Does External Debt Cause Economic Growth?
The Case of Ethiopia

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This is to certify that the thesis presented by Wessene Kassa, entitled: Does External Debt cause Economic Growth? The case of Ethiopia and submitted in partial fulfillment of the requirements for the Degree of Master of Science (Economic Policy Analysis) complies with the regulations of the University and meets the accepted standards with respect to the originality and quality.

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ABSTRACT

Does External Debt Cause Economic Growth? The Case of Ethiopia

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The study examines the long run and short run relationship between external debt and economic growth in Ethiopia over the period of 1970/71-2010/2011 using Autoregressive Distributed Lag Model (ARDLM) or bound testing approach. The empirical results indicated that the relationship between external debt and economic growth both in the short run and long run is significant with a negative sign. This indicates the existence of a debt overhang problem in the country. But, the debt servicing variable has a negative but insignificant effect on economic growth. As a result there is no evidence of crowding out effect since it is not significant. Moreover, there exists unidirectional causality from external debt to economic growth. Therefore, external debt is found to have a negative effect rather than causing economic growth in Ethiopia for the period under study. Hence, in order to tackle the problems of external debt, there should be close monitoring and consistent debt management strategies so as to avoid the misallocation and mismanagement of external debt.

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Acronyms

ADB	African Development Bank
ADF	Agumented Dicky Fuller
ADLI	Agricultural Development Led Industrialization
AIC	Akakie Information Criterion
ARDL	Autoregressive Distributed Lag
CSA	Central Stastics Authority
CV	Critical Value
DF	Degrees of Freedom
DSA	Debt Sustainability Analysis
DW	Durbin Watson
ECM	Error Correction Model
EAL	Ethiopian Airlines Lines
EEA	Ethiopian Economic Association
EPRDF	Ethiopian People Revolutionary Democratic Front
ETB	Ethiopian Birr
GDP	Gross Domestic Product
GNP	Gross National Product
GTP	Growth Transformation Plan

HIPCS	Heavily Indebted Poor Countries
IDA	International Development Association
IMF	International Monetary Fund
LDCs	Least Developing Countries
LM	Lagrangian Multiplier
MPK	Marginal Product of Capital
MOFED	Ministry of Finance and Economic Development
NBE	National Bank of Ethiopia
NGDP	Nominal Gross Domestic Product
OLS	Ordinary Least Square
PP	Philips and Perron
RGDP	Real Gross Domestic Product
SAPs	Structural adjust Program
SBIC	Schwarz Bayesian Information Criterion
SSA	Sub Saharan Africa
UN	United Nation
UECM	Unrestricted Error Correction Model
USD	United States Dollar
VAR	Vector Autoregression

VECM Vector Error Correction Model

WB World Bank

Chapter One: Introduction

1.1. Background of the Study

The accumulation of external debt is a common observable fact of the developing countries. Because of having lower saving rate, countries need to borrow more to finance economic growth. The indebtedness phenomenon is a natural consequence of economic activities; due to the fact that some countries or institutions have financial surpluses and others financing needs (Diallo, 2007). The inadequacy of domestic resources has brought the need for external debt. The external debt increases capital accumulation and has a direct relationship with economic growth. Governments often borrow to complement the fiscal gap between proposed expenditure and expected revenue as most developing countries usually have limited financial resources to finance their annual budgets (Carroll, 2013). Consequently, developing countries have accumulated huge external debts over the years since they have low per capita income, inadequate saving, low tax base and incompetent tax collection system.

Ethiopia has been facing a severe challenge of debt accumulation over the last few decades. Although the country has different sources of finance for economic growth strategy, the dependence on external debt has been increasing over time. This implies that the domestic financial resources are becoming insufficient to finance its development schemes and foster economic growth.

The poor performance of the Ethiopian economy has made external assistance a prominent feature of the country's economic structure. Since 1974, at which Ethiopia applied for loan from the International Monetary Fund (IMF), the country has shown

more and more dependence on external assistance and has reached a stage where it cannot function without it (Befekadu and Birhanu, 1999/2000 cited in Hailemariam, 2011). According to the 2010 Debt Sustainability Analysis (DSA) carried out by the IMF and World Bank, Ethiopia‘s external debt stock is increasing largely as a result of the surge in public enterprises external borrowing. In addition, Ethiopia's external debt is not simply unsustainable; even the most generous debt relief would not bring the country within reach of meeting its responsibility within the context of global poverty-reduction goal (Melese, 2005).

By theory “reasonable” levels of debt by developing country are expected to bring economic growth since external debt will enhance capital inflow in the economy. External debt is likely to have a favorable outcome on total investment in a country because most of the foreign borrowing is done on the claim that domestic savings are not sufficient to finance the planned investment expenditures. However, one can also argue that all foreign borrowings are not used for investment purposes. Furthermore, the investment expenditure financed by foreign borrowing is likely to crowd out the investment that could be financed from domestic resources (Malik et al, 2009). This is, at the time when the external debt accumulation exceeds a certain level then economic growth will be negatively affected through its effect on investment.

The question is did such borrowed funds cause growth in Ethiopia? The paper seeks to determine whether external debt can be growth promoting in Ethiopia for the period under consideration.

1.2. Statement of the Problem

The rising fiscal deficits driven by the higher level of external debt servicing is a main threat to growth of a nation. The huge accumulation of debt leads the nation to high debt burden. This situation is even worse for non-oil exporting Sub-Saharan African countries particularly those affected by civil conflicts, larger external debt burden, and cumbersome trade policies (Salisu M, 2005 cited in Hailemariam, 2011).

Ethiopia is one of the severely indebted low-income countries according to the World Bank classification of heavily indebted economies. Ethiopia's external debt has changed significantly in magnitude, structure and composition over the last four and half decades (Melese, 2005). In 1975, it stood at about 343.7 million USD, equivalent to 14% of GDP, and USD 9.1 billion (214% of GDP) in 1991. As at June 30, 1999 this figure had increased to USD 10.2 billion and in 2008/09, following the debt relief granted in accordance with development initiatives designed to benefit the Heavily Indebted Poor Countries (HIPCs) it had declined to USD 4.15 billion and recently in 2011 it reached 8.59 billion USD. There has been a growing concern the degree to which accumulated huge amount of external debt by less developed countries (LDCs) as a curb to their growth and development. It is well known that one of the causes of low growth and economic difficulties of Sub-Saharan African countries is the large debt service payments (Adam, 2004 cited in Hamilton, et al 2011).

Ethiopia has continued to face difficulties in managing and servicing it's enormous stocks of external debt for a long period. An increase in external debt generates problems while every time a country has debt accumulation a high amount of public expenditure and foreign exchange earnings are taken up by the debt burden with

heavy opportunity cost. And this resulted in depletion of resources in the form of capital flight in addition to huge accumulation of debt burden. As a consequence the growing amount of debt and indebtedness signified by accumulation of interest and principal has altered the ability of the country to meet its duty.

In view of increasing indebtedness of less developed countries (LDCs) in general and Ethiopia in particular, the question arises as to whether external debt contributes or causes economic growth in Ethiopia. It is particularly crucial to investigate the relationship between indebtedness and economic growth in the country.

There are some empirical studies have been conducted regarding the relationship between external debt and economic growth, even if, they end up with different conclusive results. Some of these works are: Jonse (2002), Befekadu (1992) and Hailemariam (2011). The results of these studies, however, are somewhat ambiguous with regard to the effect of external debt on economic growth. For instance, Befekadu (1992) study indicated that past debt accumulation relates positively to economic growth whereas, a study by Hailemariam's (2011) showed that past debt accumulation has a negative relationship with economic growth. Different from the two, Jonse's (2002) result showed that external debt variable has no significant effect directly on growth of output. These studies applied different methodological approaches which might be one reason for the difference in their findings. On top of this, none of the above studies tested for the possible causality which has implication for the reliability of the findings.

To the best knowledge of the researcher, most of the studies carried out so far have focused on the impact analysis of external debt on investment and economic growth. Further the empirical causal relationship between external debt and economic growth is yet unclear over the years. This study, therefore, aims to fill this gap by conducting an empirical study to provide an answer to the matter of causation and the direction of causality. Different from the subject of causation, most of the studies that are done taking Ethiopia as case study were based on Engle-Granger and Johanson et al (1991) procedure of analyzing long run relationships. In fact, it is known that these approaches have shortcomings where, one is the requirement of the regressers to be integrated of order one.

In order to test the long run relationship between the dependent and independent variables, this study implement an Autoregressive Distributed Lag Model or bound testing approach which is based on the works of Pesaron et al (2001). Bound testing has an advantage of using it whether the variables are I (1) or I (0) or mixture of the two.

1.3. Objectives of the Study

The general objective of the study is to explore external debt and economic growth in Ethiopia using data for the period 1970/71-2010/11.

The specific objectives are:-

1. To assess the trend, structure and composition of external debt in Ethiopia during the period under consideration.
2. To investigate the short run and long run relationship between external debt and economic growth in the country.

3. To examine whether there exists a causal relationship between external debt and economic growth in Ethiopia (direction of causality).

1.4. Hypothesis of the Study

Economic growth can be promoted through factor accumulation and productivity growth with a reasonable level of debt. However, output can be retarded due to huge debt burden through its effect on the productivity of labor and capital, which will be discussed in the literature part in detail. In view of the fact that, Ethiopia is under the category of Heavily Indebted Poor Countries (HIPC), we expect that external debt burden will impose a number of constraints on the country's growth scenario rather than causing economic growth.

1.5. Scope and Limitation of the Study

This paper will present an analysis of causal relationship between external debt and economic growth for the period 1970/71-2010/11 through a case study of Ethiopia. The study aims to provide a better understanding of the short run and long run relationship between external debt and economic growth in the country.

There were some limitations through conducting the study like the data from different sources were found to be inconsistent. In addition lack of long time series data might limit the result because long time series of data means more information which makes the result more reliable. The short coming of such procedures is that, the quality of estimated results can be reduced. Given the data problem, the quality of the data itself might also have an effect on the result. In order to reduce such problem the study attempted to focus on data from domestic institutions for most of the variables.

1.6. Significance of the Study

In previous studies greater attention has been given more particularly on how external debt influences investment or the amount of saving rather than the output level. But this study will attempt to focus on the analysis of external debt and output level in the country. Basically, this paper could be used as a policy suggestion for the concerned policy makers to examine the long run and short run relationship of external debt and economic growth in Ethiopia. This study can also serve as a spring board as well as reference material for researchers concerned in further investigation of external debt and growth relationship.

1.7. Organization of the Study

The paper has six chapters. After the introduction chapter two provides a review of theoretical and empirical literature related to external debt and it's linkage to growth. In chapter three the data type, sources, model specification and estimation procedures are presented. Chapter four provides a brief review of external debt and growth in Ethiopia. Chapter five provides the results of empirical analysis and the last chapter revealed conclusion and recommendations.

Chapter Two: Literature Review

2.1. Theoretical Literature

2.1.1. The Task of Capital in Economic Growth

In view of the fact that, capital accumulation enhances economic growth, numerous emphasis have been given on it in the literature. Initially the foundation of the economic theory of capital can be pointed back to the Classical School of thought where it was added in the production function. Even if the crucial role of capital was identified, there was an argument on the degree of its importance and the form it must have so as to render maximum utility. In this case, the Chicago School's view on the task of physical capital in support of human capital assisted to shift the center of attention from the previous to the next (i.e. from physical capital to human capital). There are points of view that capital stock generally believed to have critical importance, not only as a component of financial aggregate demand, but also in terms of impact of capital stock on the economy's growth and employment opportunities (Ghali, 1998 cited in Karagol, 2002).

The implication is, since capital contributes to output, the more of it a country has, the larger its output (income) will be, leading to larger volume of saving resulting in higher rates of investment which increases the capital stock and thus, projects the country into the virtuous circle of riches (Befekadu, 1992).

But in literature, there are two different groups of economists to debate regarding the aggregation of capital. One side of the group criticize the neo-classical production function where as the other group is a composition of those who defend the model. It can be summarized by saying that the K (capital) of the production function that

modern economists so confidently and fully rely on for their theoretical and empirical work can only be used in conditions where there is only, a single, homogenous capital good (Birner, 2001). Therefore, the others argue for the reason that, the economy is composed of variety of buildings, machines, software, skills and methods of organizing production. Therefore, the measurement became a controversial issue.

Economic theory assumes that economic growth can be promoted through factor accumulation and productivity growth with a reasonable level of debt. This is due to, countries at initial stage of development incline to have insufficient domestic financial resources and limited investment opportunities which make them to require external assistance. The inadequacy of domestic saving can be a constraint for a country to attain the targeted growth rate. Then, it becomes useful to invest in foreign borrowing in order to fill the saving investment gap so as to attain the targeted rate of growth.

Foreign capital inflow increases the total supply of resources existing to a country and thus, increases the feasible size of domestic spending. Moreover, external debt is useful when the government makes use of it for Projects, which are investment-oriented. However, it would have an adverse effect when it is spent on things which do not have any return like for the purpose of private and public consumption.

