ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

THE EFFECTS OF GOVERNMENT EXPENDITURE AND TAX ON ECONOMIC GROWTH IN ETHIOPIA

BY

SEIDA BARGICHO

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The Effects of Government Expenditure and Tax on Economic Growth in Ethiopia

By

Seida Bargicho

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DECLARATION

I, the undersigned, declare that this thesis is my original work and has not been presented for a degree in any other university. All the sources of material used for this thesis have been dully acknowledged.

Declared by:

Seida Bargicho	
Name	***Signature***

Approved by the Board of Examiners:

Seid Hassen (PhD)	
Advisor	***Signature***

Seid Nuru (PhD)	
External Examiner	***Signature***

Sisay Regassa (PhD)	
Internal Examiner	***Signature***

Chair of Department or Graduate Program Coordinator

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Table of Contents

List of Figures

List of Tables

List of Acronyms

ADF: Augmented Dickey fuller

ADLI: Agricultural Development Led Industrialization

AIC: Akaiki Information Criteria

DF: Dickey Fuller

ECA: Europe and Central Asia

ECM: Error Correction Model

EIA: Ethiopian Investment Agency

EPRDF: Ethiopian People Revolutionary Party

EU: European Union

FDI: Foreign Direct Investment

FPE: Final Prediction Error

GDP: Gross Domestic Product

GNP: Gross National Product

GTP: Gross Domestic Product

H-D: Harod-Domar

HQ: Hannan-Quinn Information Criteria

IMF: International Monetary Fund

IS: Investment and Saving

LM: Liquidity and Money

LM: Lagrange multiplier

LR: Likelihood Ratio

NBE: National Bank of Ethiopia

OECD: Organization for Economic Cooperation and Development

OLS: Ordinary Least Square

RGDP: Real Gross Domestic Product

SIC: Schwarz (Bayesian) Information Criteria

UK: United Kingdom

VAR: Vector Auto Regression

VAT: Value Added Tax

VECM: Vector Error Correction Model

WB: World Bank

Abstract

This study is under taken to analyze the effect of government expenditure and tax on economic growth in Ethiopia. The objective of the study is examining which components of government expenditure and tax compositions stimulate the economy and which of them do not both in the short run and in the long run.

In the descriptive part of the analysis the researcher found that the trend of both government expenditure and tax has been growing throughout the year under consideration at real term. The current government disperses the largest part of its total expenditure in the form of capital expenditure as opposed to the Derg regime where the largest part of the expenditure was distributed in the form of recurrent expenditure. From the revenue side both the Derg and EPRDF governments on average collected a larger part of their tax revenue in the form of indirect taxes. However, during the Derg regime out of the total indirect taxes domestic indirect taxes constituted the largest share and followed by import duties and taxes while the reverse is true for the current government.

In the econometric analysis Co-integrated Vector Error Correction approach is applied for the identification of which components of government expenditure and tax compositions have significant effect on the Ethiopian economy, based on the Ethiopian data from the sample period of 1980/81 to 2013/14. The estimation results indicate that, in the long run current expenditure and direct taxes have negative and significant effect on the real GDP. However capital expenditure and indirect taxes have positive and significant effect on the real GDP. On the other hand, in the short run, government current expenditure, government capital expenditure and direct taxes do not have any significant meaning in explaining economic growth, whereas indirect taxes have positive and significant effect on the short run real GDP of the Ethiopian economy.

CHAPTER ONE

1. Introduction

1.1. Background of the study

The goal of a nation is to achieve high level of output, full employment, price stability, fair distribution of income and good relation with the rest of the world. A government uses different policy instruments to achieve these goals of a nation. Fiscal and monetary policies are the two major tools available to policy makers to change the level of economic variables. This paper focuses on the effect of fiscal policy on economic growth.

Fiscal policy refers to a deliberate change in government expenditure and taxation so as to achieve a certain government objective. It involves the use of the government's spending, taxing and borrowing policies (Rena and Kefela, 2011). Here my concentration is to evaluate the growth effect of government expenditure and taxation in Ethiopia.

In less developed countries like Ethiopia the role of government is very important to manipulate the economic activities. Therefore both fiscal and monetary policy can be used by the government as essential instruments to manage economic growth. However, in less developed countries especially in sub-Saharan African countries monetary policy is less effective than fiscal policy because majority of governments of less developed countries lack the instruments to make monetary policy effective. So in less developed countries fiscal policy mainly serve as a tool to manipulate both aggregate demand and aggregate supply. The government can influence the aggregate demand by changing the total level of tax and government expenditure, whereas the aggregate supply can be managed by changing the components of government expenditures and tax compositions (Weeks, 2009: Jha, 2007)

According to Keynesians model, fiscal policy should be counter-cyclical in developing countries. During recession period when the total output and employment is far from its potential level, the government can use counter-cyclical fiscal expansion. That means the government can increase its expenditure and reduce taxes to increase aggregate demand thereby total output and employment level increase. Whereas when the economy is at boom period fiscal contraction can cool down an economy by reducing the government expenditure and increasing taxes in the economy. By doing so, the government can reduce the risk of overheating in the economy (Jha, 2007).

Therefore governments around the world should formulate and implement policies for taxation and government expenditure. These policies can have major impacts on economic growth.

The Ethiopia's economy passes through different economic strategy at different regimes and the last four decades have witnessed for these different types of policies at different regimes. During imperial regime the country experienced market oriented economy. After 1974 the economy had been changed dramatically from market oriented to centralized economy until 1991, during this period all private owned activities are nationalized by Derg government. After this period, the economy has been turned back to liberalized one by EPRDF and all activities previously nationalized by Derg regime were liberalized to private sectors. These different policies at different regimes have different implications to the country's economic growth. In the first and third period market oriented policy favoured the economic growth but did not in the second period (Alemayehu, 2005).

Teshome (2011) mentioned low tax collection capacity and supply side constraint among the others as the major challenge for economic development in Ethiopia. According to him, to bring economic growth in Ethiopia the government should involve itself in the economy. The main focus of the Ethiopian government should be reducing the supply side constraint, encourage more investment in agricultural sector and selective import substituted product, intensify the modernization process of the nation's tax collection system and introduce capital market to encourage private sector investment rather than spending more on consumption.

During the imperial regime major taxes and the requisite tax administration institutions were built. The revenue of the imperial government was mainly based on taxes from international trade. In 1974 due to the nationalization of the economic activities by the Derge government the level of tax in this period became insignificant. However, since 1992 the EPRDF regime has engaged in the liberalization of the economy. Among other things, this liberalization policy includes reformulation in taxation and tax administration (Alemayehu and Abebe, 2005).

Recent developments indicate that government expenditure on priority sectors especially expenditure on education, health and roads shows increasing trend (Teshome, 2006). According to Fitsum (2013), even if the government expenditure as a percentage of GDP is

declining, the total government expenditure and public sector in Ethiopia shows increasing trend from 2003/04 to 2010/11.

Therefore, the intention of this study is evaluating the growth effect of government expenditure and taxation in Ethiopia. In less developed countries, since the involvement of public sector in the economy is very high, knowing the effects of these two components are important to improve growth by adjusting these variables in favour of the economy. So this paper intended to identify which components of government expenditure and tax composition stimulate the economy and which of them do not.

1.2. Statement of the Problem

Fiscal policy shape macro economy through influencing aggregate demand, aggregate supply and distribution of wealth. The change in expenditure or tax in the economy directly affects the aggregate demand. This change of demand for goods and services has long run effect on the allocation of resources and the productive capacity of the economy. The change in the tax rate affects the productive capacity of the economy through its influence on the returns to factors of production. When the government increases the tax rate the net income of labor declines. Since saving and investment is a function of disposable income the rise in tax rate affects the level of both saving and investment therefore the productive capacity of the economy (Richard et al, 2006).

The effect of government fiscal policy on GDP growth rates is central to many debates in both developed and developing countries. One view of the government fiscal policy is that it stifles dynamic economic growth through inefficient government spending and taxation. Accordingly, changes in fiscal policy have little potential for stabilizing the economy. Instead, inevitable delays in recognizing economic disturbances, in enacting a fiscal response, and in the economy's reacting to the change in policy can aggravate, rather than diminish, business-cycle fluctuations. Another view is that government involvement in economic activity is vital for growth. The government plays a central role in economic development by providing public goods and infrastructure (Richard et al, 2006: M'Amanja and Morrissey, 2005).

In the short term, using of government expenditure and taxes in developed countries has a long history. Whereas in developing countries, where private sector is relatively weak and underdeveloped, government expenditure and taxes plays important role in medium- and long-term economic growth (Arnelyn et al, 2014).

According to Classical economists, lower government expenditure is advisable in the economy. On the other hand, Keynesian economist suggests that high government expenditure in the economy is used as stimulating factors to the stagnant economy (Teshome, 2006). M'Amanja and Morrissey (2005) on the other hand categorised government expenditure into productive and unproductive and tax revenue into distortionary and non-distortionary.

Likewise, empirical studies of the relationship between government size and economic growth have come to different conclusions. There have been many researches done on the determinants of economic growth. Most of them considered different explanatory variables. Some of them use government expenditure and taxation as explanatory variables for economic growth in different country.

Fölster and Henrekson (2001) studies the relation between government size and economic growth on a sample of rich countries covering the period from 1970–95. The result shows a robust negative relationship between government expenditure and growth in rich countries. When the rich country sample is extended to non-OECD countries both government expenditure and taxation are found to be negatively associated with economic growth (Fölster and Henrekson, 2001).

Alexiou (2009) applied panel data to estimate the relationship between economic growth and government spending in the South Eastern Europe. He found that government spending on capital formation, development assistance, private investment and trade-openness has positive effect on economic growth.

M'Amanja and Morrissey (2005) used time series analysis to investigate the impact of fiscal policy on economic growth on annual data for the period 1964 – 2002 in Kenya. They found that unproductive expenditure and nondistortionary tax revenue to be neutral to growth. However, productive expenditure has strong unfavourable effect on economic growth i.e. the country's economic growth decline as the government's productive expenditure rises and; there was no evidence on the effect of distortionary taxes on economic growth. On the other hand, government investment was found to be beneficial to growth in the long run.

When it comes to Ethiopia there have not been many research done on this topic. Alemayhu (2005), states that there has been a disappointing economic growth performance which has varied across the three regimes. He also states that market oriented policies provide the best

opportunities for growth. Given this facts it is important to assess the impact of various measures of fiscal policy on the economic growth of the country.

Teshome (2006) used Johansen Maximum Likelihood Estimation procedure to observe the impact of various components of government spending on economic growth from period 1960/61-2003/04. He found that human capital expenditure has long-run significant positive impact. However, as opposed to the expectation, productive government spending which is government expenditure on capital goods has negative but insignificant impact on growth of real GDP. On the other hand, in the short run, all components of government expenditure do not have significant meaning in explaining economic growth. But he did not include taxes as explanatory variable in his model.

In 2013 Fitsum conducted a research by using co-integrated and vector error correction approaches to identify the impact of government infrastructural expenditure on economic growth for period 1974/75-2010/11. He found that infrastructural expenditure positively and significantly affects the real GDP of Ethiopia in the long run. However, it has negative and insignificant impact in the short run (Fitsum, 2013).

Economic growth can be affected by both the volume of tax revenue and tax composition. But the effect of each composition on economic growth is different. Income tax cut financed by higher deficits reduces GDP in the long term; however, if it is financed by spending cuts it can have positive impacts on GDP (William and Andrew, 2014).

Both theoretical and empirical evidence do not generate strong conclusion about the impact of government size on economic performances. Empirical studies carried out in this area reached at different and often conflicting conclusions. These differences emanate from the methodology adopted, the way government expenditure and taxes are disaggregated and the countries and time considered in the study. Since fiscal policy is more effective in less developed countries, adjusting the fiscal policy in a proper way can improve the growth of these countries. Given this fact it is important to assess the growth effect of government expenditure and taxation in Ethiopia with the latest data.

The contribution of this study is not to resolve the debate on the nexus between fiscal policy and economic growth it is rather to contribute to the literature by examining the effects of government expenditure and taxation on economic growth in Ethiopia. So the contribution of this paper is to fill the gap that many of the researches those have done in Ethiopia didn’t

consider government expenditure and taxation as explanatory variables in their growth models analysis.

As I have tried to describe above, there have been researches done in Ethiopia to show the effect of components of government expenditure on economic growth and also to show the effect of tax composition on economic growth separately. However, any of them have not carried out researches that combine both the components of government expenditure and the tax composition as explanatory variables in their growth model analysis. Since tax revenue plays a major role on the level of government's spending, the compositions of these two variables should be considered in the growth model of the Ethiopian economy. In addition to this, in less developed countries like Ethiopia since the role of the government in the economy is large including these two variables in the model gives us better model specification. On the other hand, since tax revenue accounts the major parts of the total government revenue the study considers only tax revenue of the government. Therefore, this paper includes the effects of various components of government expenditure and taxation on economic growth of Ethiopia.

In general, the study examines the following basic questions:

- Does government expenditure in Ethiopia stimulate the country's economy?
- What is the impact of tax on economic growth in Ethiopia?

1.3. Objectives of the study

The general objective of this study is to examine the effects of government expenditure and tax on economic growth in Ethiopia.

Specific objectives of the study are:

- To assess the short run and long run impact of various components of government expenditure on economic growth.
- To examine the impact of tax compositions on economic growth both in the short run and long run.

1.4. Scope of the study

Overall economic growth of a country is determined by many factors. Different researches have been done on the determinants of economic growth and each of them has been done by using different explanatory variable to determine their relation to the economic growth. This

study totally concentrates on the growth effect of fiscal policy in Ethiopia. That is the interesting issue of this study will be to see the effect of various components of government expenditure and tax composition on economic growth in Ethiopia.

The study is based on a national level macro-data covering the period from 1980/81 to 2013/14. The choice of the period is based on the availability of relevant data for the study.

1.5. Significance of the study

This study gives information about the growth effect of taxes and government expenditure in Ethiopia.

Although government expenditure and taxation are very important for policy measures, so far no research has been done on the growth effect of various components of government expenditure and taxation in Ethiopia. There have been some researches done by different researchers on the growth effect of government expenditure on economic growth and tax compositions on economic growth separately, though they did not include them jointly on their model. Since the size of the government in Ethiopia is large; and tax and government expenditure is the major instruments of the government, including these two variables in the model helps to build a more reliable model. In addition to that, it also shows the real size of the government in the economy and its effect.

One of the major advantages of this study is that it incorporates the most recent data and employs both qualitative and econometric analysis to study the impact of various components of government expenditure and taxation on economic growth. Thus the significance of this study is to provide relevant result and policy implications to policy makers by bridging the aforementioned gap. In addition, this study will be added to the existing knowledge and serve as a ground for further studies to be carried out on this area.

1.5. Limitations of the Study

The first limitation of this study is lack of clear agreement on the determinants of economic growth. Obviously different researchers use different variables as a cause of economic growth. Economists are not yet assured about which elements are more advisable to stimulate the nation's economy and which are not. Some economists even discriminate these elements for developed and developing economy. Because of this controversy the econometrics model may be suffer from misspecifications.

The second limitation of this study is that there is no clear agreement on the classification of productive and non productive government spending. That is, there is no clear point about which component of government expenditure is productive and which one is not. Many researchers classify government expenditure as productive and non productive and, productive government stimulates the nation's economy and non productive government expenditure retards it. The same is true for the classification of taxes as distortionary and non-distortionary.

Finally the quality of the data also limits the accuracy of the econometric results of this study. This limitation arises from different reasons such as: inconsistency of the data collected from different sources for the same variable, poor record keeping of data and the others.

1.6. Organization of the Study

This paper contains six chapters. The first chapter is introductory part, which provides highlights of the intention of the paper. The second chapter presents literature review; in this chapter the main issues related to the topic are discussed both theoretical and empirical. The third chapter deals with the overview of the Ethiopian economy giving the emphasis to the trend of the government expenditure and tax. The fourth chapter discusses the nature and sources of data, the model specification, and estimation techniques. The fifth chapter presents the econometric findings of the study and finally the sixth chapter provides conclusions and policy implications.

Chapter Two

2. Literature Review

2.1. Theoretical Literature

2.1.1. Introduction

Economic growth is a base for increased prosperity. It comes from the accumulation of physical and human capital, and increased productivity arising from technological innovation. Accumulation and innovation raise the productivity of all factors of production thereby the potential level of output will be increased. Therefore an increase in productivity is the major factor to increase growth in per capita income.

Economic growth is caused by increase in aggregate supply and aggregate demand. There are two different views regarding these two factors. Classical economists believe that these two factors are adjusted by the market itself to bring economic growth. On the other hand, Keynesians view supports government intervention to manage these two factors to bring economic growth.

The governments can manage economic growth by applying different policy instruments. Fiscal and monetary policies are the two major instruments available to policy makers to change the level of economic variables. Since the concern of this study is fiscal policy the detail theory about fiscal policy will be presented in the following paragraphs.

2.1.2. Fiscal policy

What is fiscal policy? Fiscal policy is an instrument used by a government to manipulate a nation's aggregate demand and employment through government expenditure and tax system. When the money supply in the economy is constant the government can finance its spending either by borrowing or levying taxes with a view to influencing macro economic variables in a desired direction. The aim of this influence is to bring sustainable economic growth, high employment creation and low inflation. Therefore, the governance of fiscal policy is a powerful instrument for stabilizing the economy. It affects aggregate demand, the distribution of wealth, and the economy's capacity to produce goods and services (Ruba, 2014).

Fiscal policy involves the use of the government's spending, taxing and borrowing policies. In the short run, change in the government spending and taxation in the economy can change both magnitude and pattern of the demand for goods and services in the economy. There are

two types of fiscal policy, expansionary fiscal policy and contractionary fiscal policy. The government uses expansionary fiscal policy when the economy is at its recession period. To achieve the high level of total output and employment the government increases its expenditure and or reduces taxes. On the other hand, when the economy is at boom period the government reduces its expenditure and raises taxes. By doing so, the government can manage the nation's aggregate demand and employment level thereby the economic growth (Richard et al, 2006 and Jha, 2007).

There are two different controversial views about the fiscal policy. Early classical economists believe on laissez-faire policy. The most important element of this thought was that a market economy would automatically tend toward full employment. Since supply creates its own demand, any government intervention in the economy disturbs the proper functioning of the market mechanism. They believe that there is no need of any policy makers' intervention to manipulate economic growth; the market can manipulate all activities in the economy by itself. The classical theorists' belief in the economy's ability to maintain full employment through its own internal mechanisms caused them to favour a policy of laissez-faire (Keynes, 2003).

Before the Great Depression of the 1930s, the society was advised to rely on the market mechanism to function all the economic activities. The government intervention was limited to the area where it could make a positive contribution and to limit the role of government to the areas where it could make a positive contribution like maintaining law and order and providing for the national defence. However, during this Great Depression, where the market was failed to bring equilibrium in the economy another idea has been raised. Keynes argued that output and employment were well below their potential because there was insufficient total demand. If demand could be increased, output and employment could be expanded and the economy would return to its full employment. Moreover, Keynes believed this could be achieved with expansionary fiscal policy.

Keynes believed that supply responds to demand but not the converse. He argued that the level of total spending in the economy could be inadequate to provide full employment, interest rate adjustment and flexibility of wage and price could not bring full employment as classical economist believed. According to him, full employment is possible only when the level of total spending is adequate. Because Keynes did not believe that a market economy could be relied on to automatically preserve full employment and avoid inflation, he argued

that the central government must manage the level of aggregate demand to achieve those objectives. When unemployment exists, the federal government should increase its spending on goods and services and or decreasing taxes. This will shift the aggregate demand curve to the right and increase the equilibrium level of real GDP and employment. When inflation exists, government spending should be reduced or taxes increased. These policies will reduce aggregate demand and thus reduce inflationary pressures (Keynes, 2003).

2.1.3. Effects of fiscal policy on economic growth

Fiscal policy can play a significant role in economic growth. In the short term, when the economy is at cyclical downturn the government can manipulate the economy through counter-cyclical fiscal expansion so as to increase aggregate demand thereby increase aggregate output and employment. When the economy is at boom period the government uses fiscal contraction method to cool down an economy. By doing so, the government can prevent the economy from risk of overheating. Advanced economies have a long history of managing their business cycle through fiscal policy. In addition to this the government can also use fiscal policy to manage medium- and long-term economic growth. This is true specially in developing economy where the relative potential of private sector is weak and underdeveloped the government spend more on infrastructural activities which can benefits the productivity of all firms and industries, and the entire economy (Arnelyn et al, 2014).

The aims of fiscal policy are: to ensure balanced Government's spending, tax and borrowing requirements, improve domestic savings to support a higher level of investment and reduce borrowing from abroad, keep government consumption spending at an affordable level, contributing to lower inflation and a sustainable balance of payments, support an export-friendly trade and industrial strategy to ensure competitiveness, and ensure that pay increases within the public sector are market and productivity related, and are fiscally sustainable (Jha, 2007).

Fiscal influence in the economy distinguished into two components: fiscal decisions made by a government and fiscal indicators which a government cannot directly control. Fiscal decisions made by a government include management of tax, government spending and borrowing. On the other hand, fiscal indicators which a government cannot directly control includes the change in fiscal variables which are not due to someone's decisions rather they are due to the changes in economic environment. These types of fiscal changes in the economy are called automatic stabilizers (Kalle, 2012).

Keynesian economists say that fiscal policy made by policy makers has an influence on an economy. The supporters of this school believe that lower taxes and bigger government consumption have a positive impact on economy. On the contrary, classical economists believe that fiscal policy does not have sustainable influence on the economy in the long run. They believe that since price and wage adjust by itself in response of the change in supply and demand of the economy, output and employment always return back to their potential levels (Kalle, 2012).

Prior to the publication of Keynes's General Theory, mainstream economic thought held that a state of general equilibrium existed in the economy. According to them, the demands of consumers are always exceeds the capacity of the producers to produce goods and services. Once the appropriate price is settled everything produce by the producers will be consumed by the consumers. Whenever the aggregate supply exceeds aggregate demand the market price automatically drop down until these two variables become at equilibrium point. On the other hand, whenever the aggregate supply is less than the aggregate demand the market price will rise to make the two variables at equilibrium level. Therefore, policy intervention in the economy is unnecessary. As opposed to this, Keynesian economics advocates a mixed economy, i.e. they give priority to the private sector by giving a role for government intervention during recessions. Keynesians support this because they believe that general equilibrium does not exist in the economy, aggregate demand in the economy does not fit the total supply. In order to adjust this inequality the government intervention through different strategy is advisable (Keynes, 2003).

Classical economics focuses on creating long-term solutions for economic problems. According to this school, wages and prices are flexible and the aggregate supply curve is vertical, so the price level adjusts by market mechanism to bring the national output at the natural rate. Therefore, the changes in aggregate demand affect the price level but not the national total output. On the other hand, since the justification of Keynesians is based on fixed prices and wages, Keynesian approach is considered to be valid in the short run. They often focus on immediate results in economic theories. During economic recessions and depressions, individuals and businesses do not usually have the resources for creating immediate results through consumer spending or business investment. The government is seen as the only force to end these downturns through monetary or fiscal policies providing instant economic results. Therefore, according to this theory since prices are fixed and there

is horizontal aggregate supply curve the change in aggregate demand affects the nation's total output. That means actual output deviates from natural rate (Mankiw, 2003).

According to Keynes, monetary policy was ineffective to come out the economy from the great depression. The reason behind powerlessness of the monetary policy is that it depended on reducing interest rates, however during the great depression the interest rates were already close to zero. Making adjustment on interest rate could not bring any change on the aggregate demand of the economy. So, Keynes believed that fiscal policy is advisable for policy makers to move out the economy from the depression through managing aggregate demand. Using fiscal policy to manage aggregate demand does not only have direct effect but also have multiplier effect; for example expansionary fiscal policy first increases aggregate demand this leads to a chain reaction of increased demand from workers and suppliers whose incomes had been increased by this expansionary policy (Charles, 2006).

The leading interpretation of Keynesian theory is IS–LM model. Keynes developed this model to identify the determinants of national income in the short run for any given price level. As opposed to classical theory Keynes point out that low income and high unemployment that characterize economic downturns is a consequence of low aggregate demand. In this short run IS-LM model fiscal policy has its initial impact in the goods market, and monetary policy has its initial impact mainly in the assets markets. Since goods and assets markets are interdependent with each other both monetary and fiscal policies have effects on both the level of output and interest rates. The IS curve represents equilibrium in the goods market while the LM curve represents equilibrium in the money market. Expansionary fiscal policy moves the IS curve to the right, raising both income and interest rates. On the other hand, contractionary fiscal policy moves the IS curve to the left, lowering both income and interest rates (Mankiw, 2003: Dornbush et al, 2011).

