (ECM) using time serious data from 1977 to 2012 to examine the long run and short run effects. The study found that total educational expenditure has statistically significant effect on economic growth of Nigeria in the long run. The two researchers concluded from the study that economic growth is impacted by both exogenous and endogenous factors of the public expenditure. However the results indicate recurrent educational expenditure have lower impact on economic growth as compared with capital expenditure that the government have to spend more on capital educational expenditure to acquire further economic growth(Patricia &Izuchukwu, 2013).

Gangal and Gupta conducted a study to analyze the impact of public expenditure on Indian economic growth. The study incorporated total public expenditure (TPE) and GDP per capita data of India from the year 1998 to 2012 to test the existence and direction of causality between public expenditure and economic growth. The result of their analysis shows that there is long run equilibrium relationship between public expenditure and economic growth. According to their study, GDP responds positively to a change in the level of public expenditure in the long run (Gangal& Gupta, 2013).

Norris and Matovu (2002) addressed the effect of public expenditure composition in creating demand for education and economic growth. The study applied a dynamic general equilibrium analysis of overlapping generations in making schooling decisions for their children. Norris and Matovu examined the effects of alternative composition of government expenditure on education, infrastructure and transfer payments on households schooling decision and asset accumulation decision. The two researchers found that in countries where schooling costs are fixed or increasing, increased public spending in primary and secondary education will have a positive macroeconomic and poverty reduction impact. The impact is even greater in countries with less universal basic education. They also came up with the fact that tertiary education

spending has large long term economic growth impact once after universal basic education is achieved (Norris and Matovu, 2002).

Another group of researchers, Gemmell, Kneller and Sanz (2009) examined the impact of public expenditure on economic growth for both developing and developed countries of OECD countries. The study examined the growth impacts of total government expenditure and the impact of changing the share of expenditure between sectors. The researchers found that reallocating total spending from other sectors towards infrastructure and education has a positive long run growth impact. Whereas increasing the share of social welfare is neutral and even can have adverse impact on growth when its endogenous effect is ignored (Gemmell, Kneller &Sanz 2009).

Alfonso and Aubyn (2008) conducted a cross country semi-parametric analysis for four periods, (1970, 1980, 1990, &2000) by replacing the macroeconomic production function with production possibility frontier. They take GDP per worker as an output and three inputs of production, human capital, public physical capital per worker and private physical capital per worker. Alfonso and Aubyn found that i) Private capital or private expenditure is more important for growth and output accumulation than public expenditure; ii) public and human capital contribute positively to growth though the level is mostly insignificant; iii) Better governance contributes positively and helps countries to operate at a close distance from the production possibility frontier(Alfonso & Aubyn 2008).

Bagdigen and Cetintas (2004) conducted a research to validate Wagner‟s low of long run relationship between public expenditure and economic growth for the case of Turkish applying recent econometric technique over the period 1965-200. The researchers first hypothesized public expenditure an outcome of economic growth not the cause. Hence according to them causality is directed from economic growth to public expenditure not the vice versa.

The result of Bagdigen and Cetintas was surprising, on the basis of the co-integration tastes made on the six versions of Wagner‟s low, they found no co-integration between public expenditure and economic growth for Turkish case. Also they found that income growth doesn‟t

result in increase in government size which shows neither Wagner‟s low nor is Keynes hypothesis valid in Turkish economic scenario (Bagdigen & Cetinta, 2004).

Three Delhi researchers, Sahoo, Dash and Nataraj (2010) made a study to scrutinize the impact of public expenditure specifically infrastructural expenditure on economic growth of china. The researchers recognized that, massive expansion of physical infrastructure is the main contributor for China‟s huge manufacturing success and sustained economic growth. With this context, they investigated the role of infrastructure development on economic growth of china for the period 1975 to 2007. The results of the study revealed that expenditure in infrastructure stock, and human capital play an important role in China‟s economic growth performance. Also the study found that there is unidirectional causality from infrastructure development to economic growth.

The results justify why China choose to engage in massive investment expenditure on physical infrastructure and human capital formation in the early nineties. Based up on the results of the study, the researchers also suggest developing countries should devise policies that improve the development of human capital formation and physical infrastructure to achieve sustained economic prosperity (Sahoo, Dash &Nataraj, 2010).

Ekpung also made a trend analysis of public expenditure on infrastructure and economic growth in Nigeria. The main objective of the study is to assess the trend in public expenditure on infrastructure in Nigeria and evaluate the relationship between the expenditure and long-run economic growth from 1970 to 2010. The research finding show that, the rate of urbanization, openness, government revenue, external reserves, population density and type of government (Military or Civilian) determine the size of public expenditure specifically infrastructural in Nigeria. Ekpung based on his analysis concluded that although public expenditure on infrastructure has significant effect on economic growth of Nigeria, the low public spending towards the sector minimized its significant effect on economic growth (Ekpung, 2014).

In Ethiopia, studies conducted in the area are limited, besides they arrive in different conclusions. Agenor et al., (2004) conducted an experiment on the effect of change in the composition of public expenditure on selected sectors of Ethiopia. The experiment is intended to illustrate the outcome of public expenditure strategy that promotes the expansion of public

infrastructure considering its role as engine of growth and its effect on the productivity of public and private sectors. The experiment involved a 7 percent reduction in public spending of certain sectors and reallocation of the reduced expenditure on infrastructure, health and education. In the experiment, the reallocation to infrastructure is twice higher than that of education and health expenditures.

The results of the experiment divulge that, increased health and education expenditures improve the level of public capital in health and the stock of skilled labor creating effective quantity of labor in the country. The increase in the level of effective labor quantity directly affects supply side hence it will affect economic growth of the country. According to the paper, public expenditure on infrastructure also affects the supply side and therefore affects economic growth. The study also found that all the three sectors, infrastructure, education and health affect production but in different ways. Increased expenditure on health and education result in an increase in the stock of effective labor whereas expenditure in public infrastructure enhance the marginal productivity of all inputs used in both public and private production process. However, the effect of the expenditure directed towards these sectors on economic growth depends on the performance of the sectors. According to Agenor et al., among other things, the nature of the production process, the quality of education and the efficiency of the health system determine the performance of the three sectors (Agenor, Bayraktar, &Aynaoui, 2004).

Wondosen (2012) also examined the relationship between expenditure and GDP in Ethiopia using time serious data for the period 1960 to 2011. The main objective of the paper was measuring the impact of sectoral public spending focusing on human capital and agriculture, on economic growth. In doing so the study employed co-integration and error correction models in order to be able to examine the short and long run relationships between GDP and sectoral public spending on human capital and agriculture.

From the two sectors that enhance the development of human capital, that study found public spending on education sector has both short-run and long-run statistically significant effect on economic growth, Whereas health sector spending have negative effect on economic growth, though it is insignificant.

The econometric analysis of the study found that in the short run, for a 1% increase in public expenditure on education and road construction, elasticity of GDP increases by 43% and 3% respectively. However, a percentage increase in health expenditure in short run will affect short run economic growth by 22%.

Regarding agricultural spending, the study found the existence of negative relationship both in short-run and long-run. Statistically, in short -run for one percent increase on agricultural spending by the government, GDP will deteriorate by 8%. Generally the study found that government sectoral spending on human capital and road construction has positive effect on economic growth both in short-run and long run where as agricultural sector spending have an opposite effect on growth (Tsadiku, 2012).

Ketema (2006) also analyzed the impact of public expenditure on economic growth for the period 1960/61-2003/04. The study applied both descriptive and econometric methods to investigate the relationship between public expenditure and real GDP on the three regimes (Imperial, the Derg and EPRDF). The descriptive analysis shows that there is public expenditure discrepancy on the three regimes that limited the impact of public expenditure in stimulating economic growth. The reasons for the inconsistence of public spending mentioned in the study are the existence of limited revenue buoyancy, unreliable source of finance, unwise fiscal policy especially in the Derg regime and capacity deficiency. The econometric analysis applied Johanson Maximum Likelihood Estimation procedure to examine the relationship between sectoral public expenditures and real GDP. The econometric analysis found that investment on human capital has significant positive effect on real GDP in the long-run. On the other hand, government spending on investment (productive) has negative but insignificant effect on growth of real GDP. According to the study this revealed the existence of inefficiency in public investment. Also, the paper found that all components of government expenditure have insignificant effect on economic growth (Ketema, 2006).

Other researchers, Geda and Birhanu (2011) studied the reason behind the low performance of agricultural sector in Ethiopia despite the high level of public spending compared with sub Saharan countries towards the sector as evidenced by prior studies of WB and IFPRI. Focus was

given on the existing budgetary and planning system of Ethiopia at macro level by the researchers. The study revealed the fact that the planning and budgeting system in Ethiopia is at infant stage and needs to be reformed in order to maximize the effect of public spending and establish sustained economic growth. Based on their finding, Geda and Birhanu suggested appropriate planning and design that clearly defines objectives, outputs, outcomes and impacts is essential on public programs and projects so as to be able to achieve efficient resource allocation across public sectors (Geda & Birhanu, 2011).

Siraj (2012) also made analysis on the relationship between government expenditure and economic growth and the role played by ODA in assisting government expenditure in Ethiopia. Similarly as most of the other studies on the area, Siraj employed both descriptive and econometric analysis. The econometric analysis adopted Ram‟s model of 1986 to gauge the effects of various components of public spending on economic growth by using time serious data for the period 1975 to 2010. The findings of the analysis show that public spending on human capital development and physical investment has positively contributed to the economic growth. The study also revealed that expenditure on public consumption goods have significant negative effect on the real GDP growth which shows the unproductive nature of the spending as stated by Barrow (1990).

Chapter Three

Empirical analysis

Introduction

This chapter mainly deals with descriptive analysis of the trend of public expenditure in Ethiopian economy. The first part of the descriptive analysis asses the trend of public expenditure and its effect on different macroeconomic variables in the country. The second part provides an insight on the performance of public infrastructural expenditure in the country.

3.1. The Trend of public spending and Economic growth in Ethiopia

The growth trend of the Ethiopian economy for most of the recent past is characterized by its moderate level of performance and its nature of high volatility. After the end of the civil war to over throw the Derg regime and the restoration of political stability in 1991/92, the new government adapted free market economic principle with the aim of encouraging private participation while decreasing government activities. The government liberalized the market at the first Phase of economic reform program (1991/92-1995/96) with the aim of removing government control on market prices. In addition, the government minimized the level of public expenditure and tried to stabilize the macro economy by reducing the inflation rate (NB &MoFED 1998).

The government also changed the previous centralized system of fiscal administration by introducing fiscal federalism or decentralization was introduced in the country in 1991/92. The fiscal federalism system which is originated during the transitional government period was ratified by the constitution of the Federal Democratic Republic of Ethiopia gave the rights of nations and nationalities and peoples to administer their own affairs within their defined territory.

The constitution gave power to each and every regional government the rights to formulate and execute social and economic policies; prepare, approve and implement their own budget, the right to plan direct and administer their own social and economic development programs (Mogues et al., 2008).

The government has designed and implemented two five year and one, mead term development plans before GTP. The first three years plan (mead term plan) called Sustainable Development and Poverty Reduction Program (SDPRP) which was undertaken between 2002/03 and 2004/05. The first five year development strategy of the Ethiopian government known as Agricultural Development–Led Industrialization (ADLI) have a main goal of attaining fast and broad based development on the agricultural sector and uses this surplus production to power economic growth of the country. As a policy, ADLI stipulated the allocation of public expenditure in agriculture and other infrastructure and social sectors that have contribution to the productivity of agricultural sector. Hence the public expenditure policy of Ethiopia at the period has a major objective of providing ADLI with the needed financial support (Mogues et al., 2008).