2.1.2. The Theory of External Debt and Economic Growth

The relationship between external debt and economic growth remains controversial in theory. Theoretical models analyze the effect of external debt on investment and output. There are different possible results of relationship between external debt and economic growth in these models. These are positive, negative or non-linear relationship between the two variables.

2.1.2.1. Positive Debt-Growth Relationship Models

On the basis of different school of thoughts, various economic models have been constructed over the years in an effort to clarify the factors affecting economic growth both in the short run and long run. According to the neo-classical theories, there are three ways where growth takes place, i.e., holding land fixed; increase in the capital stock, labor supply and productivity. Capital increase can take two forms; physical capital and human capital. Physical capital promotes output since it improves the productivity of labor. Human capital increases economic growth since productivity will increase when there are skillful individuals. Larger amount of output will also be produced when more people are employed in a country's production.

The neo-classical growth model is frequently attributed to the work of Robert Solow (1956) and the Trevor Swan (1956) development of relatively simple growth model. This growth model is so called Solow-Swan growth model. The Solow growth model is designed to show how growth in the capital stock, growth in the labor force, and advances in technology interact in an economy as well as how they affect a nation's total output of goods and services (Mankiew, 2009). Solow (1956) model assumes that production function exhibits constant returns in labor and capital and labor augmenting technical progress. The model also assumes flexible prices so as to build a model that conciliates full employment of resource with growth.

In this model, a reasonable amount of debt inflows are positively linked with growth. Therefore, there is a need to borrow and invest for countries with inadequate capital as marginal product of capital exceeds the world interest rate.

Also, as it is implied by Harrod-Domar model the main causes of growth are: growth in saving, investment technical progress and population. In this model only physical capital and labor are included in the production. Other than the general equilibrium on the goods and labor markets, Harrod-Domar following Keynes give more attention on the equilibrium of goods market. The model implies that economic growth is a direct outcome of capital accumulation obtained through savings and scarcity of capital is the only restriction to production since abundant supply of labor is assumed. In this model capital accumulation is viewed as the engine of development. In order to attain the planned growth rate, developing countries may choose foreign borrowing if the domestic savings are inadequate to attain the desired level of investment.

But, according to endogenous growth model, the production function was extended to include human capital. This model was to solve the limitations associated with the neo classical growth models to make clear the sources of economic growth. The augmented Solow model by Romer et al (1992) simply extends the basic production function framework to allow an extra input to enter the production function; Human capital. Lucas (1988) implied that a wide range of endogenous growth models has treated human capital as a critical factor in determining growth rate of output. It is indicated that the rate of return to capital (physical and human) determine growth. Unlike the neoclassical models, in this model technology is not exogenous rather it is determined by economic activities like innovation.

As stated by Romer (1994) economic growth is not the result of forces that impinge from outside rather it is the results of economic activities that create new technological knowledge. It is implied that output can be increased by increasing

inputs of resources and productivity of these inputs. The main distinguishing behavior between the neo-classical exogenous and endogenous growth theories is that the earlier assumes constant returns to scale with diminishing marginal productivity of capital per capita (MPK) (Solow, 1956), while the latter assumes constant or increasing returns to scale with non-diminishing marginal productivity of capital (MPK).

On top of supply-driven factors, the growth of output in a nation is influenced by foreign capital through it's effect on the productivity of investment. When domestic financial resources are insufficient in the country then external borrowing is anticipated to enhance economic growth through filling the gap. By theory "reasonable" levels of debt by developing country are expected to bring economic growth since external debt will enhance capital inflow in the economy. As far as, the loans are used for growth linked expenses and macroeconomic instability and shocks are not there then, the rate of economic growth will be accelerated. It will not only provide foreign capital for industrial development but will also give managerial know how, technology, technical expertise as well as access to foreign markets for the mobilization of nations human and material resources for economic growth (Ali and Mustafa, 2011).

According to the Keynesians theory, indebtedness does not create charges either on current or future generations due to the investment that it brings. That is, indebtedness stimulates demand and leads to a more proportionate rise in investment via the accelerator principle or effect.

Foreign debt is likely to have a favorable effect on total investment in a country because most of the foreign borrowing is done on the claim that domestic savings are not sufficient to finance the planned investment expenditures.

2.1.2.2. Negative Debt-Growth Relationship Models

The relationship between external debt and economic growth can also be negative according to some other models. This is, at the time when the external debt accumulation exceeds a certain level then economic growth will be negatively affected through its effect on investment. Most of the developing countries debt situation can be explained using the two well known hypothesis of the negative relationship between external debt and economic growth, i.e., Debt overhang theory and liquidity constraint theory.

According to Krugman (1988) debt overhang is a situation in which expected repayment on external debt falls short of contractual value of debt. In other words, Krugman hypothesis state that debt overhang is partly due to the burden of foreign debt and that investment will be slow resulting in poor growth performance (Cholifihani, 2008).The debtor country will not totally gain from the rise in production since, portion of it will be used to service the external debt accumulated.

Debt overhang theory is based on the premises that if debt will exceed the country's repayment ability with some probability in the future, expected debt service is likely to be an increasing function of the country's output level. Thus, some of the returns from investing in the domestic economy are effectively 'taxed' away by existing foreign creditors and investment by domestic and new foreign investors is discouraged (Claessens et al 1996: 17). In line with this the debtor country benefits

only to some degree in any increase in output and exports as part of that increase will be used to service the external debt.

Debt overhang is the main cause for slowing economic growth in indebted countries. Since, it creates adverse incentive effects on the economic growth in the long run. The scope of debt overhang is much wider in that effect of debt do not only affect investment in physical capital but any activity that involves incurring costs up front for the sake of increased output in the future (Karagol, 2002). The activities include investment in human capital and in technology acquisition whose effects on growth may even be stronger overtime.

Cohen, (1993) implied the negative effect of debt on growth works not only through the impact of stock of debt but also via the flows of service payment on investment. Servicing of external debt affects foreign exchange which can be used for imports in the country and most of the funds will be transferred to debt repayment than on investment. Inability to service debt on time not only makes it harder for the developing countries to get aid at concessional rates with less conditionalities from the donor agencies but it also increases the country risk (Shabbir, 2013).

But, according to Were (2001) heavy external debt does not necessarily imply a slow economic growth. It is a country's inability to meet its debt obligations compounded by the lack of information on the nature, structure and magnitude of the heavy external debt. If countries have balanced level of export with external debt level it can support them to sustain the external debt. But unsustainable external debt is a great threat to the economic prosperity because of the high debt service charges which is

the factor of the higher current account deficit which ultimately may result to debt overhang (Atique and Malik, 2012). Large debt servicing depletes limited resources and hampers financial resources in the country. It will reduce the enrollment levels; slow down growth in health thus reducing human capital and slow human capital growth have an indirect negative effect on growth as it reduces the productivity of new investment (Niwaz et al, 2012). The high external debt may also bring import compression, including the imports of technological goods that are crucial for some of the export sectors to remain competitive. This is because; external debt servicing erodes the inadequate foreign exchange which is available for imports.

Other channels through which the need to service large amount of external obligations can affect economic performance include the crowding out effect, due to high real interest rates, terms of trade of over borrowed country's worsens and shut-off from foreign credit markets, it is expected that investments would have declined because of the decreasing available resources for financing investments and macroeconomic conditions (Karagol, 2002). Furthermore, the investment expenditure financed by foreign borrowing is likely to crowd out the investment that could be financed from domestic resources (Malik et al, 2009).As this is implied by the liquidity constraint hypothesis when government increased foreign borrowing then it reduces investment spending. But, if there is a debt reduction it should bring an increase in investment and repayment ability. The need to service a large amount of external obligations can affect economic performance include lack of access to international financial markets and the effects of the stock of debt on the general level of uncertainty in the economy (Claessens et al, 1996). If countries fail to channel external funds to enhance productivity and create new employment opportunities then they are eventually stuck

with lower tax revenues and higher debt servicing, leading to higher deficits (Shabbir, 2013).

Debt servicing could influence investment decision relying on how the rescheduling strategy is efficient, i.e., if the borrower country is not expected to pay back its debt due to a recognized rescheduling rule then crowding out of investment should not be there.

The disincentive effect of large debt burden might be alleviated in heavily indebted poor countries (HIPCS) since; they are receiving net positive transfers. Some imply that the effect of external debt is direct. This can be explained by the 'direct effect of debt hypothesis stated as theoretically for countries with large debt repayment, debt outstanding and servicing will directly and negatively affect growth even though it does not affect investment.

But if larger amount of foreign resources are spent for debt repayment, then smaller amount will be left for investment and growth. Likewise, Agenor and Montiel (1996) implied when debt increases there might be expectations that governments debt service duties will be financed by distortionary measures (like inflation tax). The investment under uncertainty literature stresses that in highly uncertain and unstable environment, even if the fundamentals are improving, investors continue to exercise their option of waiting when considering whether to invest in costly, irreversible projects (Serven, 1997). The high debt burden also increases capital flight in the country. The return on capital is lowered by distortionary tax burden on capital

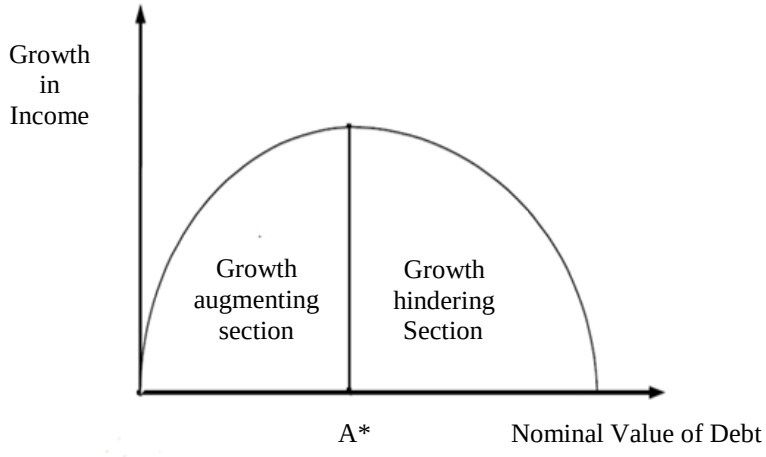
required to serve the debt (Calvo, 2002). This low return on investment will have an adverse effect on economic growth.

2.1.2.3 Non-Linear Debt-Growth Relationship Model

During the 1970s, where debtor countries were at the initial stage of borrowing a lot of countries faced higher growth rate in foreign borrowing. After some time, during the 1980s these countries incurred a serious challenge to service their debts. Then, the view of negative relationship between external debt and economic growth started which is explained above.

Recently, there starts another view which argues as the relationship between external debt and economic growth appears to be non-linear in nature. The non-linear link between debt and growth can be showed using Debt Laffer Curve. As implied in Cohen (1993), the relationship between the face value of debt and investment can be showed using "Debt Laffer Curve" as outstanding debt increases beyond a threshold level, the expected repayment begins to fall as a result of the adverse effect. The upward-sloping part of the graph indicates that higher debt is linked with higher debt repayment but the downward sloping part of the curve indicates increase in debt will reduce expected debt repayment. Similarly, it is indicated by Calvo (1998) model the relationship between external debt and growth can be grouped into three parts

Figure 3.1 Debt Laffer Curve



Economic growth is positively related to the level of debt in the first part of the graph i.e. growth augmenting section. The second part is in between where an economy can reveal either high or low growth path in the country. The last part is where economic growth is negatively related with debt accumulation i.e. growth hindering section. In the curve the peak showed by A^* indicates the optimum level of external debt where the rate of economic growth will be maximized. The favorable effect of external debt depends on the fraction of external debt that is used to enhance investment versus sustaining domestic consumption in the country.

2.2. Empirical Literature Review

A number of empirical studies have been conducted by many economists and researchers to examine the relationship between external debt and economic growth using different techniques and methodologies in different countries of the world. Since it is a bit hard to review all the literature, this part attempts to review studies that are particularly linked with the issue of the study. The studies done are broadly

categorized as those that are based on cross-country analysis and those that are based on country specific time series studies. Both are presented below.

2.2.1. Cross-Sectional Studies

There are a large number of studies that are conducted using cross country framework in order to assess the relationship between external debt and economic growth for a set of developing or developed countries. A study by Afxientiou (1993) tried to investigate the adverse effect of foreign indebtedness on the growth of GNP for twenty middle-income developing countries during the period 1971-1988. In order to examine the relationship between external debt and economic growth granger causality test was applied. The findings indicate that there exists a strong debt overhang effect in the countries under consideration for the given time period. Moreover, mismanagement and misallocallocation of resources caused negative effect on GNP.