According to Kalle (2012) any increment in budget deficit or decline in budget surplus has negative effect on growth. If the taxes and government expenditure raise by the same amount the budget deficit or surplus will remain unchanged but it does not mean that economic growth also remain unchanged rather it would slow down. In this respect the government should also recognize that changes in different categories of government revenue and expenditure may have the same impact on budget balance but they have different effects on economic growth; it depends on whether the government achieved balanced budget through increased revenue, reduced current expenditure or fewer public investments. However, if the

deficit is raised due to high spending on investment it increases economic growth. Therefore, if the objective of the government is to increase economic growth it can meet this objective by raising taxes, cutting current expenditure or increasing investment. He also added that the deficit caused by higher current spending has more negative effect on economic growth than the deficit occurred due to lower taxes. Therefore, the modest deficit at low levels of revenue and current expenditure can be more beneficial to growth compared to balanced budget at high levels of revenue and expenditure (Kalle, 2012).

Keynes rejected the view that the government's budget should be balanced. Budget balance is the difference between government total revenue and total expenditure; a deficit occurs when government spending exceeds revenue and the budget is in surplus if government spending is less than revenue. According to Keynes, appropriate budget policy should depend on business cycle. During recession rather than balancing its budget, the government should apply expansionary fiscal policy and shift its budget toward a deficit and when the economy is at boom the government should run budget surplus by following restrictive fiscal policy. By doing so, the government can manage the aggregate demand and employment in the economy and also the inflation. According to the Keynesian view, not only the gap between revenue and spending but also the levels and composition of revenue and spending have effects on the economy (Kalle, 2012: Dwight, 2012).

Fiscal deficits matter for economic growth and that patterns of fiscal consolidation affect the sustainability of deficit reduction. Specifically, fiscal adjustments that lower fiscal deficits are followed by stronger economic growth, and fiscal adjustments driven by expenditure reductions are likely to be more successful and sustainable than those driven by tax increases (Cheryl et al, 2007).

The size of government revenue and expenditure indicates the rate of government's intervention in the private sector's actions. Government can intervene into the economy through different ways like by collecting taxes, giving subsidies and social benefits, making public investments etc. By doing so the government can affect the private sectors action thereby it can affect the performance of the macroeconomic activities as a whole. What matters is not only the size of the government intervention but also the components of the means of government intervention have powerful effect on the economic growth of the nation (Kalle, 2012).

2.1.4. Growth effects of government expenditure and taxation on economic growth

2.1.4.1. Government expenditure

As to the impact of government spending on economic growth, there is no consistent theory developed to rely up on. Classical economists recommend lower government spending. Keynesian economists, on the other hand, emphasized government spending as a stimulus to a stagnant economy (Teshome Mulat,). Others, such as Barro (1990) explain the role of government spending by disaggregating it in which productive government spending enhances economic growth while unproductive government spending retards it. On the other literatures, researchers put it out that if the economy requires fiscal space; expenditure should be based on rationalizing spending and improving efficiency (IMF, 2015).

A government uses its expenditure and revenue programs to produce desirable effects on national income, production, and employment. The role of public expenditure in the determination and distribution of national income was emphasized by Keynes. As opposed to individual that determines his expenditure on the basis of his income the government determines its income on the basis of its expenditure. The government first decides the amount of expenditures to be done during a fiscal period, after that based on its expenditure the government establishes a framework for its revenue. If the amount of its spending exceeds its revenue it can fill the gap through borrowing. The last choice available to the government to fill such gap is printing of a new currency notes to increase its income, which may lead to inflation. Therefore, wise spending is essential for stability of government and proper earnings are a prerequisite for wise spending. Hence, planned expenditure and accurate foresight of earnings are the important aspects of sound government finance (Alan and Jack, 1961: Thesia et al, 2009).

Public expenditure is an important instrument for government to control the economy. It plays a major role in the economic activities whether it is developed or undeveloped economy. It is redistribution of fiscal capacity among various levels of government to obtain better allocation of resources in the economy. However, its effectiveness in expanding the economy and fostering rapid economic growth depends on whether the expenditure made by the government is productive or unproductive. If the expenditure made by the government is productive its effect on the economy would be positive and the effect would be negative for unproductive expenditures other things remain constant (Okoro, 2013: Oziengbe, 2013).

Depending on the state of governance the size of government influences economic growth rates in different way in ECA; if there is weak governance in a country a larger government spending can hinder economic growth. However, this happens only when public spending in the economy is more than 35 percent. The reason behind this is in poor governance system government spending is inefficient and misallocated due to different reasons like weak budgeting systems, high public employment, crowding out of private activity due to weak tax administrations and high government spending and corruption or poor capacity, sapping productive resources from the economy. Countries with weaker governance are recommended to practice modest form of public spending and taxation to avoid such types of problems through tight budget planning and efficient tax administration, by doing so they can register rapid rates of economic growth (Cheryl et al, 2007).

The government can improve the efficiency of public spending by identifying which categories of its activities stimulate the economic growth more than the others and also it should identify the way to allocate resources more efficiently and effectively. High levels of government spending in unproductive area like spending on public consumption and transfers negatively affect economic growth; on the other, hand government spending in productive area can stimulate economic growth. Therefore, as it mentioned before higher spending in productive area with good governance can bring higher economic growth and high levels of government spending in unproductive areas is not necessarily harmful to growth. However, if there is poor governance in the country even if there is high level of government spending in productive sectors there may not necessarily have economic improvement further higher level of unproductive spending and higher taxes slow down the economy (Cheryl et al, 2007).

On the theoretical perspective public spending plays an important role in economic activities. On the other hand, lower government spending implies requirement of lower tax to balance the budget, this will stimulate the economy and employment by increasing saving level. Nevertheless, efficient management of fiscal variables lead the economy to eliminate or at least reduce the possibility that fiscal policy itself is a source of macroeconomic instability. Therefore, public expenditure should be redirected to towards increasing the importance of fiscal and human capital accumulation. So as to mange efficient level of government size and volatility of fiscal variables, identification of which components of government revenue and spending are most detrimental to growth is important. In fact, understanding the channel through which fiscal policy affects growth can help us to understand how to redirect public spending and revenue, and which components should be limited (António and Davide, 2008).

Different economists classify government expenditure in different way some of them classify it in the nature of consumption: others, on the other hand classify it in the nature of investment and on their contribution in improving productive capacity of the economy.

Adam Smith has classified public expenditure according to the functions of the government as: protective, commercial, and development expenditure. Nicholson, on the other hand, categorizes on the basis of revenue in that public expenditure without direct return of revenue (example poor relief on some cases), expenditure without direct returns but with indirect benefits to revenue (example, education expenditure with the assumption that educated people are better tax payers), expenditure with full return or even profit like that of post office, gas service and generally public enterprises etc (Seid and Taddele, 2007).

The government expenditure is broadly divided into two categories: government capital expenditure and government recurrent expenditure. Capital expenditure is an expenditure on creating, constructing, improving or transforming an asset, infrastructure or buildings. It is an expense generally made to acquire an asset or improve the capacity of the asset. As a huge amount is spent on it, the expenditure is capitalized, i.e., the amount of expenditure is spread over the remaining useful life of the asset. In a nutshell, the expenditure which is done for initiate current as well as future economic benefit is capital expenditure. It is like a long term investment done by the entity, in the name of assets, to create financial gain for the next years. Thus capital expenditure is a long term expenditure that generates future economic benefits (Oziengbe, 2013).

Recurrent expenditure refers to payment of overheads, salaries, miscellaneous expenses, travelling, entertainment, etc. It is a short term expenditure that incurs the government every year. The benefit generated by the recurrent expenditure is for the current accounting year. High government spending on recurrent expenditure without any limits leads the economy to debt burden, since a nation finances the deficit via borrowing. It also includes most expenditure on national defence and security, but excludes government military expenditures that are part of government capital formation (OECD/Eurostat, 2012: Oziengbe, 2013).

In general, current expenditures are more effective for counter-cyclical stimulus than capital expenditures since they can be handled easily. On the other, hand managing capital expenditures are a bit difficult because of their nature of taking time to initiate as well as requiring more time to discontinue if an economy were to start over-heating. Therefore capital expenditures are more effective in raising the growth potential of an economy whereas

current expenditures are better suited in addressing shortfalls in demand that hold back realizing such a potential (John, 2003).

Others, on the other hand, classify government expenditure into three components: government final consumption expenditure, capital expenditure, and transfer payment. An expenditure made on purchase of goods and services for current use so as to satisfy individual or collective needs of the community is classified as government final consumption expenditure. On the other hand, capital expenditure includes expenditures made on goods and services planned to create future benefits such as infrastructural investment (spending on transport, health center, communications, etc), expenditure on research and development, education, so on, while expenditure on spending that does not involves transaction of goods and services rather transfer of money from government to society is called transfer payments which includes social security payments, pensions and unemployment benefits (Seid and Taddele, 2007).

According to Keynesian approach, when the government increases its spending the aggregate demand in the economy rises which further stimulates the economic growth and employment. This indicates that government spending has positive relationship with economic growth. However, the rising level of government expenditure as a result of the current expenses or unproductive may lead the economy to fiscal deficit. Since fiscal deficit negatively affects the economy through inefficient allocation of resources, high inflation and by crowding out the private investment, many economists consider fiscal deficit as the main cause for every illness of the economic activities. In the long run, this fiscal deficit turns to high debt to GDP ratio and this leads to a negative impact on country's long run fiscal sustainability thereby transfer burden to the welfare of next generations. In general, the outcomes of the fiscal deficit further cause the poverty and decrease the welfare in the economy (Rashid and Sara, 2010).

Government expenditure also classified as productive and unproductive. Those expenditures which enable the economy to produce more in the future directly or indirectly such as expenditures on social over heads (construction of roads, schools, hospitals, telephone, electric power, etc.) are considered as productive expenditure. The productive power of the society can increase in the form of human wealth. If through education, training, health, better living conditions etc, the working population of the country can add to its productive power and the expenditure on such items should certainly be termed productive (though they

are productive). There are also certain expenditures without which the economy cannot live and cannot maintain its productivity. Such expenditures indirectly help the economy in attaining higher levels of productivity. For instance expenditure on research and expenditure on made to build efficient administration, communication, and other infrastructural facilities indirectly add to the health and efficiency of the economy. On the other hand, sometimes the government has made expenditure for waging wars, for ceremonial purpose etc. Such waste full and avoidable expenditures are termed as unproductive (Seid and Taddele, 2007).

Human capital accumulation is a key contributor to growth. Inequities in education and health outcomes persist in advanced and developing economies. Unbalanced access to education in both developing and advanced economies has negative effects across generations. It may affect the opportunities to go to school and also maintains inequality across generations therefore this will restrict the economy's long-term growth. Educational reform options include: increasing investment in lower levels of education, improving the efficiency of education spending, increasing cost recovery in tertiary education, targeting conditional cash assistance and growth friendly fiscal reforms may require fiscal space (IMF, 2015).

Infrastructure spending includes spending on construction of roads, expanding communication systems, electricity, and pure water supply and so on. More infrastructure spending does not always have positive effect on economic growth; it may discourage economic growth in a bad policy environment. More emphasis should be given to promote more efficient use of scarce resources through changes in ownership, pricing, collections, and safety nets to protect the poor. Furthermore, effective policies and institutional reform are mandatory to promote efficiency and strengthen governance (Cheryl et al, 2007).

Government expenditure on education is considered as government intervention on infrastructural input. Since private schooling efforts depend on the level of government provided infrastructural input, such government intervention together with private schooling effort induces schooling technology. Eventhough private sector uses public spending as an input for their schooling effort, greater government intervention in schooling crowds out private schooling efforts. Therefore, public spending on education has two effects on economic growth. That is, complementarity between private and public sector in the human capital production promotes economic growth, while crowding out effect of government intervention discourages economic growth. If the government infrastructural role in education is significant on the nation's economy complementary effect will dominate the crowding out

effect and the outcome will be positive. Therefore, the net growth effect of government spending on education depends on which effect is dominant (Parantap and Keshab, 2010). Many factors other than public spending affect educational outcome but the level and efficiency of public spending is a necessary input in production of human capital. Thus, enhancing effective investment on education has been a principle of growth and development strategies of most countries (Bright et al, 2012).

There is bidirectional relationship between a population's health level and its level of economic growth and development. A sustainable growth and development enables better health conditions, increases the share of population of healthy individuals by providing better nutrition and disease treatment opportunities to the society. This improves the quality and quantity of labor supply. On the other hand, because healthy individuals are more fit both physically and mentally, they are expected to contribute to production more than a sick person and increase productivity and have a positive impact on economic growth. When a person is healthy, life expectancy increases and this promotes individual savings and private investments in education. Thus, contributions are made to investments and the development of human capital. There is also the opportunity for the healthy individual to find better means to benefit from these investments they have made. So government expenditure on health sector has multiplier effect on the economy. When the government raises its expenditure on the health sector it raises the level of employment in the economy through healthiness of the people thereby increases the total income in the economy. Therefore the aggregate demand increases in the economy. On the other hand, with less government spending on health sector, the quality of labor supply declines and leads to less productivity and lower output in the economy (Serdar, 2015).

Determining appropriate policies and funding mechanisms for health is a difficult public finance. High level of government spending on health sector does not necessarily mean there is high productivity rather better governance of the health system as well as stronger complementary inputs such as education, living conditions, and environmental protection are important inputs for effectiveness of such policies (OECD/Eurostat, 2012).

Increased spending on public infrastructure, health, and education would need to be financed either through additional revenue or through reductions in other public spending. Additional borrowing is an option for countries where fiscal sustainability and rollover risk are not a concern (IMF, 2015). Another area of concern is the management of pension funds. The

pension funds should be collected and managed in appropriate and efficient way, so as to earn and contribute to the national pension fund (OECD/Eurostat, 2012).

2.1.4.2. Tax

Government revenue is the means to finance its spending; broadly speaking the source of the government revenue can be either tax revenue or non tax revenue. However, the concern of this paper will be only the tax revenue part of it.

Taxes are compulsory contributions of citizens or burdens imposed by the legislative power of a state upon person or property to finance collective needs. Actually, tax payers are in all cases a person since all properties are belongs to someone the owner of the property pays tax indirectly for their properties. At the begging taxes were voluntary contributions of citizens to finance the expense that incurs the government. However, now a day it becomes obligatory in all civilized nations. When taxes are levied; the citizen is liable for their payment at the time and in the manner required and provided by the law authorizing their assessment and collection.

Taxation includes the processes of levying, collecting, and paying taxes. The primary purpose of taxation is to mobilize the revenue required to finance public spending on goods and services. It can be levied either on income or expenditure, or on a combination of the two. Since taxes play a major role to influence economic decision of both households and firms (like by affecting after tax price of goods and services for consumers and after tax profit of firms), the tax system should be designed in appropriate way to bring efficient and fair allocation of resource as much as possible. By doing so, the state can achieve appropriate level of revenue that helps to finance its expenditure. Thus, a well designed tax system should be effective in raising revenue, efficient in its effects on economic decisions of households and businesses, and equitable in its impact on different groups in society (Amin and John, 2010).

A good tax system should be applied efficiently in a way that costs a little money and resources as much as possible. Efficiency of the tax system can be measured through administrative costs, compliance costs, and excess costs. The other major principle of taxation is that the burden of tax should be distributed fairly. The ability-to-pay principle and the benefit principle are the two principles for the fairness of taxation. The ability-to-pay principle states that people should pay taxes based on their ability to pay; thus the people who have the same amount of wealth should pay the same amount of taxes, and people who have

different amount of wealth should pay different amount of taxes in accordance of their wealth.

Tax policy can influence economic growth through the four determinants of economic growth. These four determinants of economic growth are labour supply, capital investment, technological progress, and human capital. Tax policy affects these determinants of economic growth by changing their after tax return to a certain economic activities. For instance if the tax policy increases after tax income of the labor, the household will be encouraged to supply more labor and thereby increases the total output. Likewise, tax policy that rises after tax income encourages the supply of physical and human capital and promotes technological innovation that leads to high level of output in the economy. On the other hand, tax policy that decreases after tax income of the factors of production will reduce supplying of additional labor and capital, thus potentially reducing economic output. This effect of tax policy in economic growth is considered as direct effect. Tax policy might mitigate any negative growth effects from taxes by selective subsidies that support formal education and job training, and that promote investments in research and new technologies. Tax policy may have indirect influence on economic growth by affecting efficient allocation of resources. The productivity of factor of production increases as economic resources are directed to their most productive use in the economy. Taxes may lead to economy wide distortions that reduce economic efficiency however there is also an occasion that taxes may correct for market failures and thereby increase economic efficiency. Therefore, the impacts of taxes on economic efficiency vary for different composition of taxes and also depend on the economic activity being taxed (Joint Committee on Taxation, 2015).

Based on the nature of the taxes and the reason for payment of it, taxes are classified into direct and indirect taxes. Direct taxes are taxes paid entirely by those persons on whom they are imposed. I.e. the taxpayer is not able to pass the burden to someone else. On the other hand, an indirect tax is a tax whereby the taxpayer's burden to pay the tax can easily be passed on to another person. Generally, the tax incidence of an indirect tax is on the ultimate consumer; however, sometimes, sellers might absorb such indirect taxes so as to be competitive in the market in which they are operating. Direct taxes include taxes on individual or household income, taxes on the income or profits of corporations, taxes on holding gains and other taxes on income. While taxes on products like value added taxes (VAT), excise duties, stamp taxes, car registration taxes and taxes on production are included in indirect taxes (Mura, 2015).

There is no a uniform tax system that build as a standard form to fit any economic structure of every country. The best tax system for any country should depend on different factors like country's economic structure, its capacity to administer taxes, its history, its public service needs, and many other factors. Nonetheless, understanding the existing tax systems around the world can be used as an input to build the best tax system in a given country. In addition to this in accordance of the nations' preference they may attach different importance for the characteristics of a good tax system. A country's revenue structure appears to depend to some extent upon its location and economic level. For instant, international trade taxes may play an important role in small island countries and in lower income countries. While the role of such taxes decline steadily as countries become more developed, these countries relies more on direct taxes, especially those on personal income and also to some extent on consumption taxes. In general revenues in lower income countries rely on international trade taxes as they are easy to manage and also incur lower cost to collect them, while advanced nations rely on direct tax which requires more effective and sophisticated tax administration and taxpayers (Richard and Eric, 2003).

The rationale behind the intervention of government in a certain market is market failure. Market may fail to operate its activity if there is externality in the economy. Taxes are one tool that policymakers can use to correct for market failures. By using taxes as a tool they can manage after tax price of goods and services or after tax profit of the firms. Policy makers encourage the activities that have positive externality by reducing taxes or by subsidizing them. They can also discourage those activities those have negative externality in the economy via levying more taxes (Joint Committee on Taxation, 2015).

Both developed and developing countries try to offer different incentives to attract international investors into their nation to foster their economic growth. Tax incentives are the major strategy to attract the investors like tax free zones for idle sectors, tax holiday, and other incentives. However ineffective tax incentives may actually damage the country's revenue base, it may worse off economic growth and it can also direct scarce resources into inefficient activities. Therefore special attention should be given in developing countries while practicing such incentive since it does not have any compensation or alternative to pay off the damage that arises from ineffective tax incentives (Ben and Narine, 2014).

However there are two views regarding the effectiveness of the tax incentive. The supporters of tax incentive believe that a country can uses tax incentives strategy to promote investment

specially FDI with the belief that it facilitate growth through creating employment and technology transfer. On the other hand, the opponents argue that since tax incentives favour selected project it has distortionary effect on the economy (Simret, 2013).

As I mentioned above market failure is the reason for government intervention. Market fails to supply public goods and services since they are subjected to collective consumption and their natures of non-rivalry and non-excludability. Thus the government intervention into the market to supply public goods for the society is inevitable. Therefore the government uses taxes as a main source of revenue in order to finance the production of such goods and services. Taxes are the main source of government revenue and it is originally a portion of private wealth that the government extract it from individuals for the purpose of meeting the expenditure essential to carrying out the functions of government (Hubert, 2011).

Keynesian economists argue that reducing the rate of direct taxes increases after tax returns of the tax payers. Especially when the government reduce the tax rate on personal income taxes, the individuals spending power will rise since it raises their disposable income. Therefore a reduction on tax rate in the economy encourages the aggregate demand of the economy and thereby increases the economic activity as whole. On the other hand, any attempt to increase tax rates on direct taxes will discourage the incentive of factors of production to work and also reduce their productivity since it reduces their after tax return. Thus it discourages aggregate demand of the economy by reducing the purchasing power of the individual, and then finally depresses economic growth. The Ricardians, however, argue that implementation of any tax policy leads to fiscal imbalance in the economy. For instant any tax cut in the economy leads to budget deficit and recommends the government to finance the gap through borrowing (Hubert, 2011).

In an endogenous growth theory the researchers concluded that taxes have distortionary effect on growth, hence discourage the economic growth of the country. Therefore they suggested that it should be low in the long run (Rosa, 2012).

A well designed tax system can ensure stable public finances, increases employment and contributes to a fair distribution of income and thereby boost economic growth. Therefore to ensure the efficiency and fairness of tax systems the policy makers should focus on identifying appropriate ways to shift some of the tax burden away from distortionary effects to non-distortionary one. For instant policy makers can design lower taxes on labours those are more reactive to tax reduction and compensate this revenue by levying more taxes on less

harmful activities to growth and employment, such as consumption, recurrent property and environmental taxes. In general, broader tax bases and lower tax rates tend to be more conducive to growth. There are also some occasions that tax exemptions and deductions become justified when they are designed to address specific social concerns or market failures. Whereas they should be designed carefully to meet intended goals (Florian and Gaëtan, 2015).

In many case a public spending plays a very important role in supporting economic growth. However if there is a low level of public spending in the economy then the economy requires smaller amount of revenues to finance such low level of spending and to achieve balanced budgets. Therefore the government can levy lower taxes level which stimulates the country's economic growth and employments (António and Davide, 2008).

The government can raise its revenue through levying taxes on different sectors, while giving a careful attention in balancing its revenue with economic growth. High levels of tax collection increases the spending power of the government, on the other side it may discourage certain productive economic activities. For instant an increase in tax on capital obviously raises the government's revenue and increases its ability to spend and foster economic growth, however high level of tax also reduces the marginal productivity of capital and thereby discourage investments in the economy. Therefore the net effect of the taxes on economic growth depends on which effect dominates the other (Christine, 2014).

The primary objectives of Tax systems are financing public expenditures in addition it also used to promote equity, to address social and economic concerns, to affect the decision of households and firms (affects the decision of households: to save, supply labour and invest in human capital and firms to produce, create jobs, invest and innovate, as well as the choice of savings channels and assets by investors) (Alicja, 2013).

High tax expenditures and narrow tax base negatively affect the economy through creating economic distortions and diminish the efficiency of the tax system. Narrow tax base often leads to uneven distribution of fiscal burden between economic factors and taxpayers, as it forces small part of the population to pay high income tax. Since corporate income tax is paid by small number of companies and personal income tax is usually paid only by civil servants high tax burden is imposed on them and therefore the objectives of reducing inequality between citizens can not achieved. Rather these high tax expenditures and narrow tax bases increase compliance costs and lower tax collection without always achieving their economic

or social objectives. Therefore broadening the tax bases and reducing tax expenditures as much as possible can thus reduce the complexity of the tax system, compliance costs and the costs of tax collection. By doing so the government can increases the efficiency and fairness of taxes (Alicja, 2013).

Taxes can stimulate economic growth either by providing appropriate incentives within the provisions of specific taxes or by shifting the tax structure in a desirable way. Taxes on corporate and personal income play a major role in economic growth. Corporate income taxes affect the companies' decision regarding location and volume of investment and thereby decrease domestic and foreign direct investment. Personal income taxes and social security contributions affect the decision of the individual between work and leisure, hence they affects the total labour supply in the economy. In addition social security contribution paid by employers affects the cost of hiring labours and hence affects the demand for labour. On the other hand VAT should be levied to the extent possible on a broad base minimising revenue losses from exemptions and reduced rates (Tax Reforms in EU Member States, 2012).

Taxation of labour affects the decision of economic agents to participate in the labour market since it affects after tax returns. Thereby affects the decision to invest on education and hence has effect on the level of skilled human capital. Taxation on capital affects the households' decision to invest and save thereby influences the location of businesses and affect domestic and foreign direct investment. On the other hand taxation on research and development reduces the profitability of the innovators and this leads to depress technological developments. Taxation on consumption favours economic growth since it discourages spending on unproductive activities (Mura, 2015).

2.1.5. Effect of government expenditure and tax on economic growth in developing countries

Using fiscal policy in developing countries is more effective than monetary policy. The reason behind is that in developing countries especially for sub Saharan countries there is lack of instruments to apply monetary policy.