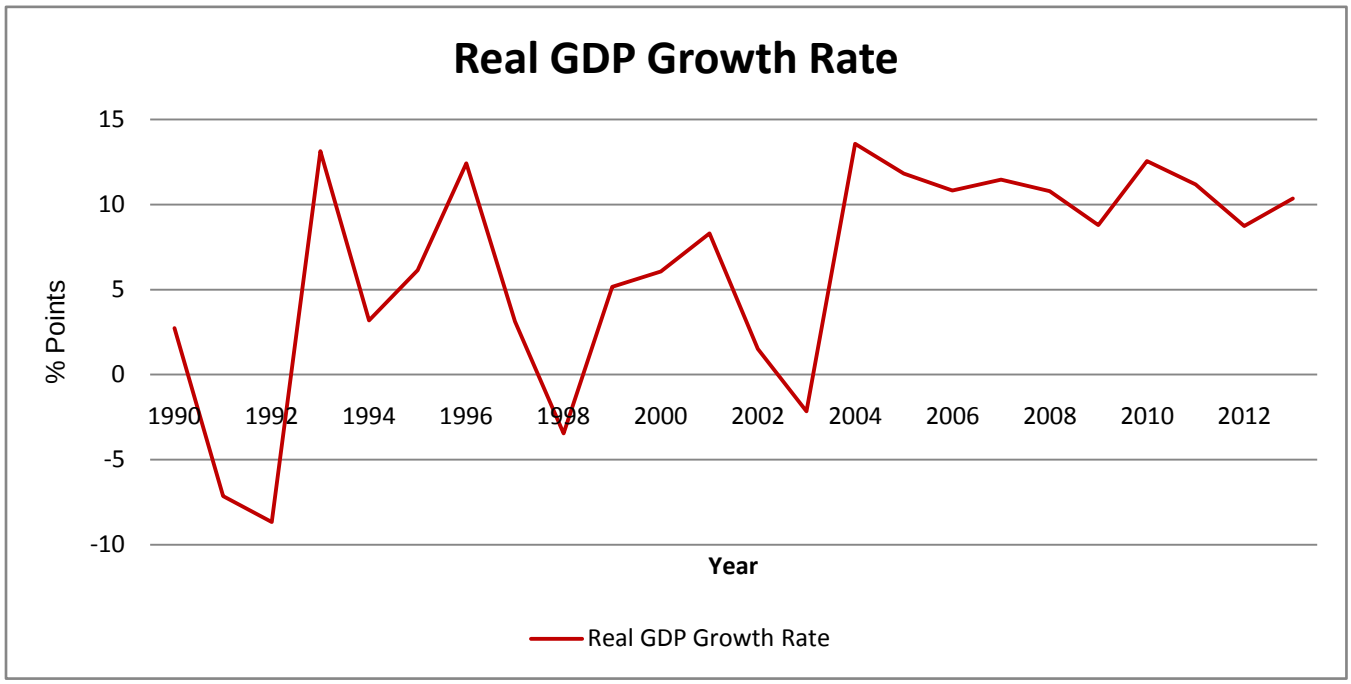
The second program Plan for Accelerated and Sustained Development to End Poverty (PASDEP) was undertaken between 2005/06-2009/10. The program was aimed to eradicate poverty and improve the level hood of the society through accelerated and sustained economic growth (MoFED 2012).

The expenditure policy of the government in the PASDEP period is targeted to build economic and social infrastructure and provision of basic services with a focus of poverty eradication. During the seven years of SDPRP and PASDEP the share of capital expenditure have grown 30% per annum and reached a total of 55% of the total expenditure, while the share of current expenditure reduced to 45% from the previous 58%. This shows the recent trend of government outlays targeted productive investments that significant share of the spending goes towards the development of infrastructure and social facilities (MoFED 2012& 2013).

The Ethiopian economy before 2004 was volatile and shows large discrepancies. Two major factors contributed for the fluctuation in the performance of the economy, the performance of the agricultural sector and war. The agricultural sector consisted of mainly small holder farming and livestock production is the main driver of economic growth in the country employing 80% of the country‟s population and covering 50% of the country‟s GDP. The development of irrigation in the country is minimal that agricultural sector is largely dependent on rainfall. The growth rate of real GDP in Ethiopia for most of the recent past is erratic as the result of the fluctuations in the performance of this sector. Thus the most probable sources for the fluctuation in the economic output of the country are natural factors mainly rainfall level (NB 2012).

War also played a significant role in fluctuation of real GDP of the country. The beginning of the decade in 1990‟s the period where by the Derg regime was overthrown by the transitional government was marked by political and economic instability resulting deteriorating GDP growth. As shown in the graph above, the level of per capital GDP growth reached its lowest point in 1991/92 around to -8% since the country‟s economy at the time was affected by the civil war. Right after the end of the civil war the political stability and economic restoration real GDP raised by more than 13%.This sharp increment is also related with the increase in agricultural production as a result of peace and economic stabilization in the country (MoFED 2012& 2013).

Figure 3.1 Economic Growth (Real GDP Growth) of Ethiopia



Source MoFED (2013)

The trend of real GDP growth continued to fluctuate for a while and reached negative point for the second time in five years in 1998 (-2.9%). The above two reasons again played a vital role for the deterioration of the real GDP growth in 1998/99. The outbreak of border conflict with Eritrea, where large government expenditure was directed towards financing the country‟s defense sector and decreased external trade. In addition to the war, the macro economic performance of the country at the time was also affected by the deterioration of agricultural production due to the drought incidence.

After the end of the war, to avert the downward trend of the economic performance, the government prepared macroeconomic reform and recovery program. The main objective of the program was to attain macroeconomic stability and sustained economic growth by rehabilitating and recovering affected sectors of the economy. The program was supported mainly by the IMF under a three-year Poverty Reduction and Growth Facility (PRGF) arrangement. The program

also gates support from the International Development Association (IDA) and other development partners. The government aimed to reduce the deficit to a sustainable level by reducing defense expenditure. The recovery program reorients the reduced defense expenditure to poverty focused sectors in addition it supports reforms in public sector management, public expenditure policy and management, private sector investment and export competitiveness. The program is also targeted to rehabilitate war damaged community structures, resettlement of displaced households.

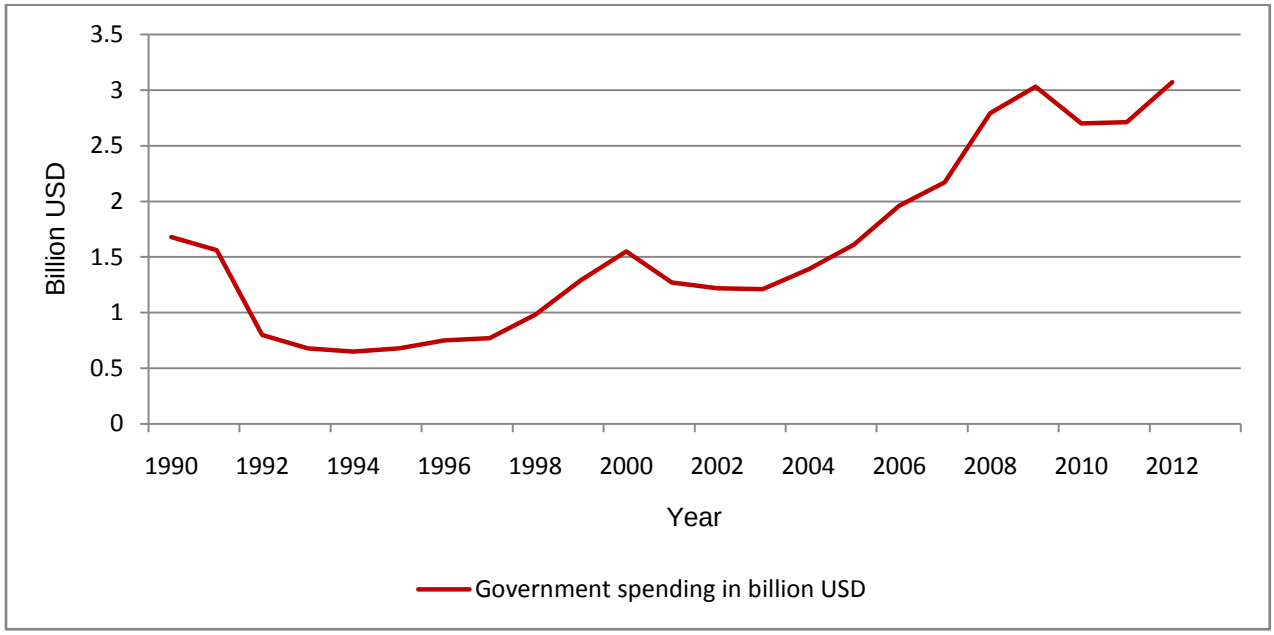
Accordingly, expenditure targeted at poverty reduction was increased in 2001/02, even though total government expenditure has decreased due to the reduction in defense expenditure to reduce budget deficit as planned. Poverty targeted expenditures that are intended on improving delivery of services that affect human capital development components (education and health), increase the efficiency of production and enhance the income earning of the poor (agriculture and infrastructure) increased from 4.5% of GDP in 1999 to 5.2% in 2001/02.

Also with the implementation of the reform after emerging from conflict with Eritrea, the country registered positive economic growth. Real GDP growth in 2001/02 maintained an upward trend at 7.9 per cent from 5.4 per cent in 1999/00 and the yearly average of 4.8 per cent during 1994/95-1998/99. Mainly three factors contributed for the raise in the real GDP growth performance of the country after the Ethio-Eritrean war. First, there was a sharp increase in the agricultural surplus production even it was the biggest expansion in five years. Second, there was high provision of external aid which enabled Ethiopia to withstand shortfalls in export earnings after the end of the war. Thirdly, there was improvement in macroeconomic stability, with narrowing budget deficit and the growth in monetary aggregates slowing down.

However the progress of real GDP growth is limited for a short run that it declined sharply in 2002/03 to -1.7%. The sharp decline was again associated with the low level of rainfall and its resultant large reduction in agricultural output. Right after 2003 the growth rate of real GDP increased rapidly and reached 13.6% in 2004. This high growth performance is again related

with the high production performance in the agricultural sector and the negative growth rate in 2003 that lowered the base year level.

Fig 3.2.Trend of public spending in Ethiopia



Source: World Bank 2013

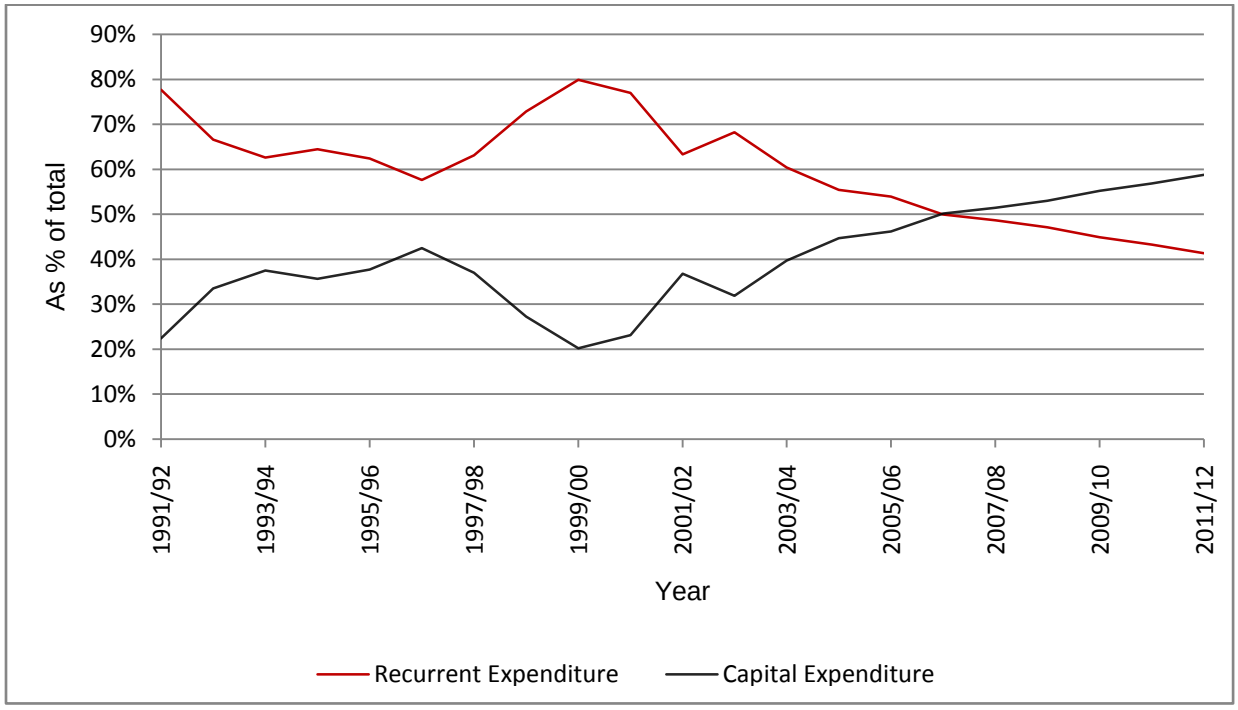
Regarding the share of public expenditure to the aggregate GDP, there is large discrepancy in the level of public expenditure in the periods studied. As discussed above, in the first years after the fall of the Derg regime, the transitional administration and the EPRDF government decided to take policy measures that minimize the size and role of the government in the economy where by the government strategy was focused towards facilitating growth indirectly by supporting the private sector. Thus the period was marked by the privatization of government owned sectors so as to reduce its direct involvement in the production and provision of services while the private participation is enhanced.

This is clearly seen in Figure 2that the amount of public expenditure declined sharply after 1991/92consecutively for 5 years. The ratio of public expenditure to GDP also declined by around 5% after 1991/92 and rolled between 8 and 9 percent in the later year. However starting from 1998/99, the level of public expenditure began to rise immensely. The share of public expenditure to GDP also raised and reached an all times high level of 35% in 2000 and 2001. The raise in public expenditure in this period is the result of increased military expenditure to finance the war with Eritrea.

3.1.1. Composition of Public Spending

So far as the effect of public expenditure on economic growth is concerned, literatures suggest that expenditure on capital investments is considered as growth enhancing than expenditure on recurrent goods.