The relationship between external debt burden and economic growth for 16 highly indebted nations during the period 1971-1987 was examined by Cunnigham (1993). He supposed that the production function only consist of physical capital, labor and debt service. For the period 1971-1979 the result shows a strong negative relationship between growth and debt burden but for the period 1980-1987 no significant result was found to sustain similar inference. He concluded that external debt burden had strong negative effect on the productivity of capital and labor. That is, when a nation has huge debt burden then debt service will influence how capital and labor will be employed in the production.

A study by Cohen (1993) used a larger data set of 81 developing countries over a period of 1965-1987. He did not get any evidence in support of a negative relationship between external debt and economic growth.

Chowdhury (1994) tested the causal relationship between external debt and economic growth in Bangladesh, Indonesia, Malaysia, Philippines, South Korea, Sirilanka and Thailand for the period 1970-1988. The study employed panel data for the analysis. He used the granger causality tests to resolve the existing argument about the cause and effect relationship between external debt and economic slowdown. Both hypotheses: external debt of developing countries is a symptom rather than a cause of economic slowdown and external debt leads to economic slowdown are rejected. He got that external debt has a positive effect on GNP growth rate. Regarding the causality between external debt and economic growth, the finding shows a bi-directional relationship for Malaysia and Philippines.

Amoateng and Amoaku (1996) examined the relationship between external debt servicing, economic growth and exports for a sample of African countries for the period from1971- 1990 using granger causality test. The result indicated that there is a negative and unidirectional relationship between external debt service and GDP growth for the middle income African countries for the period from1983-1990. But for the low income African countries they got a positive and unidirectional causality between external debt service and GDP growth by excluding export revenue growth for the period from 1971-1982. But starting from 1982 onwards, the finding shows a bidirectional and positive causality between external debt service and GDP growth for

low income countries. In short, they conclude that external debt negatively affects economic growth of Africa in general and particularly sub-Saharan African countries.

Fosu (1996) investigated the effect the effect of external debt on economic growth in Sub-Saharan African countries using an ordinary least square regression technique. It is showed that debt directly and negatively affects growth by decreasing the productivity. This proves that the effect of debt is direct as stated by 'direct effect debt hypothesis' which is stated earlier. He also made further research in 1999 and he again confirmed his previous result which concludes that external debt directly and negatively affects Sub-Saharan African countries. In his conclusion, it is indicated that the effect of debt on investment is weak and negative.

A study carried out by Elbadawi et al, (1997) investigated the relationship between debt burden and GDP. The study used cross sectional regression for 99 developing countries across sub-Saharan African countries, Latin America, Asia and Middle East. In sub-Saharan African countries there are three direct channels which indebtedness performs against growth. These are current debt inflows as a ratio of GDP, past debt accumulation and debt service ratio. It is implied that debt burden indicators also affect growth and development indirectly through their effect on public sector expenses.

A study conducted by Shabbir (2013) tested the long run relationship between external debt and economic growth in developing economies using a sample of 70 developing countries over a period of 1976-2011. Empirical examination is made through using linear panel data model of fixed effects and random effects. This paper

investigated debt overhang theory and the liquidity constraint hypothesis. The outcomes are consistent with the debt overhang hypothesis which states that economic growth will slow down with the current stock of external debt which implies an increase in external debt negatively affects economic growth. And also, adversely affect the amount of private fixed capital formation in the economy. The findings of this paper implies that developing countries need to mobilize enough resources so that they can, not only meet their debt service duties on time and have an access to tap the external resources, but also have resources to accelerate their private investment.

2.2.2. Time Series Studies

Karagol (2002) checked the causal relationship between external debt and economic growth for Turkey during the Period 1956-1996. He used multivariate cointegration technique to develop a vector error correction model to investigate the long-run effects of external debt service on GNP level through extending the model of Cunningham (1992). In the cointegration relationship GNP was taken as a function of investment, labor force, human capital and external debt service. And both in the short run and in the long run debt service was found to be negatively related with GNP. The granger causality test revealed a unidirectional negative relationship between external debt service and economic growth. According to him, the existence of causality in debt service and GNP relationship may be as a result of the fact that borrowed resources are misallocated or wasted on consumption. The negative effects on productivity will disturb the economy as it struggle over debt servicing in the future.

Patenio and Tan-Curz (2007) investigated the relationship between external debt servicing and economic growth in Philippines using quarterly data for the period 1981-2005. More specifically, it examines whether external debt servicing together

with other variables such as capital stock, labor force, and human capital have any significant effects on the rate of economic growth in the Philippines. In the study the result implied that economic growth was not very much influenced by external debt servicing. In addition, the relationship between debt servicing and economic growth was also examined with the use of the vector autoregressive (VAR) representation. At last, it was indicated that economic growth is not very much influenced by external debt servicing in Philippines, implying that, debt servicing is not that much high for debt overhang to occur. As a result in Philippines, debt servicing is not yet a risk to economic growth.

A study done by Cholifihani (2008) analyzed long run and short run relationships between public debt service and GDP in Indonesia by using cointegration analysis of time series model from 1980-2005. In the study GDP was given as a function of debt service, capital stock, labor and human capital. The result indicated that in the long run period, the ratio between external debt service showed a significant negative relationship with GDP. Therefore, Indonesia faces a debt overhang problem in the long run as increasing the public external debt service slows economic growth. Moreover, in the short run Indonesia may not face debt overhang situation since external debt service has a positive insignificant effect on income.

Akram (2011) tried to see the consequence of public debt for economic growth and investment in Pakistan for the period 1972-2009. The role of public debt is explicitly incorporated in the growth equation and an autoregressive distributed lag model (ARDLM) technique has been applied to estimate the model. The result indicates that public external debt has negative relationship with per capita GDP and investment

confirming the existence of 'debt overhang effect. The hypothesis of existence of crowding out could not be confirmed due to insignificant relationships of debt servicing with investment and per capita GDP.

Also, Nawaz et al (2012) attempted to examine the long run and short run dynamics of external debt and economic growth in Pakistan using time series data for the period 1980-2010. The analysis was done using Johanson cointegration and granger causality Test. The evidence showed the existence of long run relationship between the two variables. Furthermore, in the short run there exists bi-directional causality between them. It is implied that, since Pakistan's external debt is sustainable, external finance could be used to tackle the scarcity of capital.

A study carried out by Ogunmuyiwa (2011) investigated whether external debt actually promotes economic growth in developing countries using Nigeria as a focus of study from 1970-2007. For the purpose of analysis Augmented Dickey Fuller (ADF) test, Granger causality test, Johansen cointegration test and Vector Error Correction Method (VECM) techniques were employed. The conclusion indicates that causality does not exist between external debt and economic growth as causation between debt and growth was also established to be weak and insignificant in Nigeria. Therefore, the external debt could not be applied to forecast advance or slowdown in economic growth in the country.

Choong et al (2010) carried out the effect of different types of debts on the economic growth in Malaysia during the sample period 1970 – 2006. The result of the cointegration test shows that, all components of debts have a negative effect on long-

run economic growth. Furthermore, the granger causality test shows the existence of a short-run causal relationship between all debt measures and economic growth in the short run. It is concluded that an increase in foreign debt level negatively affects economic growth, while the reduction in the rate of economic growth reduces the ability of the country to pay back its debt.

Kasidi and Said (2013) study examined the effect of external debt on economic growth of Tanzania for the period 1990-2010. For the analysis time series data on external debt and economic performance was applied. The result showed a significant effect of external debt and debt service on GDP growth, i.e., debt service payment has a negative effect and external debt has a positive effect where the borrowed funds are used largely to support development sectors The Tanzania's external debt portfolio is majorly accumulated multilateral and bilateral loans which are about 95% of total external debt. This situation affected the greater level of concessional in a debt stock of Tanzania thus allows for long grace and maturity periods and low interest, compared with commercial loans which are short maturity and high interest rate. It is implied that, if the country's external debt rise it might bring a rise in economic growth but at the time of repayment it might adversely affect the economic growth of the county. But, the cointegration test shows that there is no long run relationship between the external debt and GDP.

At the home front, Befekadu (1992) showed that there was positive correlation between external resource inflow and economic growth relationship in Ethiopia between 1975 and 1988 using a simple macroeconomic model. The result was explained by different policy regimes practiced by two governments where the

positive contribution to growth was during the Imperial era and the negative contribution was during the Derg regime. Also, in that ere resources were taken away from agriculture to other sectors by the policy practiced.

He also implied that not only is the country's debt unsustainable, but also, even though large amounts of debt relief were allowed, they will not be enough for the country to discharge its responsibility towards global poverty reduction goals. He concluded that total debt forgiveness, come up with additional resource inflows will be needed if an attempt is to be made to achieve internationally agreed poverty reduction targets.

A study by Jonse (2002) investigated the impact of external debt on economic growth in Ethiopia using macroeconomic model estimated for 1970-2000. For the purpose of the analysis simultaneous equation approach was employed. The result discovered that external debt affects investment positively and is stastically significantly indicating external debt in Ethiopian case encourage investment rather depress it. This implies that there is no sign of crowding out effect. As a result, wise and proper utilization of foreign resource given its short-run and long-run macroeconomic implications and management is recommended.

Melese (2005) found that all debt burden indicators have a negative relationship with economic growth in Ethiopia during the period 1970-2002 using a structural macroeconomic model. The regression result partly does not confirm the hypothesis that the coefficient of past debt accumulation relates positively to economic growth in Ethiopia. Further, the debt service variable has a negative effect on growth through

the crowding out effect of public investment and appears statistically insignificant. At last, he recommended that the government should further promote the rational and proper utilization of resources, while increasing the concessionality of newly acquired debt inflows and actions should be taken to promote non borrowed funds.

Hailemariam (2011) examined the impact of external debt on economic growth and private investment of Ethiopia using a cointegrated VAR model over the period 1960/61-2008/09. The findings of the cointegration test, implementing using Johansen Maximum likelihood approach, indicate the occurrence of long run relationship among the variables included in both growth and private investment models. The study confirmed the existence of debt overhang but, in the long run both external debt stock and debt servicing ratio have a negative and significant impact on economic growth and private sector capital accumulation activity. He concluded that the estimated short run growth equation showed that the current flow of external debt has a positive contribution while the past external debt accumulation has long run growth equation reveled the negative and significant relationship between external debt and economic growth.

All in all, most of the studies came up with an influence that higher level of external debt is linked with relatively lower level of economic growth except few studies that obtained no conclusive result that support these hypotheses. But regarding the causality between external debt and economic growth there is no conclusive evidence that can be obtained from the literature since, different researchers obtained diverse results.

Along with this review of literature, some facts that must be taken into consideration can be recognized, like examining the relationship between external debt and economic growth is important. In Ethiopia, mainly the studies reviewed above studied the effect of external debt on economic growth and investment. It is very clear from the literature that, huge external debt negatively impact on economic growth but the direction of causation is yet to be explored (causality issue). The question that remains unanswered is: does external debt cause economic growth? On the other hand, most of the studies were conducted based on Engle-Granger and Johanson et al (1991) procedure of analyzing long run relationships. In fact, it is known that these approaches have limitations where, one is the requirement of the regressers to be integrated of order one.

This study, though, implement Autoregressive distributed lag model (ARDLM) or bound testing approach to test the long run relationship and between external debt and economic growth. And bound testing solves the limitation associated with the other approaches mentioned above. This approach is applicable whether the regressors are found to be integrated of order one or zero or mixture of the two.

To the best knowledge of mine there is no study conducted in Ethiopia which tried to examine the relationship between external debt and economic growth using the methodological approach called Autoregressive distributed lag model (ARDLM) or bound testing. Therefore, this paper aims to fill this gap by conducting an empirical study.

Chapter Three: Model Specification, Estimation Procedure and Data

3.1. Model Specification

3.1.1. Theoretical Model

The theoretical foundation of the study is based on the augmented Solow Model and endogenous growth model with a modification that extends the basic production function framework to permit human capital as an additional input to enter the production function. As implied by Solow's formulation, economic growth is a function of capital accumulation, an expansion of labor force and exogenous factor, technological progress which makes physical capital and labor more productive.

However, according to endogenous growth model human capital influences economic growth and the model can be given in one aggregate production function i.e.

$$y_t = A_t K_t^{\alpha} H_t^{\beta} (L_t)^{1-\alpha-\beta}$$

The reduced equation for the above expression can be given as

$$Logy_t = \alpha \log K_t + B \log H_t + (1-\alpha-\beta)\log(A_t, L_t)$$

where, $Logy_t$ = log of real output at time t proxied by RGDP

$\log K_t$ = log of capital stock at time t proxied by real domestic investment as percentage of GDP

$\log H_t$ = log of human capital at time t proxied by total education expenditure

$LogL_t$ = log of labour force at time t

A_t is Total Factor Productivity (TFP)

From the above expression, the model can be rewritten as

$GDP = f(K, H, L, A)$

$\ln GDP = \ln \alpha_0 + \alpha_1 \ln K_t + \alpha_2 \ln H_t + \alpha_3 \ln L_t$; assuming α=α1; $\beta = \alpha_2$; $(1-\alpha-\beta) = \alpha_3$

and the economic expectations are ; $\alpha_0, \alpha_1, \alpha_2$ *and* α_3 are greater than zero.