The basic objectives of developing countries are to attain a rapid economic growth in both public and private sectors. They want to achieve equal distribution of income, better employment opportunities and the nations also intended to reconstruct the agricultural sector since most people are engaged in this sector. However there is a shortage of capital in developing countries. Thus public expenditure in those countries plays a critical role in

increasing the rate of capital formation. In these countries since the economic development is at the initial level the priority should be given to the agricultural and allied sectors which provide a base for industrial development. Therefore the government should spend more on such sectors like dams, irrigation projects, soil conservation etc and must also concentrate on social and economic overheads. By facilitating such infrastructure the government can motivate private entrepreneurs to invest on modern industries and thereby foster economic growth (Seid and Taddele, 2007).

Fiscal policy plays a significant role in economic growth of developing economies where the private sector is relatively weak and underdeveloped. Public spending on physical infrastructure, such as roads, ports, and power plants, affects the productivity of all firms and industries, and the entire economy. Likewise, public spending on education fosters human capital which is a vital ingredient to long term growth. On the other hand, taxes can harm growth because they distort economic incentives and behaviour through reducing after tax returns of the factors of production and then the aggregate demand of the economy. However different taxes are vary in the extent of their distortionary impacts. For instant corporate income taxes have a negative impact on investment but like excise tax, VAT and others have non distortionary effect on the economic growth (Arnelyn et al, 2014).

The market mechanism in the developing countries cannot generate sufficient amount of savings and investment needed for rapid economic growth. The saving potential in a developing economy is very limited due to shortage of particular resources, lack of adequate demand, especially for capital good and high cost of production. Saving oriented government budget plays an important role to overcome such problem and helps to increase capital formation (Seid and Taddele, 2007).

Many developing countries face the problem of fiscal deficit due to high government expenditure. This leads to inflation in the economy and also crowd out the private investment in the long run and decreases the employment and output which adversely affects the poverty (Rashid and Sara, 2010).

In developing economies the government allocates large share of its budget to higher levels of education as compare to the budget allocated to the lower levels. Therefore lower groups often fail to access to higher level of education since higher income groups are disproportionally accessed it. Therefore improvements should be made accessibility of

primary level education and progress to higher levels of education trough improving government spending on this sector (IMF, 2015).

Health expenditure in developing countries is an important component of government expenditure. Since developing countries use labor intensive technology, the increase in the rate of non-healthy individuals in the community increases workforce loss and reduces productivity. In addition they cannot fully take advantage of the cheap labor factor to the extent required. Therefore, the health of the society and the labor markets are more important for developing countries. Therefore high government expenditure on health sector improves the quality and quantity of labor in developing countries (Serdar, 2015).

2.2. Empirical literatures

Several empirical papers have studied the effect of government size on economic growth. However there is no consensus on the direction of this impact on the economy. The following pages will discuss different empirical findings investigated by different researchers based on the data from different countries.

The paper that analyses the effects of government revenue and spending on growth in terms of size and volatility in OECD and EU countries indicates that both government revenue and spending slow down economic growth in both country samples. The study analyse the effect of revenue by disaggregating it into direct taxes, indirect taxes and social contributions. The result from this indicates that indirect taxes and social contributions are the most harmful factors to growth, both in terms of size and volatility. On the other hand the study also disaggregates government spending into transfers, subsidies, government consumption and government investment expenditure. The result from this disaggregation indicates that both subsidies and government consumption have negative and significant effect on economic growth of both countries. In addition government expenditure on investment does not have any significant effect on growth while spending on transfers has a positive and significant effect only for the EU countries (António and Davide, 2008).

Fölster and Henrekson (2001) conducted an econometric panel study on a sample of rich countries covering the 1970–95 periods. Extended extreme bounds analyses are reported based on a regression model that tackles a number of econometric issues. They found out that the more econometric problems are addressed, the more robust the relationship between government size and economic growth appears. The results point to a robust negative relationship between government expenditure and growth in rich countries. The size of the

estimated coefficients imply that an increase of the expenditure ratio by 10 percentage points is associated with a decrease in the growth rate on the order of 0.7–0.8 percentage points. When the rich country sample is extended to non-OECD countries both government expenditure and taxation are found to be negatively associated with economic growth.

Margareta and Åsa, (2012) studied how statutory tax rates on corporate and personal income affect economic growth by using panel data from 1975 till 2010 for 25 rich OECD countries. We find that both taxation of corporate and personal income negatively influence economic growth. The correlation between corporate income taxation and economic growth is more robust, however.

Long-run GDP impacts of changes in total government expenditure and the shares of different spending categories were examined by Norman et al (2014) for a sample of OECD countries. The findings indicate that government spending on infrastructure and education sector stimulate the long run GDP of the OECD countries, while the share of social welfare spending has negative effect on GDP in the long run. They concluded that reallocating total spending towards infrastructure and education helps the OECD countries to accelerate their economic growth.

The result on investigation of the effects of changes in taxes on economic growth by using annual data from 1965 to 2007 for a panel of twenty-six OECD economies shows that an increase in taxes has negative and persistent effect on real GDP per capita. This effect of tax changes has a large impact on investment than that of GDP or consumption. The study also disaggregated taxes as taxes on income, profits, and capital gains; taxes on property; social security contributions; and taxes on goods and services. The result indicates that except taxes on property, all types of taxes have negative and significant effect on real GDP per capita while the property taxes affect the per capita income negatively though it is insignificant. The study also estimated that a higher share of social security contribution on total tax revenue has a large negative effect on economic growth than income taxes (Davide and Georgios, 2007).

Rudolf Macek (2014) evaluates the impact of tax compositions on economic growth by carrying out a regression analysis in the OECD countries for the period of 2000 - 2011. Accordingly the result indicates that personal income taxes, corporate taxation and social security contributions have negative effect on economic growth since they discourage capital accumulation, inflow of FDI and creation of savings. Among these types of taxes a higher

corporate taxation is found to be the most destructive to hinder economic growth and it is followed by personal income taxes and social security contributions. In contrast property tax has positive effect on economic growth of the OECD countries. He also investigated that government spending associates negatively with economic growth. He related this negative association with crowding out effect of private investment as government spending rises and also outweigh of unproductive spending which leads to lower economic growth rate.

Another finding is that not all tax changes will have the same impact on growth. Reforms that improve incentives, reduce existing subsidies, avoid windfall gains, and avoid deficit financing will have more auspicious effects on the long-term size of the economy, but in some cases may create tradeoffs between equity and efficiency (William and Andrew, 2014).

Rashid and Sara (2010) examined the long run as well as short run relationship between the fiscal deficits, which is outcome of high government expenditure over the level of tax revenue collection, and poverty. The results reveal a negative relationship between government expenditure and poverty based on time series data from 1976 to 2010. The short run and long run relationships between poverty and other variables are identified by ECM model and Johnson Cointegration test respectively. The results show that there exist short run as well as long run relation between the poverty and government expenditure.

Alexiou (2009) applied panel data to estimate the relationship between economic growth and government spending in the South Eastern Europe found that government spending on capital formation, development assistance, private investment and trade-openness all have positive and significant effect on economic growth.

Sagiri (2010) studies the effect of a temporary tax cut and a temporary rebate transfer on economic growth. He found out that in the short run a reduction in income taxation encourage workers to work and save more since it increases after tax income, thereby raising aggregate output and consumption. However the long run effect of such reduction on tax rate leads to debt accumulation and this can be served by imposing high tax rate in the future which can crowd out capital and reduce output and consumption. Therefore in the long run income tax cut have a negative impact on the economic growth.

The study on the optimal allocation of tax revenue among a universal transfer payment, a pure public good and expenditure on education revealed that expenditures on education raise

the productivity of individuals through human capital development and besides education has substantial fiscal spillover effect on each activities of the economy (John and Solmaz, 2008).

There is a study in Malaysia to investigate the association between government expenditure and economic growth based on the data from 1970 to 2007. To investigate the relationship of these variables the researcher used OLS regression mechanism. Based on this the findings indicate that rising of the total government development expenditure has a significant and negative relationship with economic growth. The study also found out that the government development expenditure on transport, health and public utilities have a positive and significant relationship towards economic growth (Khairul and Bin, 2011).

There is a study undertaken over the period from 1980 to 2010 in east Africa to investigate the effect of disaggregated government expenditure on economic growth by using unbalanced panel fixed effect mode. The results reveal that expenditures on health and defence have positive and significant effect on economic growth. In contrast, as oppose to the expectation expenditure on education and agricultural sector were insignificant (Naftaly et al, 2014).

John and George (2005) utilize annual data drawn from the UK, Greece and Ireland to examine the relationship between government size growth and income growth. From their Granger causality test public expenditure Granger causes growth in national income in all countries either in the short or the long run. That is the impact of public sector has positive and large government spending foster the economic growth of all countries. The result also investigate that the Wagner hypothesis is applicable in both Greece and UK date, while the results for Ireland do not indicate any Wagnerian-type causality effect.

Santiago and Jiae (2012) investigated different countries with at least 20 years of observations on total tax revenue during the period 1970-2009. The findings indicate that increasing income taxes while reducing consumption and property taxes has a negative impact in the long run economic growth. They also find that the higher share of social security contributions and personal income taxes in the total income tax revenue have strong negative impact on economic growth than the high level of corporate income taxes. In addition a shift from income taxes to property taxes contributes positively to growth. Their findings also reveal that value added and sales taxes have positive and significant relation with economic growth. Finally they confirm these findings only to high and middle income countries and shifting tax composition in lower income countries has no any significant effect in their economic growth.

There is a study done to investigate the impact of taxation on economic growth in Jamaica by using a general autoregressive distributed-lag model. The finding indicates that increasing the share of indirect taxes in the total tax revenue has positive effect in the long run economic growth, while tax revenue from consumption taxes foster the short run economic growth. The finding also reveals that increasing the total tax revenue through personal income taxes harms the economy both in the short run and in the long run (Hubert, 2011).

The study that the impact of tax rates on economic growth rate using panel data from Canadian provinces over the period 1977–2006 reveals that a higher corporate income tax rate has negative effect on economic growth since it crowd out private investments. The finding also reveals that increasing sales taxes in the economy encourages private investment and then leads to a higher economic growth in Canada (Ergete and Bev, 2012).

Mura (2015) investigates the impact of direct and indirect taxes on economic growth based on the date from six East-European countries for the period of 1995-2012. Accordingly the investigation from this date indicates that direct taxes have a negative and significant effect on economic growth while the effect of indirect taxes on economic growth is positive but it is insignificant to stimulate economic growth.

Ziengbe (2013) investigated the relative impacts of federal capital and recurrent expenditures on Nigeria's economy in the 1980–2011 period by using cointegration and error correction mechanism. The result indicates that capital and recurrent expenditures have a long run effect on the Nigeria's economy. However the short run relationship of these variables with economic growth is insignificant though they become significant with a lag. When they become significant with a lag the recurrent expenditures have negative impact on the economic growth while the capital expenditures have positive impact. Besides, the impact of recurrent expenditures dominates the impact of capital expenditures in the short run. He also concluded that excessive recurrent expenditures have dangerous and inhibiting effect on the economy of the developing countries. In Nigeria his study reveals that government expenditure contributes significantly to the size of Nigeria's economy, though the predominance of recurrent expenditure in the composition has tended to reduce its effectiveness.

Another researcher investigated the impact of government capital and recurrent expenditure on economic growth in Nigeria using the Johansen co-integration analysis for the period of 1970-2009. The result indicates that the components of total government expenditure have

negative and insignificant effect on economic growth of Nigeria except the spending on education and health which have positive and fiscal spillover effect on the economic activities. However, in the long run the components of capital expenditure have a positive effect on the economic growth of the country (Adeyemi and Stephen, 2001).

There is also a study that investigates the effects of public expenditure in education on economic growth in Nigeria over a period from 1977 to 2012. The result revealed that the government expenditure on education has positive and significant effect on the economy in the long run. However the recurrent expenditure on education negatively affects Nigerian economy. Based on this the researcher recommended that in order to accelerate economic growth the Nigerian government should redirect its expenditure from recurrent expenditure on education to capital expenditure, especially towards education sectors since it increases human capital and thereby increases productivity in the economy (Nkiru and Daniel, 2013).

The study conducted on nature and impact of Federal Government Expenditure on Nigeria's economic growth for the period 1992 – 2011 uses Ordinary Least Square (OLS) multiple regression technique to identify the impact of government expenditure on economic growth. The results of this study show that the Federal Government Expenditure has a positive and insignificant impact on the economic growth of Nigeria for the period under study (Nwaeze and Nwaeze, 2014).

Mohame (2012) carried out a study to test the Wagner hypothesis in the context of the Sudan for the period 1970-2010. He investigates the hypothesis base on the data for the period by using cointegration, causality, and error correction model (ECM). The result indicates that the Wagner's hypothesis is valid on the Sudanese date for the period considered. Therefore as oppose to the Keynesian theory that increases in government spending result in increases in GDP, as the Sudan's economy grow up so does the size of the government in the country.

When we come to Ethiopia in 2006 Teshome used Johanson Maximum Likelihood Estimation procedure to see the impact of various components of government spending on the growth of real GDP in Ethiopia for the period 1960/61-2003/04. He found that only expenditure on human capital have long-run significant positive impact. Investment (productive) government spending displays a negative but insignificant impact on growth of real GDP, which again reveals the inefficiency and poor quality nature of public investment. In the short run, all components of government expenditure do not have significant meaning in explaining economic growth.

In 2013 Fitsum conducted a research by using co-integrated and vector error correction approaches to identify the impact of government infrastructural expenditure on economic growth for period 1974/75-2010/11. He found that infrastructural expenditure positively and significantly affects the real GDP of Ethiopia in the long run. However it has negative and insignificant impact in the short run (Fitsum, 2013).

Dasalegn (2014) uses multiple regressions method to analyze how VAT becomes a tool for national development in Ethiopian context from the period of 2003 to 2012. His finding reveals that, VAT, total tax revenue and non-tax revenue has positive and significant effect on Ethiopian economic growth during the periods under review. They also find that taxes collected from VAT boosts the general economic growth more than the sales tax in Ethiopia. It plays an energetic role for the national development of Ethiopia and it also enables to succeed the current growth and transformation plan (GTP) of the country.

CHAPTER THREE

3. The effect of government expenditure and tax on economic growth in Ethiopia

3.1. Overview of Ethiopian economy

Ethiopia is one of the poorest countries in the world. And the economy is a subsistent one that is dependent on agriculture which uses the oldest methods to be implemented. The country's export sector is concentrated around a few primary commodities like coffee, oilseed, chat, pulses, gold, live animals and flowers; and manufacturing commodities like leather and leather product, frozen meat, sugar and textiles. The high dependency of rainfall for production in agricultural sector is also one of the main determinants for its agricultural output. Hence the performance of the economy is guided by the performance of the agricultural sector.

According to annual report from national bank of Ethiopia, despite the fact that the agricultural sector remains a dominant one its share in GDP is declining throughout the years. In 2014/15 the agricultural sector contributed 38.8 percent to GDP which declined by 1.8 percent from 2013/14, while industrial sector and service sector contributed 15.2 percent and 46.6 percent to GDP, respectively. Accordingly, the contribution of industrial sector increased by 1.4 percent while the contribution of service sector remained constant, this indicates that the Ethiopian economy is transforming from the agrarian economy to the modern economic activities.

Most reports indicate that Ethiopia is growing at double digit rate for the past several years. Further Ethiopia's growth rate is double the Sub Sahara Africa and triples the world average growths and has led Ethiopia being rated as one of the fastest growing economies in the world.

Although economic growth is not a primary objective of the Ethiopian government, it is a principal method to achieve a primary goal which is poverty alleviation. To achieve this goal the government uses agricultural development led industrialization (ADLI) strategy. The objective of this strategy is to strength the interdependence between agricultural and industrial sectors by increasing the productivity of peasant farmers, expanding large scale private commercial farms, and by reconstructing manufacturing sector into utilizing domestic

resource input oriented. Since the nation is endowed with a large number of labor forces and a sizable arable land ADLI is designed to use labor and land intensive methods (Rahel, 2003).

According to Alemayehu and Befekadu (2005) the quality of public policies is among the major determinants of Ethiopian economic growth. So appropriate designing of public policy in favour of economic growth has a significant contribution to economic growth of the nation and thereby in poverty alleviation. Ethiopian government uses both fiscal and monetary policy to achieve its development objectives. However the concern of this paper is only fiscal part of the government policy that is policy on government expenditures and taxes. Since there are different sectors in the economy with different outcome the government should distribute its expenditure by identifying the productive sector of the economy and also design taxation policy that suites the economy.

In this context, it is interesting to know the relationship between fiscal policy and economic growth in the country. More specifically in the following sections the effect of government expenditure and tax on the Ethiopian economic growth will be discussed at different regimes.

Throughout the period under consideration both government expenditure and tax revenue have shown increasing trend at nominal term except a little fluctuation during the Derg regime. The concern of this paper however is not only the trend of these variables rather the main focus of the study is to investigate the effect of these variables on the country's economy. Since the trend and values at the nominal term does not represent the exact size of the government intervention in the economy, the researcher deflates the nominal values with their respective deflators so as to identify the real effects. In addition the share of these variables on RGDP is calculated based on the data obtained from National Bank of Ethiopia since it is a very rational to measure the government size in the economy. Therefore the next part of this paper will discuss the size of the government in the economy by considering the ratio of different means of government intervention (via expenditure and taxes) into the economy to GDP.

3.2. The Imperial (Monarchy) Regime: Pre 1974

The Ethiopia's economy passes through different economic strategy at different regime. The last four decades have witnessed a cyclical evolution of policy regimes. The environment for growth evolved from a fairly market-oriented one to a highly controlled one before being liberalized in the third period. This cyclical policy stance is associated with a growth cycle

which was favourable in the first and third periods and very poor in the second (Alemayehu, 2001).

Ethiopia was ruled by a monarchy for around a millennium. The socio-economic system was essentially 'feudal' and landed aristocracy and majority of peasants (tenants) constitute the major socio-economic agents during this period. Until the early 20th century, before the establishment of a salaried bureaucracy and military, the peasantry carried the burden of supporting government functionaries. In this period an attempt was made to modernize the country through the expansion of modern schools and health facilities, the promulgation of a constitution, the development of infrastructure, and the beginning of medium-term planning (Alemayehu, 2004).

During imperial period the government's expenditure in Ethiopia was one of the smallest in the world as measured the government expenditure to GNP ratio. However it showed increasing trend it raised from 8.5 percent of GDP in 1961 to about 13 percent in 1971. During the late seventieth and the early eighties public spending in Ethiopia grew to the intermediate level and finally it became one of the largest spending in the world after 1983. In 1989 the country's ratio of total government expenditure to GNP was the second highest of 18 low income economies, the eleventh highest of 56 low and middle income economies and the twenty second highest of 77 countries of the world for which data were provided (Wogene, 1994).

The growth of the public sector was also accompanied by changes in the composition of expenditure. During the imperial regime the government allocated more finances on current expenditure and little on capital expenditure. Even though the share of capital expenditure to total expenditure is generally lower, it showed increasing trend due to relatively higher investment on infrastructure by virtue of the first five year plan (Teshome, 2006).

Another way to analyse the change in the structure of government expenditure is the classification of it by 'function' or 'sector'. The functional classification derives from what may be thought of as broad objective of the government and falls under four broad headings: general services, economic services, social services and other services which include debt services, subsidies and other miscellaneous expenses).

The expenditure structure that emerged between the mid-fifties and the first half of the seventies is explained by the priorities and objectives set in the three five-year plans of the

imperial regime and the attempts were made to allocate resources accordingly. During the First Five Year Plan (1957/58-1961/62), since the government thought infrastructure as a prerequisite to accelerate economic growth and to raise the level of education the priority is highly given to the development of infrastructure. The Second (1962/63-1966/67) and Third Five Year (1968/69-1972/73) Plans on the other hand, gives priority for the development of the directly productive sectors of the economy (agriculture and industry); accordingly, agricultural and industrial sectors took the highest priority and capital budget allocated to these sectors was immensely increased. Further these two plans also emphasised on the building of a far stronger foundation for sustained and rapid growth and development of the economy, which, was expected to be achieved by enlarging the educational base of the population. Similarly because of these three consecutive plans the share of expenditure on education and public health also increased (Wogene, 1994: Teshome, 2006).

Taxation has a long history in Ethiopia, but the modern system of taxation began after independence of Ethiopia from Italian invasion. The tax system in Ethiopia before the period of 1941 was traditional, even though there was a starting for modern tax system which is interrupted by the Italian invasion in 1936 like introduction of "excise and consumption" taxes in 1931, the "entertainment tax" in 1932 and the income tax in 1934 (Taddese, 2014).

The imperial regime was also the period when major taxes and the essential tax administration institutions were built. The Emperor restructured the old fiscal system by introducing a new monetary taxation and public expenditure system under the Ministry of Finance. In the post-war fiscal history of Ethiopia, the first generation of taxes were set between 1942 and 1944. The years from 1947 to 1952 are probably the second period in which amendment on tax system was taken place. These changes were generally discretionary, including amendments to property taxes. The late fifties and early sixties form yet another period during which changes were also made in the rate and structure of taxes, especially on income. Broad-based taxes on goods and services were also introduced in the mid 1950s (Wogene, 1994: Ghebrehiwet, 2015).

During the imperial period the tax law in Ethiopia was failed to achieve both horizontal and vertical equity since their rate structure had always involved regressivity and the income from agricultural sector was not covered. The government was highly dependent on taxes from international trade (Wogene, 1994).

Resources were allocated among the various sectors of the economy differently in the different regimes. Likewise the revenue of the governments in different regimes was collected in different forms. During the imperial regime since a majority of the population were living at a subsistence level, there was limited opportunity to increase taxes on personal or agricultural income. Consequently, the imperial government relied on indirect taxes (customs, excise, and sales) to generate revenues.

3.3. The Socialist (Derg) Regime: 1974-1991

The revolution in 1974 ultimately resulted in removal of the emperor from power. It was evident that the first reason behind broke out the Ethiopian Revolution was the land tenure and taxation system that prevailed during the imperial times. A number of laws were issued after the Revolution that radically altering the landscape of land tenure and tax system of the country. After 1974 the economy had been changed dramatically from market oriented to centralized economy until 1991, during this period all private owned activities are nationalized by Derg government.

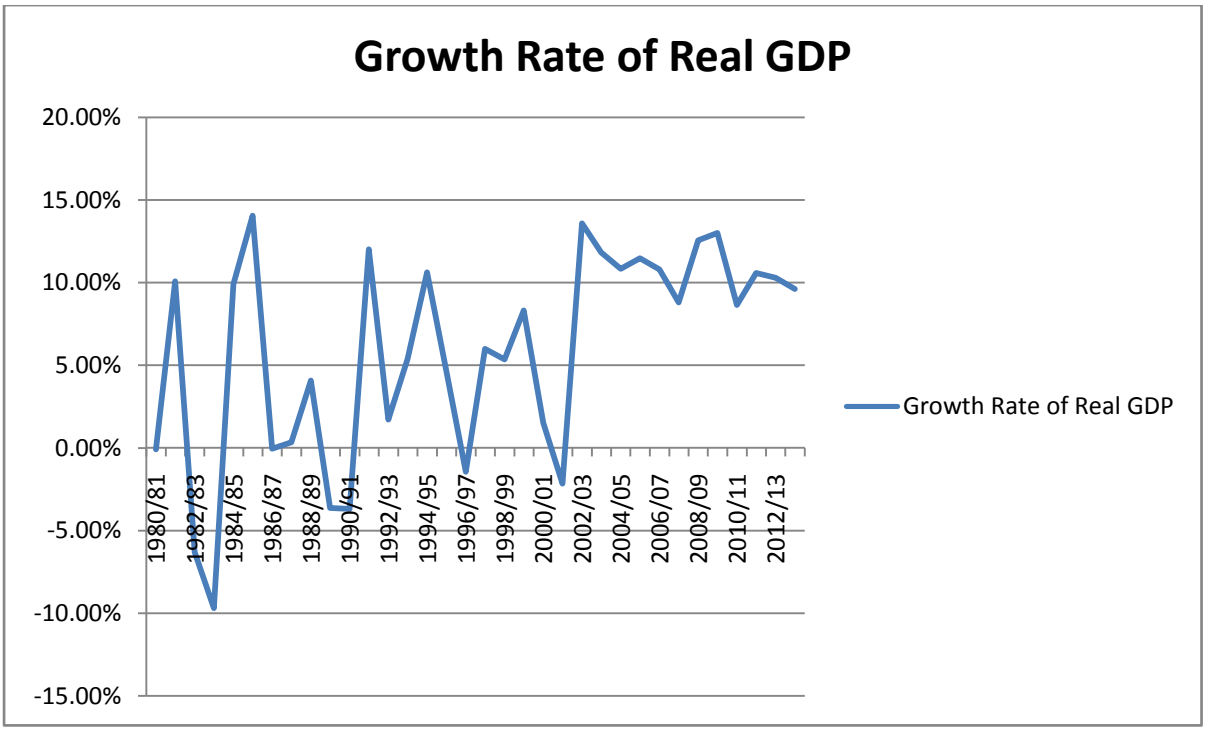
While important changes in the rate structure were made in all periods, during the post-revolution period (1974-91), particularly during 1976-79, significant major changes on the rate and structure of all types of taxes were made. These involved widening the land tax base, introducing capital and surplus transfers from nationalized firms, as well as certain minor arrangements on other taxes. In this period, two basic changes in the revenue base occurred following the nationalization of land and other productive resources. The changes in the ownership pattern of productive sectors like industrial, agricultural, commercial and financial enterprises and their subsequent expansion under government ownership created additional benefit in the form of capital charge and residual surplus. On the other hand because of the ownership change made in land the land tax base was expanded (Wogene, 1994).