Figure 3.3The composition of public spending



Source: MoFED different collections

The trend in the components of public expenditure shows that for mach of the past two decades (1991/92 up to 2007/08) after the fall of the Derg, government spending productive capital investments is minimal. The above graph shows that the level of capital expenditure from the total expenditure was very low at the time of transitional government (1991/92) where much of the public spending goes towards recurrent spending targeted to support and revitalize war suppressed sectors of the economy. After 1992/93, the level of capital expenditure started to grow and reached around 40% of the total expenditure in 1996/97where as recurrent expenditure started to decrease. However, the increment in capital expenditure started to decline after 1998/99due to the emergence of the Ethio-Eritrean where the level of defense expenditure of which the share of recurrent expenditure began to raise.

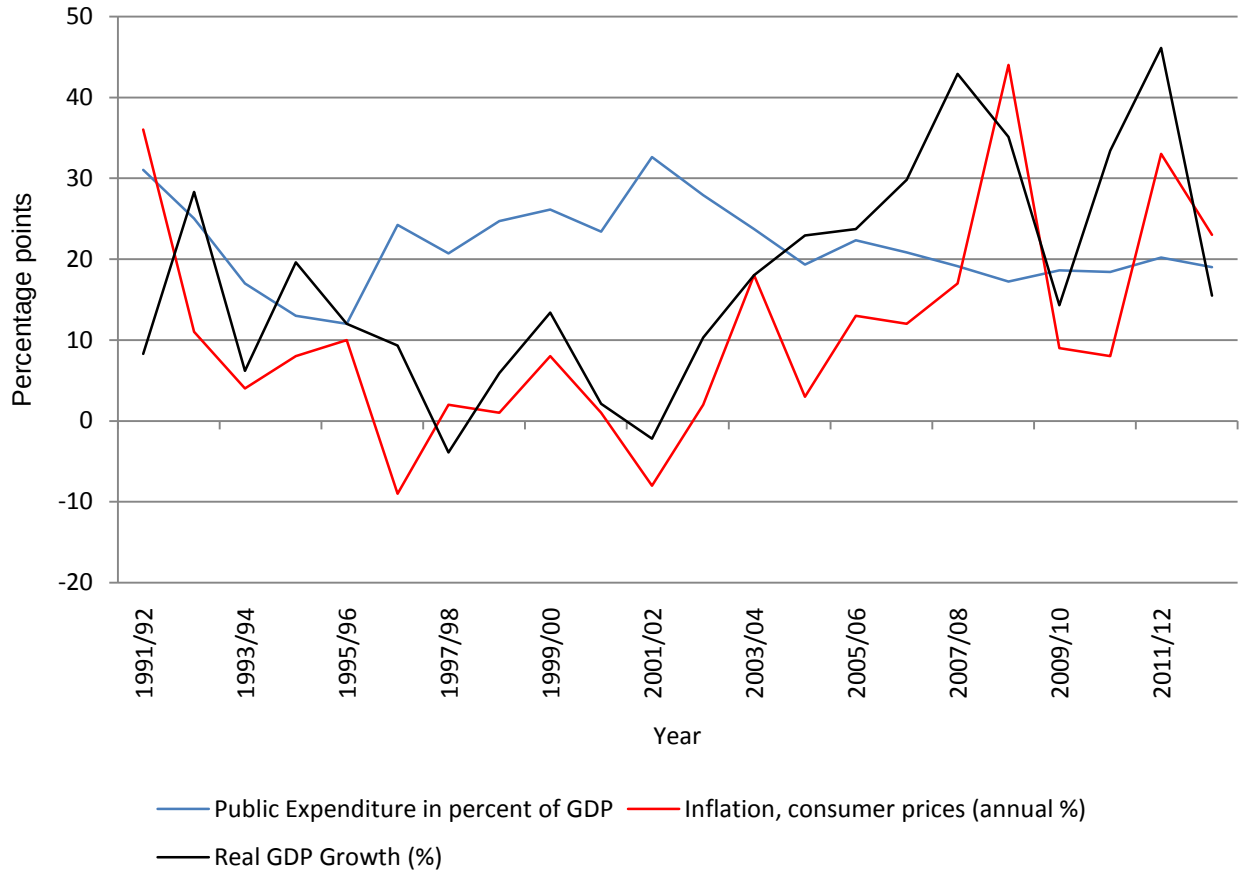
GDP remained unchanged in 2001/02 at 22% however capital expenditure compared with the war period (see figure 4). After the end of the border conflict with Eritrea, the share of defense expenditure declined sharply with around 4 to 15 percent hence the share of current expenditure to GDP declined significantly. On the other hand, the level of capital expenditure rose by 13.1% due to the increase in poverty targeted expenditures. The share of capital expenditure after the war continued to rise consistently and exceeded recurrent expenditure for the first time in 1999. The increase in government spending on growth enhancing sectors such as roads, energy, education and health sector played a vital role for the increase in capital expenditure. This indicates after 1999/00 the greater share of the country"s expenditure was directed towards productive investments.

3.1.2 Effect of Increased Public Expenditure on Macro Economy

It is known that Ethiopia has registered a rapid economic growth for the past eight years starting from 2005/06. However, Along with this growth, the country has seen an accelerated, double-digit increase in the price of goods and services. The souring in the price of consumer goods in the country coupled with the high level of demand for consumer non durable goods affected the living condition of the society. The main cause for the raise in the level of inflation in Ethiopia is not clearly known. However, we can see from the chart below the trend of inflation in the

country show the existence of strong relationship with the level of real GDP growth which in return is associated with the raise in government investment expenditure of increased public spending in the country at list in the short run.

Figure 3.4 Public expenditure and Macro economic variables



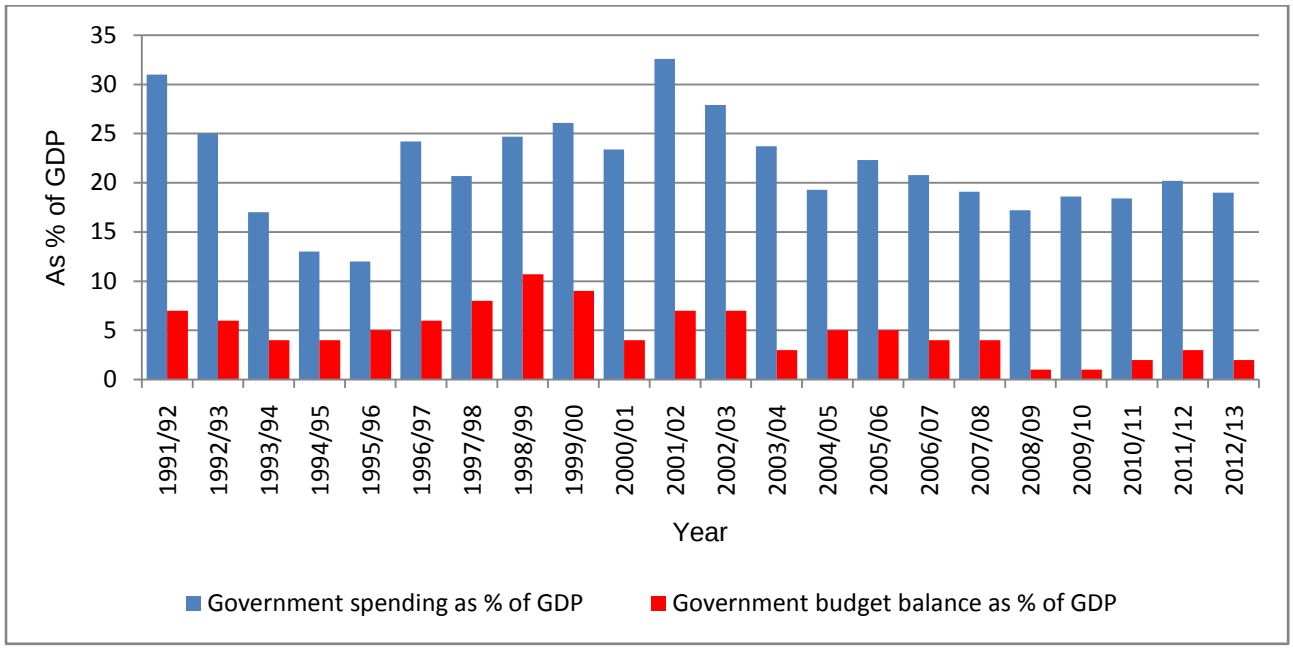
Source: NBE 2013 & own calculation

The above graph shows the existence of close positive relationship between inflation and real GDP growth. In 2007/08, the level of real GDP growth have raised to 42% accordingly in the following year 2008/09 the level of inflation raised to an all time high level of 44%. This indicates the increase in the growth of real GDP in one year may induce the level of inflation to rise in the coming year. Thus the high level of inflation in 2008/09 is attributed mainly to

monetary expansion in relation to real GDP growth in addition to the rise in the world food and fuel prices at the time.

The raising level of inflationary pressure in 2008/09 has resulted in reduction the purchasing power of the Ethiopian birr. This may be the cause for the increased consumption expenditure of the private sector and a reduction in the private capital formation or private investment. As we can see from figure 7, the level of private capital formation in 2008/09 was reduced moderately.

Figure 4.5 Government budget balance as percent of GDP



Source- MoFED and World Bank

Regarding budget deficit, the gap between government revenue and spending excluding grants is negative in all the periods examined showing there exists deficit in government budget balance. The level of the deficit in Ethiopia varies between the years studied due to the change macroeconomic policies specifically in the fiscal policies of the country. During the first years of the EPRDF administration 1992/93 since the government applied macroeconomic policy measures to reduce the level of public expenditure, government budget deficit began to reduce to less than 5%. However the gap between government revenue and spending began to widen

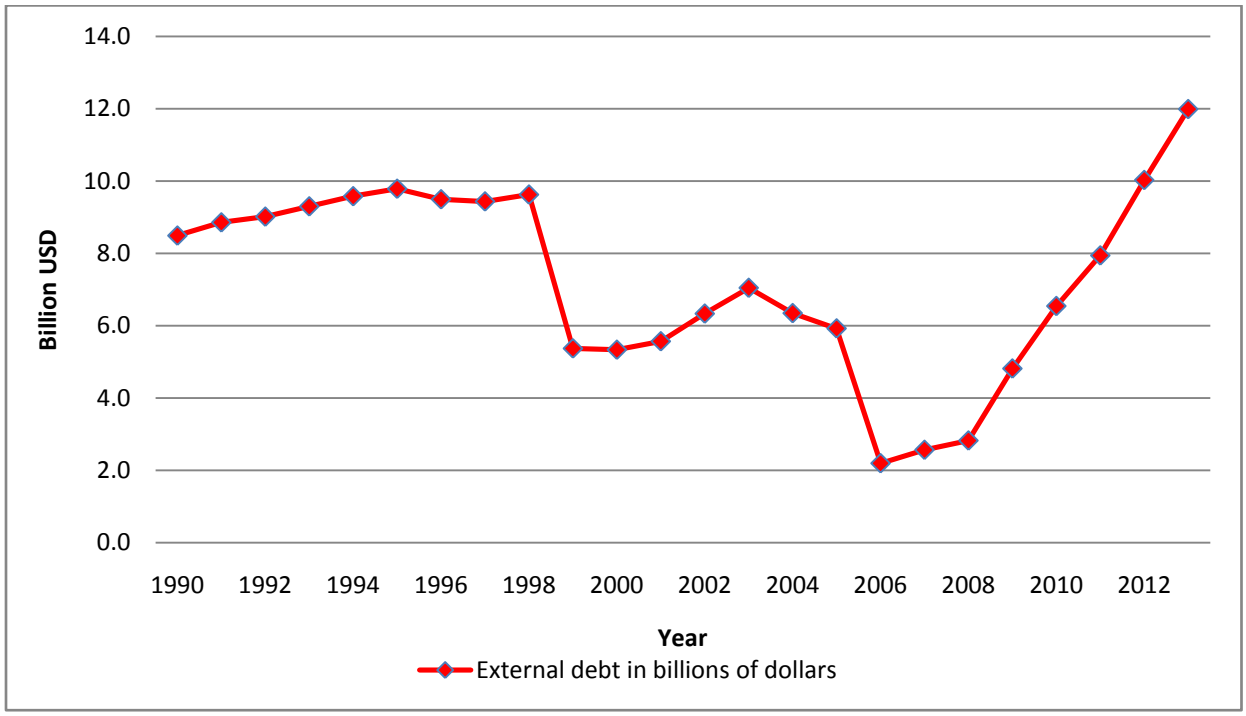
starting from 1994. More interestingly even though public spending between 1995 and 1998 has not changed, government deficit has increased due to the decrease in the level of government revenue in the periods. With the out brake of border war with Eritrea in 1998/99 the level of deficit raised sharply. However, the deficit level reached its maximum point in 2001/02to more than 10% of the GDP. This huge deficit level is the result of the drought incidence that reduced the agricultural revenue of the country and the war with Eritrea that increased the country‟s military expenditure.

Recently with the raise of government expenditure, the deficit level of the country is rising annually. For instance in 2012/13 poverty targeted expenditures increased by 23 % to 107.8 billion Birr consequently, the overall budget deficit, excluding grants, was 29.8 billion Birr or 3.5 % of GDP which is higher than the 2% deficit level of 2011/12.