Generally, it is believed that capital stock is crucial not only as part of aggregate demand but also through its effect on country's economic growth and investment opportunities. Due to insufficient resources countries need to get external funds in order to fill the gap in the economy. The external funds are expected to bring economic growth as far as the borrowed funds are used for productive investments.

The growth model employed here is; a modified endogenous growth model where debt variables are primary determining factors of the real growth. Usman (2013) used the dual-gap theory to give explanation for the theoretical basis related with external borrowing. The dual–gap theory implied that development of a nation is a function of investment and that such investment which requires domestic saving, is not sufficient to ensure development take place. There must be the possibility of obtaining from abroad and the amount that can be invested in any country with the amount that is saved. Furthermore, the domestic resources are to be supplemented from abroad, such as excess of import over export. Therefore, external borrowing finances the saving investment gap by raising the saving level. Likewise, it finances the foreign exchange gap by increasing imports so as to attain the aspired rate of growth in the country.

In the model of Cunningham (1993) debt servicing was originally included as a primary factor of production in order to examine the effect of external debt on

economic growth in sixteen heavily indebted nations. Cunningham (1993) noted that debt burden can be considered as a debate in the productivity of labour and capital in a manner similar to the inclusion of exports in the production function. The model assumed that the production function only consists of labour and physical capital. The model clearly excludes human capital. That is,

$$Y = (LF, K, DS)$$

where, Y =Gross National Product

LF = Labour Force

K = Physical Capital

DS =Debt Service

Romer (1996) implied that physical capital is important for production function but human capital is vital. The Cunningham model was extended to include Romer's conceptualization of human capital (Karagol, 2002). For the purpose of investigation of causal relationship between external debt burden and economic growth, the inclusion of knowledge of particular workers was found to be important.

According to (Karagol, 2002) if a country has significant debt burden, the need to service its debt will affect the employment of labour and capital in the production function more specifically, if the gains of productivity increase are to foreign creditors than domestic agents then, there is little motivation to increase the productivity of capital or labour. So, through it's effect on the productivity of capital and labour economic growth will be affected. The extended model is given by:

$$Y = (K, LF, H, DS) \qquad (1)$$

where, Y = Gross National Product

K = Physical Capital

LF = Labour Force

H =Human Capital

DS =Debt Service

The production function in natural logs, L can be expressed as

$$LY_t = B_o + B_1 LK_t + B_2 LLF_t + B_3 LH_t + B_4 LDS_t + \varepsilon_t \quad (2)$$

where, ε_t is white noise error term.

Following the work of (Karagol, 2002) debt burden indicators are augmented with the factors in the production function in order to examine the causal relationship between external debt and economic growth.

3.1.2. Empirical Model

In this study, the empirical model is specified based on the theoretical framework explained in the above part taking into consideration other variables that are believed to be important in explaining the model better in the context of the country under study. Moreover, the empirical model is preferred based on its relevance and availability of data. As previously mentioned, the main objective of the study is to examine whether external debt causes economic growth (causality issue) rather than to model the determinants of economic growth. Given the sample size, with the intention of making sure that less degrees of freedom is lost and strengthen the regression result; some variables which are not significant to the study objectives were not included.

The model under this study is constructed up on the following augmented function.

$$RGDP = f(INVG, LLFP, HK, EDGDP, DSEXP, OPEN) \quad (3)$$

where, $RGDP$= Real Gross Domestic Product

$INVG$ =Real Gross Domestic Investment as share of GDP

$LLFP$ = Labour Force as share of Total Population

HK =Human Capital (proxied by real education expenditure)

$EDGDP$=Total External Debt as a percentage GDP

$DSEXP$=Total Debt Service as a percentage of export of goods and services

$OPEN$ = Trade Openness

The production function stated in natural logs

$$LRGDP_t = B_0 + B_1 LINVG_t + B_2 LLFP_t + B_3 LHK_t + B_4 LEDGDP_t + B_5 LDSEXP_t + B_6 LOPEN_t + \varepsilon_t \quad (4)$$

where, ε_t is white noise error term

3.1.3. Description of Variables

The variables entered in the model are discussed in line with simple explanation what they indicate and how they are related with the variables under consideration.

Real gross domestic product is used as a proxy to measure economic growth in the country. It is the nation's total output of goods and services produced in the country at a constant price/birr. In this study, variable of income is represented by real GDP at constant prices since GDP better reflects the independent productive capacity of the country (Cordella, 2005 cited in Cholifihani, 2008).

The other variable included here is real gross domestic investment as share of GDP which is a proxy for physical capital. It is included in order to indicate the domestic investment (Gross capital formation) in the country. Even if, there is a controversy on the aggregation of capital, the study used domestic investment as a proxy for physical capital as it was done in most studies in literature. In view of the fact that, it is an input in the production function as indicated by many growth models and has favorable effect on economic growth; it is expected to have a positive sign.

The variable labour force includes both employed and unemployed labour force. It is an important factor in the production function specifically; employed labour force is positively related with economic growth. But in this study labour force is a combination of both employed and unemployed labour force. There is also some argument that the contribution of the labour force can be negative for developing countries in that additional unskilled and inefficient labour decreases output rather than increasing it (Todaro, 1994). This might be true for Ethiopia since, it is one of the developing countries, where the labour force is unskilled and have limitation to make it more productive. As a result, it is difficult to predetermine the expected sign. The study used labour force as share of total population so as to see it's effect on output as share of total population.

The other vital variable as indicated by Romer (1986) is human capital. It consists of skills and knowledge of particular workers. Human capital accumulation (the acquisition of knowledge and skills that improves the ability of individuals to solve problems and to think critically) is believed to promote higher growth by improving labour force which will be more productive on the job by requiring less supervision

and possessing greater initiative in handling job related problems (karagol, 2002). It is proxied by real expenditure on education and training.

Total External debt stock is the amount owed to nonresidents that include: the outstanding amount of actual liabilities that need payments of interest plus principal by the debtor country in the future. But in this study, we used total external debt as a percentage of GDP. It shows the effect of external debt on the economy and it measures the indebtedness of the country in the given period of time. External debt does not necessarily imply slow economic growth. It is a country's inability to meet its external debt obligations that pose a risk to economic prosperity and often leads to debt overhang (Shabbir, 2013).

Total debt service is the sum of principal and interest actually paid in foreign currency on debts to the creditor. More specifically, if foreign creditors rather than domestic agents benefit from the rise in productivity, the latter are discouraged from increasing capital or labour (Karagol, 2002). We used this total external debt service as a percentage of export of goods and services since; it reflects the debt burden of the country and tries to capture the crowding out effect.

The other variable included in the growth model is trade openness. In literature it is implied that openness contributes to economic growth since, it creates the chance to grow financially. So, increased international trade promotes growth when there is financial openness. It is proxied by the sum of export plus import to nominal GDP.

3.2. Estimation Procedure

For the purpose of analyzing the long run relationships and dynamic interactions among the variable of interest, autoregressive distributed lag model (ARDLM) or bound testing approach which was developed by Pesaran et al (2001) is used. For a long period of time, the classical Engle-Granger approach and Johansen cointegration approach are widely applied in empirical literature in order to test the presence of long run relationship among the variables under consideration. But, these approaches are associated with some limitations. To begin with, the Engle-Granger and Johanson cointegration approaches, for instance requires the underlying variables to be integrated of order one i.e. I (1). This implies that, the pretesting for integration order is prior important step needed to determine long run cointegration relationships. In addition, Johansen's approaches based on maximum likelihood technique results an estimator which is asymptotically efficient. It shows that the parameter estimates will be exposed to small sample bias, when the Johnson approaches are conducted to small sample size. Therefore, there is a need to look for an alternative cointegration approach that is applicable for further investigation in small sample size. In this study, so as to test the occurrence of long run relationships among the dependent variable real GDP which is used to measure economic growth and the independent variables, we applied on Autoregressive Distributed Lag Model or bound testing approach which was developed by (Pesaran et al, 2001). In contrast to the previously stated approaches, bound testing has several advantages to use it.

Firstly, autoregressive distributed lag model is a single equation method which can be applied on relatively small sample size whereas; the Engle–Granger approach and Johansen cointegration approach are fairly data intensive. This approach results in

unbiased estimates in the long run (Pesaran, 1995) and also the estimates obtained are relatively more efficient for finite and small sample size which is similar to this study. This avoids the problems that come as a result of serial correlation and endogenity (Pesaran et al, 2001).

Secondly, it is applicable irrespective of whether the regressors are purely I(0) or purely I(1) or mutually integrated. Consequently, it avoids the volatility linked with the pre-testing for the order of integration of the individual variables.

Thirdly, once the lag order of the model is obtained, it permits the cointegration relationship to be estimated by OLS and also bound testing is helpful to make a distinction among dependent and independent variables which allows investigating the existence of long run relationship between them. Moreover, the short-run and long-run coefficients of the model are estimated simultaneously (Pesaran and Shin, 1997).

The ARDLM approach starts with construction and estimation of the following unrestricted error correction model (UECM) using OLS to ensure for the occurrence of long run relationship between the variables under consideration.

$$\Delta Y_t = \alpha_0 + \sum_{i=1}^{k} B' \Delta Y_{t-i} + \sum_{i=0}^{k} \gamma' \Delta X_{t-i} + \theta_1' Y_{t-1} + \theta'_2 X_{t-1} + \varepsilon_t \quad (5)$$

Where, Δ is first difference operator, Y_t is the vector of dependent variables, X_t is the vector of independent variables, K is the number of lags and ε_t is the error term which is assumed to be white noise.

The model used in this study can be given as (in natural logs)

$$\Delta LY_t = \alpha_0 + \sum_{i=1}^{k} \alpha_{1i} \Delta LY_{t-i} + \sum_{i=0}^{k} \alpha_{2i} \Delta LINVG_{t-i} + \sum_{i=0}^{k} \alpha_{3i} \Delta LLFP_{t-i} + \sum_{i=0}^{k} \alpha_{4i} \Delta LHK_{t-i} + \sum_{i=0}^{k} \alpha_{5i} \Delta LEDGDP_{t-i} + \sum_{i=0}^{k} \alpha_{6i} \Delta LDSEXP_{t-i} + \sum_{i=o}^{k} \alpha_{7i} \Delta LOPEN_{t-i} + \delta_1 Y_{t-1} + \delta_2 LINVG_{t-1} + \delta_3 LLFP_{t-1} + \delta_4 LHK_{t-1} + \delta_5 LEDGDP_{t-1} + \delta_6 LDSEXP_{t-1} + \delta_7 LOPEN_{t-1} + \varepsilon_{1t} \quad (6)$$

where, Δ is first difference operator, $\delta_i, i = 1.....7$ are long run coefficients and $\alpha_i, i = 1.....7$ are the short run dynamic coefficients of the ARDLM. And all the variables are as previously defined. The above model will be estimated using OLS for the purpose of testing long run relationship.

In order to check the significance of lagged labels of the variables an F-stastics is used for the determination of existence of long run relationship, the null hypothesis that there is no cointegration among the variables is tested against there is cointegration among the variables. That is, for equation 6

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

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

There is nonstandard asymptotic distribution of F-stastic under the null hypothesis. According to the Pesaran et al (2001) there are two sets of critical values where, one set assumes that all the underling variables are integrated of order one, i.e., I(1) and the other set assumes that all the underlying variables are integrated of order zero, i.e., I(0) or mixture of integrated of order one or zero, i.e., I(1) or I(0). If the computed F-stastics is larger than the upper bound critical value, then the null hypothesis of no long run relationship is rejected in favor of the alternative hypothesis that there exists

a long run relationship. But, if the computed F-stastics is less than the lower bound critical values the null hypothesis is accepted showing that there is no long run relationship. At last, if the computed F-stastics lies between the lower and the upper bound critical values, inference is inconclusive and we have to determine the order of integration of the regressors prior to making conclusive inference (pesaran et al, 2001).