However due to imposing high marginal tax rates on income both individuals and private businesses became reluctant to increase their income since the return of increasing income for them was very small. Finally this leads to decline in economic growth that was evidenced from the last years' performance of the regime (Giulia, 2013).

During the Derg regime at the beginning of the period under consideration growth rate of the Ethiopian economy was registered as -0.1 percent. It also shows strict declining rate for four consecutive years from 1981/82 to 1984/855, it declined from -0.1 percent in 1981/82 to -9.69 percent in 1984/85 with exception of 1982/83 and 1986/87 in these periods the

economy registered a double digit growth. Finally the regime ended up with growth rate of -3.62% in 1990/91.

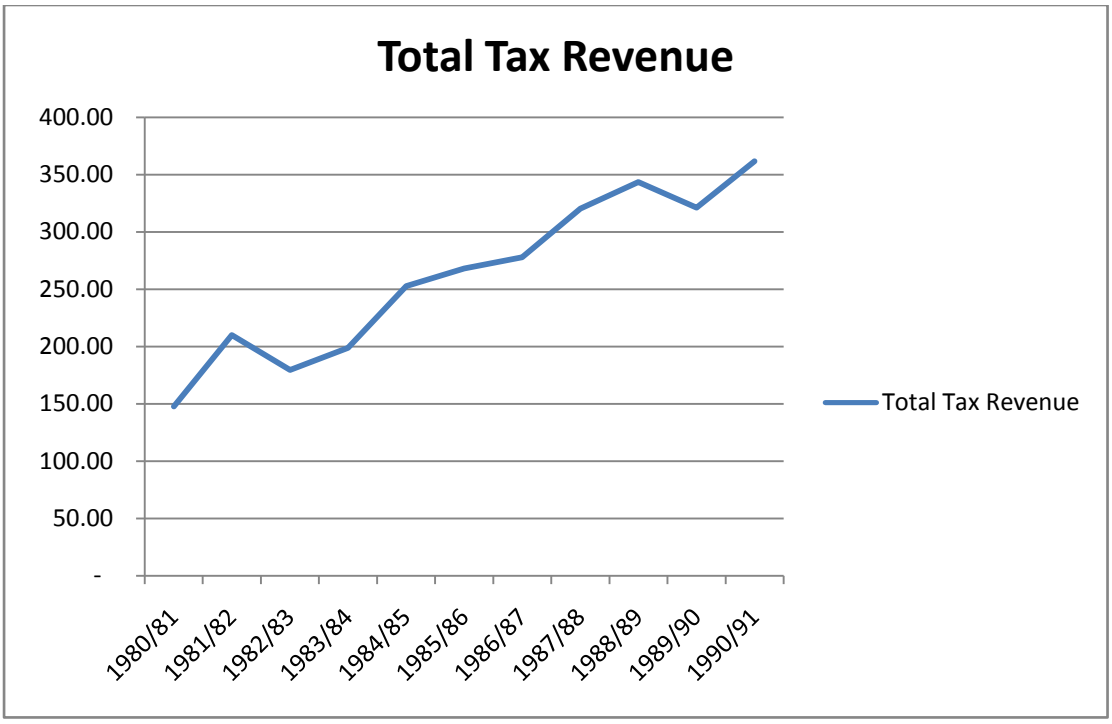
Figure 3.1: Trend of growth rate of the real GDP



In order to finance its expenditure in the economy a government should mobilize revenue from different activities and economic units. Accordingly the military government used to mobilize its revenue in the form of tax and non tax revenue. However the concern of this paper is to analyse the effect of tax revenue part on economic growth for the period under consideration. The revenue mobilized in the form of tax is the major source of the military government fund rising which constituted 70.40% of the total revenue.

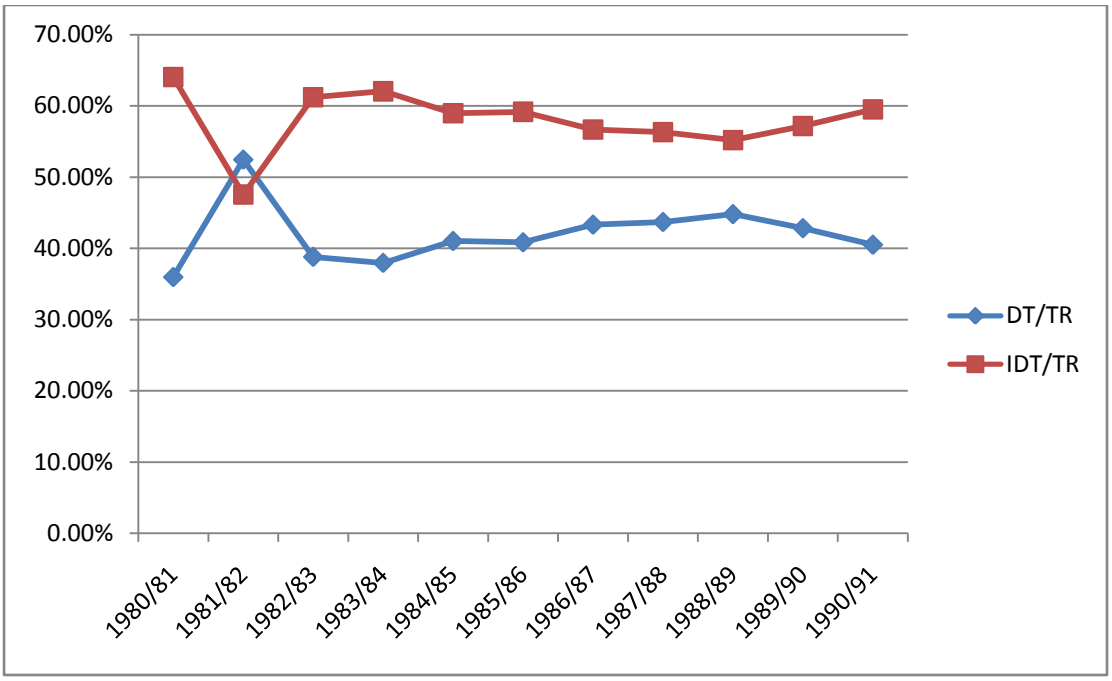
Figure 3.1 show that the trend of tax revenue during the Derg regime for the period under consideration showed an increasing trend throughout the year except some fluctuations in 1982/83 and 1989/90. It rose from 147.79 million in 1980/81 to 361.77 million birr at the end of the Derg period.

Figure 3.2: The trend of total tax revenue



The government collect the tax revenue in the form of both direct and indirect taxes. A large amount of tax revenue was collected in the form of indirect tax. Figure 3.2 below indicates that indirect taxes dominated direct taxes throughout the year under consideration except for the 1982/83. In 1982/83 a large amount of taxes were collected in the form of direct taxes which constituted 52.46% of total tax revenue while the rest 47.54% were collected in the form of indirect tax. The trend from Figure 3.2 indicates that the gap between direct and indirect taxes became closer; at the beginning of the year under consideration direct taxes constituted 35.95% of total tax revenues whereas indirect taxes covered the remaining 64.05%. While at the end of the Derg regime the share of direct taxes rose to 40.49% whereas the share of indirect taxes declined to 59.51%.

Figure 3.3: The trend of direct and indirect taxes as a percentage of total revenue

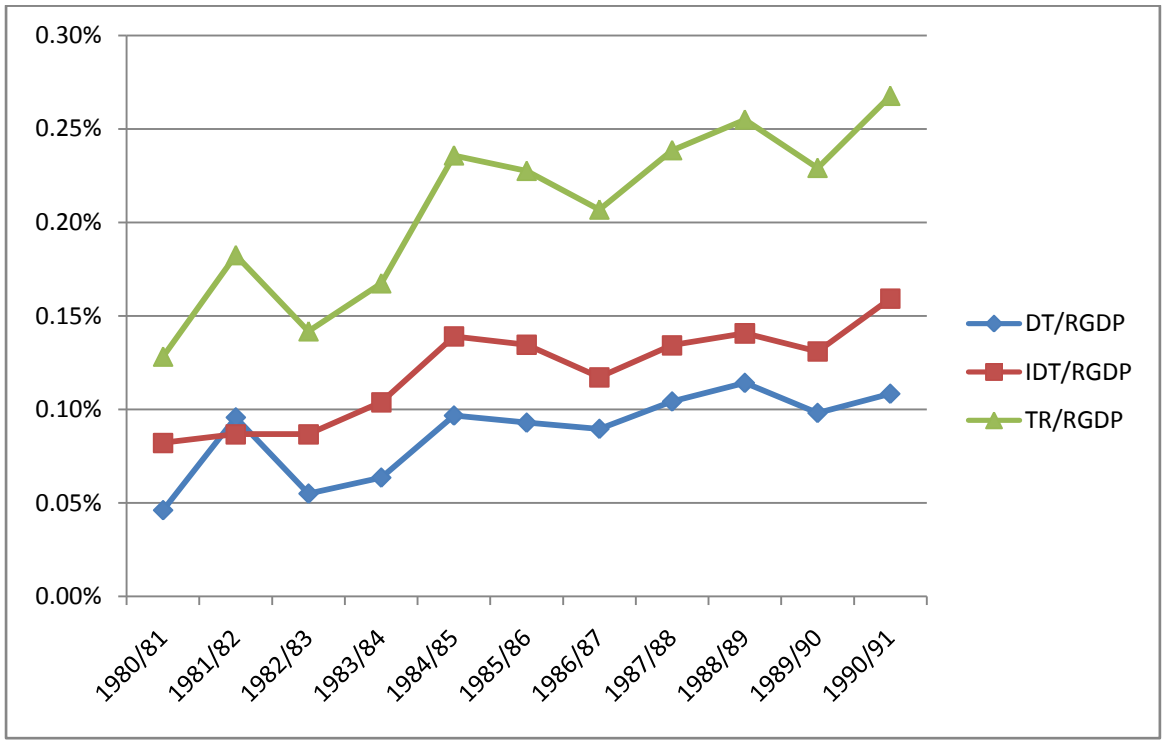


On average indirect taxes contained 57.67% of the total tax revenue from 1980/81 to 1990/91 (see table 3.1). Revenue collected from indirect taxes includes domestic indirect taxes, import duties and taxes and export taxes. The revenue collected from domestic indirect taxes covered a large part of indirect taxes throughout the year with a share of 44.41% from total indirect tax revenues in 1980/81, while import duties and taxes and export taxes covered 34.01% and 21.58% respectively in the same year. At the end of this regime the share of domestic indirect taxes rose to 62.01% and followed by import duties and taxes which constituted 36.28% of total indirect tax, while the share of tax revenue from export declined to 1.71%.

On the other hand direct taxes which come from income and profits tax, rural land use fee and urban land lease fee on average constituted 42.33% of the total tax revenue. In 1980/81 income and profits tax covered a larger share which constituted 89.75% of the total direct taxes and followed by taxes from rural land use fee which was 10.25%. The Derg regime did not collect any revenue from the urban land lease fee in the period under consideration except for the year 1981/82, in this year 45.41 million birr was collected from this form. During the eve of the downfall of the Derg regime almost all taxes collected in the form of direct taxes are came from income and profits tax which constituted 95.97% of the total direct tax and taxes from rural land use fee was 4.03%.

The contribution of tax revenue as a percentage of GDP at the beginning of the Derg regime for the period under consideration accounted 0.13%, from this direct taxes constituted 0.05% while the contribution of indirect taxes accounted 0.08%. At the end of this regime the share of tax revenue as a ratio of GDP showed a slight increment which reached 0.27%, while the contribution of direct taxes raised to 0.11% on the other hand the contribution of indirect taxes became 0.16%. However on average the contribution of tax revenue to the RGDP during this regime was 0.21% for the period under consideration out of this amount 0.09% came from direct taxes while 0.12% came from indirect taxes.

Figure 3.4: Trend of Total tax revenue, Direct taxes and Indirect taxes as a percentage of real GDP



The revenue collected in different form is directed towards financing the government expenditure which helps for a nation to fill the gap that created as a result of market failure. Likely during the Derg regime the government refunded this revenue into the economy either in the form of capital expenditure or current expenditure. The total expenditure of the government is the sum of these two types of expenditures.

As it is presented in figure 3.5 the trend of total government expenditure during the Derg regime for the period under consideration shows increasing trend with some fluctuations

within the period. However it rose from 245.7 million birr in 1980/81to 850.9 million birr at the end of the regime.

Figure 3.5: Trend of total government expenditure

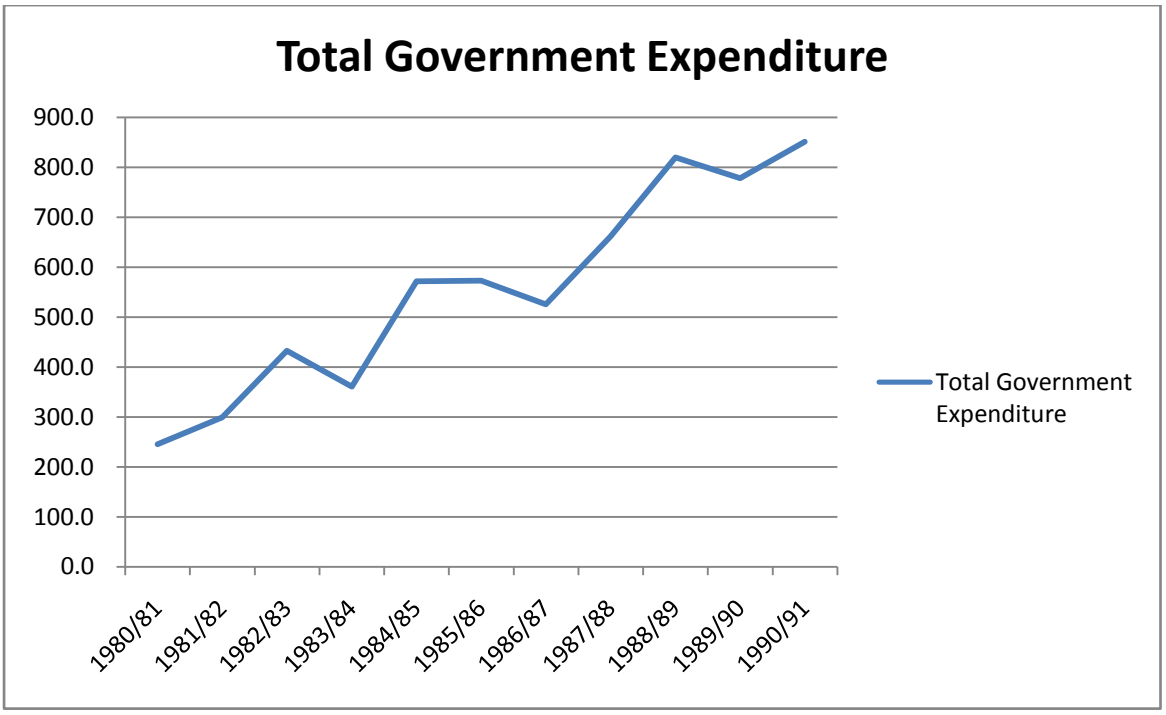
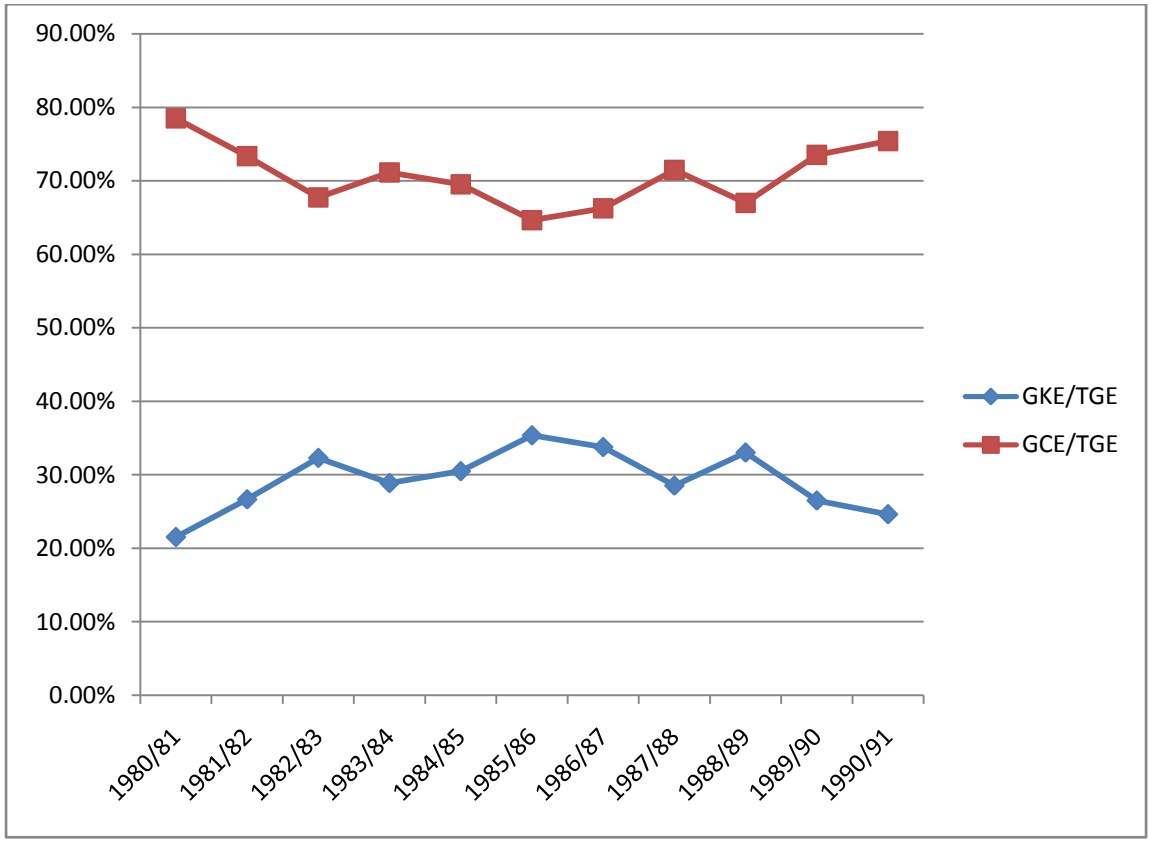


Figure 3.6 indicates that at the beginning of the period under consideration the share of current expenditure was the dominant one which covered 78.47% of total government expenditure, while 21.53% was spent in the form of capital expenditure. The share of government capital and current expenditure from total government expenditure showed fluctuation throughout the period in a reverse direction keeping the current expenditure as a dominance one. At the end of the Derg regime capital expenditure and current expenditure as a ratio of total expenditure showed a little change which ended up with 24.63% and 75.37% respectively. During the period under consideration, on average the Derg government spent 164.19 million birr for capital expenditure and 392.04 million birr for current expenditure which is 29.52% and 70.48% of the total government expenditure respectively (see table 3.1).

Figure 3.6: Trend on capital and current expenditure as a percentage of total government expenditure

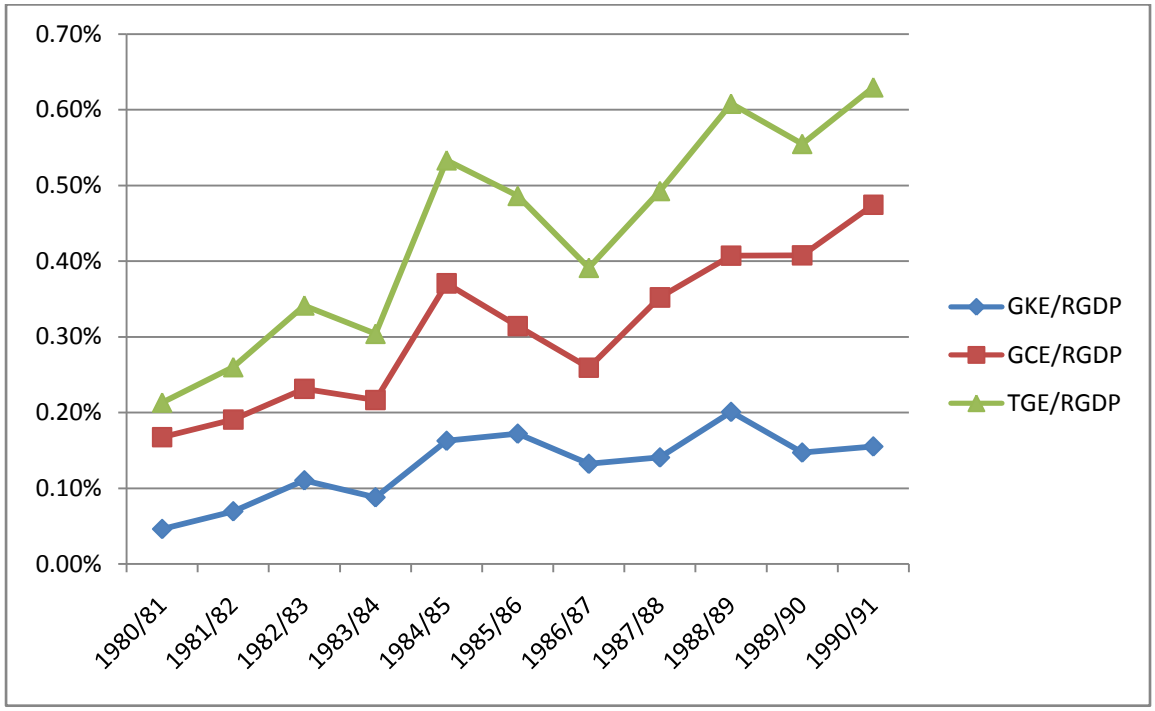


Capital expenditure can be distributed in the form of economic development, social development and general development. Expenditure on economic development took a large part of capital expenditure which covered 85.27% of capital expenditure in 1980/81 and followed by 12.83% and 1.82% on social development and general development respectively. In addition at the end of this regime expenditure on economic development as a share of capital expenditure rose to 89.69% while the share of social development and general development declined to 8.36% and 1.5%.

On the other hand, expenditure on general services accounts a larger portion of recurrent expenditure which covers 53.57% in 1980/81 and rose to 54.99% at the end of the period. The next highest part of the current expenditure was directed to social services that accounts 18.04% in 1980/81 and declined to 17.76% in 1990/91. Economic services, pension payment, and interest and charges accounted 6.53%, 5.09%, and 4.38%, respectively in 1980/81 and ended up with 6.08%, 4% and 7.36% the rest gone to other current expenditures.

According to Figure 3.6, during this period the total government expenditure as a share of GDP showed increasing trend with some fluctuations. It accounted 0.21% in 1980/81 and from this the contribution of capital expenditure was only 0.05% and current expenditure took the rest 0.17%. At the end of this regime, the government total expenditure as a percentage of GDP reached 0.63%. Still the share of current expenditure was the dominant one which covered 0.47% while capital expenditure was 0.16%. On average, the share of government expenditure on GDP during this period was 0.44% from this capital expenditure and current expenditure constituted 29.52% and 70.48% respectively.