The annual budget deficit in Ethiopia is financed both from domestic and external borrowings. The raising level of budget deficit recently associated with the expansion of public investment, resulted total public debt of the government to enlarge significantly. The stock of Ethiopia‟s external debt is steadily increasing with annual average growth rate of 21% over the past decade and reached 11.1 billion in 2012/13 from $2.7 billion in 2005/06.

As we can see from the graph below, the level of external debt borrowed to finance the budget deficit which intern is the result of increased public expenditure is getting larger and larger recently. The trend showed reduction from 1998 to 2000 and showed some growing tendency especially in 2002, the period where drought and war affected the country‟s economic performance.

Figure 3.6 Public External debt Level of Ethiopia



Source: World Bank 2013

The IMF (2003) standard sustainable ratio of external debt calculated in Net Present Value (NPV) to export earnings is 150% and to GDP is 40%. A threshold above this is harmful for the economy.

The ratio of present value of total public and publicly guaranteed (PPG) external debt to GDP of Ethiopia in 2005/06 was 44 % after seven years in 2012/13 it is declined to 14% percent. Similarly the ratio of PPG external debt to exports at present value declined from 284% in 2005/06 to 110% percent in 2012/13. This shows the current Ethiopian debt sustainability is at low risk.

As discussed in the theoretical literature part, theories suggest that reasonable levels of borrowing if invested in productive areas promote economic growth through factor accumulation

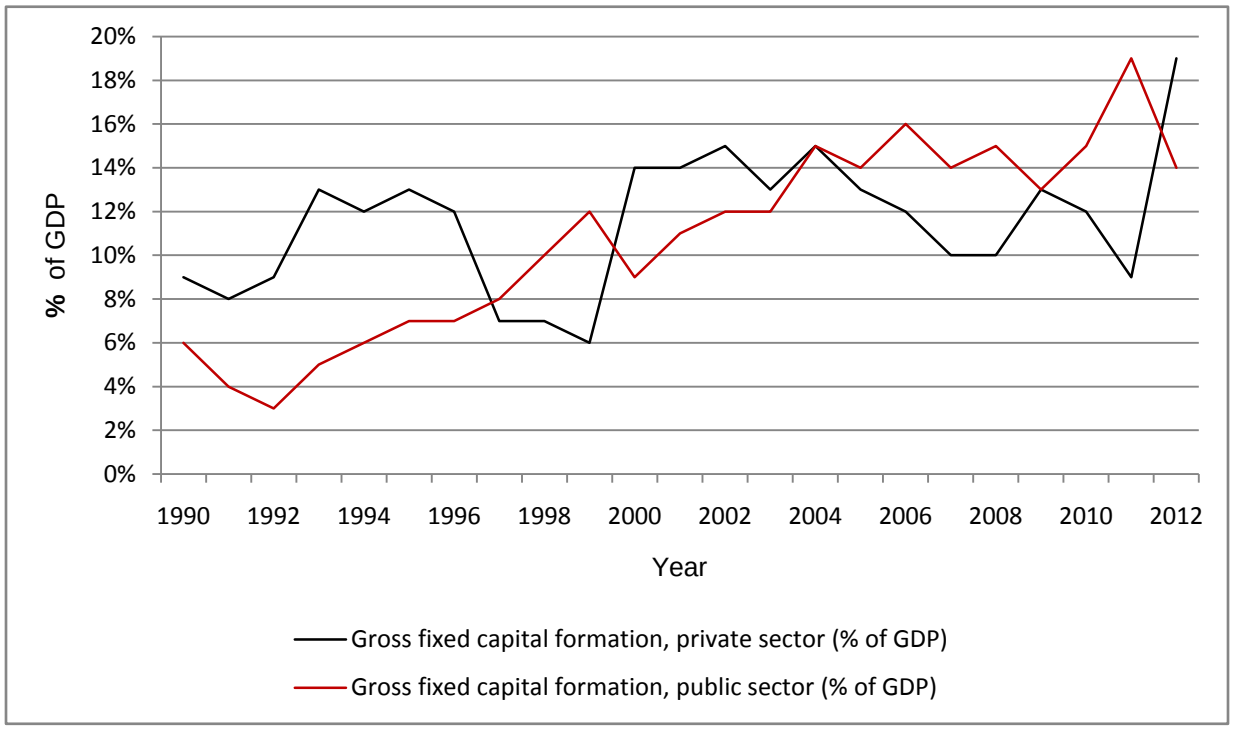
and productivity growth. However, the benefit of debt especially external debt may not be acquired and can even result in economic collapse if it is not properly managed and gets accumulated beyond a certain threshold. The level of external debt in Ethiopia is mounting from time to time whereas the annual debt servicing ratio to GDP is less than 2% of the total outstanding stock of external debt.

The recent disbursement of external debt to various sectors of the economy indicates that high percentage of the debt is spent to finance the countries infrastructural projects. For instance a report by MoFED (2008) indicates that in 2005/06, 42% and in 2006/07 37% of the external debt was spent electric power expansion. Thus, assuming there is efficient resource utilization in the country, the allocation of the debt to productive investments will have a greater chance of generating return in the future.

Financing deficit through external loan is one of the fiscal strategies advised for developing countries. Since domestic borrowing from banks result in inflation in the economy or it may result in shortage of credit for the private sector, the government relied on external borrowing to finance the deficit. Nevertheless, recently the level of domestic borrowing by the public sector is rising in Ethiopia that the highest portion of the deficit is financed by domestic borrowing. The growth rate of domestic debt as compared with the preceding year in 2002/03 was 2.4% however it was increasing with an increasing rate after that and in 2011/12 it reached 39. Thus with raising level of domestic debt, it is vital to see macro and micro economic vulnerabilities as large public investments draw financing from domestic sources. In addition, creating shortage of money supply, the raise in the level of domestic borrowing for public investments beyond a certain limit could also destabilize the inflation rate.

One of the main reasons behind positive and sustainable macroeconomic performance depends on investment and its sources of financing (either public or private). During the Derg regime the share of public investment from the aggregate capital formation in the country take the highest share. After the fall of Derg, there has been an institutional shift from public to private where by the government with draws from the market to enhance private participation.

Figure 3.7 The trend of gross fixed capital formation in Ethiopia



Source: World Bank (2013)

The annual gross fixed capital formation measures the amount of fixed investment produced domestically in a country within one year. The gross fixed capital formation of the private sector was higher than the public sector before 1998. However after 1998 the share of public sector on the country"s gross fixed investment began to rise that the public sector played significant role in the investment process of the country. After 2006 the government heavily dominated the private sector and reached its peak 19% of GDP in 2010. This indicates that, as a result of increased public sector expenditure in recent years, the private fixed capital formation has minimized as compared with the public sector. However, though the public sector investment surpassed the private sector for the past ten years, when measured separately against its own previous performance, the trend of private sector capital formation has grown moderately.

The annual growth of total gross fixed capital formation of Ethiopia show double digit increment according to the World Bank report for the past seven years. The growth further reached 29% in

2012 which is among the highest in Africa. This indicates the growth of public investment in one way has opened an opportunity for the creation or expansion of new and additional private investments and increased the gross investment level on the other. `

3.2. Public Investment on Infrastructure in Ethiopia

Ethiopia is a predominantly rural country. Addis Ababa, which is in the middle of the country, is by far the largest urban center. Population and agricultural activity are concentrated in the central and northern areas of the country, and the far south and east are only sparsely inhabited. Ethiopia‟s infrastructure backbone development therefore tends to be centered in Addis Ababa and to spread from there outward.

Expansion and maintenance of infrastructure such as road and electric power supply have huge benefit in accelerating the economic growth of a country. Public investments on infrastructure sector enhance the productivity of the private sector and will support pro-poor growth in a number of ways such as creating access to market and public services, creating employment. During the past several years, huge investment has been directed to finance the development of the sector. However, the country‟s infrastructure base has not yet reached its advanced level. Limited human capacity at local level, the requirement of huge finance especially in the form foreign currency acted as bottlenecks for the growth of public infrastructure development in Ethiopia.

Based up on the PASDEP achievements, the government drafted another 5 year integrated development plan. Similar to the previous development plans (ADLI & PASDEP), the main objective of GTP is eradicating poverty while rapid economic growth is taken as the key strategy to achieve this stated objective. The rapid economic growth is targeted to achieve 11.2 – 14.9% GDP growth annually and is expected to be broad based, equitable and sustainable for long run. The plan is also intended to achieve the Millennium Development Goals (MDGs) and attain

middle-class income status by 2025. To achieve these goals, the government is investing heavily in large-scale public investments in infrastructural, social and energy projects.

According to World Bank estimation, to address Ethiopia‟s infrastructure shortage until 2020 a sustained annual expenditure of 5.1 billion USD is required annually. The report indicates the power sector alone requires 3.3 billion USD that is equivalent to 40% of the country‟s 2013 GDP. This indicates compared to the size of the economy, the spending needed to upgrade the country‟s infrastructure platform to a level that fully saturates the domestic demand and further realize its power export potential is very large. As of 2006, the gap between available and needed funds was $3.5 billion per year.

The existence of this huge funding gap dictates a careful allocation of this scarce resource on productive areas that enhance the growth of the economy and improve livelihood of the society. This involves identifying infrastructural needs sating targets and prioritizing key areas for public investment.

The concept of public capital in infrastructure in this paper includes those public goods that enhance the productivity of the private sector. Thus road sector that will provide access both input and output market for the private sector and energy sector that will contribute to an increase in the productivity of the private sector by taking part in the production process are selected as indicators for examining the effect of public expenditure on economic growth.

3.2.1 Energy sector

The first growth and transformation plan of Ethiopia (GTP I) has a target of achieving 11 to 14.9% annual growth of GDP until the end of the plan period in 2015. During its 5years of implementation, the GTP planed the industrial sector to play a leading role in the economy with presumed growth of 21.3%. The rest two sectors, agricultural sector with 14.9% and service sector with 12.8% growth are aimed to follow the industrial sector (MoFED 2012).

In order to achieve the planned growth in the industrial sector and other sectors, improvement of the country‟s public infrastructure is highly essential. Constraints caused by the inadequacy of

infrastructure in Ethiopia reduced the productivity of firms by 50%. (Foster et.al 2010). More importantly, according to Foster the inadequacy of energy supply is the main constraint affecting the production of firms in the country.

Since the expansion of the industrial sector entail the introduction of heavy duty manufacturing machineries and plants, the demand for energy will escalate exponentially. Similarly the growth of advanced mechanized farming in the agricultural sector will also demand higher energy supply and the same is true for the service sector. With the accelerated economic growth in the country, the demand for energy consumption have raised in the past decade.

The consumption of energy in the country depends largely on biomass energy sources (such as wood and charcoal) that comprise around 92% of the total energy consumption. With the exception of dry animal dung, these biomass energy sources are non-renewable. Thus, the most important issue in the energy sector is the supply of household fuels, hence relaying on these type of energy source is associated with massive deforestation and the resultant land degradation. The other energy source is oil, which accounts about 5% of the total energy supply in the country. Since oil is imported with expensive foreign currency which is expected to soar in the future. Moreover, due to its high cost, most of the Ethiopian population cannot afford this source of energy. The above facts show that the countries energy supply depends on sources that, either would soon be run out or are very expensive.

However, the country has abundant renewable electric energy sources such as hydro electric, geothermal and wind. Nine of the major rivers in the country are suitable for hydroelectric power generation with a total capacity of generating 45,000 MW. If utilized effectively the hydro electric power source of Ethiopia has the potential in making the country the largest electric power producer and exporter in Africa. In addition, the long term marginal cost of generating hydro power in Ethiopia which is $ 0.04 per kWh is among the lowest in Africa. The topographic condition of Ethiopia has an advantage to generate wind power and also the country is endowed with vast potential of generating geothermal energy.

Moreover, in accordance with the non renewability and expensiveness of other energy sources (biomass and oil) in Ethiopia, the expansion of electric energy generation will benefit country in the following three major ways;

i) It will replace the use of combustible non-renewable sources of energy and rescue the country‟s biomass from depilation.
ii) Complement the oil energy source in order to support the energy demand in the transportation sector with the introduction of electric train and other electric automotives.
iii) It will generate foreign currency if exported to neighboring countries, which are highly in need of electric power supply.

Even though Ethiopia has high potential to generate electric power, until recently the provision of electricity is minimal as compared to the demand in the country. For instance, electricity supplies only 2.6% of total energy consumption in the country that only 10% of the Ethiopian population had access to electricity in 2009. The average per capita power consumption in the country is around 33.6KWh which is very low as compared with the 99.5KWh average consumption level of similar low income countries.

The central actor in the much needed development of Ethiopia‟s power network is the Ethiopian Electric Power Corporation (EEPCO). EEPCO is mandated with the task of generating, transmitting, distributing, and selling electricity in Ethiopia. The corporation generates electricity through two different power supply systems, the Inter Connected System (ICS) and Self Contained System (SCS).Among the two systems, the ICS which is largely generated by hydropower plants (99%) constitutes the major source of electric power in Ethiopia supplying about 99% of the electric power supply in the country.