But, this study applied the critical values developed by Narayan (2004) which is performed based on small sample size among 30 and 80 observations where as pesaran et al (2001) critical values are based on large sample size, i.e., (500and above). Next to the identification of existence of cointegration then, the cointegrating vector is derived using the following ARDLM

$$y_t = \alpha_0 + \sum_{i=1}^{p} \alpha_{1i} y_{t-i} + \sum_{i=0}^{q} \alpha_{2i} LINVG_{t-i} + \sum_{i=0}^{q} \alpha_{3i} LLFP_{t-i} + \sum_{i=0}^{q} \alpha_{4i} LHK_{t-i} + \sum_{i=0}^{q} \alpha_{5i} LEDGDP_{t-i} + \sum_{i=0}^{q} \alpha_{6i} LLDSEXP_{t-i} + \sum_{i=0}^{q} \alpha_{7i} LOPEN_{t-i} + \varepsilon_t \quad (7)$$

Then, the short run dynamics of the model can be obtained by the estimation of the error correction model linked with the long run estimates. It is given by

$$\Delta y_t = \theta_0 + \sum_{i=1}^{p} \theta_{1i} \Delta y_{t-i} + \sum_{i=0}^{q} \theta_{2i} \Delta LINVG_{t-i} + \sum_{i=0}^{q} \theta_{3i} \Delta LLFP_{t-i} + \sum_{i=0}^{q} \theta_{4i} \Delta LHK_{t-i} + \sum_{i=0}^{q} \theta_{5i} \Delta LEDGDP_{t-i} + \sum_{i=0}^{q} \theta_{6i} \Delta LDSEXP_{t-i} + \sum_{i=0}^{q} \theta_{7i} \Delta LOPEN_{t-i} + \gamma ecm_{t-1} + e_t \quad (8)$$

where, $\theta_{1i}, i = 1, ...7$ are the short run dynamic coefficient of the variables in the model, ecm_{t-1} is the error correction term which is obtained from ARDLM long run dynamics of the model. The coefficient of ecm_{t-1} indicates the speed of adjustment to bring back equilibrium in the model. Moreover, it is expected to have a negative sign,

showing the variables converge to the equilibrium. Prior to the ARDLM cointegration test or estimation of the long run relationship of the model it is required to make sure that the variables are not I(2) or above so as to avoid spurious regression. For the reason that, ARDLM approach is based on the assumption that the variable are either I(1), I(0) or mixture of I(1) and I(0).

3.2.1. Unit Root Test

In order to determine the order of integration of the series, the usual Augmented Dicky-Fuller (ADF) and Philips–Perron (PP) unit root tests are carried out. If the variables in the model are non stationary, it will end up with spurious regression and the test stastics become asymptotically non normal. Even if, bound testing does not require pretesting for a unit root, in the case of I(2) variables, the computed F-stastic for the existence of cointegration is not valid (Pesaran et al, 2001). As previously mentioned, bound testing is based on the assumption that the variables are I(0) , I(1) or mixture of the two.

The ADF test can be given by

$$\Delta y_t = \mu + \gamma t + \beta y_{t-1} + \sum_{i=1}^{k} \lambda_i \Delta y_{t-i} + u_t \qquad (9)$$

where, y_t is the variable of interest, t is the time trend, k is the maximal lag length, u_t is the white noise error term.

Then, we test the set of hypothesis

$H_0 : B = 1$ (i.e., y_t series is I (1) or unit root)

$H_1 : B < 1$ (i.e., y_t series is I (0) or non unit root)

After that, the computed value will be compared with Mackinnon (1996) critical values to determine whether the series are stationary or not. And the ADF_t stastic is based on the OLS estimate given by:

$$ADF_t = t_{B=1} = \frac{\hat{B}-1}{se(\hat{B})} \quad (10)$$

As stated above, Philips–Perron test stastic of Philip (1987) and Philips and Perron (1988) is also conducted. Philips and Perron test corrects for any serial correlation and hetroschedasticity in the errors (U_t) non-parametrically by modifying the Dicky-Fuller.

3.2.2. Causality Test

As stated earlier, the ARDL Model solves for endogenity problem. The existance of cointegrating relationship among the variables indicates that there must be granger causality at least in one direction, though the direction is not known (Chandran et al, 2010 cited in Tsadikan, 2013). ARDL model doesn't need test for granger causality since it consider endogenity problem in the model (kibrom, 2013). According to Chandran et al, (2010) cited in Tsadikan, (2013) the long run effect can be captured by Error Correction Term. Thus, the regressors granger cause the dependent variable or there exists unidirectional causality from the explanatory variables to the dependent variable.

3.3 Data Type and Source

Secondary data is employed in this study for the given range of time 1970/71-2010/11 for the variables that are included here. The sources of data are mainly different domestic and international organizations that are involved in arranging and bringing together related data. For the variables that are used in real terms are deflated by GDP

deflator. The domestic sources include a range of organizations and ministries like Ministry of Finance and Economic Development (MOfED), Central Stastical Agency (CSA) and Ethiopian Economics Association (EEA). On the other hand, the international Sources are International Monetary Fund, World Bank and World Debt Stastics.

3.4. Method of Data Analysis

Both simple descriptive and econometrical method of data analysis are employed in this paper. For the purpose of achievement of the first objective, we applied descriptive stastical tools. But, for the other remaining research objectives the standard econometric technique is adopted. The stastical software packages used for the tests conducted are Microfit 4.1 and Eviews 7.1 version.

Note

- ✓ *An attempt has been made to include the variable inflation in order to capture the macroeconomic condition of the economy. But, the regression result does not seem to be satisfactory when the variable is included. That is, where majority of the regressors become insignificant to explain economic growth including the variable itself. Therefore, the variable is excluded from the model. For further reference the unsatisfactory regression result that included level of inflation is attached in the appendix part of the paper.*

Chapter Four: Overview of Ethiopian Economy

4.1. Overview

In this part an attempt has been made to overview external debt and economic growth in Ethiopia for the period 1970/71-2010/2011, using descriptive analysis. Although, the study is limited to the topic 'Does external debt cause economic growth?' this section tries to deal with structure, trend and composition of external debt in Ethiopia for the period under consideration.

Ethiopia is one of the least developed countries with a total population of over 84 million in 2011. It is one of the most populous countries in Africa with a per capita income of 370 US $ in the year 2013(WB, 2013). The economy is characterized by the dominance of agricultural sector which implies that, the performance of the economy depends on the performance of the agricultural sector.

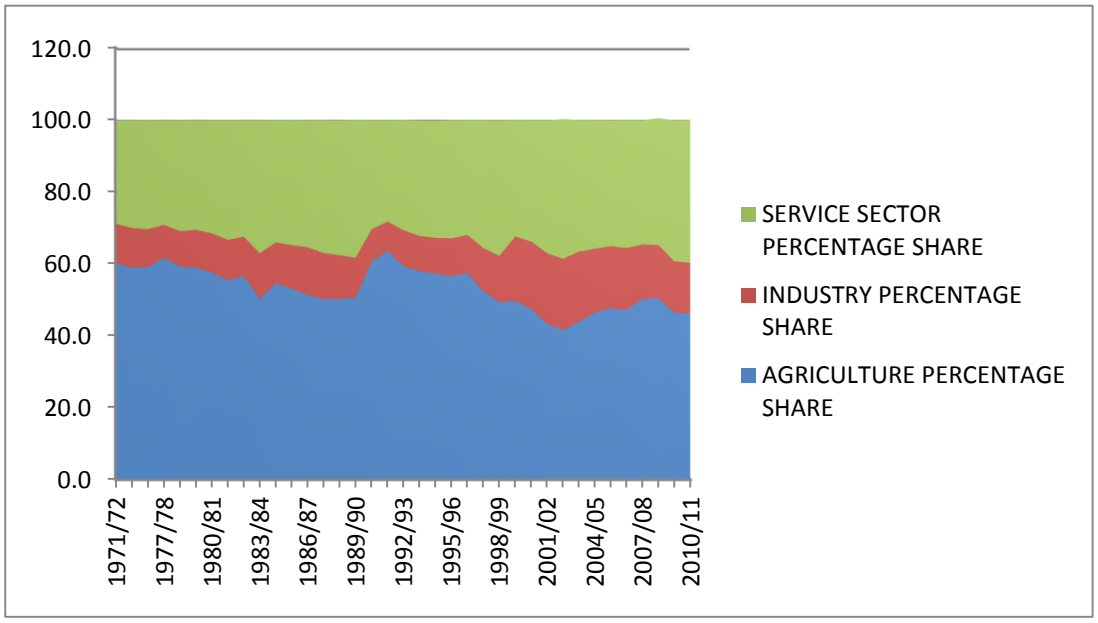
During 1960's and 1970's much of the focus was centered on transfer of resources from agriculture to develop manufacturing sector within the framework of free-market economic system (Zerihun, 2002). This was, due to, the greater attention of policy makers to attain industrialization through import substitution. Then, in 1970's and 1980's when the militarist took the power, the agriculture sector and also the other sectors were adversely affected as a result of excess government intervention and other various economic policies applied by the time. But, in 1990's, when the Ethiopian People's Revolutionary Democratic Front (EPRDF) took power, an Agricultural Development Led Strategy (ADLI) and free market economic system were adopted.

In general, economic growth in Ethiopia has been closely linked with the performance of the agriculture sector. This sector is highly rain fed and it's performance is mainly determined by the existence of good weather condition in the country. Recurrent drought and traditional cultivation practices, land fragmentation, low level of fertilizer application and high population growth rate are the main problems of the sector (EEA, 2007).

The agriculture sector accounts for 42% of GDP, 80% of employment and 85% of Ethiopia's export earnings and the increase in agricultural production is attributed mainly to favorable weather condition, improved supply of inputs and expansion in land under cultivation (CSP, 2011).

The core source for the recent growth of the country is progress in agricultural sector as a result of favorable climatic condition and improved supply of fertilizers (ADB, 2012). Although, there exists difference of opinion on the amount of growth rate, in recent times international organizations has began to acknowledge the country's good economic progress (WB, 2012).In the country, the growth base is also expanding with rising contributions of manufacturing and service sector to GDP.

Figure 4.2 Sectoral Percentage Contribution to GDP (1971-2011)



Source: Own calculation based on unpublished data from MoFED

From the above figure, it can clearly be observed that the agricultural sector takes the largest percentage share contribution in the structure of the Ethiopian economy. Following that the service sector takes the next share with a continual growth amount whereas the contribution of industry has been very little.

For the period from 1971-2011 the average percentage contribution of the service sector was 32.1% while, the industry's contribution was 12.3%. On comparable basis the service sector's growth has been fascinating. The impressive growth in service sector was as a result of rapid expansion in financial intermediation, public administration and retail business activities. These services sub-sectors grew by more than 10 percentage point in GDP share during the past five years (Fekadu, 2012). Even if the agricultural sector stays the most vital sector with the aspect of it's GDP

contribution, it is the service sector that showed up as the main source of growth in the economy.

In effect, the performance of the economy varies with different ruling system. During the period from 1960-1970 the economy maintained an average growth rate of 4.1% per annum. The population was growing on average at a rate of 2.3% per annum with per capita income of 1.8% per annum. By this time the economy was performing better. For the period from 1971-1973 the real gross domestic product was growing at an average growth rate of 2.5% percent. In 1974, the Imperial era was over thrown by the Derge regime. This military regime was characterized by the socialist political ideology.

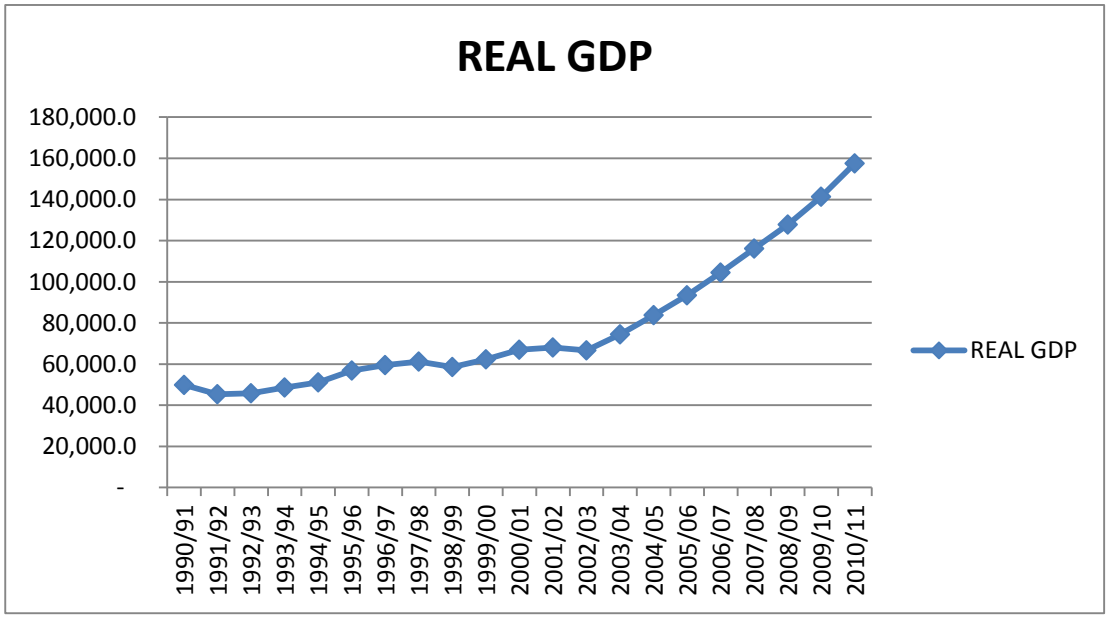
From 1974-1991, the average growth rate of real GDP was 2.1% per annum with an amount of 2.8% population growth rate. The economy was also facing a reduction in per capita income of 0.7% on average per annum. During this period, the economy was in bad position in it's performance. This was due to huge government intervention in almost all sectors of the economy. This resulted in private sector repression, scarcity of foreign exchange earnings and reduction in the country's productivity. Moreover, recurrent drought, civil war and high population growth were the main reasons for the unsatisfactory performance of the economy during the military regime.