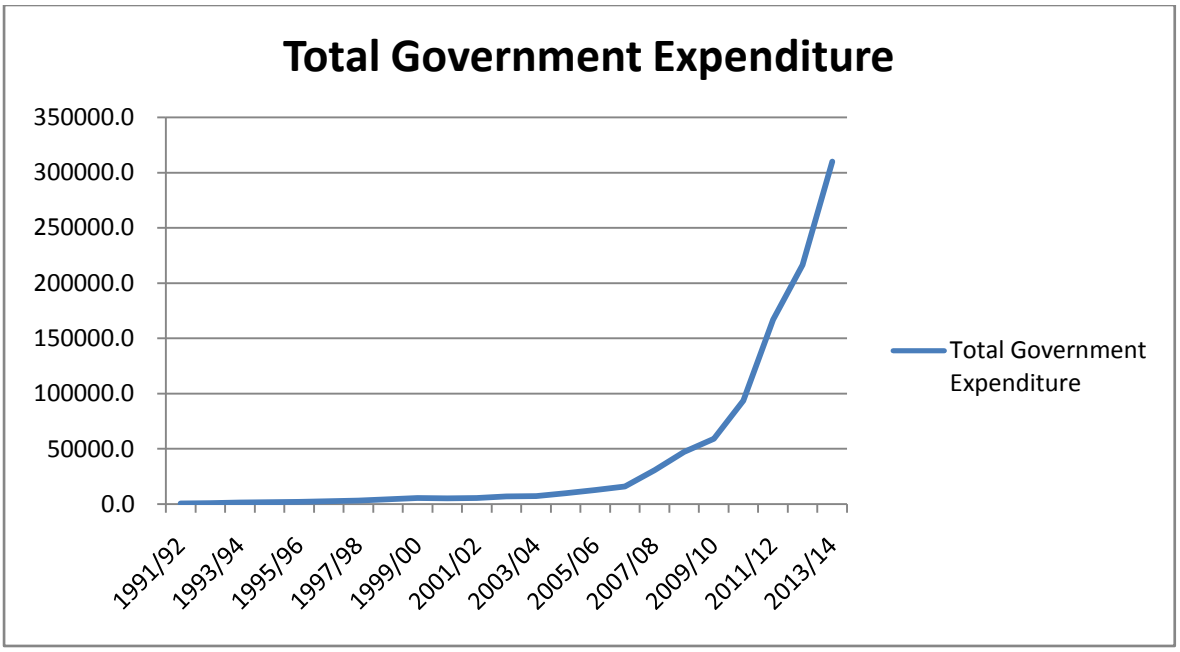
Figure 3.7: Trend on capital and current expenditure as a percentage of RGDP



3.4. EPRDF: 1991 to the Present

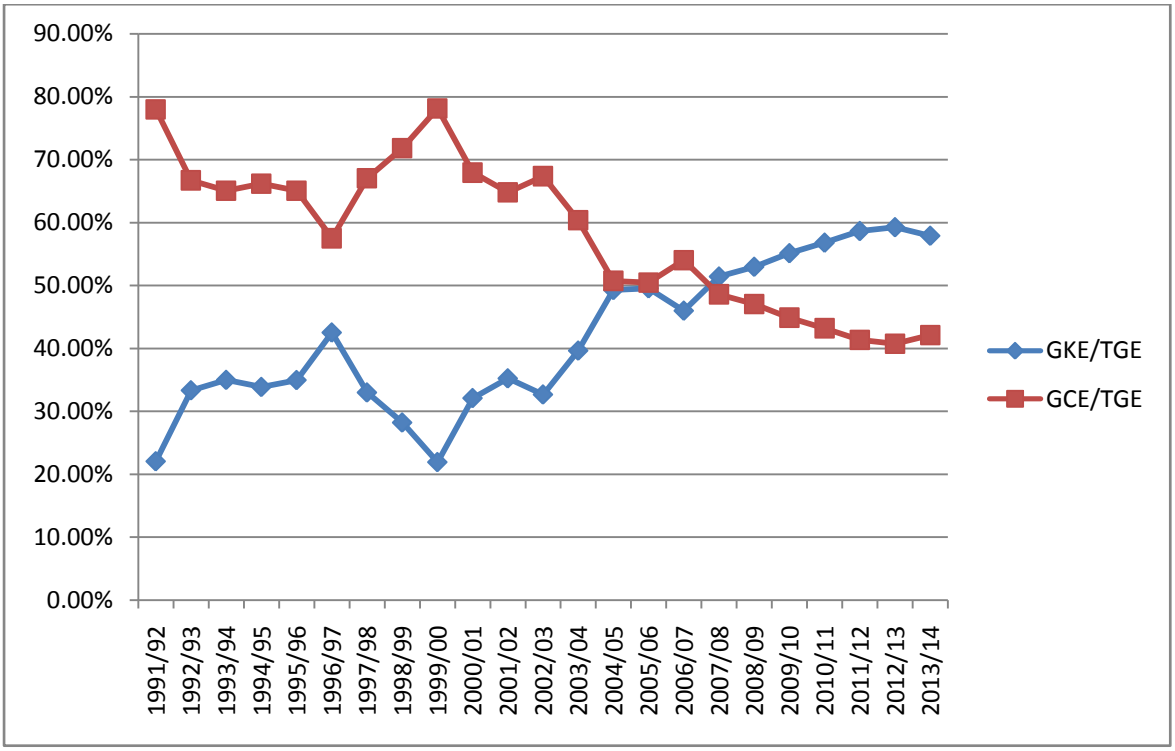
After the reformation period the government expenditure has shown a strict increasing trend it rose from 826.8 million birr at the beginning of the period to 310046.5 million birr in 2013/14. On average the government expenditure rises from 556.22 million birr during the Derg regime under consideration to 44153.22 million birr in (1991/92-2013/14). Figure 3.8 shows this trend of total government expenditure.

Figure 3.8: The trend of total government expenditure



As it is presented in figure 3.9 during the current government regime the two main components of government expenditures as a ratio of total government expenditure showed a radical change, capital expenditure rises from 22.03% in 1991/92 to 57.9% in 2013/14, while the share of current expenditure declined from 77.97% to 42.1% for the same year. The figure 3.9 also indicates that at the beginning of this regime the gap between the share of current and capital expenditure from the total government expenditure was wider, it became narrower in 1996/97 and then again turned back to wider until 2004/05. In 2004/05 and 2005/06 it became closer almost equal with the share of the capital expenditure constituted 49.5% whereas the share of current expenditure accounted 50.5%. The Figure indicates that the share of current expenditure kept the dominant one until 2007/08, however after this year forward the share of capital expenditure has exceeded the share of current expenditure.

Figure 3.9: Trend of the share of current and capital expenditure as a percentage of total government expenditure

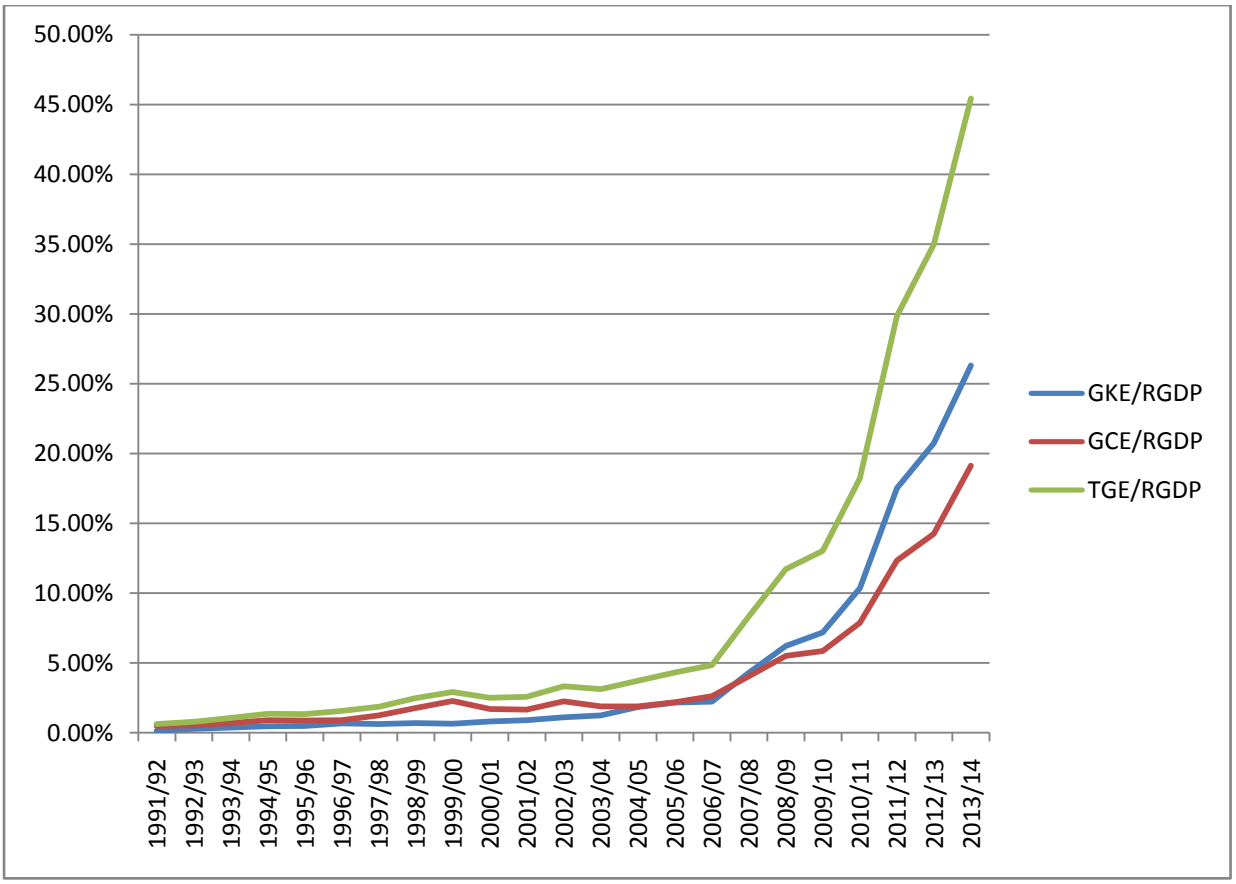


At the beginning of this period expenditure on economic development as a percentage of capital expenditure constituted a highest one which is 88% and followed by expenditure on social development and general development (9.92% and 1.66%) respectively. However, the share of expenditure on economic development declined to 68.41% in 2013/14 while the share of expenditure on social development and general development grow in to 24.4% and 7.19% respectively. On the other hand expenditure on other capital expenditures rises from 0.42% in 1991/92 to 17.5% in 2013/14.

On the other hand, at the beginning of this period from the side of current expenditure compositions expenditure on General Services accounts a larger portion which constituted 32.6% followed by social services (24.32%). Economic Services, Pension Payments, and interest & charges constituted 7.49%, 5.97% and 9.44% of current expenditure respectively, while the rest share is spent on other current expenditures. The share of these compositions final ended up as 41.65% of the current expenditure is directed to social services and followed by general services and economic services they constituted 37.39% and 13.28% of the total current expenditure respectively for the period under considered. As compared to the

Derg regime the share of expenditure on general Services shows reduction while the share of the expenditure on economic and social services rose.

Figure 3.10: Trend of the share of the expenditures as a percentage of real GDP



As Figure 3.10 indicates the share of total government expenditure on GDP shows an increasing trend throughout the period it jumps from 0.64% in 1991/92 to 45.43% in 2013/14. At the end of the period under considered as oppose to the Derg regime from the total contribution of the government expenditure the share of capital expenditure is higher than the share of current expenditure. On average after the reform period the total government expenditure as a percentage of GDP rises to 14.69% while the average share of capital and current expenditure to GDP constituted 8.23% and 6.47%. Therefore as compare to the Derg regime the share of total expenditure on GDP increased by 14.25% and also the current government shift its expenditure from current expenditure to capital expenditure, accordingly on average 26.47% of the government current expenditure as a percentage of GDP shifted towards capital expenditure.

The government expenditure as a share of real GDP during the two periods on average are presented in table 3.1. It indicates that the real GDP rose on average from 125427.066 to 300479.649 million birr. Total government spending as a percentage of GDP on average constituted 0.44% of the RGDP during the Derg regime, while during the EPRDF period the government spending as a percentage of GDP rose to 14.69%.

During the Derg period the average government current expenditure dominates the expenditure on capital goods and services while the EPRDF direct large part of its expenditure on capital goods and services. Out of the total current expenditure the average expenditure on social services constituted the major part for the Derg regime, while expenditure on general services is the dominant one for the current government. On the other hand expenditure on the economic development is the major part of the government expenditure during both periods.

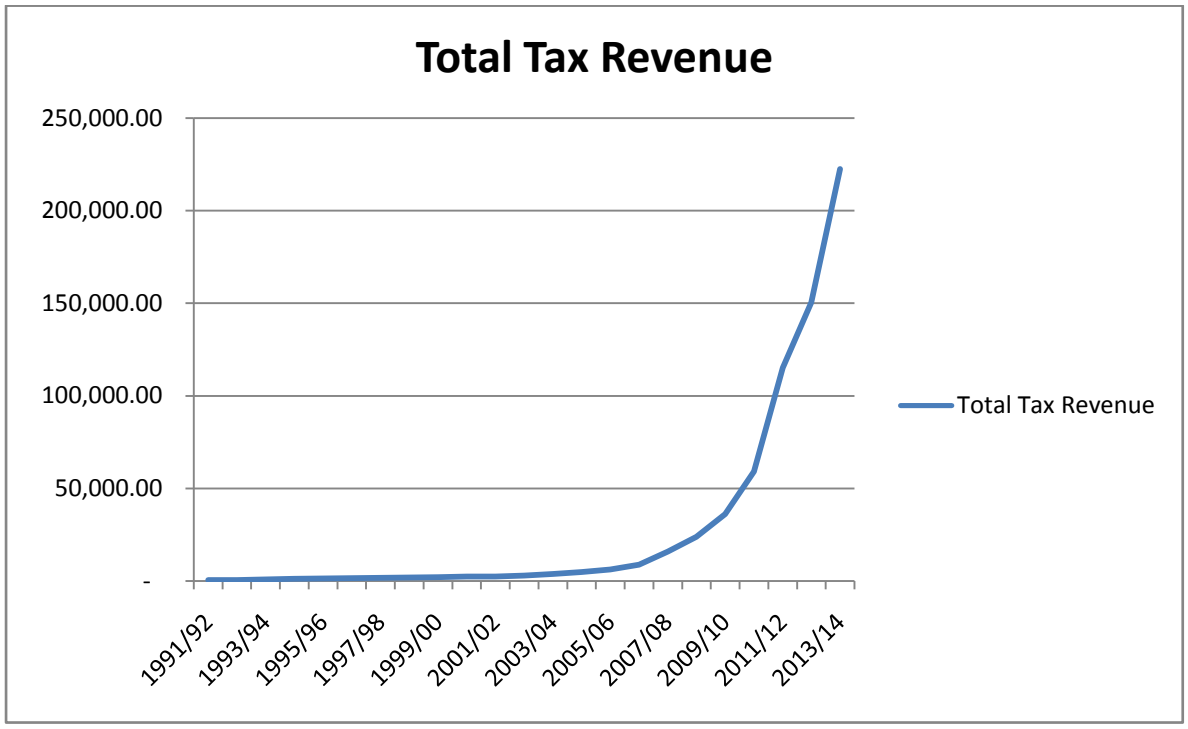
Table 3.1: Government expenditure to real GDP ratio

Year		1980/81-1990/91	1991/92-2013/14
RGDP(in millions)		125427.066	300479.649
Total Government Expenditure (%)		0.44%	12.70%
Current expenditure (%)		70.48%	29.52%
	General services	53.23%	40.27%
	Economic services	6.02%	10.93%
	Social Services	18.63%	30.38%
	Pension Payment	4.25%	1.71%
	Interest and charges	6.12%	9.35%
	Other	11.76%	7.28%
Capital expenditure (%)		29.52%	55.99%
	Economic Development	89.23%	66.70%
	Social Development	8.48%	22.29%
	General Services	1.73%	7.37%
	Other	0.56%	9.84%

Like the Derg government the government of EPRDF collect its revenue in the form of tax and non-tax revenue. The trend of the total government revenue shows strict increment it

raised from 543.40 million birr at the beginning of the EPRDF regime to 244,351.76 million birr in 2013/14. Out of this on average for the period only 14.92% of it comes from non-tax revenue the remaining 85.08% is collected from tax revenue. This indicates that tax revenue is a key source of government income. As it is shown in figure 3.11 it was 426.55 million birr at the begging of the period, after that it rises continuously and finally reaches its maximum of 222,529.01 million birr in 2013/14 for the period under consideration. From the side of its share to total revenue in 1991/92 the share of tax revenue constituted 78.5% of total revenue and its rise to 91.07% in 2013/14 which means it is almost all part of the government revenue.

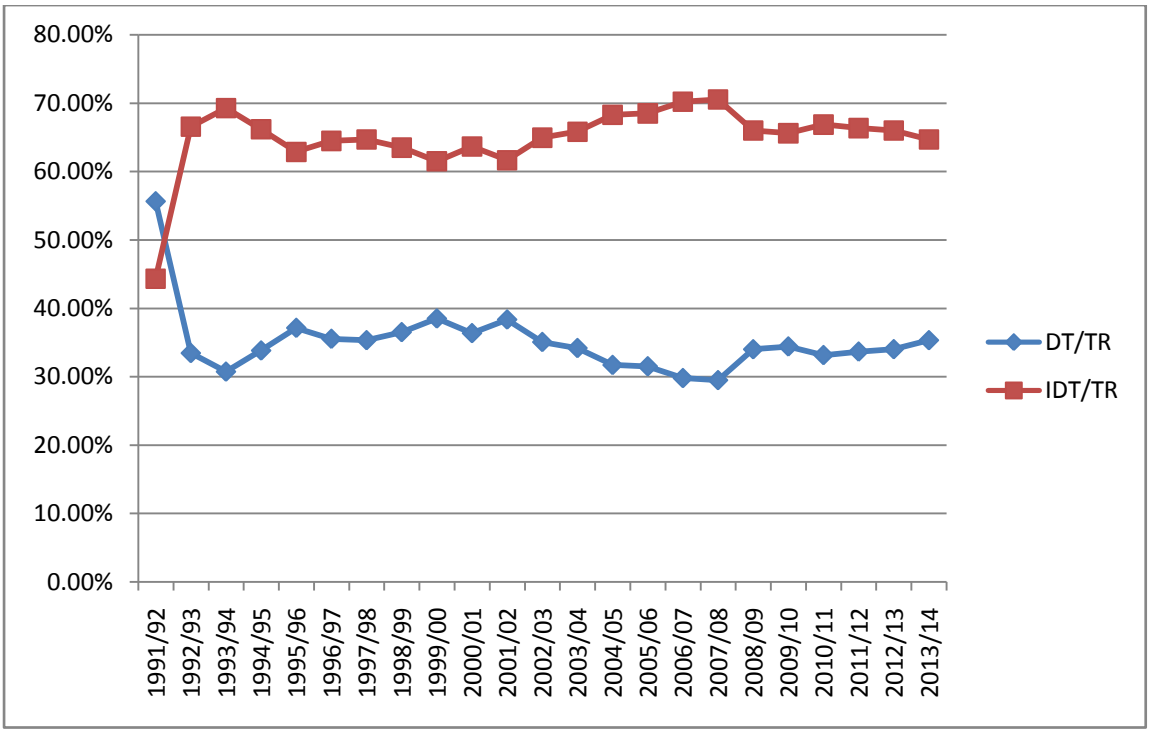
Figure 3.11: The trend of total tax revenue



Having discussed the share of tax revenue from total revenue the next step is which compositions of taxes contribute more for the income of the nation. Figure 3.12 below shows that after the reformation period the share of indirect taxes is the dominant one throughout the years except at the beginning of the period. The share of indirect tax at the beginning of this period was 44.34% of the total tax revenue while the share of direct taxes constituted 55.66%. However in 2013/14 the indirect taxes as a percentage of tax revenue rises to 64.68% while direct taxes as a percentage of tax revenue declined to 35.32% as compare to the beginning of the period. From table 3.2 below on average for the period under

consideration indirect taxes as a percentage of tax revenue accounted 65.8% while direct taxes as a percentage of tax revenue accounted 34.2%.

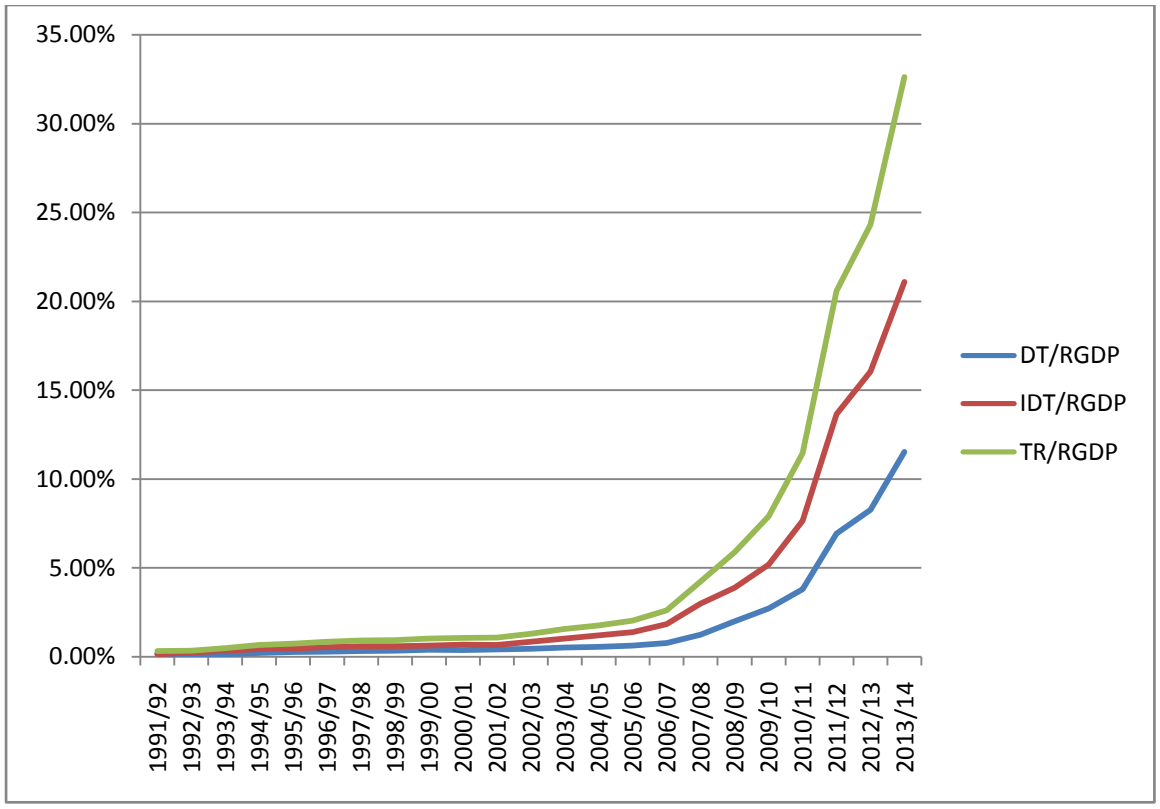
Figure 3.12: Trend of Direct and Indirect taxes as a percentage of Total tax Revenue



At the beginning of the reformation period the domestic indirect taxes contributed the largest amount from the total of indirect taxes it constituted 55.99% of the total indirect taxes and followed by import duties and taxes an export taxes which accounted 43.03% and 0.97% of the total tax revenue respectively. However, at the end of the period under consideration the share of the domestic indirect taxes declined to 47.04% and the share of import duties and taxes rose to 52.96% while tax revenue from export taxes drop down to zero.

On the other hand, revenue comes from income and profit taxes constituted the largest share of the direct taxes throughout the years under consideration. Its share as a percentage of the total direct tax measured as 55.09% in 1991/92 and followed by urban land lease fee and rural land use fee which contributed 44.61% and 0.3% respectively. Moreover, in 2013/14 the contribution of income and profit taxes as a percentage of direct taxes grow up to 97.21% and income from rural land use fee declined to 0.69% while the remaining 2.1% of the direct taxes comes from Urban land lease fee.

Figure 3.13: Trend of the share of tax as a percentage of real GDP



From Figure 3.13 the contribution of tax revenue to the GDP shows increasing trend throughout the year. In 1991/92 tax revenue as a percentage of GDP was 0.33% and gradually it rose and reached 32.61% in 2013/14. At the beginning of the reformation period out of the 0.33% of tax revenue contribution to GDP, 0.18% of which comes from direct taxes while 0.15% is from indirect taxes. When the share of tax revenue to GDP reached 32.61%, 11.52% of this share comes from direct taxes while 21.09% is from indirect taxes. From 1991/92 to 2013/14 on average the contribution of direct taxes and indirect taxes to GDP is calculated as 3.29% and 6.33% respectively, in short after reformation period for the period considered tax revenue as a percentage of GDP which is the sum of those two components measured as 9.62%.

Table 3.2 below shows a simple comparison on the average share of tax revenue on real GDP between the Derg regime and the EPRDF. It indicates that the average RGDP during the Derg regime was 12427.066 million birr it rises to 300479.649 million birr during the EPRDF. From this the share of tax revenue on average rises from 0.21% to 9.62%, out of which indirect taxes play a major part in both period. A large part of the direct taxes on average came from income and profits taxes during both periods followed by rural land use fee for

Derg regime while urban land lease fee for the EPRDF. On the other hand a large part of average indirect taxes came from domestic indirect taxes for the Derg regime followed by import duties and export taxes while import duties and taxes contributed the largest share for the EPRDF revenue which is followed by domestic indirect taxes and export taxes.