Recognizing the shortage of electric power supply in the country and the importance of electric energy to the economy, the government built three hydropower plants with a combined capacity of 1.18GW in 2010. This expansion alone is more than double of the total supply until 2009.

The recent trend in electric power supply and consumption in Ethiopia show a rapid increment. Accordingly, the major plan of the energy sector in Ethiopia during the GTP period is to meet this ever growing demand for energy by providing sufficient and reliable power supply that meet international standards and regulations. In order to achieve the stated objectives, ongoing and new construction of hydroelectric power and other renewable energy generation projects is underway and will continue in the future. The electric power transmission grids will also be strengthened and expanded to provide access to regions all over the country and further to neighboring countries for export. The construction of five other large dams expected to be finalized in 2015 which increase the capacity by more than 11 GW. The 25 year master plan of EEPCO have a target of constructing large dams including the Grand Ethiopian Renaissance Dam and is targeted to raise the total capacity to 15 GW.

The benefits of the dams built is not only limited to meet the growing electricity demand in the country it goes further to export power to neighboring countries such as Sudan, Kenya and Djibouti. The dams are also expected to benefit the agricultural sector by providing irrigation and fishery development.

Financing Energy Sector

The construction of such large dams involves large costs that are both tangible and appear in the balance sheet and intangible costs that is difficult to quantify. Environmental costs that are associated with the construction of the dam and its permanent effect after its completion; social displacement costs on communities around the dam are the major intangible costs.

However only the tangible costs which are associated with direct government expenditures spent in constructing this large hydro power projects are the focus of this paper. The tangible costs of constructing this large hydropower dams and power transmission and distribution lines are very large thus involve serious fiscal policy decisions of resource allocation. The total government expenditure for the construction of dams that have been completed since 2009 and are scheduled to be completed by 2015 is estimated at about 11 billion USD. The cost is equivalent with one third of the annual GDP of Ethiopia for five years until 2015 and it does not include the cost to build transmission lines and distribution grid.

Table 3.1 Large scale Hydro power Generation Projects

No.	Project Name	Installed capacity	Year of Completion	Source of Finance	Cost
1	Gilgel Gibe I	180 MW	2004	World Bank	$331m
2	Tekezé	300 MW	2009	China	$365m
3	Beles	460 MW	2010	Ethiopian government	
4	Gilgel Gibe II	420 MW	2010	Italy and EIB	Euro 370m
5	Gilgel Gibe III	1,870 MW	2014	Ethiopian government and China	Euro 1.55bn
6	Fincha Amerti Nesse (FAN)	100 MW	2012	Exim Bank of China	$276m
7	Halele Worabese	440 MW	2014	NA	Euro 470m
8	Gilgel Gibe IV	2,000 MW	2014	China	$1.9bn
9	ChemogaYeda	278 MW	2013	China	$555m
10	GenaleDawa III	256 MW	2015	China	$408m
11	Grand Ethiopian Renaissance Dam	6000 MW	2018	Ethiopian Government	Euro 4.8 billion

Note: NA – Not Available Source: EEPCO (2013)

The common cost measurement method of electric power is expressed in terms of long run adjusted marginal cost of providing 1kWhin USD. The combined generation, transmission and distribution of electricity in the GTP is estimated to be 0.067 USD per kWh. The average electricity tariff in Ethiopia is 0.032USD per kWh in real terms and it has not been revised since 2006 and it was even lower than this amount before. This shows the price of electricity in

Ethiopia is lower than half of its provision cost. Hence, given this low tariff level of electricity in Ethiopia, the price has to increase by more than double to cover its marginal cost.

3.2.2 Road Sector

Poor infrastructure and high transport costs for moving row materials or outputs are often identified as key constraints for industrial development in low-income countries. Ethiopia is heavily dependent on road infrastructure for transporting freight and public transport services. Water transport is minimal in the country since only few of the country‟s major rivers are navigable due to the mountainous topography of the country.

Ethiopia, a country having five times larger geographic area than United Kingdom has six times smaller total road network. The total road network of Ethiopia during the transition period in 1991 is 19017 Km. Recognizing its wide applicability for transportation and thus its importance in supporting social and economic activities in the country the new government of Ethiopia formulated a massive road infrastructure building program called Road Sector Development Program in 1997.

RSDP initially was a two phase program planned to end in 2008. However the program was extended to have four phases having additional three years life span until 2010. Again, with the introduction of the GTP the government formulated the fourth RSDP program and extended the plan for additional five years, planned to be finalized by 2015. Generally, this program under the Ethiopian Roads Authority (ERA) undertakes public investment and other policy issues related with the development of road infrastructure in the country.

Below is the chronological list of RSDP phases with their fifteen year implementation periods

- RSDPI from July 1997 to June 2002 (5 year)
- RSDP II from July 2002 to June 2007(5 year)
- RSDP III from July 2007 to June 2010 (3 year)
- RSDP IV from July 2010 to June 2015 (5 year)

The first phase of the program gave priority to build road infrastructures that improve access to ports, potential areas with new resources, areas vulnerable to drought and shortage of food and maintain equitable road infrastructure between regions. In order to achieve these priority objectives, large share of expenditure were allocated to asphalt and gravel road building. Totally during the five years of RSDP I, new roads 6417Km where built and the total stock of road network in the country rose to 33297Km. In doing so, a total of 7.28 billion birr was invested out of which more than 4 billion birr was funded by the government.

The second phase of the program RSDP II is implemented from 2003 to 2007. The program was designed with a major objective of improving road access especially to the rural population. Focus was given by the program to address the low level of road connectivity among regions and it emphasized the development of rural roads, which will benefit mainly the rural poor population. A total of 18.1 billion birr were spent on the program and the total major road network rose to 42429Km. The program also implemented Productivity Safety Net Project (PSNP) and constructed 57,000Km of community roads under "food for work" scheme. The PSNP involved large portion of the rural population where they got payment in the form of food by constructing the roads in addition to gating access to rural road infrastructure.

The third RSDP program was the continuation of the previous program having similar objective of improving access to road particularly to the rural portion of the population. The program also gave focus to build the capacity of the regional and federal road authorities‟ effective management of the road sector program and improve the overall quality of the road network in the country. A report from Ethiopian road authority indicates that the total road network of the country after the completion of RSDP III in 2010 reached 53,997Kmand the average road density had increased to 44.4km per Km^2.

The fourth RSDP program is planned as part of the second growth and transformation program for five years (2010/11-2014/15). During the five years implementation periods of GTP I, 4331 Km of new trunk/link roads construction, 5023 km of upgrading of trunk and link roads is planned in addition 4700 km of periodic maintenance 84,649 Km of routine and term maintenance are included in the program. Pre construction studies and institutional capacity

building activities to holders in the program are also planned to be done within five years (See MoFED 2010).

RSDP IV have a major sub program called Universal Rural Road Access Program (URRAP) which was launched in 2010/11 with a target of connecting all Kebeles in the nation by standard all weather roads that provide year round access until2014/15. Hence, currently 62% of the rural population still do not have access to road, the sub program have a plan of constructing 71,523 km of all-weather roads ensuring close to 80% of the total rural population with year round access. However, during the first year of implementation in (2010/11), only 854 km of roads were constructed. The total cost of the program is estimated at ETB 26 billion and will be fully financed by the Government of Ethiopia.

During the total 15 years (from 1997 to 2012) of RSDPs‟ the road network expanded with more than double of its previous amount 26,550Km to 56,100Km. This development is the result of the increased public expenditure to the road sector that reached a total amount of 108.5 billion birr until 2012.

Financing Road sector

The cost of road construction has soured up after 2011 and affected the performance of the sector. The increase in fuel prices, shortage of construction materials coupled with their soaring price, limited competition in the construction industry, shortage of skilled man power, currency fluctuation and inflation both in global and national level are the major causes for the ever increase in the cost of road construction.

Over the last seven years of SDPRP and PASDEP there has been a massive increase in funds allocated for road construction. State spending on roads accounts for a quarter of each year's infrastructure budget and the government has earmarked the equivalent of 4 billion USD to build, upgrade and repair roads over the next ten years.

Financing the construction and maintenance of roads is a difficult task for the government that will involve tough policy decisions. Inadequate funding and resource mobilization are major

problems in the road sector. Moreover, insufficient public resources and finances lead to underfunding of road infrastructure resulting construction of poor quality road network and low periodic maintenance level. Hence, the development of road infrastructure demands the supply of huge amount of foreign currency; it is difficult to finance this huge amount of money only by the government of Ethiopia and internal sources.

Accordingly, the government of Ethiopia finances road construction and maintenance through loans and aid from other countries and organizations in addition to domestic finance. However, the trend in the road sector financing pattern shows that the share of domestic financing has increased recently. For instance, the domestic financing share in 1997 has been twice that of the external share, whereas recently it is more than four times that of the external finance.

From table 2 below we can see that larger share (71%) of the total RSDP fund comes from internal sources such as the Government of Ethiopia (GOE), the Road Fund and community mobilizations (a Road Fund is a special fund acquired by a levy on fuel prices in order to ensure a constant flow of funds for the maintenance of the road network).The remaining 29% is financed by development partners. The Government of Ethiopia takes the highest share at 54% from internal sources followed by Road Fund (14%). From external sources, the International Development Association (IDA) (12%) and European Union (EU) (9%) take the largest share of finance.

Table 3.2 .Fifteen year‟s performance of RSDP

RSDP Phase	Financing From Local Sources		Financing From External Sources		
	Amount in USD	Percentage	Amount in USD	Percentage	Total
RSDP I	4,434,.1	61	2,850.90	39	7,285.00
RSDPII	12,110.20	67	6,002.70	33	18,112.90
RSDPIII	26,068.50	75	8,889.30	25	34,957.80
RSDP IV	39,186.70	81	8,920.40	19	48.107.1
Total	42,612.80	71	17,742.90	29	60,355.70

Source: ERA 2013

During the 13 years of RSDP, 40% of the total RSDP expenditure was utilized for rehabilitation and upgrading of trunk roads, 32% was for upgrading and construction of link roads and 10% was for expansion and maintenance of the regional roads. Around 11% of the expenditure was utilized for routine and periodic maintenance of federal roads and 3% of the spending was targeted for building institutional capacity of the project administrators. By participating the rural community, a total of 100,384 km of community roads have been built over the period 2004/05-2009/10. In doing so, around 3.8% of the total RSDP expenditure was utilized during the thirteen years of RSDP period.

Table-3.3: Road sector Expenditure by category

Expenditure Category	Share of Expenditures (%)
Federal Roads	
Rehabilitation of Trunk Roads 11.8	11.8
Upgrading of Trunk and link Roads	35
Construction of Link Roads	25.1
Periodic and Routine Maintenance	8.5
Others (including Institutional Support)	2.9
Regional Roads	
Construction	6.6
Emergency and Routine Maintenance	1.7
Others	0.1
Woreda Road	
URRAP	6.2
Community Roads	2.1
Total	100

Source ERA 2013 & Own calculation

The development of road construction has further importance of enhancing the capacity of domestic construction industry if the participation of domestic contractors is encouraged. By taking part in road construction, domestic contractors will acquire larger capital; skilled labor and improved technology thus develop wide expertise and competitive capacity in construction industry. Also on the other hand, the participation of domestic contractors minimizes the amount of finance that would be paid for foreign contractors with hard currency thus minimizing the level of capital out flow from the country.

The RSDP program during its 15 years of enrolment has involved substantial amount of local contractors both for construction and consultancy of road projects. From the total 887 contracts, around 643 contracts were given for domestic companies. In the total fifteen years of RSDP, 69% (ETB 38, 8) billion worth of projects have been awarded to local contractors and consultants. Local contractors are mostly awarded on projects financed by GOE that are small or medium scale.

Chapter Four

Econometric Analysis

To empirically investigate the relationship between government spending and economic growth in Ethiopia, econometric regression approach is developed and used to estimate elasticity of GDP with respect to selected types of government expenditure with a particular focus on public investment on electric power supply and road sector.

Researchers give attention to observe the relationship between public spending and economic growth using economic model starting from 1960‟s. Researchers such as Arrow and Kurz (1970) at the time consider that consumers can drive utility both from private investment and public capital stock and they consider all public investment as productive. However, their model was neoclassical in nature that public spending only affect the transitional state of economic growth not the long run or steady state growth.

The introduction of endogenous growth model such as Barro‟s (1990) however link public spending with long run economic growth and changed the neoclassical perceptions. The basic reference model in this empirical analysis is the model developed by Devarajan et al. (1996). This model evaluates the effect of public expenditure allocated to different components of public sector on short run and long run economic growth. The model developed by Barro considers government spending as having both short run and long run effect on economic growth. More over the empirical literatures at the time introduced in addition to the size or amount of public spending, the composition of the spending (towards which sector the spending is allocated) affect the steady state economic growth.

The model also allows to test whether the share allocated to the different components of public expenditure today is associated with greater future growth however not properly defining which component of the spending is productive or unproductive. Each component of spending in total government expenditure, then, is the explanatory variables. To control for the level of public expenditure, the model also includes the share of government spending in GDP. According to

Devarajan et al. (1996), this allows to control the effects of expenditures financing on growth, which is a function of the level of spending.