In 1991, the military regime was over thrown by the Ethiopian People's Revolutionary Democratic Front (EPRDF). The economy follows a liberal market oriented system with a clear difference from the militarist regime which constrained

growth of the private sector. Therefore, in this period better economic performance is witnessed.

During the period from 1992-2011, the economy has grown at an average annual growth rate of 6.1% with 4.39% average annual growth rate of real GDP per capita and 2.7% average annual growth rate of population. If we exclude the abnormal years between 1990 and 1992, the impressive performance of the economy during the first 10 years of EPRDF's stay on power was due to reforms taken by the government and the good weather (Alemayehu et al, 2005 cited in Tsadikan, 2013).

Figure 4.2 Real GDP Trend from 1991-2011(in millions of ETB)



Source: Unpublished data form MoFED

As indicated above in the figure, the economy is performing better except for few variations in some years. The existence of drought in the year 1997/98 and 1998/1999 highly affected the performance of the agricultural sector which is the dominant sector

of the country. Therefore, real GDP decreased by 1.3%. After 1998/99, real GDP started to rise with an amount of 6.2%. Similarly, in the year 2002/03 real GDP has reduced by 2.1% as a result of drought that existed in that period. Subsequent to the year 2002/03, a continual growth of real GDP was observed. On average, from the period 2003/04-2010/11 the real GDP grew at an average rate of 11.3%. On top of favorable weather condition, the country's recent growth has been linked with better policy achievements and good external situations.

In the economy, the different sectors had different growth rate. For the period from 1999/00-2010/11 the various sectors growth rate can be observed from the table below.

Table 4.1 Growth Rate of Sectors for Some Recent Years (in %)

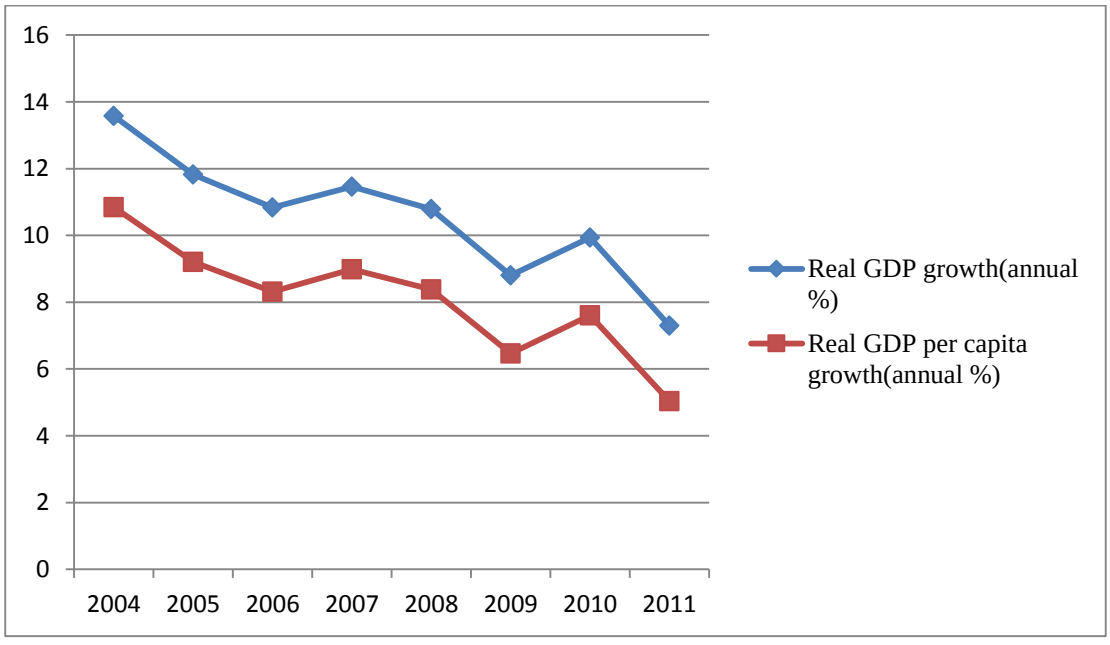
Year	Agricultural sector	Manufacturing sector	Industrial sector	Service sector	Export	Import
1999/00	3.1	7.5	5.4	10.1	29.3	0.1
2000/01	9.7	3.6	5.1	5.3	4.9	1
2001/02	-1.9	1.3	8.3	4.3	13.3	8.9
2002/03	10.5	0.8	6.5	5.9	15.3	5.3
2003/04	16.9	11.7	6.6	6.1	36.4	19.9
2004/05	13.5	9.4	12.8	12.7	3.4	23.8
2005/06	10.9	10.2	10.6	12.8	0.2	17.9
2006/07	9.4	10.2	8.4	15.2	10.4	31.4
2007/08	7.5	8.9	7.1	15.3	-3.4	12.6
2008/09	6.4	8.9	12.3	14.6	6.9	16.4
2009/10	5.8	8.8	9.8	14.7	14.4	15.9
2010/11	6.4	9.5	8.9	6.8	21.9	0.5

Source: World Bank

For the period from 2000/01-2010/11 the agricultural sector has grown at an average rate of 8.6% per annum where as the manufacturing and industry sector has grown at an average rate of 7.6% and 8.8% respectively. During this period the service sector also has grown at an average rate of 10.3% per annum. Ethiopia's exports have also been increasing at an average rate of 11.2%. In the country coffee remained as the major source of export earnings. Regarding imports, it has been growing by 14% on average per annum.

Ethiopia's growth prospects are good, with public investment in infrastructure, transformation of agriculture and non-traditional exports are expected to continue driving growth (Fekadu, 2012). The recent economic growth was challenged by high inflation specifically after 2005. Especially, in the year 2008 the inflation reached its highest level and this inflationary trend was mainly derived by food prices. In the county the food price inflation has reached over 37% in April 2008 (CSA, 2008).

Figure 4.3 Growth rates of RGDP and RGDP per capita, 2004-20011



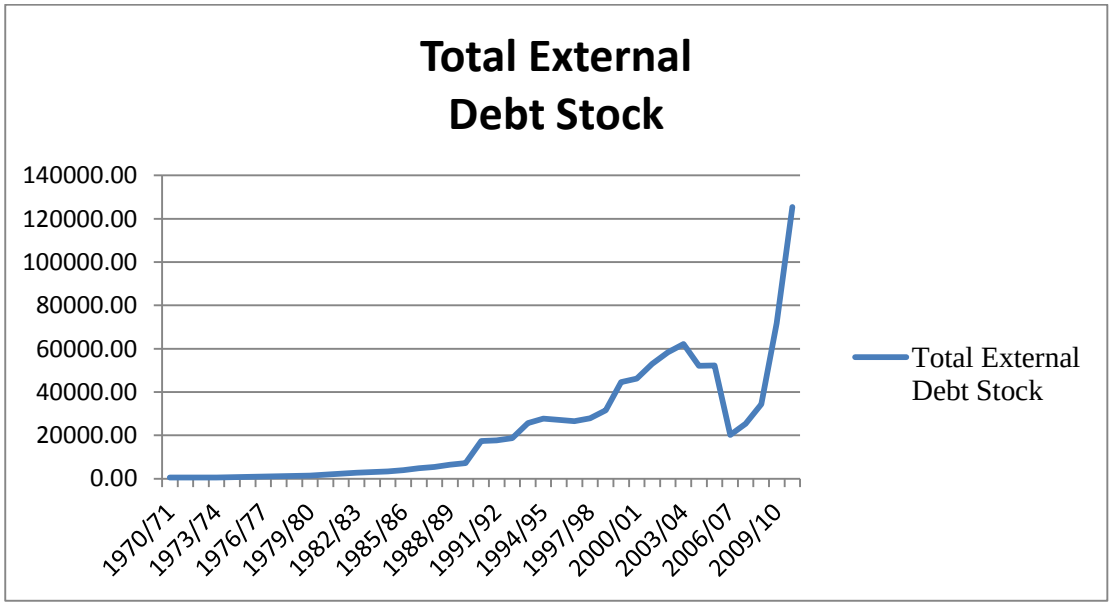
Source: World Bank

From the above figure one can view that both Real GDP growth (annual %) and Real GDP Per capita growth (annual %) has similar declining trend during the period from 2004-2011.

4.2. Trend in Total External Debt in Ethiopia (Only from Official/ Traditional Sources)

Ethiopia's external debt has shown significant change in its size, structure and composition over the years under consideration. The figure below sums up the country's external debt during the different regimes excluding the debt obtained from non traditional sources.

Figure 4.4 Trend in Total External Debt Stock in Ethiopia from 1970/71-2010/11(in millions of ETB)



Source: National Bank of Ethiopia

During the period from 1970/71-1973/74 the country's external debt has been grown at an average rate of 5% per annum. Since 1974, at which Ethiopia applied for loan from the IMF, the country has shown more and more dependence on external assistance and has reached a stage where it cannot function without it (Befekadu and Birhanu, 1999/2000 quoted in Hailemariam, 2011).

In 1974/75, when the Derge regime took power, the total external debt stock stood at 759.10 million Birr or 12.05% of GDP at current prices. In the year 1991, the Derge regime was over thrown by the Ethiopian People's Revolutionary Democratic Front (EPRDF). In 1992, the country's budget was issued and during that time the total external debt was 17.7 billion birr or 94.1% of the GDP at current prices. During the Derge regime the total external debt was growing at an average rate of 24% per annum. Since, there was a rising amount of current account deficit and public finance as a result; there exist large amount of external debt stock during the militarist regime.

For the period from 1992/93-2003/04 the external debt has grown at an average growth rate of 11.8% per annum. After the year 2003/04, with some fluctuations it has reached it's lowest level in the year 2007/08. This huge decline in debt stock was linked with debt relief obtained as per the enhanced Heavily Indebted Poor Countries (HIPIC) initiative. Then, it started to rise with an increasing trend.

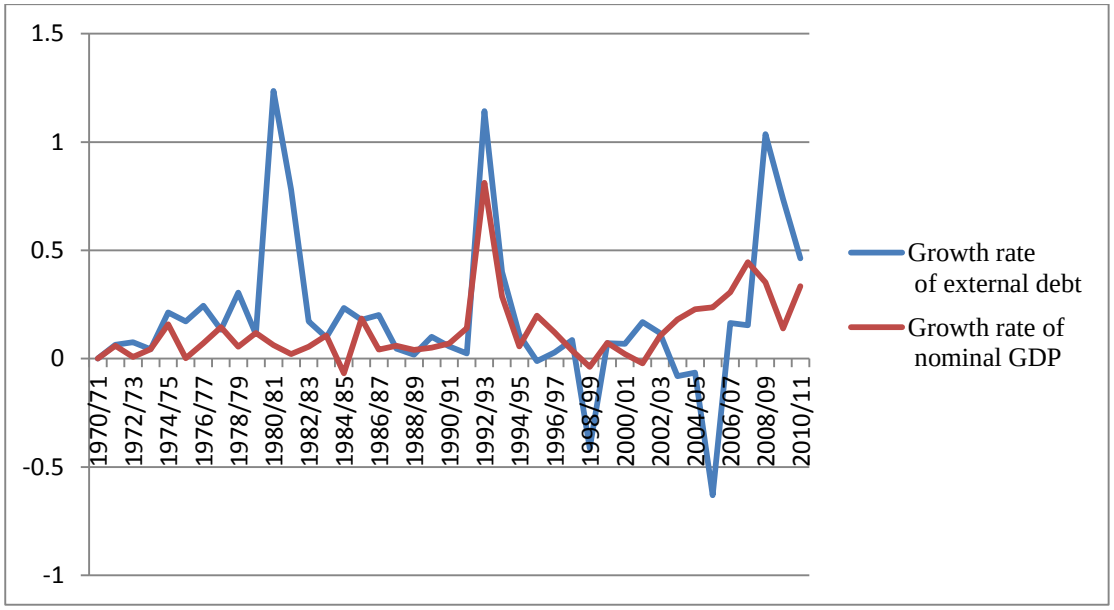
In the country both the total debt stock and debt as percentage of GDP increased gradually since 1980s and the 1990s. This makes Ethiopia one of the Sub-Saharan, which have a total debt that exceeds their GNP, having a debt to GNP and debt to

export ratios of 108.2 percent and 642.4 percent in 1980s and 150 and 980 percent in 1990s, respectively (Jonse, 2002).

4.3. Trends in the Annual Growth Rate of Nominal GDP and External Debt in Ethiopia

The trend in annual growth rate of nominal GDP and External Debt can be observed from the below figure.