Table 3.2: Tax revenue to real GDP ratio

Year		1980/81-1990/91	1991/92-2013/14
RGDP(in millions)		125427.066	300479.649
Tax revenue (%)		0.21%	9.62 %
Direct taxes (%)		42.32%	34.2%
	Income and profits tax	90.37%	91.76%
	Rural land use fee	5.89%	3.28%
	Urban land lease fee	3.75%	4.96%
Indirect taxes (%)		57.68%	65.8%
	Domestic indirect taxes	57.40%	37.48%
	Import duties and taxes	31.86%	60.93%
	Export taxes	15.74%	1.59%

CHAPTER FOUR

4. Methodology, Model Specification and Data Sources

4.1. Nature and Sources of Data

To undertake this study, time series data are used. The relevant data are collected from sources such as: World Bank (WB), National Bank of Ethiopia (NBE), and Ethiopian investment agency (EIA), which are perceived to be relevant and reliable.

4.2. Method of Data Analysis

The data collected from different sources is analyzed and presented using descriptive statistics and econometric analysis. In the econometric analysis, VAR model is applied to identify the effect of government expenditures and taxation on economic growth. The rationale behind using VAR model is the suspicion of bidirectional relationship between government expenditure and taxation with economic growth, and also most economic variables are a linear function of past lags of itself and past lags of the other variables. Associated tests are taken when they are necessary.

4.3. Model Specification

The theoretical view about economic growth model can be classified under three broad headlines: the Keynesian (Harod-Domar growth model), the neo-classical (Solow) growth model, and the endogenous growth theory.

Harod-Domar (H-D) Growth Model uses saving as a ladder to growth. The model is based on the assumptions that potential output is proportional to the stock of capital and factor inputs are employed in fixed proportion with no possibility of substitution. It also assumes that, the economy is closed, there are only two factors of production; labor is homogeneous and grows at a constant rate, and there is no technical progress. Therefore, in the Harod-Domar model the change in potential output will be:

$$dy = \beta dk \quad \text{……………………………………………………….. (4.1)}$$

Where; Y = potential output, K= physical capital and β= constant output capital ratio.

According to the model, change in capital stock equals to gross investment and capital depreciation at constant rate (δ), then the growth rate of potential output will be:

$$\frac{dy}{y} = \beta\frac{dk}{y} = \beta\frac{I}{y} = \beta s - \delta \quad \text{………………………………………………… (4.2)}$$

Where; s=marginal propensity to save and I=capital formation or investment

Unlike the H-D model, the neoclassical growth model allows for factor input substitution and diminishing marginal returns in the production process. Technology is considered as exogenous, whose prime role is to augment labor. The model further assumes that the rate of investment and population growth determines the growth rate of per capita output. Nevertheless, growth continues only in the transition to a new steady state. The policy measures do not affect long run growth rate (Mankiw *et al*, 1992).

The production function is given as:

$$Y(t) = F[k(t), L(t), A(t)] \quad \text{..... (4.3)}$$

Where Y(t)= potential output at time t, K(t)=physical capital at time t and A(t)= technology

The endogenous growth model endogenizes improvements in technology. In the endogenous growth setup, the role of externality that arises from research and development is considered as growth stimulant factor. Therefore, rate of growth continues even in the steady state. Therefore, new growth models acknowledge that policy measures could have significant impact on long run growth (Johns, 1998).

The production function is given as:

$$Y_t = f(K_t, L_t, H_t) \quad \text{..... (4.4)}$$

Where $Y_{t=}$ output at time t, $K_{t=}$ capital accumulation at time t, $L_{t=}$ labor force at time t and $H_{t=}$ human capital at time t

Having the above different theoretical model specifications in mind, the researcher based this study on the neoclassical growth model and its extension of the endogenous growth model since it acknowledges the long run impact of policy measures and also includes human capital in the model.

Therefore a Cobb-Douglas production function with constant returns to scale is used as an initial point to build my model.

$$Y = (AK^{\alpha}, L^{\beta}, H^{\delta}) \quad \text{----------(4.5)}$$

This study is based on econometric model in the sense that additional variables other than the above endogenous growth model variables are included in the model to get a better

description of Ethiopia's economic growth model. Since the researcher's major objective is to discover the impact of various components of government expenditure and taxation on economic growth, these two variables should be added to the model. Barro (1990) suggested the role of public services as an input to private sector production activities. According to him such role of public sector on the activities of the private sector creates strong linkage between public sector and economic growth. Therefore in this study government expenditure and taxes are used as a proxy of the public sector and help us to measure the size of the government in the Ethiopian economy.

$$Y = f(K, L, H, G,) \quad (4.6)$$

Where, G denotes the public sector i.e. it measures the size of the government in the economy

Since the government spends what it collected in the form of revenue, using tax revenue and government expenditure in one model makes one of these variables redundant. So that, to avoid the redundancy of these variables, two different equations are estimated in order to measure the size of the government in Ethiopia.

$$Y = f(K, L, H, GE) \quad (4.7)$$

$$Y = f(K, L, H, T) \quad (4.8)$$

Where, GE denotes the government expenditure and T stands for taxes

Other variables are also included in to the model to get a better specified model. In the Solow cob-Douglas production function K denotes physical capital, so the change in this physical capital can be represented as investment. Since a nation's investment can come from both private and public sector, separating this variable into private and public investment is an important input to the model. Therefore, in this study government expenditure can be used as a proxy of public investment and to measure private investment the study uses gross domestic private capital formation. However, based on the different theoretical views of the effects of government expenditure on influencing the efficiency of productive factors, which could be negative or positive, government expenditure can be thus decomposed into productive and unproductive. Government current expenditure is represented as a proxy of the unproductive component of government expenditure, whereas government capital expenditure is as the productive component of government expenditure.

On the other hand, in order to handle different effects of tax revenue on economic growth, tax revenue classified into two major components i.e. direct taxes and indirect taxes.

In the context of developing countries, export is a potential determinant of growth which is not accounted for by any other independent variables, therefore net export should be included in the model.

In general, the variables included in the models are: government current expenditure, government capital expenditure, direct taxes, indirect taxes, gross domestic private capital formation, human capital, labor force and net export. Therefore the models to be estimated in the study are specified as follows:

$RGDP_t = (GCE_t, GKE_t, GPKF_t, HC_t, NX_t, LF_t, U_t)$..... (4.9)

$RGDP_t = (DT_t, IDT_t, GPKF_t, HC_t, NX_t, LF_t, U_t)$..... (4.10)

These can be written in a regression form as:

$RGDP_t=\beta_0+\beta_1GCE_t+\beta_2GKE_t+\beta_3GPKF_t+\beta_4HC_t+\beta_5LF_t+\beta_6NX_t+U_t$..... (4.11)

$RGDP_t=\beta_0+\beta_1DT_t+\beta_2IDT_t+\beta_3GPKF_t+\beta_4HC_t+\beta_5LF_t+\beta_6NX_t+U_t$..... (4.12)

Where:-

RGDP = Real Gross Domestic Product

GCE_t=Government Current Expenditure at time t

GKE_t= Government Capital Expenditure at time t

$GPKF_t$ = Gross Private Domestic Capital Formation at time t

HC_t = Human Capital at time t

LF_t = Labor Force at time t

DT_t = Direct Tax at time t

IDT_t = Indirect Tax at time t

NX_t = Net Export at time t

U_t = the Error term.

To make the interpretation of the results of the variables easier and also to get the stationarity of the variables in lower order of integration we will take the natural logarithmic form for the above equations. Therefore the letter L represents logarithmic terms of the variables. The logarithmic form of the regressions and the final models to be estimated in the study are specified as follows:

$$LRGDP_t=\beta_0+\beta_1 LGCE_t+\beta_2 LGKE_t+\beta_3 LGPKF_t+\beta_4 LHC_t+\beta_5 LLF_t+\beta_6 NX+U_t \quad (4.13)$$

$$LRGDP_t=\beta_0+\beta_1 LDT_t+\beta_2 LIDT_t+\beta_3 LGPKF_t+\beta_4 LHC_t+\beta_5 LLF_t+\beta_6 NX+U_t \quad (4.14)$$

Description of Variables and Expected sign of Coefficients

Real Gross Domestic Product: - it is the measure of real production measured by removing the effects of price change on the GDP measurement, or it is the value of currently produced goods and services measured at constant price. Note that all variables are deflated on their respective year's deflation rate.

Government current expenditure:- it refers to the total government expenditure on consumption purpose. Since it does not contribute to capital formation, the expected relation to GDP is negative.

Government Capital Expenditure:- it refers to the total government expenditure on capital investment. Since it increases productivity the expected sign of its coefficient is positive.

Gross Private Domestic Capital Formation:- it refers to only capital formation invested by private sector. Since it increases productivity it is expected to have a positive sign.

Human capital:- refers to a set of skills which an employee acquires through either training or experience that increases the employee's value in the marketplace. Here, it is measured by secondary education enrolment. Since it increases the value to the labor it increases productivity therefore the coefficient of human capital is expected to have positive sign.

Labor Force:- labor force includes group of people within the age from 15-64, who are actually employed and those who are without a job but are actively searching for a job. It measures as percentage of total population. Since it includes working people, expected sign of labor in relation to RGDP is positive.

Direct Tax:- it refers to the total tax revenue of government collected in the form of direct tax. It includes personal income tax, rental tax, withholding tax, business profit tax and other

taxes (like income from rent patent and copyright and income from share in company). Since a high direct taxes negatively affect disposable income and then investment through saving it can retard the economic growth. On the other hand, since the mobilized direct taxes directed towards infrastructural construction it can also stimulate the economic growth. Therefore the expected sign depends on which effect is dominant. Since Ethiopia is one of the less developed countries, the income is at subsistence level therefore the expected sign here is negative.

Indirect Tax:- it includes value added tax (VAT),customs duty excise and turn over taxes. Indirect taxes may also have two different effects on the economic growth. On the side of trade liberalization it may have ambiguous effect on the economy; on the other hand the target of infant industry protection may stimulate domestic economy. However in less developed countries since most of these types of taxes are imposed for the purpose of protection the expected sign of this variable is positive.

Net Export:- It is a difference between export and import, so it is a component of RGDP in an open economy. If export is greater than import it is called surplus and if import exceeds export it is called deficit. If the balance is surplus the coefficient is expected to be positive and if it is deficit it is expected to be negative. Here hypothesized sign is negative.

4.4. Estimation Technique

4.4.1. Unit Root Test

All economics data are mostly non-stationary. Undertaking regression on non-stationary time series may give a spurious result in which estimators and test statistics are misleading. Even if there is no real relation between variables the result may show a high R^2 and a significant relationship between variables. So checking for the stationarity of the data is mandatory before regressions are undertaken.

A variable is stationary means its mean and variance are time invariant. If the mean and variance are dependent over time, then the series is called non-stationary. There are different methods to identify whether the series is stationary or not. The emphasis here is on using the most common test that is unit root test. There are also different ways to test for the presence of unit root. Here Augmented Dickey fuller (ADF) test is used to test for the stationarity of the variables.

Let Y be any time series variable and it is given as:

$Y_t = Y_{t-1}+u_t$ ---------- (4.8)

Where: Y_{t-1} is the value of Y at time t-1

u_t is white noise error term

Equation 1 is simply a random walk model without drift that means it is non-stationary. If we rewrite equation 1 as:

$Y_t = \rho Y_{t-1}+u_t$ ---------- (4.9) $-1 \leq \rho \leq 1$

If $\rho=1$ it will be the same with equation and therefore it becomes non stationary. So simply by regressing Y_t on it lagged value of Y_{t-1}, we can estimate the value of ρ. If the estimated value of ρ is 1 the series Y_t is said to be non stationary. So here the null hypothesis will be $\rho=1$, i.e. the time series is stationary.

Or alternatively we can rewrite equation 2 as:

$Y_t - Y_{t-1}= \rho Y_{t-1} - Y_{t-1}+u_t$ ---------- (3.10) (Subtracting Y_{t-1} from both sides of equation 2)

$\Delta Y_t = (\rho-1) Y_{t-1} + u_t$ ---------- (4.11)

To simplify the equation 4 it can be rewritten as:

$\Delta Y_t = \delta Y_{t-1} + u_t$ ---------- (4.12)

Where: $\delta = (\rho-1)$

Δ indicates the first difference operator

Now the null hypothesis is $\delta =0$. I.e. $\delta =0$ means the value of $\rho=1$, in this case the time series is non stationary or there is a unit root against the alternative that is $\delta <o$. To test the null hypothesis, $\rho=1$, the τ (tau) statistic is used. Dickey Fuller test can be estimated as follow:

$\Delta Y_t = \delta Y_{t-1} + u_t$ ---------- (4.13)

$\Delta Y_t = \beta_1 + \delta Y_{t-1} + u_t$ ---------- (4.14)

$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + u_t$ ---------- (4.15)

Equation (4.13) represents an equation with no constant term and time trend. Equation (4.14) is an equation with constant term but no time trend. On the other hand equation (4.15) represents an equation with both constant term and time trend. The null hypothesis is the same for three of the equations, which means the null hypothesis is given as the series is non-stationary or it contains a unit root.

Dickey Fuller (DF) test is based on the assumption that the error term is uncorrelated. However Augmented Dickey Fuller (ADF) test is an extension of DF test that augment preceding three DF equations by lagged values of the dependent variable in order to manage autocorrelation problem (Gujarati, 2003). Therefore in this paper ADF test is used to identify whether the variables are stationary or not, while all tests and the hypothesis for ADF test are the same with DF test. It is estimated as:

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + a_i \sum_{i=1}^{m} (\Delta Y_{t-i}) + u_t \text{ ---------- (4.16)}$$

As I mentioned above regressing a non-stationary variable on another non-stationary variable may give false relationship between variables or it may produce a spurious regression. To avoid the spurious regression problem between variables we have to transform non-stationary variable in to stationary variables. In other words, if a time series has a unit root, we have to transfer it into a stationary time series before regression is undertaken. To do so, the researcher uses differenced method. According to Verbeek (2004), if a series becomes stationary after first differencing it is called integrated of order one, denoted by I(1). In some case taking first difference may not transform the series into stationary. In that case a series must be differenced twice, to make it stationary, then it is said to be integrated of order two, denoted by I(2). In general, if a series becomes stationary after differencing d times, it is called integrated of order d, denoted by I(d).

4.4.2. Co-integration test

Having tested the variables for stationarity, the next step of time series analysis is testing for co-integration, which is whether the linear combination of the variables is also stationary or not. Even though the variables are individually non-stationary at level, liner combination of these non-stationary variables can be stationary. Co-integration of the time series variables tells us the existence of a long run or equilibrium relationship among them. If the time series variables are co-integrated, the regression at level of the two variables is meaningful i.e., the regression is not spurious because of their individual non-stationarity.

For the existence of such relationship, the error term of the model should be stationary, since it is a linear combination of the variables in the model. If we put our model as:

$Y_t = \beta_0 + \beta_1 X_t + u_t$ ---------- (4.17)

The linear combination will be

$u_t = Y_t - \beta_0 - \beta_1 X_t$ ---------- (4.18)

If the error term or the linear combination of the variables is stationary or it is I(0) then the variables Y_t and X_t are called co-integrated and therefore they have an equilibrium relationship. Co-integration analysis can be applied by using either the Engle-Granger two step procedures or the Johansen maximum likelihood estimation approach.

Since the Engle-Granger approach is based on a single equation, it has limitations on identifying the existence of multiple co-integrating vectors. The Engle-Granger approach is also focused on only residual term, however, the residual-based test tends to lack power because it does not exploit all the available information about the dynamic interactions of the variables. An alternative approach that does not suffer from these drawbacks was proposed by Johansen (1988), who developed a maximum likelihood estimation procedure, which also allows one to test for the number of co-integrating relations. Therefore, the Johansen approach is preferred and it is possible to test for the presence of more than one co-integrating vectors with this approach. It also allows estimating the model without priority restriction of the variables as endogenous and exogenous. To identify the number of co-integrations the Johansen approach relies heavily on the relationship between the rank of a matrix and its characteristic roots. In this procedure determining the rank of the long run matrix provides the number of co-integrating vector between the variables (Verbeek, 2004). Therefore this study used the Johansen maximum likelihood estimation approach to test the existence of co-integration among variables.

4.4.3. Vector Error Correction Model

Having tested the stationarity of the error term, the next step will be depending on the stationarity test. If the error term is stationary then the Vector error correction model (VECM) will be estimated by using the error term from the equilibrium regression. This VECM helps us to reconcile the short run behaviour of the variables to its long run behaviour, with disequilibrium as a process of adjustment to the long run model.

Defining a vector Zt = {Yt, X1t, X2t,..., Xnt}' of n potentially endogenous variables, it is possible to specify the following unrestricted vector auto regression (VAR) model involving up to K-lags of Zti :

$Z_t = A_1 Z_{t-1} + \ldots\ldots + A_k Z_{t-k} + U_t$ ..... (4.19)

Where Z_t is (nx1) and each of the A_i is an (n x n) matrix of parameters. Equation (4.19) can be reformulated in to a vector error-correction (VECM) form:

$\Delta Z_t = \Gamma_1 \Delta Z_{t-1} + \ldots\ldots + \Gamma_k \Delta Z_{t-k+1} + \Pi Z_{t-k} + u_t$ .....---..... (4.20)

Where, ΔZ_t represents the first differences of the variables; $\Gamma i = -(I - A1 - \ldots - Ai)$ is the coefficient matrix in the error correction term that represents the short run parameters; $\Pi = (I - A1 - \ldots..-Ak)$ is matrix of long run responses, which contains information about the long-run relationships and (i=1,…., k-1).

Since the co-integration result may be sensitive to the number of lags included in the VAR model determination of the appropriate lag length is important to estimate the VECM. Thus before testing the co-integration analysis and also estimating the VECM, the appropriate lag length that fits the model should be decided. Therefore, the lag length can be determined using different model selection criteria. The Akaiki Information Criteria (AIC), the Schwarz (Bayesian) Information Criteria (SIC), the Final Prediction Error (FPE) and the Hannan-Quinn Information Criteria (HQ) is used to determine the optimal numbers of lags (Davidson and Mackinnon, 1999).

In the Johansen (1988) procedure the decision criteria on determining the existence and the number of existent co-integrating vector depend on the rank(r) of the long run matrix (Π). In general, there are three cases that may occur. The first case is when all variables are stationary in this cases the rank (r) of the long run matrix (Π) is equal to n (r=n). The implication of this result is that there is no problem of spurious regression, thus estimating unrestricted vector auto regression (VAR) model is an appropriate modelling strategy. The second case is when there is no co-integration relation at all which means the system is non-stationary, in this case the rank (r) of the long run matrix (Π) is equal to zero (r=o). The implication of this result is that there is no linear combinations of the variables at I(0), thus the appropriate model is a VAR in first-differences involving no long-run elements. The third case is when there is up to (n-1) co-integrating vectors, in this case the rank (r) of the long run

matrix (Π) is in between zero and n (o<r<n). The implication of this result is that the system is non-stationary, but there are *r* co-integrating relationships that are stationary. Therefore Π has reduced rank and gives information about the long-run equilibrium. To determine the rank of the long-run matrix and hence the number of co-integrating vectors, Trace (λ_{trace}) and Maximum Eigenvalue (λ_{max}) statistics are used. (Harries and Robert, 2003). These statistics are given by

$$\lambda_{trace}(r) = -T \sum_{i=r+1}^{n} \log(1 - \hat{\lambda}) \text{----------(4.21)}$$

$$\lambda_{max}(r, r+1) = -T \log(1 - \hat{\lambda}_{r+1}) \text{----------(4.22)}$$

Where *r* is the number of co-integrating vectors, λ is the estimated characteristic root (eigen values) from the matrix, and *T* is the number of observation. For Trace (λ_{trace}) statistics the null hypothesis is there is at most r co-integrating vectors against the alternative more than *r* co-integrating vectors. On the other hand for Maximum Eigenvalue (λ_{max}) statistics the null hypothesis is that there are *r* co-integrating vectors against the alternative that r + 1 exist.

4.4.4. Granger Causality Test

Granger causality test in time series analysis is useful to identify which variable granger causes another variable. In a time series analysis if the variables are stationary at first difference and also they are co-integrated then either the first variable granger causes the second or vice versa. However the number of lagged terms to be included in the model during causality test is an important part of the test. i.e. the direction of granger causality may depend on the number of lagged terms involved in the model. Given two variables X and Y, X is said to Granger causes Y if lagged values of X predict Y well. The same is true if the lagged values of Y predict X well, and then Y is said to Granger causes X. If lagged values of X predict Y and, at the same time, lagged values of Y predict X, then there is a bi-directional granger causality between X and Y. In general, a time series X is said to Granger causes another time series Y if it can be shown that the series X values provide statistically significant information about the future values of series Y; if not, X does not Granger causes Y (Alemayehu et al, 2011)

4.4.5. Diagnostic tests

Diagnostic tests are utilized to check the validity of the fitted model. Since high R square, no heteroskedacity, normality of residual distribution, no serial correlation in the residual are features of the best regression model, checking these diagnostic tests are important.

Therefore residual normality test, error vector autocorrelation test, heteroskedacity test and stability test are applied to identify whether the regressed model is suitable.

The residual normality test is carried out in order to investigate whether residuals are normally distributed or not. In order to diagnose this normality test the multivariate extension of the Jarque-Bera (JB) normality test which compares the third and the fourth moments of the residuals to those from the normal distribution is applied. This test is a joint asymptotic test in which the statistic is calculated from the skewness and kurtosis of the residuals as follows.

$$JB = \frac{N}{6}[S^2 + \frac{(\beta_3 - 3)^2)}{4}] \text{---------- (4.23)}$$

Where T is the number of observation; S is the coefficient of skewness, β_3 is a measure of kurtosis; and the test statistic is χ^2 distributed. The null hypothesis is that residuals are normally distributed thus the null hypothesis is desirably.

The residual serial correlation test is applied to investigate whether the residual is serially correlated with its lagged orders. In order to test the possibility of serial correlation in the residuals the residual serial correlation Lagrangian Multiplier test is used, that uses Breusch-Godfrey Lagrange multiplier (LM) test which is a multivariate test for residual serial correlation up to some specific lag order. The LM test is given as:

$$LM = (N-q)\, R_{\varepsilon\wedge}{}^2 \text{ ---------- (4.24)}$$

Where q is the degrees of freedom and $R^2_{\varepsilon\wedge}$ is the coefficient of determination obtained from the auxiliary regression, and the LM test statistic is χ^2 distributed. The null hypothesis is given as residual is not serially correlated, thus here also the null hypothesis is desirably.

Heteroskedacity Test is carried out to investigate whether the error term in the model are constant. To analyse this test the White's test is applied in which the null hypothesis represents that the residuals are both homoscedastic and that there is no problem of misspecification. Here also the null hypothesis is desirable in the diagnostic process.

Stability test is undertaken to determine whether the regressed model is stable. In order to test this test the inverse characteristic roots is applied. If the characteristic roots of the variables lie within the circle, then the estimated parameters are considered as stable.

4.4.6. Impulse Response Function

The VAR model helps us to examine the impulse response of endogeneous variables to onetime shock of other variables in the model. The impulse response function shows the effect of one time shock to one of the innovations on current and future values of the variable itself and also compares this response to shocks from other variables. The cholesky method is applied to estimate the impulse responses.

CHAPTER FIVE

5. Results and Discussions

5.1. Unit root test result

The stationaity of the data in this study is checked using Augmented Dickey fuller (ADF) test. As it is discussed in chapter four the null hypothesis is that the series has a unit root i.e. $\delta = 0$ against with the alternative of the stationarity, $\delta < 0$. Based on this the result of this test is presented in table 5.1 below

Table 5.1: Augmented Dickey Fuller test results

Variables	Test static under different assumption			Order of integration
	Intercept	Trend and Intercept	None	
LRGDP	3.045361	-0.515694	5.167372	I(1)
DLRGDP	-4.241937*	-7.013203*	-2.724352*	
LGCE	2.370346	-0.149286	6.728060	I(1)
DLGCE	-4.702881*	-5.495203*	-2.670771*	
LGKE	1.608859	-0.451285	5.759061	I(1)
DLGKE	-5.682335*	-6.454854*	-2.174137**	
LDT	4.253802	0.333262	8.777205	I(1)
DLDT	-3.197734**	-4.381120*	-0.912424	
LIDT	2.576460	0.209582	5.842277	I(1)
DLIDT	-5.452595*	-8.063916*	-1.424794	
LDPKF	5.392368	2.248782	3.322797	I(1)
DLDPKF	-2.581353	-4.073815**	-0.255881	
LHC	0.073220	-2.064793	2.156435	I(1)
DLHC	-3.490534**	-3.517043**	-2.596693**	
LLF	-1.400603	-2.077468	-1.750072	I(1)
DLLF	-4.914140*	-4.831708*	-4.677622*	
LNX	1.811444	-0.633130	6.896978	I(1)
DLNX	-5.521352*	-6.615385*	-1.415498	

NB: * indicates the significant level at 1%

** indicates the significant level at 5%

*** indicates the significant level at 10%

L- Indicates log of respective variables

D- Indicates the first difference of respective variables

Table 5.1 shows the result of the Augmented Dickey Fuller test. The ADF test is applied on both at level and first difference respective to the consideration of their constant, with constant and trend, and without constant and trend. According to the result of the ADF test all variables has a unit root at level throughout the three cases. Therefore to transform the variables into stationary the first difference is taken and the result on the first difference shows from the table that all variables are stationary at first difference with constant and trend at 1% significant level, except DLHC and DLDPKF they are stationary at 5% significant level. Moreover, the first difference with only constant also shows that all variables are stationary at 1% significant level, except that DLDT and LHC are stationary at 5% while the DLDPKF is non-stationary. Since all variables are turned out to the stationary at first difference the implication of this result shows that all variables are integrated of order one I(1).