The Model

In the model by Devarajan et al., the researchers assume a production function with two types of public spending productive (g1) and unproductive (g2) and stock of private capital k. In this study, the stock of labour capital in case of Ethiopia is surplus that it is will not be considered as a constraint for production thus is not included in the production function. If the production functions has constant elasticity of substitution (CES), then:

$$y = f(k, g_1, g_2) = [\alpha k^{-\tau} + b g_1^{-\tau} + \gamma g_2^{-\tau}]^{-1/\zeta}, \quad (1)$$

Where

$\alpha > 0, \beta \geq 0, \gamma \geq 0, \ \alpha + \beta + \gamma = 1, \delta \geq -1$

Adopting Barro"s (1990) assumption, the government is assumed to finance the public expenditure using income tax rate τ

$$\tau y = g_1 + g_2, \quad (2)$$

From the total government expenditure the share of expenditure that is allocated towards g_1 is

$$g_1 = \phi \tau y \text{ and } g_2 = (1 - \phi)\tau y, \quad (3)$$

Where the share $\phi(0 \leq \phi \leq 1)$

Individual agent maximizes his level of utility by choosing consumption C and capital K, taking the government decision on tax rate τ and allocation to sectors ϕ as given.

$$U = \int_0^{\infty} u(c)\, e^{-\rho t}\, dt\,, \qquad (4)$$

Subject to

$$\dot{k} = (1-\tau)y - c\,, \qquad (5)$$

Where ρ is the rate of time preference

In order to obtain analytical equation that clearly defines the productivity of the sectors, the Devarajan et al. further specialized the utility function to its isoelastic form or constant elasticity form as:

$$u(c) = \frac{c^{1-\sigma}-1}{1-\sigma}\,, \qquad (6)$$

By substituting equation (6) in to (4) and maximizing it subject to (1) (2) (3) and (5) yields the equation for growth rate of consumption:

$$\frac{\dot{c}}{c} = \frac{\alpha(1-\tau)\left\{\alpha+\left(\frac{g}{k}\right)^{-\zeta}\left[\beta\phi^{-\zeta}+\gamma(1-\phi)^{-\zeta}\right]\right\}^{-(1-\zeta)/\zeta}-\rho}{\sigma}\,, \qquad (7)$$

Now let the steady state growth rate of consumption be λ, and assume tax rate is constant along the steady state growth path thus g/y is constant and g/k will also be constant. By manipulating equation (1) with (3) we can have:

$$\frac{g}{k} = \left\{\left[\tau^{\zeta} - \beta\phi^{-\zeta} - \gamma(1-\phi)^{-\zeta}\right]\middle|\alpha\right\}^{1/\zeta}\,, \qquad (8)$$

Then substituting the value of g/k from (8) into (7) the steady state growth rate of consumption will be:

$$\lambda = \frac{\alpha(1-\tau)\left\{ \alpha\tau^{\zeta} \Big/ \left[\tau^{\zeta} - \beta\phi^{-\zeta} - \gamma(1-\phi)^{-\zeta}\right] \right\}^{-(1+\zeta)/\zeta} - \rho}{\sigma}, \quad (9)$$

We can derivate λ with ϕ to obtain a relationship between the steady state growth and the share of expenditure devoted to each type of the sector say $g_1$by:

$$\frac{d\lambda}{d\phi} = \frac{\alpha(1-\tau)(1+\zeta)\left[\alpha\tau^{\zeta}\right]^{-(1+\zeta)/\zeta}\left[\beta\phi^{-(1+\zeta)} - \gamma(1-\phi)^{-(1+\zeta)}\right.}{\sigma\left[\tau^{\zeta} - \beta\phi^{-\zeta} - \gamma(1-\phi)^{-\zeta}\right]^{-1/\zeta}}, \quad (10)$$

The above equation (eqn 10) defines which component of public expenditure is productive and will result in a raise in steady state growth rate if its share is increased.

$$\text{If} \quad (1+\zeta)\left[\beta\phi^{-(1+\zeta)} - \gamma(1-\phi)^{-(1+\zeta)}\right] > 0, \quad (11)$$

Then the right side of the equation will be positive thus the sector is productive

According to Devarajan et al. (1996), assuming that the utility function has constant elasticity, in order to obtain analytical solutions, it is derived the relationship between steady-state growth rate and share of government spending aimed to g1. With this it is possible to determine that productive spending is the one that leads to an increase in steady-state growth rate of economy. This definition implies that for a change in the composition of the expenditure increase the growth rate by

$$\frac{\phi}{1-\phi} < \left(\frac{\beta}{\gamma}\right)^{\theta}, \quad (12)$$

Where $\theta = 1/(1+\zeta)$ denotes the elasticity of substitution.

Accordingly, the impact of change in the composition public spending on economic growth depends not only on the productivity of the two components of spending (β and γ), but also on their initial shares in the overall public spending level of the country. A change in composition

towards a more productive spending, for example, $\beta > \gamma$, may not lead to an increase in growth rate if share in total (Φ) is at its maximum efficiency level.

In addition, the model states that the increased growth rate resulting from the change on the spending composition can occur without any change in total spending. Since an increase in total expenditure must be financed by the same amount of taxes, an increase on the growth rate only will happen if the productivity of that expenditure ($\beta + \gamma$) is greater than the revenue needed for financing it.

The analytical model developed by Devarajan et al. (1996), Moreover, is simple and has the benefit of providing an insight on what makes a particular component of government expenditure productive or unproductive. In addition, the model clearly shows the relationship between the coefficient that is output elasticity and the actual share from the total expenditure determine the productivity of each component of public expenditure.

4.1 Data and Selection of Variables

With reference to the Devarajan et al. (1996), the basic model in this paper choose real percapita GDP growth as a dependent variable and the different components of public expenditure as explanatory variables.

Thus the model has the following equation;

$$MaRPCIG_{(t+1,t+5)} = \alpha + \beta_1(TGE/GDP)_t + \beta_2 GSE_t + \varepsilon_t \quad (13)$$

Where $MaRPCIG_{(t+1,t+5)}$ is the five year forward moving average percapita income real GDP growth for Ethiopia;

α is the constant;

$(TGE/GDP)_t$ is the share of each type of public expenditure in the total expenditure at time t;

GSE_t is the share of each component of public sector expenditure from the total expenditure at time t;

and ε_t is the error term or the residual.

The model used the five year forward moving average per-capita GDP growth as a dependent variable to address the problem of reverse causality between the two variables (public expenditure and economic growth). Also, the five year forward moving average is chosen due to the fact that it will take time for public expenditure to affect growth on output.

The vector GSE_t indicates the share of each component of public expenditure to total expenditure. The vector denotes current and capital expenditure from the economic classification. From the functional classification; expenditure on social sector, expenditure on economic sector, expenditure on general service and expenditure on other services are included. Also, in order to analyze the impact of infrastructural expenditure on percapita income growth, expenditure on road and electric power are included as explanatory variables. Hence the major explanatory variable in the model is the vector SE. The share of total government expenditure to GDP is included as explanatory variable to observe the effect or the dead weight loss of financing public expenditure on growth.

The data used for this analysis is time serious data for 22 years covers the period after the fall of the Derg regime and the coming to power of the EPRDF administration (from 1991 until 2013).

4.2 Test of Variables

In the regression, the method used is the ordinary least squares (OLS), which obtains parameter estimates that minimize the sum of squared residuals. This tool allows analyzing how a single dependent variable is affected by several independent variables.

Stationery Test

Hence the type of data used in this analysis is time serious in nature, the classical assumption of time serious regression with stationery data generating process have to hold true. Stationery serious by definition is the moment of variables in regression irrelative of time (Gujarati, 2003).

However, regression results with non-stationery variables will result in a spurious regression analysis reflecting the observed relationship is not real. In spurious regression, the results obtained show that there are statistically significant long-run relationships between the dependent and independent variables in the regression model indicating very high R^2 value and significant t-ratios. Though the result obtained is evidence of contemporaneous correlations rather than meaningful causal relations between the variables (Gujarati, 2003).

Stochastic or random process is a collection of random variables ordered in time. Based on the properties of the variables in relation to change of time, a stochastic process can be grouped as; strictly stationery, weekly stationery or non stationery. Time serious data is weakly stationary if its mean and variance are constant over time and the covariance between two periods depends only on the distance or gap between the two time periods not on the actual time the covariance is computed. A stochastic process is said strictly stationary if none of the moments of its probability vary over time. Furthermore, a stochastic process is said to be non-stationery if the variables are affected with change in time. Since the normal stochastic process is fully specified by its two moments, the mean and the variance the condition of week stationary time serious data is acceptable (Gujarati, 2003).

Among the methods of testing stationarity (or non-stationarity) of time serious data, the unit root test has become widely popular and applicable technique over the past several years.

In the method, stationarity or Non-stationarity of a variable depends on whether it has a unit root or not. The widely applicable method for testing the existence of unit root i.e. stationarity or non-stationarity of variables used in this study is the extended method of Dickey Fuller called the Augmented Dickey Fuller (ADF) test.

$$Y_t = \beta 0 + \beta 1_t + u_t \quad (14)$$

$$u_t = \alpha_{ut-1} + \varepsilon_t \quad (15)$$

Where t denotes time and ε_t is a zero mean covariance stationary process. The reduced form of (eqn 14) using (eqn 15) can be written as:

$$Y_t = \delta 0 + \delta 1_t + \alpha y_{t-1} + \varepsilon_t \quad (16)$$

Where $\delta 0 = \beta_0(1-\alpha)$ and $\delta 1 = \beta_1(1-\alpha)$

The Dickey-Fuller test tests the null hypothesis of unit root $\alpha=1$ against the alternative hypothesis of $\alpha<1$ of equation (16). If the null hypothesis ($\alpha=1$) holds true then there is unit root meaning the stochastic process is non stationery. To perform the presence of unit root test, the resulting t-statistics will be compared with the respective critical values given on the Dickey Fuller table. If the calculated t- value is less than the Dickey Fuller critical value, then the null hypothesis of the presence of unit root will hold true.

The above stated Dickey-Fuller test is based on the assumption that the data generating process is autoregressive of order one (AR(1)). However, if the data generating process is autoregressive of higher order or if the errors are auto correlated, it may lead to wrong conclusion. The Augmented Dickey fuller test (Dickey and Fuller, 1981) provides a solution to such problem by

including additional higher order lagged differences to DF test. The added term allows Autoregressive Moving Average (ARMA) errors (Gujarati, 2003).

$$Y_t = \delta_0 + \delta_1 t + \alpha y_{t-1} + \sum_{i=1}^{n} yi\, \Delta\, Y_{t-1} + \mathcal{E}_{1t} \quad (17)$$

As it can be seen from the above equation (17), the ADF test includes extra lagged terms of the dependent variable in order to eliminate autocorrelation in the test equation.

Cointegration Test

As seen in the previous part, the regression of non stationery time serious may produce a spurious result. The problem of non stationarity can be mitigated by differencing the serious however this may result in loss of important relationships and information about long run relationship from the serious. The best way to encounter the problem of non stationery-series while important long run relationships are unaffected is using cointegration test. Two variables are said to be cointegrated if they have a long term relationship or equilibrium relationship with each other.

Hence if long run or equilibrium relationship exists between them, then although the variables contain stochastic trends or non-stationary trend, they will nevertheless move closely together overtime and the difference between them will be stationery.

4.3 Engle–Granger Error Correction Model

A number of methods are available for testing cointegration among them the Engle and Granger (EG) two step methods is selected in this study. According to Engle and Granger (1987), for any non-stationery serious, I(p) where p is the order of integration, if a linear combination of stationery serious exists I(0), then the serious are referred to as cointegrated and the resulting regression is not spurious. Since such types of series integrate over time a long run relationship will exist between them. However, if no relationship exists between two series the serious are not cointegrated that they will drift away from each other in the long run.

The Engle-Granger two-step procedure tests the integration of variables with the same order (usually first order I(1)) are tested. In the procedure first the long run static model of I(1) variables will be estimated and residuals will be predicted. Second the obtained residual which is the linear combination of the variables or the disequilibrium, is tested for stationarity. If the residual is stationery then the variables are said to be cointegrated. Here, Engle and Granger suggest several cointegration testes but suggest using the ADF test to check the existence of unit root in $\hat{u}_t$.(G.S. Maddala, 1992)

Conducting the first step in Engle-Granger obtains the long run relationship between variables however the short run dynamics must also be analyzed to examine the short term relationship of the variables. The second step in the Engle-Granger procedure is to estimate the error correction model (ECM) in which the first difference of the dependent variable is regressed on the first difference of the explanatory variables with their appropriate lags, and also including the first lag of the residual obtained in the first step. Thus the Error correction mechanism (ECM) developed by Engle and Granger is a means of reconciling the short-run behavior of an economic variable with its long-run behavior.