Figure 4.5 Trends in the Annual Growth Rate of Nominal GDP and External Debt in Ethiopia (1971-2011)



Source: MoFED and NBE

From the above figure, it can be observed that both growth rates do not seem to have similar trend except for some year. That is, when the growth rate of external debt increases the growth rate of nominal GDP declines. For instance for the year, 1981/82 when the growth rate of external debt has reached it's peak, the growth rate of nominal GDP has reached it's minimum. But, for the year 1992/93 both seem to have

similar trend until 1994/95. After 1994/95 the growth rates again seem to move in opposite direction i.e. when one declines the other starts to rise. The growth for external debt has reached minimum during the period where there was debt relief like the year 2004/05. On the contrary the trend for the growth rate of nominal GDP started to rise. Therefore, the trend for the annual growth rate of these variables varies across the years.

4.4. The Sources of Ethiopian External Debt

The structure and composition of the country's external debt (obtained from official/ traditional sources) has shown an observable change over the past few decades. The lenders can be categorized into multilateral, bilateral and commercial creditors. Under the multilateral creditors, World Bank, International Development Association (IDA) and African Development Fund (ADF) are the major ones to be mentioned. The group of official bilateral creditors includes the Paris Club creditors and also Non-Paris club creditors.

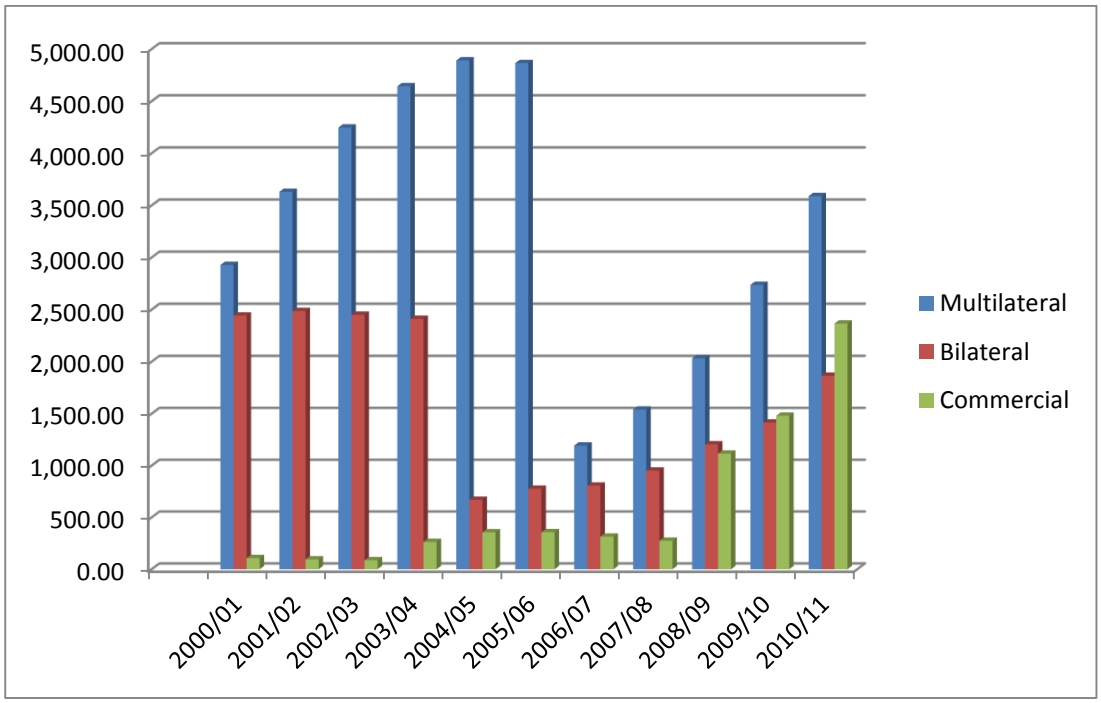
The shares of multilateral, bilateral and commercial credit were 46%, 39% and 15% respectively, in 1974/75, when the military regime took power. During this time the total external debt was 372 million USD or 14% of GDP. Over the given period, the changes in these sources of long term credit are merely noticeable.

In 1992, the total debt owed to the multilateral creditors was a total of 1473.8 million USD or 16.8% of the total debt where the bilateral creditors were amounting to 6706.8 million USD or 76.3% of the total external debt. The commercial creditors stood at about 603.7 million USD or 6.9% of the total debt (where 320 million USD or 53% of the total commercial credit goes to Ethiopian Airlines).

So, these shares have shown variance in the year 1992. The change in relative share in favor of bilateral at the cost of multilateral and commercial was mainly due to military credit from the former Soviet Union, which accounted nearly 60% of the total debt stock (Hailemariam, 2011).

In the year 2000/01 these shares become 53.5%, 44.6% and 2% respectively. Multilateral creditors took the lion share of credit of the total amount gained from the different sources of credit. The rise in the proportion of multilateral credits is linked with the debts gained mainly from the World Bank, the IMF and the African Development Fund (ADF) to finance the Structural Adjustment Programs (SAPS). Conversely, the debt relief gained from the Paris Club creditor countries resulted in reduction in the commercial debt buy-back operation completed by EAL as a result of regular and timely payments; in turn the commercial creditors share has declined.

Figure 4.6 External Debt Disbursement by Lender Category



Source: Unpublished data from MoFED

In the year 2000/01 the amount of loan owed to multilateral creditors was total of 2929 million USD or 53.5% of the country's external debt. The amount had been increasing up to 4891.5 million USD in the year 2004/05 where as the amount for the bilateral creditors had a decreasing trend from 2443 million USD or (44.6% of total external debt) to 669.7 million USD till the year 2004/05.

After 2004/05 the multilateral creditors share had declined to 2032.31 million USD or 46.7% of the total of external debt. The decline was accompanied by the rise in the bilateral creditors share from 669.67million USD to 1204.30 million USD in 2008/09. Then, again the multilateral creditors share started to rise up to 3589.41million USD in 2010/11. Similarly, the bilateral's share continued to increase up to 1864.54 million USD or 24% of the total debt. In the year 2010/11 multilateral credit, bilateral credit and commercial credit were amounting to 46%, 24% and 30% of the total external date respectively.

4.5. External Debt Allocation by Economic Sectors

The country's external date was distributed among different sectors. The table below shows the external debt disbursement by economic sector.

Table 4.2 Sectoral Allocation of External Debt (in millions of USD)

Economic Sectors	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
Agriculture	23.45	31.7	35.6	32.41	21.64	170.1	36.36	14.96
Financial Sector	37.55	24.7	8.52	9.46	20.33	72.63	175.66	67.53
Transport & communication	216.3	136	49.11	1.97	1.76	776.5	361.14	882.49
Highway Transport–Infrastructure	75.44	68.3	25.37	61.12	104.6	134.9	264.61	297.5
Electricity, Gas & Steam	35.68	31.4	186.3	128.97	164.9	430.3	285.93	353.11
Industry & Tourism	0.36	0.35	1.52	1.63	0.5	62.1	104.61	113.8
Education & Capacity Building	8.65	24	25.01	51.58	39.34	49.78	28.14	54.88
Health	36.43	30.7	21.99	5.97	7.43	5.11	-	-
Social	85.13	53	59.4	43.97	-395	16.49	35.5	88.22
Water Works & Supply	3.01	8.67	10.31	20.71	33.68	32.37	36.07	54.72
Structural Adjustment	29.36	89.2	-	-	-	-	236.47	160.17
Reorganiza-tion	0.31	-8.7	-	-	-	-	-	-
Total	551.7	498	423.2	357.79	395.1	1,750.21	1,564.49	2,080.17

Source: Various Years of MoFED data

In the year 2003/04 the total external debt disbursed among different economics sector was 551.7 million USD. In this year, the disbursement for transport and communication took the largest share 39.2% where as service sector and infrastructure took the second and the third share with the amount 15.4 and 13.7%, respectively. In the year 2010/11, the total external debt disbursed was 2080.17 million USD where again transport and communication took the highest share 42.1%, followed by electricity, gas and stream 17% and infrastructure 14.2%.

For the years from 2003/04-2010/11 the total external debt disbursed among different economic sectors was 7627.77 million USD. For those years on average transport and communication took the highest share, 31.8% followed by electricity, gas and stream 21.2% and infrastructure 13.6%. On average, huge amount of loan was disbursed for the transport and communication sector for the years from 2003/04-2010/11.

In Ethiopia, nearly all outstanding debt is held by the public sector or is guaranteed by the government despite the debtor. In1992, the central government external debt stood at 2.8 million USD or 80% of the total non-ruble debt, though the remaining 20% was held by non–central government public sector but, in 1999, the amount had increased from USD 2.8.million of central government to USD 4 billion or (93% of the total) and the remaining was held by Parastatals. The increment shows that the government reliance has been rising through time. In addition, as a result of the Paris Club debt rescheduling, some proportion of the public sector loans now has become, part of the central government loans (Jonse, 2002).

The country's external loans are mainly concessional, having low interest rate and long grace and maturity periods. Based on the table below, the average interest rate increased from 1.75% in 1971 to 4.69% in 1991 having some variations in between. However, it showed a greater decline and it was 0.93% in 2001. Again, it had increased in the year 2006. But, after that year it had showed some fluctuations and reached 1.08% in 2011.

The maturity period (in years) of new external debt had declined from 42.7 years in 1971 to 20.5 years in 1991. But, in 2001, it increased to 43 years. Subsequent to that year, it had a fluctuating value and reached to 30.4 years.

While, the average grace period on new financing increased from 9.67 years in 1971 to 11.4 years in 2001, with some fluctuations in between. Then, it started to decline and reached 4.18 year in 2011, having some changes in the intervening time.

The grant element of new financing changed from 70.7% to 36% in 1991. Then, it increased to 80.3% in 2001. Thereafter, with some fluctuations it reached 62.6% in 2011.

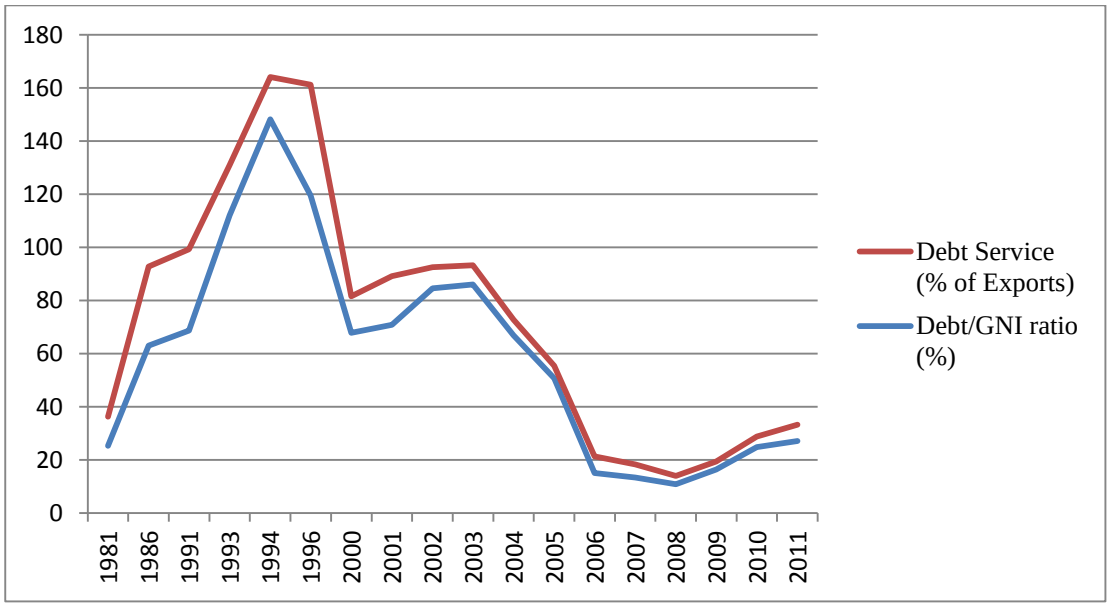
Table 4.3 Terms and Conditions of the Entire Lenders

Year	Average interest (%)	Average maturity period (years)	Average grace period (years)	Average grant element (%)
1971	1.75	42.7	9.67	70.7
1981	2.34	20.1	10.4	57.7
1991	4.6894	20.4752	5.9982	36.0301
2001	0.93	43	11.4	80.3
2002	1.05	39.6	9.9	77
2003	1.29	20.9	5.71	47.8
2004	0.91	37.9	9.53	76.7
2005	0.94	32.3	6.34	68.5
2006	5.23	20.7	4.47	31.9
2007	1.25	37.1	9.1	72.9
2008	2.98	23.6	5.88	48.5
2009	1.89	27.2	7.54	61.1
2010	1.827	24	6.786	55.04
2011	1.085	30.4	4.18	62.57

Source: World Bank

Total external debts as % of GNP and debt service as % of export are the major debt burden indicators that are mainly applied in many analyses. In the country, both had been varying with similar trend over time (see the fig below).