5.2. Co-integration test analysis

Having tested the variables for stationarity, the next step of time series analysis is testing for co-integration, which is whether the linear combination of the variables is also stationary or not. However since the Johansen co-integration test needs the prior decision on lag length, deciding the optimal lag length of the model is an important input to undertake this test.

5.2.1. Lag length selection criteria

Unrestricted VAR test is applied in order to determine the optimal lag length that should be included in the model. As it is mentioned in chapter four the optimal lag length is determined with the sequential modified Likelihood Ratio test statistics (LR), the Akaiki Information Criteria (AIC), the Schwarz (Bayesian) Information Criteria (SIC), the Final Prediction Error (FPE) and the Hannan-Quinn Information Criterions (HQ). The following table shows the optimal lag length test at 5% significant level based on different information criterions.

Table 5.2: Optimal lag length criteria

	Lag	LogL	LR	FPE	AIC	SIC	HQ
Expenditure	0	94.34998	NA	1.00E-11	-5.459374	-5.138744	-5.353094
	1	286.254	287.856	1.43E-15	-14.39087	-11.82584*	-13.54064
	2	350.1573	67.89722*	9.12e-16*	-15.32233*	-10.51288	-13.72813*
Tax	0	111.7677	NA	2.11E-13	-6.485483	-6.119049	-6.36402
	1	333.6366	318.9365	1.24E-17	-16.35229	-13.05438*	-15.2591
	2	441.8563	101.4560*	1.82e-18*	-19.11602*	-12.88664	-17.05116*

∗Indicates the lag length selected by respective criterions

Table 5.2 indicates that except SIC all other information criterions propose the optimal lag of 2 at 5% level of significance for both models. The Schwarz Information Criteria suggest the optimal lag of 1 at the same significance level.

5.2.2. Lag Exclusion test

Lag exclusion test helps to identify the best optimal lag order among the lags suggested by different information criterions. That is some of the lags of the endogenous variables that are chosen as optimal lag may not have significant impact on the model, individually as well as jointly. Accordingly this study uses VAR Wald Lag-Exclusion test in order to identify the lags which have significant effect in the models. Table 5.3 presents the Wald Lag-Exclusion test result which indicates that even if LR, AIC, FPE and the HQ Information Criterions propose the optimal lag length of 2, the VAR Wald Lag-Exclusion test result indicates that the use of only first lag is valid both individually and jointly for both expenditure and tax models, which is suggested by the Schwarz (Bayesian) Information Criteria (SIC).

Table 5.3: VAR Wald Lag-Exclusion test result

		LRGDP	LGCE	LGKE	LDT	LIDT	LDPKF	LHC	LLF	LNX	Joint
Expenditure	Lag 1	3209.4 [0.0000]	4987.7 [0.0000]	4127.9 [0.0000]			17237.7 [0.0000]	2135.8 [0.0000]	249.9 [0.0000]	4011.7 [0.0000]	32989.3 [0.0000]
	df	7	7	7			7	7	7	7	49
Tax	Lag 1	4306.6 [0.0000]			6645.5 [0.0000]	5583.6 [0.0000]	12988.7 [0.0000]	1459.9 [0.0000]	2024.4 [0.0000]	377.9 [0.0000]	4041.9 [0.0000]
	df	7					7	7	7	7	49

5.2.3. The Johansen integration test result

Having got the stationarity at first difference and the optimal lag length, the next step is the analysis of co-integration test result. The presence and the number of co-integrating relationships are evaluated with the Trace and Maximum Eigenvalue statistics based on the decision criteria presented in chapter four. The results of Trace and Maximum Eigen value statistics are presented in the following tables.

Table 5.4(a): Johansen test of integration (Expenditure model)

Trace statistics			
Null hypothesis	Alternative hypothesis	Test statistics	Critical value
Ho: r≤0	Ha: r>0	197.4354*	125.6154
Ho: r≤1	Ha: r>1	119.5094*	95.75366
Ho: r≤2	Ha: r>2	79.93155*	69.81889
Ho: r≤3	Ha: r>3	47.2328	47.85613
Ho: r≤4	Ha: r>4	22.20878	29.79707
Ho: r≤5	Ha: r>5	10.23039	15.49471
Ho: r≤6	Ha: r>6	0.011015	3.841466
Maximum Eigenvalue statistics			
Ho: r=0	Ha: r=1	77.92597*	46.23142
Ho: r=1	Ha: r=2	39.57785	40.07757
Ho: r=2	Ha: r=3	32.69875	33.87687
Ho: r=3	Ha: r=4	25.02402	27.58434
Ho: r=4	Ha: r=5	11.9784	21.13162
Ho: r=5	Ha: r=6	10.21938	14.2646
Ho: r=6	Ha: r=7	0.011015	3.841466

*denotes the rejection of the null hypothesis at 5% significant level

Table 5.4(a) indicates the Johansen test of integration for expenditure model. In this table Trace statistics result indicates that there are three co-integrations between the involved variables at 5% significance level. On the other hand, Maximum Eigenvalue statistics indicates that there is one co-integrating vector between the variables at the same significance level. Therefore, the result of both Trace and Maximum Eigenvalue statistics reject the null hypothesis in favour of the existence of at least one co-integrating vector. The implication of this result is that there is a long run relationship between the variables involved in the expenditure model of the study.

Table 5.4(b): Johansen test of integration (Tax model)

Trace statistics			
Null hypothesis	Alternative hypothesis	Test statistics	Critical value
Ho: r≤0	Ha: r>0	239.2968*	125.6154
Ho: r≤1	Ha: r>1	148.9114*	95.75366
Ho: r≤2	Ha: r>2	90.77061*	69.81889
Ho: r≤3	Ha: r>3	51.32525*	47.85613
Ho: r≤4	Ha: r>4	25.90755	29.79707
Ho: r≤5	Ha: r>5	11.026	15.49471
Ho: r≤6	Ha: r>6	0.084164	3.841466
Maximum Eigenvalue statistics			
Ho: r=0	Ha: r=1	90.38543*	46.23142
Ho: r=1	Ha: r=2	58.1408*	40.07757
Ho: r=2	Ha: r=3	39.44536*	33.87687
Ho: r=3	Ha: r=4	25.4177	27.58434
Ho: r=4	Ha: r=5	14.88155	21.13162
Ho: r=5	Ha: r=6	10.94184	14.2646
Ho: r=6	Ha: r=7	0.084164	3.841466

Table 5.4(b) presents the result of the Johansen integration test for tax model. Accordingly, the Trace statistics result indicates that there are four co-integrations between the involved variables at 5% significance level. On the other hand Maximum Eigenvalue statistics indicates that there are three co-integrating vectors between the variable at the same level of significance. Therefore the result of both Trace and Maximum Eigenvalue statistics reject the null hypothesis in favour of there exist at least three co-integrating vectors. This also implies the existence of a long run relationship between the variables involved in the tax model of the study.

Although the result indicates more than one co-integrating vectors in both models, since the concern of this paper is analysing the effect of government expenditure and tax on the Ethiopian economy; the vector that represents the regression of LRGDP on LGCE, LGKE,

LDPKF, LHC, LLF, and LNX in an expenditure model and the vector that represents the regression of LRGDP on LDT, LIDT, LDPKF, LHC, LLF, and LNX in a tax model are used.

Weak Exogeneity Test (Test for zero restriction on α coefficient)

Since the Johansen co-integration procedure does not restrict the variables of interest in the regression equation as endogenous and exogenous, testing for weak exogeneity should be undertaken. Accordingly, weak exogeneity Test result indicates that the null hypothesis of weak exogeneity is rejected for real gross domestic product at 5% level of significance in both cases, which indicates the real GDP as endogenous variable. On the other hand, the result indicates that the null hypothesis of weak exogeneity is failed to reject for the rest of the variables. Therefore, it is possible to express real GDP as a function of the other variables.

Table 5.5 Weak exogeneity test result

α-Coefficients	Expenditure		Taxes	
	LR-test of restriction(ch2=1)	P-value	LR-test of restriction(ch2=1)	P-value
LRGDP	7.758786	0.005345	9.817294	0.001729
LGCE	0.121861	0.727024		
LGKE	0.493455	0.263250		
LDT			3.036102	0.081431
LIDT			1.262337	0.261209
LDPKF	0.508450	0.241414	0.912184	0.252600
LHC	0.797912	0.371718	0.834181	0.361066
LLF	0.349656	0.268950	0.971779	0.182590
LNX	0.166446	0.683290	0.050763	0.821741

5.3. The vector error correction model result

As it is discussed in the fourth chapter of this paper the VECM gives information about the features of both the long run and the short run models, with disequilibrium as a process of adjustment to the long run model. Therefore, the two parts of the VECM (the long run and the short run models) are presented in the following paragraphs.

5.3.1. The long run model

As I have said before, the Johansen co-integration result provides more than one co-integration among the involved variables, however, this study focused on only a single co-integrating vector in each models. I.e. in the first model the vector which represents the response of real Gross Domestic Product to the real government recurrent and capital expenditures; real domestic private capital formation, human capital, labour forces and real net export is taken; whereas in the second model the vector that represents the response of real Gross Domestic Product to real direct and indirect taxes, real domestic private capital formation, human capital, labour forces and real net export is taken. These equations are presented in the following table.

Table 5.6: The estimated long-run model for RGDP

Explanatory Variables	Expenditure		Tax	
	Coefficient	t-value	Coefficient	t-value
LGCE	0.03711	[7.73190]		
LGKE	-0.0035	[-8.04602]		
LDT			0.51048	[8.02100]
LIDT			-0.3616	[-9.51384]
LDPKF	-0.3296	[-4.55407]	-0.1626	[-3.09826]
LHC	-0.3467	[-13.5432]	-0.1134	[-4.18705]
LLF	-0.2451	[-6.09923]	-0.1092	[-6.51465]
LNX	0.15563	[5.78907]	0.19955	[6.19498]
C	-7.8976	[-6.70507]	-8.7804	[-3.10185]

From table 5.6 all variables (GCE, GKE, LDT, LIDT, DPKF, HC, LF and NX) have significant effect on the long run RGDP as measured by t-statistics. Therefore the long run

equilibrium model of the RGDP for expenditure model can be written in equation form after reversing the signs of the coefficients as follow:

LRGDP = 7.89762 - 0.037114LGCE + 0.003494LGKE + 0.32955LDPKF + 0.346654LHC + 0.245121LLF-0.155625LNX ---------- (5.1)

From model 5.1 the real government current expenditure negatively affects the RGDP in Ethiopia in the long run. As the government increases its expenditure on current consumption by 1% then the long run RGDP in Ethiopia will decline by 0.0371%. As the government's current expenditure is redefined it is an expenditure on goods and services consumed within the current year, hence, it has no long run value added effect on the productivity of the economy. Rather it shifts resources towards current consumption at the expense of future consumption and retards the long run economic growth. Since it is an expenditure on the government daily activities which does not contribute any significant amount on capital formation as it is expected its contribution on Ethiopian GDP in the long run is negative.

The long run model of RGDP in Ethiopia also shows that the government spending on the capital expenditure has positive effect on the RGDP. Accordingly a 1% increase in government expenditure on capital expenditure positively affects the Ethiopian RGDP; it increases the RGDP by 0.0035%. In contrast to the government expenditure on current expenditure, capital expenditure has a positive effect in the long run. Since the government expenditure on capital goods and services is expenditure on future capital formation, it increases productivity of the economy. Therefore, it should have positive effect on the economy. Accordingly, its long run effect on Ethiopian economy found to be positive. Therefore, large amount of capital expenditure has favourable effect on Ethiopian economy.

On the other hand, the long run equilibrium model of the RGDP for tax model can be written in equation form after reversing the signs of the coefficients as follow:

RGDP=8.78035-0.510475LDT+0.361578LIDT+0.162583LDPKF+0.11339LHC +0.109224LLF - 0.19955LNX ---------- (5.2)

The equation 5.2 indicates that the effect of taxes on the Ethiopian economy in the long run, the model indicates that a percentage increase in direct taxes collected from the economic activities negatively affects the long run RGDP. Accordingly, as the government revenue collected in the form of direct taxes increases by 1%, the long run RGDP decreases by 0.51%. On the other hand, as opposed to the direct taxes the effect of indirect taxes on the

long run RGDP has positive and significant effect. The long run model indicates that as the government raises its revenue collected in the form of indirect taxes by 1%, the RGDP of the Ethiopian economy rises by 0.36%.

As it is described in the third chapter of this paper tax revenue collected in the form of indirect taxes is the dominant one especially after the reformation period. Since the taxes collected through import duties and taxes play the major role of the indirect taxes its contribution on the long run RGDP is justifiable. The justification is that since Ethiopia is among one of the developing countries, industries in Ethiopia is at their infant stage and hence they need a protection from outside world influences. Therefore imposing high taxes and duties on import stimulate the economy. Thus the model also ensures this fact behind the positive and significant effect of the indirect tax in the long run RGDP.

On the other hand, the effect of direct taxes on the long run RGDP is negative as it is expected. The researcher justifies this effect through the composition of the taxes included in this category as it is done for indirect taxes. In Ethiopia the largest part of the direct taxes are come from income and profit taxes, since high tax rate on this categories discourages the people to work and moreover decreases the disposable income of the people which leads to low level of saving and thereby low investment in the country; it obviously discourages the economy in the long run. Therefore, it will have negative and significant effect on the RGDP in the long run.

The implication of the results of effect of tax on economic growth indicates that in Ethiopia from the side of the effects of indirect taxes on economic growth, the protection effect dominates the negative effects that can arise from lack of trade liberalization. On the other hand the effect of direct taxes in discouraging saving and then investments dominates the positive effects that can come from the indirect effect of direct taxes which is the construction of infrastructures that promote the economic growth using mobilized direct taxes.

The effect of domestic private capital formation and human capital in the long run RGDP is found as positive and significant in both models. Since these two variables increases the productivity of the economy, they contribute positively to the Ethiopian economy in the long run.

The other finding of the study indicates that net export has a positive effect on the long run RGDP. As opposed to the expectation the net export in Ethiopia stimulates the RGDP in the

long run. On the other hand, increasing the number of labor force in the Ethiopian economy has positive effect on the long run RGDP, since it increases the working force of the economy.

In general the result from the long run models of the RGDP estimation indicates that government capital expenditure, indirect taxes, domestic private capital formation, human capital, labour forces and net export have positive and significant effect on the Ethiopian RGDP in the long run. On the other hand government current expenditure and direct taxes have negative and significant effect on the real GDP of the Ethiopian economy.

5.3.2. The short run model

Table 5.7: The estimated short run model for RGDP

Error Correction	Dependent Variable: D(LRGDP)			
	Expenditure		Tax	
	Coefficient	t-value	Coefficient	t-value
EC_{t-1}	-0.541030	-2.302631	-0.368210	-3.117926
DLRGDP(-1)	0.270551	1.987162	0.536347	2.800012
DLGCE(-1)	0.063022	0.638564		
DLGKE(-1)	0.023519	0.395199		
DLDT(-1)			0.110413	1.135461
DLIDT(-1)			0.123659	2.937631
DLDPKF(-1)	0.126065	0.865945	0.100987	0.865901
DLHC(-1)	-0.007211	-0.052502	-0.027794	-0.256636
DLLF(-1)	-0.41886	-0.979843	0.092773	0.344451
DLNX(-1)	-0.017867	-0.255661	-0.061705	-1.312515

In Table 5.7 the short run estimations of RGDP are presented, which indicate that the short run RGDP in Ethiopia is a function of one period lagged difference of the RGDP itself and one period lagged difference of the other involved variables (LGCE, LGKE, LDT, LIDT, LDPKF, LHC, LLF and LNX).

The table shows that in the short run the current period of RGDP is influenced by the previous level of the RGDP itself. A 1% increase in the RGDP in the current period leads to 0.27% increase in the next year RGDP in the expenditure model, whereas it leads to 0.54%

increase in the next year RGDP in the tax model. The result from the short run estimation indicates that the level of RGDP in the previous period has positive and significant effect in the current RGDP of the Ethiopian economy.

The study also finds out that indirect taxes have positive influence on the RGDP in the short run. Thus, if the government increases its revenue through indirect taxes, it will have favourable result in both the short run and the long run activities of the country's economy. As the government's revenue increases via indirect taxes by 1% it leads to 0.12% increases in the short run RGDP in Ethiopia. The t-statistics result of the model indicates that the effect of lagged difference indirect taxes has positive and significant effect in the short run RGDP also. However, in the short run, the rest all other variables do not have any significant meaning in explaining economic growth in both cases.

Table 5.7 also describes that the coefficient of the error correction terms in both cases have a negative sign and they are significant, indicating that they are error-correcting. That means the short run model adjusts towards its equilibrium position or its long run model for any deviation. Based on the result in the expenditure model 54.10% of the short run disequilibrium in the RGDP in one period will adjusts towards its long run value every year, thus full adjustment would require a period of less than two years. Whereas, in the tax model 36.82% of the short run disequilibrium in the RGDP in one period will adjusts towards its long run value every year, thus full adjustment would take about three years.

5.4. Granger Causality test result

In order to identify whether there is/are a bidirectional relationship between the variables the Granger Causality test is undertaken. Accordingly the result of the Granger Causality test is presented in table 5.8 below.

Table 5.8: Results of the Granger Causality test

Equation	LRGDP	LGCE	LGKE	LDT	LIDT	LDPKF	LHC	LLF	LNX
LRGDP		9.34567 (0.0047)	5.75465 (0.0229)	2.12743 (0.1551)	15.4898 (0.0005)	10.3925 (0.0030)	2.82315 (0.1033)	7.05657 (0.0125)	1.45214 (0.2376)
LGCE	3.62512 0.0665		0.87220 0.3578	0.20966 0.6503	2.10747 0.1570	7.37345 0.0109	2.20848 0.1477	4.16786 0.0501	0.02715 (0.8702)
LGKE	5.21518 0.0296	5.23890 0.0293		0.00496 0.9443	6.07021 0.0197	0.67030 0.4194	2.89153 0.0994	6.21583 0.0184	0.15785 (0.6940)
LDT	5.17396 0.0302	12.6005 0.0013	14.0722 0.0008		34.1656 2.E-06	4.48473 0.0426	2.31105 0.1389	6.79195 0.0141	0.54849 (0.4647)
LIDT	8.74161 0.0060	6.05110 0.0199	8.53081 0.0066	0.17155 0.6817		1.66076 0.2074	0.87598 0.3568	7.09034 0.0123	0.18451 (0.6706)
LDPKF	4.74874 0.0373	16.2841 0.0003	5.25950 0.0290	0.60048 0.4445	4.29992 0.0469		1.16148 0.2897	4.22578 0.0486	1.58496 (0.2178)
LHC	0.38851 0.5378	1.849948 0.1840	1.28452 0.2660	1.31128 0.2629	1.27340 0.2681	2.32847 0.1375		2.47787 0.1259	1.36362 (0.2521)
LLF	0.24164 0.6266	0.10369 0.7497	2.38543 0.1330	1.14896 0.2923	0.18029 0.6742	0.15077 0.7005	2.32213 0.1380		1.21424 (0.2793)
LNX	5.23890 (0.0293)	10.2102 (0.0033)	13.3994 (0.0010)	3.46149 (0.0726)	5.00749 (0.0328)	0.26962 (0.6074)	3.01492 (0.0928)	6.68340 (0.0148)	

Table 5.8 indicates that there is bidirectional relationship between real GDP and government current expenditure, indirect taxes, government capital expenditure, domestic private capital formation; government current expenditure and domestic private capital formation; and government capital expenditure and indirect taxes.

The table also describes that real GDP granger causes government current expenditure, government capital expenditure, indirect taxes, domestic private capital formation and labor forces; and government current expenditure granger causes domestic private capital formation. While the government capital expenditure granger causes real GDP, government current expenditure and labour force. On the other hand direct taxes granger causes real GDP, government current expenditure, government capital expenditure, labour force and domestic private capital formation while indirect taxes granger causes real GDP, government current

expenditure, government capital expenditure and labour force. Finally domestic private capital formation granger causes real GDP, government current expenditure, government capital expenditure, indirect taxes, human capital and labour force; while net export granger causes real GDP, government current expenditure, government capital expenditure, indirect taxes and labour force.

Therefore the finding of this study indicates that the lagged values of the variables have significant effect to explain both current and future values of some other variables. The finding also indicates that sometimes there is bidirectional effect among some variables. This result can also justify the reason behind using the VAR model to undertake this study.

5.5. Post-Estimation Diagnostics

To insure the truthfulness of the regressed models and also to guarantee the Gaussian assumption different post-estimation diagnostic tests were performed. Accordingly, the diagnostics results on residual normality test, error vector autocorrelation test and heteroskedacity test tell us that in three of the cases the null hypotheses are accepted for both models since the p-values are more than the 5% in all cases, thus the regressed model is suitable to the Ethiopian macro data. The results of these diagnostics are presented in the following Figure.

Table 5.9: Post-diagnostic test result

Tests	Model 1			Model 2	
	Statistics		P-value	Statistics	P-value
Residual Vector Serial Correlation (LM) test	Lag	Chi-square		Chi-square	
	1	39.44327	0.8334	58.64298	0.1628
	2	48.66919	0.4865	42.12529	0.1740
Residual Vector Normality (Jarque-Bera test)	Joint	9.165700	0.8203	16.49226	0.2842
Residual Vector Heteroskedasticity		23.09351	0.0588	13.63649	0.4771

From table 5.9 the diagnostic result of the Residual Vector Serial Correlation LM test indicates that the residuals are not serially correlated, thus there is no autocorrelation as desired. The residual normality diagnostic of the Jarque-Bera test indicates that the residuals

of the models are normally distributed. Moreover the result of the diagnostic test indicates that heteroskedasticity is not a problem which means the residuals of the models are found to be homoskedastic. Therefore the result of these diagnostics together with the results of the other pre and post estimation diagnostic tests, suggests the validity and robustness of the estimated results.

5.6. Stability test

Like the post-estimation diagnostics discussed above the stability of the VAR model can also affect the truthfulness of the estimators estimated from regressed model and also inferences made from the model. Moreover the validity and robustness of the results of the impulse response functions also depend on the result of the stability of the model as well as the other pre and post diagnostics test results. Therefore such tests should be tested prior to the further going.

Accordingly the results from stability tests indicate that all of the points lie inside and on the unit circle in both cases. The implication of these results is that the models satisfy the stability condition (see Appendix A).

5.7. Impulse response function

VAR model helps us to examine the impulse response of endogenous variables to one time shock of the other variables in the model. In our case it tells us how the real GDP at any point in time may respond to any shock or a one standard deviation impulse generated from any of the variables earlier times and how that effect may be multiplied i.e. whether it last for a long period of time or it die out in the short run.

Accordingly, the result from impulse response function indicates that even if the response of real GDP to positive impulse of RGDP itself shows fluctuation throughout the periods, it shows permanent positive effect. The real GDP has no any response at the first period for the shock comes from the government current expenditure; however its positive response starting from the second period rises continuously. Likewise the response of real GDP resulting from a one standard deviation impulse generated from government capital expenditure is none, starting from the second period its negative response increases permanently in the short run.

In short, the response of real GDP for any shocks is zero at the first period, except for the shocks that comes from Real GDP itself. Hence the response of real GDP resulting from a shock of direct and indirect taxes is positive and increasing in the short run. On the other

hand, at the earlier period the real GDP respond negatively for the shock that comes from domestic private capital formation until the fifth period beyond that it starts increasing. As opposed to this, the response of real GDP for the shock comes from human capital and labour force is positive throughout the period under test, however, it is insignificant. Finally, the response of real GDP to the net export is negative throughout the years under consideration.