4.4 Data analysis and interpretation

Dickey Fuller and ADF- test for unit root

The data analysis in this paper begins with studying the order of integration of each variable applying unit root test. for testing the null hypothesis of the existence of unit root against the alternative no unit root exist on the serious both the DF and ADF tests are applied in the paper. The results of the two tests are listed below;

Table 4.1 ADF test

Variable	Test equation			
	Intercept with trend	Critical value at 1% significance level	Critical value at 5% significance level	Order of Integration
MaRPCI	-2.641	-4.38	-3.6	**I** (1)
TE/GDP	-3.331	-4.38	-3.6	**I** (1)
GSE	-1.78	-4.38	-3.6	**I** (1)
ESE	-1.331	-4.38	-3.6	**I** (1)
SoSE	-1.376	-4.38	-3.6	**I** (1)
OthE	-3.18	-4.38	-3.6	**I** (1)
RE	-2.045	-4.38	-3.6	**I** (1)
CE	-2.123	-4.38	-3.6	**I** (1)
EEPCO	-1.82	-4.38	-3.6	**I** (1)

From the table above, the DF test shows the fact that the calculated value is less than the critical or tabulated value. These indicate the existence of unit root and the failure to reject the null hypothesis of stationarity.

Table 4.2 Differenced ADF test

Variable	Test equation			
	Intercept without trend	Critical value at 1% significance level	Critical value at 5% significance level	Order of Integration
DMaRPCI	-3.155	-2.681	-1.782	**I** (1)
DTE/GDP	-4.095	-2.583	-1.746	**I** (1)
DGSE	-2.901	-2.583	-1.746	**I** (1)
DESE	-3.029	-2.583	-1.746	**I** (1)
DSoSE	-3.165	-2.583	-1.746	**I** (1)
DOthE	-6.251	-2.583	-1.746	**I** (1)
DRE	-3.242	-2.583	-1.746	**I** (1)
DCE	-3.242	-2.583	-1.746	**I** (1)
DEEPCO	-2.285	-2.583	-1.746	**I** (1)

The ADF test result in the above table shows that the null hypothesis of unit root is rejected and the data is stationery at first difference without trend.

Engle-Granger Cointegration test

Although the variables at first difference is stationery, the unit root test usually suffers from poor size and power property and can lead to over-rejection of the null hypothesis when it is true and even when it is false. Thus it is important to test the Cointegration of the variables since it indicates the existence of long run relationship between them. Considering the variables are best integrated of order one the long run Cointegration was tested by applying augmented Engle granger (AEG) test is applied.

Following the AEG procedure, the unit test on the residual is done after an OLS regression on the variables with their respective classification.

$$MaRPCIGR_{(t+1,t+5)} = \alpha + \beta_1(TE/GDP)_t + \beta_2 GSE + \beta_3 ESE + \beta_4 SoSE + \beta_5 OthE$$

Appling Engle Granger cointegration test procedure, the residuals for the above regression were obtained and unit root test was carried out on the obtained residuals to test their stationarity. The test indicated that the residual r_1 for the first regression at its first lag is stationery at all critical levels (1%, 5% and 10%). These indicate that the existence of long run relationship between the variables for the first regression.

Error Correction Model

The above AEG test depict that the variables are cointegrated and have long run relationship. Hence the dynamic or short run relationship can be evaluated by using Error Correction Model (ECM). The ECM involves using the lagged residuals to correct for short run deviations from equilibrium. The lagged residual in the ECM model plays as error correction in the model. The error correction coefficient has to be negatively signed or near to zero and have to be statistically significant to best play its role. The negative sign indicates the convergence of the variables to equilibrium point. The absolute value of the coefficient of the lagged residual shows the speed of adjustment that indicates how fast the equilibrium is restored in the system for temporary shocks. The long run empirical relationship which was lost while differencing to secure stationarity is retrieved by error correction model. The error correction models estimated in the paper are listed below;

ECM model for functional classification components of public expenditure

$$\text{DLogMaRPCIGR}_{(t+1,t+5)} = \alpha + \beta_1 \text{DLog(TE/GDP)}_t + \beta_2 \text{ DLogGSE} + \beta_3 \text{DLogESE} + \beta_4 \text{DLogSoSE} + \beta_5 \text{DLogOthE} + \text{Log}\hat{E}$$

Table 4.3 Regression result for the functional classification;

Source	SS	df	MS		
Model	15.6657542	6	2.61095904	Number of obs =	21
Residual	11.9506712	14	.853619372	F(6, 14) =	3.06
Total	27.6164254	20	1.38082127	Prob > F =	0.0397
				R-squared =	0.5673
				Adj R-squared =	0.3818
				Root MSE =	.92392

D.MaRPCIGR	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
tegdp						
LD.	-.0794366	.0652755	-1.22	0.244	-.2194386	.0605654
gse						
LD.	-.1227909	.0475073	-2.58	0.022	-.2246839	-.0208978
ese						
LD.	-.0531629	.0484559	-1.10	0.291	-.1570904	.0507646
sose						
LD.	.1371562	.0643934	2.13	0.051	-.0009538	.2752662
othe						
LD.	.0772732	.0498531	1.55	0.143	-.029651	.1841973
residual						
L1.	-.1077904	.14399	-0.75	0.466	-.4166183	.2010375
_cons	.5558158	.7226332	0.77	0.455	-.9940783	2.10571

One important test variable to emphasize in any regression analysis is the coefficient of determination denoted by Adjusted R-Square. The coefficient of the adjusted R-Square expresses the proportion of variability in a data set that is accounted by the statistical model, providing measure of how well the model is likely to predict the current and future outcomes. For social science researches, Adjusted R^2 level of 47% is considered as very high.

When we come to the first regression, the level of adjusted R-square in the above error correction model is 0.38, which means 38% of the dependent variable is explained by the independent variable. From the variables GSE have negative effect on percapita income growth that a 1% increase of expenditure towards the sector will suppress percapita income growth by 12%. This finding goes in line with study made by Ejuvbekpokpo (2012) that public expenditure

on administrative governance purposes hampers economic growth. In contrary, social sector expenditure have positive effect on percapita growth that a percentage increase on the sector raises percapita income by 13%. The main components of the social sector expenditure, health and education sector play a vital role in the growth process. Since expenditure on the two sectors enhance the supply of healthy and skilled man power to the labour force thus enhance the production process. The empirical findings pertain with previous works of Teshome (2006) Wondosen (2012) in the literature that has found the existence of positive significant effect on economic growth as a result of public expenditure on social sector components of health and education sector.

The other important variable in this regression is TEGDP (the share of total government expenditure from GDP) this variable indicates the level effects of public expenditure in the regression. The significance level of TEGDP is statistically insignificant that it is not sufficient to relay and observe the level effects of government spending on economic growth of Ethiopia.

The second regression is made on the economic classification of public expenditure to gauge the impact of capital and current expenditure on the growth of real percapita income.

Table 4.4 Regression result for capital expenditure

Explanatory Variable	Coefficient	Significance (t) Value	p>(t)
Capital Expenditure	0.097	3.36	0.003
(constant)	1.073	0.89	0.384

Adjusted R^2 ; 0.31

The above OLS regression of capital expenditure on moving average percapita real GDP report the existence of considerable Adjusted R-Square amount (0.31) indicating 31% of the variability of the dependent variable is explained by the explanatory variable. The regression result reveled

that 1%capital expenditure growth will increase percapita income growth by more than 9% in the long run. These shows capital expenditure have significant positive effect on growth of percapita income on the long run.

Table 4.5 Regression result for current expenditure

Explanatory Variable	Coefficient	Significance (t) Value	p>(t)
Current Expenditure	0.099	-3.45	0.002
(constant)	10.92	6.18	0

Adjusted R^2; 0.33

Also the above regression on recurrent expenditure has modest level of Adjusted R-Squared (33%). The above table report that current expenditure has significant negative effect on growth of percapita income in the long run that a 1% increase of recurrent expenditure will decrease percapita income growth by around 10%. The empirical result is supported by similar findings of Leonardo (2011), Ukah O.C(2009) that capital expenditure have positive effect on the growth of an economy while recurrent expenditure will negatively suppress it. The empirical finding thus supports the endogenous growth theorists‟ idea that government expenditure only on productive areas has positive effect on economic growth.

The second regression analyzes the outcome of public expenditure on infrastructure on the growth of real percapita income. The AEG test for unit root on the residual r_2 also show the absence of and hence the presence of cointegration and long run relationship between the dependent variable and the explanatory variables of public infrastructural expenditure.

Table 4.6 Regression result of infrastructure sectors

Explanatory Variable	Coefficient	Significance (t) Value	p>(t)
TE/GDP	0.28	4.44	0.00
Electric power sector Expenditure	0.10	2.85	0.01
Road Sector Expenditure	0.09	0.80	0.04
(constant)	9.55	6.26	0.00

Adjusted R^2; 0.53

The regression result on the two sectors have high Adjusted r-square indicating 53% of the dependent variable is being explained by the explanatory variables. The coefficient of road sector expenditure indicates that public expenditure on road development have insignificant out come on the long run growth of percapita income. The result supports the work of Wondosen (2012) that found expenditure on road sector have insignificant effect on growth. However the insignificance could be due to the low performance of other sectors such as agriculture sector. Since growth is the outcome of integrated performance of various sectors, the low performance of other related public sectors can shadow the impact that the road sector would have resulted on the economy.

Among the selected public infrastructure sectors, government expenditure on electric power has significant positive effect on percapita income growth. Numerically, a one percent increase of government expenditure on electric power sector will result in 10% increase in real percapita growth. This indicates the effect that public investment on electric power accelerates the economic growth of the country in the long run.

Key informant interview

The regression result in this paper has found that road sector development have no significant impact on the growth of real percapita income of the country. With the aim of triangulating the result of the study and to understand the reason behind the insignificant effect of the sector, in this study, key informant interview has been conducted. In order to get unbiased real answers about issues, key informant interview is a more important research methodology. The key informant selected for this paper was Ato Addisu Assefa from the Ethiopian Road Authority (ERA). The interview questions with his respective responses are shown below;

- *What is your position in ERA and your experience in this position?*

  I am a senior economist and team leader Monitoring and Evaluation department in the planning and programming directorate at ERA. I have 8 years experience in the authority being responsible for much of the monitoring and evaluation tasks in road projects.

- *What benefits do you think our country will obtain from road development? (Please give emphasis to economic importance's)*

  No one argue with the fact that availability of road networks in a given country is the back bone of the economy. The road sector development plan and its efforts are no exception with this fact. The development in road infrastructure is a base for intended development target in the social, economic, and political sphere. Economically, products moving to market and input that move to a particular location needs the proximity and availability of reliable and all seasoned road infrastructure. Thus, reducing the operating and logistics cost of commodity movement, that the country will benefit a lot.)

  More over infrastructure development mainly road sector development is a basis for any country to boost its economy by linking regions, zones, woredas and Kebeles, with each other both horizontally and vertically so that there will be fast output flow to market or input flow for production and market for output. Also, in addition to improving agricultural productivity road sector development improves food security, particularly in

terms of transporting food from surplus to deficit areas in the country. The development of road sector also facilitates investment, both foreign and domestic, in the country. In general road development is a means for everything for all activities that going on in our country. In my opinion no road means no development at all.

- *How do you evaluate the performance of ERA in the road sector development?*

  The authority derivate the nationwide macro plan and achieved to register a remarkable result in increasing the overall road coverage in the country. This can be seen with the physical outcomes that are specially accomplished within the recent years. Considering the challenges in the sector; capacity of local contractors, financing requirement of the expensive road projects and shortage of budget to carry on planned tasks, and others, lack of experience with local firms, I would say the performance of ERA is satisfactory. In short it‟s progressive and it needs more effort and investment to cover the wide range of road development in our country. In short we are in the beginning of the long journey.

- *Can you mention the major challenges the authority faced in road development?*

  As a developing country our authority has a lot of weakness but our major weaknesses are a direct replica of our economy which means lack of budget. In addition to the shortage of budget, time delay on the allocation of the available budget to the projects is also a bottleneck that many projects will be halted for months. However, the authority has passed through this weakness and has achieved much of its goals in the past years.

  We have a very limited number of local road construction companies in addition we have to take in account their low capacity and poor efficiency and lack of skilled man power. The above stated weaknesses are the major ones. Regarding our strength we can mention our government effort and commitments to develop the sector besides our good government policy to work with foreign road construction companies and countries that facilitate loan and foreign aid.

The empirical analysis of my research indicates that public expenditure on road sector have Insignificant impact on the long run growth of percapita income.

- *How do you see this finding in relation with the objective of the authority?* As long as I know road development is unproductive in short run but personally I believe that in the future it will improve our economy growth. But impact on per capita income is not only the contribution of the road sector it‟s the aggregate sum of the whole economy performance so it is difficult to conclude that road sector is not significantly the growth of the per capita income.
- *What do you think is the main reason behind this insignificant contribution of the road sector to percapita income growth?* I believe that the rising cost of road construction have shaded the effect of road development on economic growth. For instance the cost of 1Km road standard asphalt road was birr 2million in 1990 currently it is birr 20 million. This will suppress the economic benefit road development will result for a while but once it repays its initial cost, the benefit will last much longer and will be visible.