Table 5.10: Impulse response analysis of real GDP

Response of LRGDP:									
Period	LRGDP	LGCE	LGKE	LDT	LIDT	LDPKF	LHC	LLF	LNX
1	0.040437	0.00000	0.0000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
2	0.046583	0.01465	-0.00519	0.007492	0.030854	-0.01178	0.00236	0.004132	-0.0007
3	0.042563	0.033613	-0.00578	0.034214	0.036096	-0.01482	0.010918	0.003009	-0.0037
4	0.047035	0.045565	-0.01035	0.042012	0.031301	-0.00563	0.006205	0.002744	-0.01473
5	0.046344	0.046447	-0.01385	0.040769	0.043115	-0.00099	0.002156	0.004172	-0.01763
6	0.044952	0.048818	-0.01372	0.051132	0.047725	0.000394	0.004916	0.004736	-0.01833
7	0.048088	0.053327	-0.01470	0.056196	0.044649	0.003493	0.003162	0.004832	-0.02333
8	0.049814	0.054853	-0.01568	0.05529	0.048312	0.004954	0.000439	0.005291	-0.02561
9	0.049611	0.056499	-0.01551	0.059135	0.051696	0.004522	0.000789	0.005706	-0.02539
10	0.050490	0.059145	-0.01563	0.062637	0.051034	0.005226	0.000348	0.00574	-0.02702

Chapter Six

6. Conclusions and Policy Recommendations

6.1. Conclusions

This study is under taken to analyse the effect of government expenditure and tax on economic growth in Ethiopia. The purpose of the study is to examine which components of government expenditure and tax compositions stimulate the economy and which of them do not both in the short run as well as in the long run. Co-integrated Vector Error Correction approach is applied for the identification of which components of government expenditure and tax compositions have significant effect on Ethiopian economy both in the short run and in the long run. The study under take sample period from 1980/81 to 2013/14, the rationale behind using this period is availability of relevant data for the study.

The contribution of this paper is to fill the gap that many of the researches have done in Ethiopia did not consider government expenditure and taxation as explanatory variables in their growth model analysis. As to my knowledge there have not been any research done that combine both the components of government expenditure and the taxes composition as explanatory variable in their growth model analysis. Unlike other researches who study the effect of tax compositions on economic growth and the effect of the various components of government expenditure on economic growth separately, this study examines the effects of both various components of government expenditure and tax compositions on economic growth of Ethiopia.

There are both theoretical and empirical controversy regarding the effectiveness of fiscal policy both in developed and developing countries. The classical economists argue that the market can manipulate the economic activities by itself through the interaction of market demand and market supply. Their argument has been based on Say's law that market tend towards full employment. According to this stream any policy intervention rather disturb the well functioning of the economy, hence they support laissez fair policy.

Keynesian economists on the other hand argue that government intervention into the economy stimulate the economy rather than retarding well functioning of the economy as what classical economists thought. Keynesian economists believe that appropriate policy intervention in the economy can stimulate economic growth of the economy both in developed and developing economy. According to these thought since there is lack of

instruments to implement monetary policy, in developing economy using fiscal policy is more effective than the monetary policy. Moreover very low level of social services and poor infrastructural facilities limit to a great extent the role of private sector in the development endeavours and therefore invites the public sector to fill the gap through fiscal policy. Thus government intervention generates a means to create social and economic infrastructure thereby encourage private participation in the economy.

The economists who support government intervention in the economy believed that fiscal policy can play a significant role in economic growth. In the short term, when the economy is at cyclical downturn the government can manipulate the economy through counter-cyclical fiscal expansion so as to increase aggregate demand thereby increase aggregate output and employment. When the economy is at boom period the government uses fiscal contraction method to cool down an economy. By doing so, the government can prevent the economy from risk of overheating. Advanced economies have a long history of managing their business cycle through fiscal policy. In addition to this the government can also use fiscal policy to manage medium- and long-term economic growth. This is true specially in developing economy where the relative potential of private sector is weak and underdeveloped the government spend more on infrastructural activities which can benefits the productivity of all firms and industries, and the entire economy.

Likewise various empirical studies based on data from different countries at different period of time and using different methodology, also reached different and controversial findings regarding the effect of fiscal policy which is mainly government expenditure and taxes. This study is based on the Ethiopian data from 1980/81 to 2013/14 and both descriptive and econometric analyses are employed to identify which component of government expenditure and tax compositions favour economic growth and which do not.

From the descriptive side of the analysis the researcher found that the trend of both government expenditure and tax has been growing throughout the year under consideration at real term. During the Derg regime the government used to spend more on current goods and services which accounted 70.48% of the total government expenditure and on average the largest share of this expenditure went to general services followed by expenditure on social services. Whereas the remaining 29.52% of the total government expenditure on average went to capital expenditure, out of this expenditure on economic development constituted the largest portion followed by social developments. From the revenue side of the Derg regime a

larger part of the government tax revenue was collected in the form of indirect taxes which was 57.68% of the total tax revenue on average while the remaining 42.32% of the total tax revenue came from direct taxes. Taxes came in the form of income and profit taxes took the major part of the direct taxes throughout the regime while the taxes collected in the form of domestic indirect taxes accounted the major part of the total indirect taxes throughout the Derg regime.

On the other hand, during the current government on average a large portion of government expenditure directed towards capital expenditure which constituted 55.99%, out of this on average 66.7% of it directed towards economic development and followed by social development. The remaining 44.01% of the total government expenditure directed to the current expenditure and expenditure on general services accounted the largest share of the current expenditure (40.27%) and followed by social development (30.38%). From the revenue side of the EPRDF like the Derg regime a larger amount of tax revenue was mobilized in the form of indirect taxes which constituted 65.8% of the average total tax revenue, here as oppose to the Derg regime import duties and taxes constituted the largest share and followed by domestic indirect taxes. on the other hand the remaining 34.2% of the total average tax revenue collected in the form of direct taxes and income and profits tax constituted the largest portion of the direct taxes (91.76%) followed by urban land lease fee.

From the econometric analysis Co-integrated Vector Error Correction approach is applied for the identification of the effect of various components of government expenditure and tax compositions along with other relevant variables on real GDP both in the short run and in the long run. Based on this the researcher arrived at the following conclusions.

In the long run current expenditure and direct taxes have negative and significant effect on the real GDP. However capital expenditure, indirect taxes, domestic private capital formation, human capital, net export and labour forces have positive and significant effect on the real GDP. On the other hand, in the short run, all variables do not have any significant meaning in explaining economic growth except lagged difference of real GDP itself and lagged difference of indirect taxes. These two variables (real GDP and indirect taxes) have positive and significant effect on the short run real GDP of the Ethiopian economy.

From the granger causality result the real GDP has bi-directional granger causality with government capital expenditure and indirect taxes. On the other hand government capital expenditure and indirect taxes has bi-directional granger causality.

6.2. Policy Implications

Since the intervention of the government has both positive and negative implications on the economic activities, Ethiopian government advised to identify the productive and unproductive sectors of its intervention. Based on the results obtained and conclusions made in this study, the following policy implications are drawn.

First, since the government current expenditure negatively affects the real GDP, appropriate measure should be taken to reduce such expenditures in the economy. Although it has positive effect in the short run its effect on the economy is insignificant, thus reducing this expenditure will have significant positive effect on the Ethiopian economy.

Second, the long run positive impact of government capital expenditure implies that the government expenditure on capital goods and services plays a significant role in stimulating Ethiopian economy. Thus shifting the government expenditure from current expenditure towards capital expenditure is advisable to stimulate economic growth. In less developed countries since there is low economic and social infrastructures the government intervention so as to fill such gap is very important, likewise as Ethiopia is one of the less developed countries the government intervention in these sectors plays important role. Moreover, the government intervention in improving infrastructure has positive influence on private capital formation and human capital development. As the effect of private capital formation and human capital in the long run real GDP is positive, the government expenditure on capital goods and services has multiple positive effects on the economy. Therefore, appropriate measure should be taken in allocating this expenditure into the economy.

Third, a positive relationship between indirect taxes and real GDP both in the short run and in the long run indicates that a large amount of indirect taxes mobilization helps as stimulating factor in the Ethiopian economy. Since it has positive and significant effect both in short run and long run real GDP, important attention should be given to raise the revenue that is mobilized in the form of indirect taxes. In general, every possible measure should be taken to mobilize more indirect taxes which help to boost the economy. On the other hand, although direct tax has positive effect in the short run real GDP its effect is insignificant rather since it has negative and significant effect in the long run real GDP the government should reduce its revenue collected in the form of direct taxes so as to stimulate the economy.

Finally, Ethiopian economy needs the involvement of the government to stimulate the economy. Therefore, since its involvement can boost the economy and also helps to facilitate

the participation of the private investments, appropriate designing of the government intervention into the economy plays fundamental role. Therefore both the level and structure of the government expenditure and taxation should be designed in effective and efficient way.

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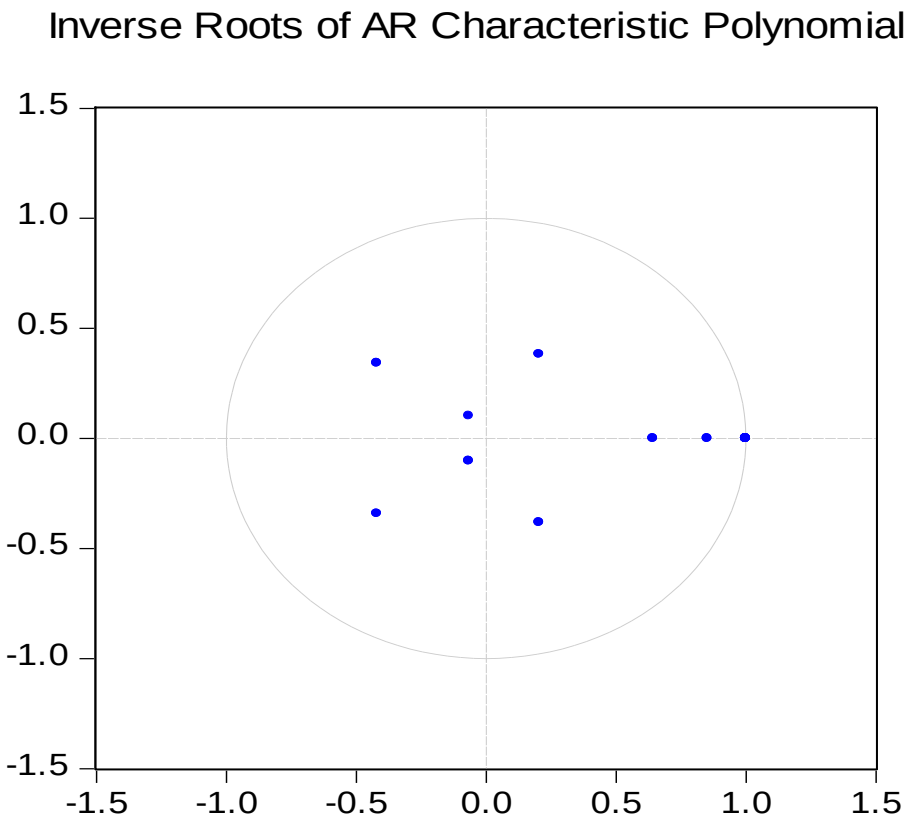
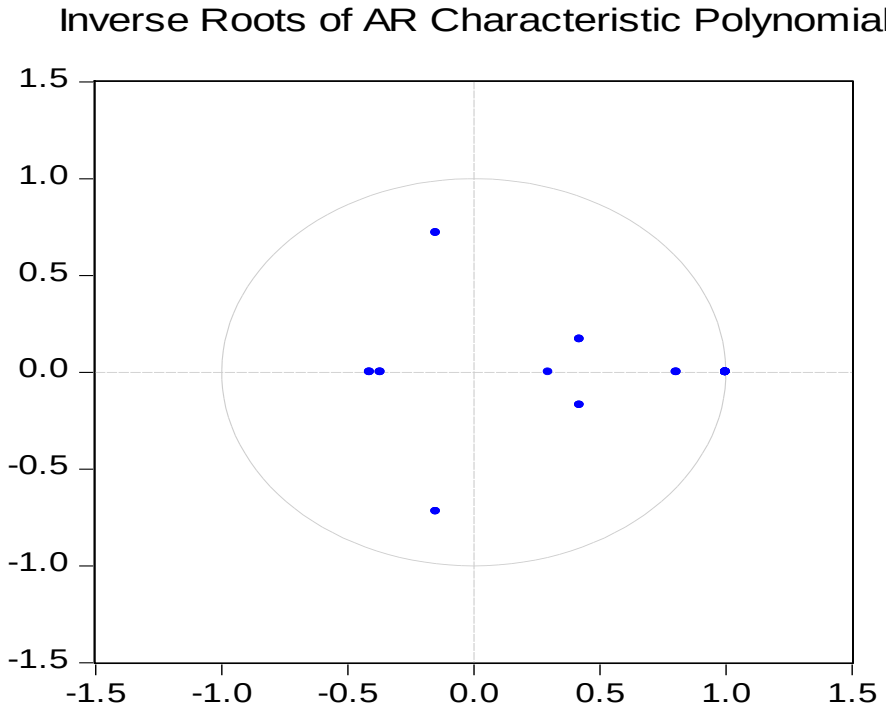
Appendixes

Appendix A: the inverse roots of AR characteristic polynomial

(a) Model 1



(b) Model 2



Appendix B: Impulse response analysis of real GDP

Response of LRGDP:									
Period	LRGDP	LGCE	LGKE	LDT	LIDT	LDPKF	LHC	LLF	LNX
1	0.040437	0.00000	0.0000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
2	0.046583	0.01465	-0.00519	0.007492	0.030854	-0.01178	0.00236	0.004132	-0.0007
3	0.042563	0.033613	-0.00578	0.034214	0.036096	-0.01482	0.010918	0.003009	-0.0037
4	0.047035	0.045565	-0.01035	0.042012	0.031301	-0.00563	0.006205	0.002744	-0.01473
5	0.046344	0.046447	-0.01385	0.040769	0.043115	-0.00099	0.002156	0.004172	-0.01763
6	0.044952	0.048818	-0.01372	0.051132	0.047725	0.000394	0.004916	0.004736	-0.01833
7	0.048088	0.053327	-0.01470	0.056196	0.044649	0.003493	0.003162	0.004832	-0.02333
8	0.049814	0.054853	-0.01568	0.05529	0.048312	0.004954	0.000439	0.005291	-0.02561
9	0.049611	0.056499	-0.01551	0.059135	0.051696	0.004522	0.000789	0.005706	-0.02539
10	0.050490	0.059145	-0.01563	0.062637	0.051034	0.005226	0.000348	0.00574	-0.02702

Appendix C: Impulse response analysis of GCE

Response of LGCE:									
Period	LRGDP	LGCE	LGKE	LDT	LIDT	LDPKF	LHC	LLF	LNX
1	-0.0122	0.176619	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.004394	0.220269	-0.00916	0.020101	-0.00054	0.033917	0.00147	-0.02393	-0.0034
3	0.044282	0.254086	-0.02181	0.038264	0.014864	0.043812	-0.02996	-0.00877	-0.01266
4	0.036862	0.272946	-0.02354	0.062452	0.068882	0.042359	-0.02678	-0.00952	-0.0186
5	0.045283	0.304835	-0.02508	0.114154	0.063127	0.047567	-0.02805	-0.00611	-0.02673
6	0.053548	0.32151	-0.03138	0.118897	0.071675	0.061217	-0.043	-0.00588	-0.0453
7	0.053323	0.328575	-0.03357	0.131955	0.092716	0.063884	-0.04804	-0.00234	-0.0456
8	0.054313	0.339327	-0.0334	0.152792	0.096596	0.067324	-0.0478	-0.00179	-0.04956
9	0.059607	0.348257	-0.03558	0.160171	0.096997	0.072681	-0.05454	-0.0008	-0.05843
10	0.06069	0.352085	-0.03659	0.163859	0.10626	0.074638	-0.05834	0.000287	-0.06073

Appendix D: Impulse response analysis of GKE

Response of LGKE:									
Period	LRGDP	LGCE	LGKE	LDT	LIDT	LDPKF	LHC	LLF	LNX
1	0.0545	0.079962	0.210724	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.055507	0.109756	0.177642	0.083726	0.068956	-0.00777	-0.02799	-0.00346	0.009079
3	0.082213	0.176924	0.189834	0.148351	0.054644	-0.01785	-0.07451	0.015225	0.002332
4	0.074031	0.194877	0.189741	0.160209	0.104401	-0.00324	-0.09148	0.009146	-0.00783
5	0.075065	0.21833	0.188472	0.210759	0.114754	-0.00391	-0.10697	0.020816	-0.00653
6	0.075236	0.231934	0.189145	0.22766	0.123653	0.009892	-0.11511	0.018136	-0.02754
7	0.080599	0.241521	0.186251	0.242092	0.131416	0.014624	-0.12825	0.023403	-0.02900
8	0.080348	0.24772	0.187261	0.253032	0.143137	0.017973	-0.13128	0.023545	-0.03154
9	0.083798	0.256303	0.186804	0.266447	0.144384	0.019873	-0.13588	0.025414	-0.03756
10	0.085802	0.261709	0.186267	0.270841	0.149122	0.022617	-0.14031	0.025754	-0.04032

Appendix E: Impulse response analysis of DT

Response of LDT:									
Period	LRGDP	LGCE	LGKE	LDT	LIDT	LDPKF	LHC	LLF	LNX
1	0.043145	0.088548	0.092134	0.094961	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.063755	0.1448	0.068776	0.148816	0.037044	0.006891	-0.0509	0.00535	-0.02188
3	0.067882	0.186676	0.07316	0.195919	0.077854	0.007778	-0.07899	0.015472	-0.02265
4	0.064585	0.215517	0.072727	0.246331	0.103015	0.018566	-0.08893	0.016893	-0.03443
5	0.07204	0.239612	0.068971	0.278586	0.108937	0.030965	-0.1078	0.022113	-0.05106
6	0.074196	0.250907	0.067161	0.293013	0.12854	0.04043	-0.11949	0.024085	-0.06215
7	0.076696	0.262674	0.066812	0.315493	0.138752	0.043821	-0.12541	0.027184	-0.0643
8	0.080718	0.273733	0.066219	0.329309	0.143153	0.048737	-0.13152	0.028023	-0.07181
9	0.083772	0.281354	0.065057	0.337647	0.150122	0.051601	-0.13779	0.029653	-0.07754
10	0.084598	0.287297	0.064912	0.346669	0.156602	0.053144	-0.1405	0.03056	-0.07894

Appendix F: Impulse response analysis of IDT

Response of LIDT:									
Period	LRGDP	LGCE	LGKE	LDT	LIDT	LDPKF	LHC	LLF	LNX
1	-0.00998	0.037207	-0.04274	0.039145	0.137272	0.000000	0.000000	0.000000	0.000000
2	0.042175	0.128554	-0.03021	0.160868	0.101658	0.006064	0.002824	0.004368	-0.00761
3	0.078279	0.182101	-0.04885	0.16471	0.133345	0.028723	-0.03986	0.004695	-0.04446
4	0.076821	0.212889	-0.05276	0.208025	0.197415	0.024405	-0.05029	0.014543	-0.03568
5	0.077627	0.249949	-0.05303	0.271704	0.20633	0.034168	-0.04837	0.014761	-0.05394
6	0.090752	0.275515	-0.06123	0.291251	0.208724	0.051768	-0.06941	0.018085	-0.07586
7	0.091269	0.284169	-0.06437	0.302203	0.237412	0.058933	-0.07879	0.021135	-0.08152
8	0.092599	0.297607	-0.06416	0.330919	0.245629	0.061864	-0.07947	0.023356	-0.08534
9	0.099084	0.310338	-0.06617	0.343191	0.245901	0.068784	-0.08707	0.024049	-0.09503
10	0.101728	0.316536	-0.06788	0.348287	0.256598	0.071772	-0.09356	0.02577	-0.1001

Appendix G: Impulse response analysis of DPKF

Response of LDPKF:									
Period	LRGDP	LGCE	LGKE	LDT	LIDT	LDPKF	LHC	LLF	LNX
1	-0.00759	0.083148	0.018753	0.041538	0.028726	0.052369	0.000000	0.000000	0.000000
2	0.012489	0.115034	0.000849	0.091703	0.041845	0.086544	-0.01924	-0.00101	-0.02785
3	0.043867	0.147531	-0.00265	0.119002	0.062376	0.100686	-0.04441	0.007285	-0.04081
4	0.050691	0.174415	-0.00475	0.151659	0.100514	0.101311	-0.0531	0.01026	-0.04487
5	0.059349	0.205945	-0.00565	0.193929	0.109217	0.105086	-0.06052	0.013352	-0.05427
6	0.065993	0.226765	-0.00975	0.211684	0.121228	0.114258	-0.07355	0.014999	-0.06792
7	0.06726	0.238942	-0.01196	0.228974	0.13809	0.118991	-0.08083	0.017867	-0.07259
8	0.068747	0.250191	-0.01274	0.247877	0.145235	0.123634	-0.08424	0.019182	-0.07848
9	0.072456	0.259158	-0.0144	0.258303	0.149032	0.12864	-0.0902	0.020423	-0.08507
10	0.074182	0.264662	-0.01535	0.265079	0.156334	0.131349	-0.09432	0.021561	-0.08815

Appendix H: Impulse response analysis of HC

Response of LHC:									
Period	LRGDP	LGCE	LGKE	LDT	LIDT	LDPKF	LHC	LLF	LNX
1	0.046348	-0.03619	-0.0091	-0.0153	-0.00845	0.009424	0.053566	0.000000	0.000000
2	0.078465	-0.02215	-0.01794	-0.02825	-0.01866	-0.00338	0.075986	-0.00349	-0.00800
3	0.093366	-0.00452	-0.02246	-0.03681	-0.01398	-0.01316	0.087696	-0.00707	-0.00145
4	0.094981	0.008615	-0.02724	-0.03198	-0.00589	-0.01833	0.095546	-0.00779	0.000716
5	0.093504	0.016646	-0.0309	-0.02526	-0.0038	-0.01584	0.100532	-0.00876	-0.00423
6	0.093267	0.019339	-0.03442	-0.0233	-0.00257	-0.01096	0.101326	-0.00873	-0.01029
7	0.092996	0.019327	-0.03624	-0.02227	0.000274	-0.0078	0.10233	-0.00855	-0.01279
8	0.093812	0.020115	-0.03701	-0.0199	0.000749	-0.0062	0.103259	-0.00841	-0.01421
9	0.095219	0.021321	-0.03757	-0.01912	0.000891	-0.00521	0.103035	-0.00837	-0.01657
10	0.09597	0.022302	-0.03789	-0.01853	0.002148	-0.00503	0.102782	-0.00824	-0.01792

Appendix I: Impulse response analysis of LF

Response of LLF:									
Period	LRGDP	LGCE	LGKE	LDT	LIDT	LDPKF	LHC	LLF	LNX
1	0.011684	0.003316	0.003382	0.000287	-0.00768	-0.0021	-0.0101	0.007266	0.000000
2	0.014277	0.006006	0.009331	-0.00513	-0.00746	-0.01081	-0.01491	0.004195	0.005029
3	0.021494	0.012268	0.013217	-0.00156	-0.0108	-0.01611	-0.0191	0.004872	0.012747
4	0.020129	0.015809	0.01356	-0.00187	-0.00514	-0.0204	-0.02301	0.005377	0.013693
5	0.017576	0.018002	0.014831	0.003394	-0.00369	-0.0214	-0.0226	0.005377	0.015078
6	0.017062	0.019112	0.014446	0.005139	-0.00527	-0.01995	-0.02426	0.005536	0.013387
7	0.016501	0.018159	0.014281	0.004117	-0.00399	-0.01889	-0.02543	0.005717	0.013314
8	0.016056	0.017637	0.014539	0.005151	-0.00344	-0.01887	-0.02524	0.005901	0.014222
9	0.01643	0.017882	0.01467	0.005641	-0.00428	-0.01865	-0.02543	0.005864	0.014017
10	0.016727	0.017888	0.014637	0.005128	-0.00408	-0.01863	-0.02593	0.005919	0.013927

Appendix J: Impulse response analysis of NX

Response of LNX:									
Period	LRGDP	LGCE	LGKE	LDT	LIDT	LDPKF	LHC	LLF	LNX
1	0.133669	0.185571	0.047993	0.097085	0.02699	0.038241	0.00000	0.000000	0.000000
2	0.078093	0.29138	-0.00184	0.154203	0.142727	-0.05101	-0.11347	0.03991	0.140659
3	0.058024	0.339275	0.041681	0.264495	0.162331	-0.00067	-0.06948	0.010138	0.106305
4	0.083264	0.38221	0.005828	0.307624	0.144308	0.020497	-0.14497	0.038744	0.087568
5	0.065771	0.375104	0.013794	0.302395	0.21417	0.04239	-0.14725	0.031761	0.080165
6	0.072897	0.396798	0.012619	0.367306	0.208262	0.041386	-0.15216	0.042812	0.071299
7	0.083793	0.412956	0.01191	0.370698	0.208124	0.056382	-0.16588	0.039259	0.069965
8	0.088521	0.420297	0.009245	0.378477	0.227108	0.056066	-0.17792	0.0448	0.067351
9	0.086707	0.429768	0.011572	0.397801	0.237186	0.056045	-0.17629	0.04469	0.059242
10	0.091699	0.440752	0.010117	0.410143	0.233933	0.059911	-0.18245	0.045952	0.057497