With regard to the feedbacks given by the expert, this study has tried to dig some literatures on the cost overrun of road construction. According to a study made by Turkey (2011), the road projects in the four RSDP periods suffer from unexpected cost overruns. Inflation in material costs, delays on completion time due to disputes with contractors with regard to cost overrun, inadequate site investigations etc… are identified as major factors leading to cost overrun.

Chapter Five

Conclusion and Policy implications

5.1 Conclusion

For most developing countries like ours, economic growth is the principal objective in their effort to alleviate poverty and achieve sustainable development. Hence, fiscal instruments such as public spending are intended to facilitate growth performance of developing countries with the needed urgency. With regard to this, one major concern of public finance studies is directed towards gauging the impact that the growing of public sector spending will result on the country‟s economic growth.

However, there is no consistent theory that clearly states the effect of government spending on economic growth. Likewise, empirical studies on the area have also different conclusions about the issue. This leads to the fact that there are circumstances in which lower level of government spending would enhance economic growth in some countries and other circumstances that government spending above the certain level will affect economic growth of a country.

The objective of this paper is to analyze the outcome of government sectoral spending on the real percapita income growth of Ethiopia while focusing on road and electric sector. In doing so, the study has incorporated descriptive methods of analysis using both quantitative and qualitative data. The qualitative data was obtained from key informant interview and have the aim of triangulating the validity of the obtained results.

The descriptive analysis revealed that there is large discrepancy in the level of economic growth and public expenditure in the periods studied. The volatility in the growth of real GDP which is the major of economic growth, was mainly due to war and the prevalence of drought which have a higher effect on the agriculture sector, the back bone of the country‟s economy.

The variation in the level of public expenditure however is mainly related with the government fiscal policy. Initially in the first years after the fall of the Derg regime, the level of government spending was minimal. This is due to the fact that the EPRDF government decided to take policy measures that minimize the size and role of the government in the economy. The trend shows increment after this period due to war and other disaster related reasons. However in 2004 the level started to raise highly with the country‟s continuous growth policies that support the allocation of intensive public expenditures to public sectors. The descriptive analysis also shows that the trend in the components of public expenditure was higher for current expenditures for mach of the past two decades but productive capital investments is minimal. After 2008 the share of capital expenditure began to rise and exceeded the recurrent component. The increase in government spending on growth enhancing sectors such as road, energy, education and health sector played a vital role for the increase in capital expenditure.

Literatures on fiscal policies specifically on the impact of public spending expect four major drawbacks that are likely to occur with raise in the level of public spending; budget deficit, inflation, debt accumulation and crowd out effect on the private sector. The descriptive analysis gave an insight to these major drawbacks with relation to the raise in public spending in Ethiopia.

With the raise in the level of public spending in Ethiopia, the level of budget balance (deficit) shows raising trend recently. This raising level of deficit in Ethiopia is financed through borrowing both from domestic and external sources. Accordingly the stock of Ethiopia‟s external debt is steadily increasing with annual average growth rate of 21% over the past decade.

Despite the raise in the growth level of debt accumulation, the level of total public debt accumulated and its annual growth trend when compared with the IMF standard of acceptable debt level for a country is normal and sustainable. Thus the fear that the current increase in public spending will result in high debt accumulation is not a big problem since Ethiopia is not at risk of becoming highly indebted country.

However the allocation of debt to productive sector justifies the raising accumulation level and its servicing or repayment. The largest share of this huge amount of external grant was disbursed to various public sectors of the economy indicate that high percentage of the debt is spent to finance the countries public expenditure especially infrastructural projects.

With the scarce availability of capital resources for production in developing countries, the raise in the level of public spending may absorb the available finance from the private sector in addition to soaring borrowing the interest rate. This effect of increased public spending on private sector called crowd out effect have been analyzed in the study. The result of the descriptive analysis shows that the gross fixed capital formation of the private sector was higher than the public sector before 1998. However after 1998 the share of public sector on the country‟s gross fixed investment began to rise and after 2006 the government heavily dominated the private sector. However, the trend of private sector capital formation has grown moderately when measured separately against its own previous performance. This indicates the private investment performance was not affected by the increase in the public sector investment. The descriptive analysis also show that the level of inflation show little association with the raise of public spending especially on the past decade. However, it needs deep analysis and further research to fully conclude this issue.

Econometrically in order to test for the presence of long-run relationship between the variables, Engle Granger Error Correction method was applied. The results from the regression analysis revealed that only expenditure on general services and social services have long run significant effect on economic growth. However government expenditure on other services and economic services is insignificant.

Regression on the economic classifications of public expenditure showed that capital expenditure has significant positive effect on growth of percapita income on the long run, whereas public expenditures on recurrent areas have significant negative effect on economic growth of the country.

From the infrastructure sector spending, the regression result shows that expenditure on road sector has insignificant effect on the growth of the country‟s GDP. In order to triangulate the

result and to have an insight on the reason behind the low performance of the road sector, the study have conducted key informant interview. With relation to the finding, the key informant raised the existence of high cost over runs on road projects may have hindered the outcome. Thus it may take more extended period for road projects to offset their high construction cost and enhance growth.

Despite the low impact of road sector expenditure on economic growth, expenditure on Electric power sector have strong positive impact that a 1% increase of public expenditure to this sector have a 10% increase in real percapita income growth.

5.2 Policy implications

Based up on the results obtained from the analysis, the following policy recommendations are forwarded;

- The study found that public expenditure on social sectors in general and electric power development from the infrastructure sector show positive effect on both long run and short run economic growth of the country. Hence government expenditures towards these sectors have to be enhanced.
- On the other hand the study, the study found that road sector expenditure has insignificant effect on the growth of real GDP. Considering the importance of road sector for a growing economy like Ethiopia‟s, the result the finding of this study is associated with the high cost of road construction payable in terms of hard currency in the country. Thus, the government has to build the capacity of local contractors and enhance their participation on the sector.
- Also, the study revealed that public expenditure on general services suppresses the growth of real percapita in the country thus the government have to carefully consider expenditures allocated to this portion.
- The level effects of government expenditure (the total share of public spending) so far show no danger to most of the macro economic variables. However the raise in the accumulation of public debt may have serious impact in the near future thus have to be considered.

Bibliography

Agénor, P., Bayraktar, N., & Aynaoui, K. El. (2004). *Assessing the Links between Aid , Public Investment , Growth , and Poverty Reduction* (No. 3490). Washington.

Aghion, P., & Howitt, P. (2009). *The Economics of Growth*. Cambridge, Massachusetts: MIT press.

Alfonso Arpaia, A. T. (2008). *Government Expenditure and Economic Growth in the EU*. http://doi.org/10.2765/22776

Ba, M., & Çetinta, H. (2004). Causality between Public Expenditure and Economic Growth : The Turkish Case. *Journal of Economic and Social Research*, *6*(1), 53–72. Retrieved from http://mpra.ub.uni-muenchen.de/id/eprint/8576

Bayraktar, N., & Moreno-Dodson, B. (2010). How Can Public Spending Help You Grow ? An Empirical Analysis for Developing Countries. *Policy Research Working Paper*, (July).

Blinder, and Solow, 1973. "Does Fiscal Policy Matter?" *Journal of Public Economics*: 319-337.

Brian Dollery & Sukhvinder Singh. (1999). *A Note on The Empirical Analysis of Wagners Law*. New England: Univeristy of New England.

Busatto, L. M. (2011). The quality of public expenditure and its influence on economic growth : evidences from the State of Rio Grande do Sul (RS). *The Institute of Brazilian Issues*.

Daron Acemoglu. (2009). *Introduction to Modern Economic Growth*. Princeton: Princeton University Press.

Ebert, W., Afonso, A., & Schuknecht, L. (2005). "*Quality of public finance and growth*" . European Central Bank Working Paper Series, *438*, 1 – 47.

Ekpung, E. G. (2014). Trend annalysis of public expenditure on infrastracture and economic growth in Nigeria *International Journal of Asian Social Science*, *4*(4), 480–491. Retrieved from http://www.aessweb.com/journals/5007

Era Dabla-Norris and John M.Matovu. (2002). Composition of Governmnet Expenditure and Demand for Education in Developing Countries.

Gangal, V. L. N., & Gupta, M. H. (2013). Public Expenditure and Economic Growth A Case Study of India. *Global Journal of Management and Business Studies.*, *3*(2), 191–196. Retrieved from http://www.ripublication.com/gjmbs.htm

Geda, A., & Birhanu, D. (2011). *Spending without Proper Planning Alemayehu Geda and Dawit Birhanu* (No. A10/2011). *IAES Working paper serious* (Vol. NO. A10/20, pp. 1–64). Retrieved from http://www.iaesafrica.com

G.S. Maddala. (1992). *Introduction to Econometrics,* second eds. New York: Macmillan Publishing Company.

Ketema, T. (2006). *The Impact of Government Spending on Economic Growth*: the case of Ethiopia. Addis Ababa

Ministry of Finance and Economic Developmnet of Ethiopia, Annual Reports, Various years.

Ministry of Finance and Economic Developmnet of Ethiopia (2012). GTP report.

Ministry of Transport of Ethiopia (2013), *„Assessment of 15 years performance of RSDP'*, Addis Ababa.

Mullard, M. (2005). *The Politics of Public Expenditure* (Second edi.). London New York: Taylor & Francis e-Library.

National Bank of Ethiopia, Annual Reports, various years.

Norman Gemmell, R. K. and I. S. (2009). *The Composition of government expenditure and economic growth: some evidence from OECD countries*. Brussels: European commission. doi:10.2765/41428

Paternostro, S., Rajaram, A., & Tiongson, E. R. (2007). How Does the Composition of Public Spending Matter ? *Oxford Development Studies*, *35*(1). http://doi.org/10.1080/13600810601167595

Patricia, N., & Izuchukwu, D. (2013). Impact of public expenditure on economic growth in Nigeria. *International Journal of Business and Management Review*, *1*(4), 64–71.

Pina, G. M. G. (2013). Public Expenditure, Inflation and Economic Growth in Cape Verde, 1–19.

Sahoo Pravakar, Dash Ranjan Kumar, N. G. (2010). Infrastractural Development and Economic Growth in China. *IDE discusion paper* (261). Retrieved from www.ide.go.jp

Shenggen Fan, Bingxin yu, Anuja Saurkar, David Coady, Annie white, Hans Lofgren, S. R. (2008). *Public Expenditure Growth and Poverity*. (S. Fan, Ed.). Baltimore: The Johns Hopkins University Press. Retrieved from www.press.jhu.edu

Toye, J. (2008).' *Public Expenditure and Indian Development Policy'*. London: Cambridge univeristy press, Cambridge London.

Tsadiku. (2012). '*Impact of governemnt sectoral spending on economic growth in Ethiopia, a particular focus on human capital and agriculture sectors'*. AAU Addis Ababa.

Vedder, R. K., & Gallaway, L. E. (1998). '*Government size and economic growth*' joint economic committee study. Washington D.C. Retrieved from http://www.house.gov/jec/

Annex

Regression of Capital expenditure on MaRPCIGR

```
. regress MaRPCIGR ce
```

Source	SS	df	MS	Number of obs =	23
				F(1, 21) =	11.28
Model	32.0674329	1	32.0674329	Prob > F =	0.0030
Residual	59.708247	21	2.84324986	R-squared =	0.3494
				Adj R-squared =	0.3184
Total	91.7756799	22	4.17162182	Root MSE =	1.6862

MaRPCIGR	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ce	.0968523	.0288393	3.36	0.003	.0368776	.156827
_cons	1.073449	1.20714	0.89	0.384	-1.436937	3.583834

Regression result of Recurrent expenditure on MaRPCIGR

```
. regress MaRPCIGR re
```

Source	SS	df	MS	Number of obs =	23
				F(1, 21) =	11.88
Model	33.1513584	1	33.1513584	Prob > F =	0.0024
Residual	58.6243215	21	2.79163436	R-squared =	0.3612
				Adj R-squared =	0.3308
Total	91.7756799	22	4.17162182	Root MSE =	1.6708

MaRPCIGR	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
re	-.0997272	.0289396	-3.45	0.002	-.1599104	-.0395441
_cons	10.92082	1.766861	6.18	0.000	7.246429	14.59521

Regression result of infrastructural sectors EEPCO and ROAD sector

```
. regress MaRPCIGR tegdp eepco road
```

Source	SS	df	MS	Number of obs =	23
				F(3, 19) =	9.59
Model	55.2650599	3	18.4216866	Prob > F =	0.0005
Residual	36.51062	19	1.92161158	R-squared =	0.6022
				Adj R-squared =	0.5394
Total	91.7756799	22	4.17162182	Root MSE =	1.3862

MaRPCIGR	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
tegdp	-.2878241	.0648015	-4.44	0.000	-.4234551	-.152193
eepco	.1011151	.0354218	2.85	0.010	.0269764	.1752539
road	.0900413	.1120293	0.80	0.431	-.1444387	.3245213
_cons	9.559848	1.525981	6.26	0.000	6.365934	12.75376