Figure 4.7 Trends in Debt/GNP Ratio and Debt Service Ratio (debt burden indicators)



Source: World Bank

From the above figure both have reached their peak in 1993. This increment could be due to lack of enough export earning as a result of the war that took place between the military regime and the EPRDF, since the war affected the production in the economy.

The rise in the amount of interest and principal ahead of the country's ability to repay brought an outcome of ongoing arrears increment.

The debt burden indicators clearly show the country's debt sustainability. The idea of sustainability, hold by creditors presumes that, by eliminating arrears, rescheduling, and debt-reduction measures, the country can meet its debt-service obligations (i.e., equating debt service paid and debt service due) (Befekadu, 2001). Moreover, the

country is also required to raise export earnings so as to get enough foreign exchange, which creates the capability to repay the loan.

The sustainability level for debt to GNP ratio and debt service ratio are 80% and 20-25%. In Ethiopia, as it is shown in the figure above, amount the debt to GNP ratio was higher, mainly after the year 1993. But in the 2000's due to the debt relief the amount had been declining. Debt service to export ratio was continuously declining after 2001, this was not due to an improvement in the country's debt servicing capacity rather, it is due to the huge debt relief obtained at that time. Similarly, the debt to export ratio had declined due to the rise in export earnings and huge debt relief gained. Therefore, Ethiopia is categorized under the Heavily Indebted Poor Countries (HIPCS).

The Heavily Indebted Poor Countries (HIPCS) initiative was launched in1996 in order to give debt relief for severely indebted poor countries. Ethiopia has been one of the main receivers of these debt reliefs in the world and got billions of USD debt relief especially after 2003 which will significantly affect the debt stock amount. Following the year 2003/04 the total debt stock of the country had declined from 6680.00 million USD to 2896.2 million USD in 2007/08. This huge reduction in debt stock was linked with the debt relief obtained from the Heavily Indebted Poor Countries (HIPCS) Initiative.

Chapter Five: Results and Discussion

5.1. Empirical Results for Unit Root Testing

While doing with time series data, checking for stationarity is a prerequisite. As stated in the third chapter determination of the nature of stationarity of each series is crucial prior to applying the suitable ARDL model. And this is important to avoid spurious regression as pointed out earlier and also we need to check whether the variables are not integrated of order two. That is, if any one of them found to be integrated of order two then we are not allowed to use bound testing approach to cointegaration test. The table below shows the result of ADF test of variables under consideration.

Table 5.1 ADF Test for Unit Root

Variable	ADF t-stastic in Level			ADF t-stastic in First Difference	
	Intercept	Intercept & Trend	None	Intercept	Intercept & Trend
LRGDP	0.221363[0]	-2.213755[0]	1.899837[0]	-6.400962***[0]	-6.592512***[0]
LINVG	-0.630249[0]	-2.217427[0]	1.237081[0]	-6.645265***[0]	-6.570723***[1]
LLFP	0.472431[0]	-0.434046[0]	-4.052608***[0]		
LHK	0.170632[0]	-1.702352[0]	3.436875[0]	-6.927020***[0]	-6.858883***[0]
LEDGDP	-2.065762[1]	-1.302329[0]	-1.251058[0]	-4.695903***[0]	-4.749698*** [0]
LDSEXP	-0.346529[0]	-1.455821[0]	0.829191[0]	-6.831100***[0]	-6.973904*** [0]
LOPEN	1.141218[0]	-1.959794[0]	-1.333439[0]	-6.300344***[0]	-6.216219***[0]
Mackinnon (1996)		with constant, no trend	with constant & Trend	None	
Critical Values	1%	-3.610453	-4.211868	-2.624057	
	5%	-2.938987	-3.529758	-1.949319	
	10%	-2.607932	-3.196411	-1.611711	

Source: Eviews 7.0 output result *** indicate stastical significance

where, LRGDP is the natural log of real gross domestic product, LINVG is the natural log of real domestic investment as share of GDP, LLFP is the natural log of total labour force as share of total population, LHK is the natural log of human capital which is proxied by the real total education expenditure, LEDGDP is the natural log of external debt as percentage of Gross Domestic Product, LDSEXP is the natural log of debt service as percentage of export and LOPEN is the natural log of trade openness . ***, ** & * are significance level at 1%, 5% and 10% respectively. And the value in [ ] imply the lag length automatically determined by SBIC.

The decision rule is reject the null hypothesis if the ADF test statistics is less than the critical value, if this is the case the time series variables are stationary or has no unit root conversely, the accept null hypothesis if the ADF test statistics is greater than the critical values which indicates the non-stationarity of the time series variables.

From the output table, the null hypothesis of non stationary are failed to be rejected for all variables in level except for the variable labour force as share of total population. That is, the remaining variables become stationary with and without trend once they are first differenced. This implies that none of the variables are integrated of order two which is the precondition in order to use ARDL cointegration approach.

Table 5.2 Philps- Perron Test for Unit Root

Sim	Variable	PP test stastic in Level			PP test stastic in First Difference	
		Intercept	Intercept & Trend	None	Intercept	Intercept & Trend
i	LRGDP	5.896589	2.157060	1.899837	-4.114119***	-5.035172***
l	LINVG	-0.630249	-2.217427	1.237081	-6.645265***	-6.570723***
a	LLFP	0.472431	-0.434046	-4.052680***		
r	LHK	0.170632	-1.702352	3..436875	-6.858883***	-6.927020***
	LEDGDP	-1.711611	-1.302329	1.251058	-4.678493***	-4.569182***
t	LDSEXP	-0.312793	-1.412376	0.829191	-6.808853***	-6.972024***
o	LOPEN	-1.141218	-1.959794	-1.333439	-6.300344***	-6.216219***

Source: Eviews 7.0 output result

Similar to the earlier ADF test, the PP test also proved that all the variables that are used in the model become stationary after they are first differenced except the variable LLFP.

Therefore, both the above tests proved that the model is a mixture of variables that are integrated of order one and zero i.e. I(1) and I(0), so the Autoregressive Distributed Lags Model (ARDL) Cointegration technique proposed by Pesran et al (2001) is the most appropriate method for estimation in these circumstances. Thus, both tests revealed that none of the variables were found to be integrated of order two. Therefore, now we are allowed to use Autoregressive Distributed Lag Model or bound testing approach in order to check the presence of long run relationship among the variables.

5.2. Stability and Diagnostic Tests

Priorly in doing analysis, we are required to check the standard property of the model so as to test the reliability of the model. Thus, the study conducted various diagnostic and stability tests. These are: Serial correlation (Brush and Godfray LM test), Functional form (Ramsey's RESET test), Normality (Jaque-Bera test), and Hetroscedasticity and also CUMSUM and CUMSUM square test were also carried out. For the tests included in order to reject or accept the null we can decide by looking the p- values associated with test stastic. That is, the null is rejected when the p-values are smaller than the standard significance level. And, every test has it's own assumption and distribution.

Table 5.3 Diagnostic Tests for the Long Run ARDL(1,1,0,0,0,0,0)

Test Statistics	LM Version	F Version
A:Serial Correlation	CHSQ(1) = 2.2058[.137]	F(1, 28)= 1.6786[.206]
B:Functional Form	CHSQ(1) = 0.53081[.466]	F(1,28)= 0.38635[.539]
C:Normality	CHSQ(2) = 1.2932[.524]	Not applicable
D:Heteroscedasticity	CHSQ(1) = 5.0472[.025]	F(1,37)= 5.5002[.024]

A:Lagrange multiplier test of residual serial correlation

B:Ramsey's RESET test using the square of the fitted values

C:Based on a test of skewness and kurtosis of residuals

D:Based on the regression of squared residuals on squared fitted values

Source: Microfit 4.1

From the above table:

A) The null hypothesis of no serial correlation (Brush - Godfray LM test) is failed to be rejected. For the reason that, the p- value associated with the test stastic is greater than the standard significance level 0.05. This LM test for serial correlation is applied

since; it resolves the drawback associated with the traditional Durbin Watson test stastic i.e. it is not allowed to use DW test stastic as long as the lagged value of the dependent variable is incorporated as a regressor in the model.

B) We could not reject the Ramsey RESET test which tests whether the model suffers from omitted variable bias or not. That means we failed to reject the null hypothesis of Ramsey RESET test which says that the model is correctly specified. This is because the probability value is larger than the conventional significance value. The result proves that the model did not have omitted variable bias.

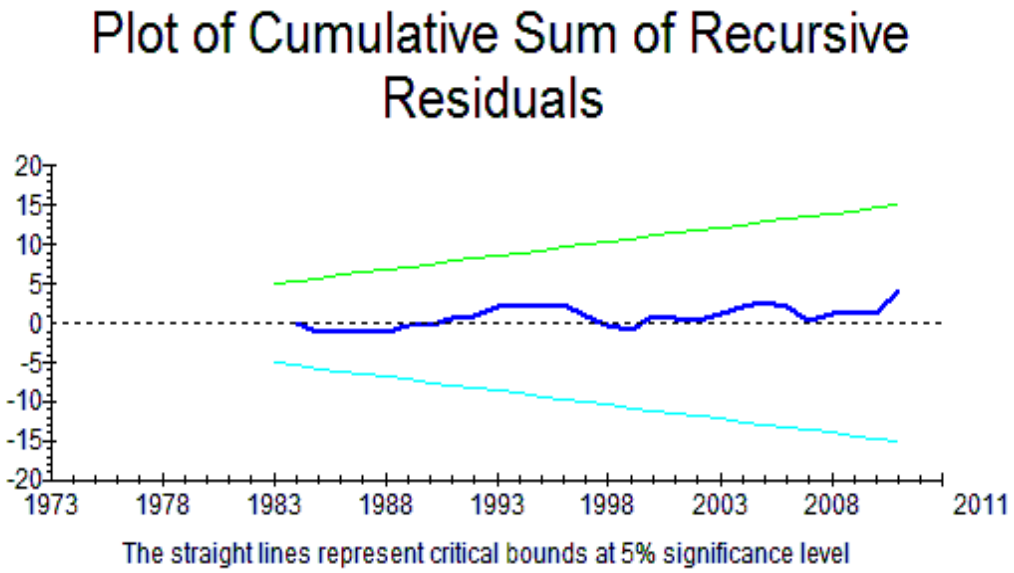
C) We cannot reject the null hypothesis which says that the residuals are normally distributed. For the reason that, the p value associated with the Jaque-Berra normality test is larger than 0.05, we accept that the error term is normally distributed.

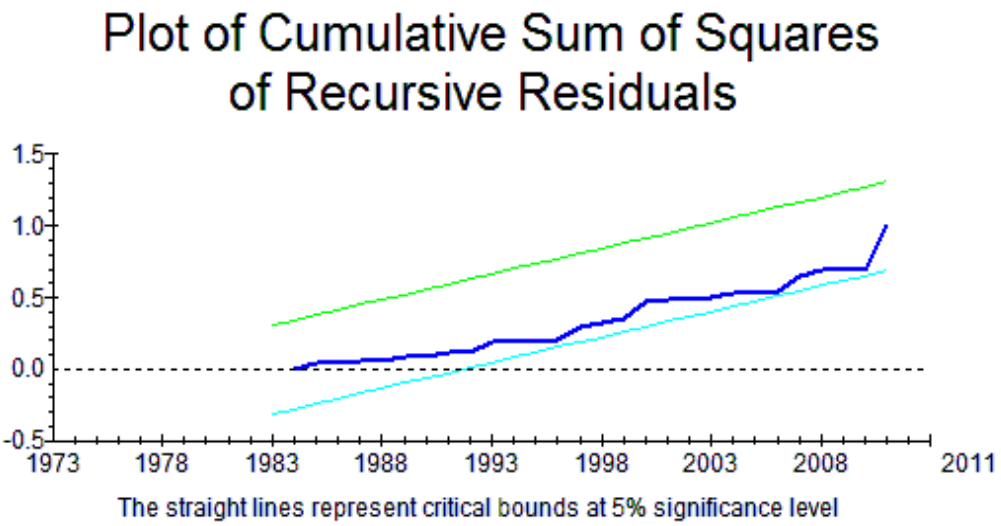
D) The null hypothesis of no heteroscedasticity is failed to be rejected at 1% significance level. But, we reject it at 5 percent significance level, but, by no way at all weaken the soundness of the model. The reason behind is, although it may lead to loss of efficiency, the existence of hetroschedasticity in itself does not basically invalidate standard least square inference (Engle, 1982).

Moreover, the stability of the model for the long run and short run relationships is detected using CUMSUM and CUMSUM square test as suggested by Pesearon and shin (1997). For the stability test the graph plots both the cumulative sum and the 5% critical lines. And, if the cumulative sum remains inside between the two critical lines the null hypothesis of correct specification of the model can be accepted but if the

cum sum goes outside (never returns back) between the two critical bounds there exists series parameter instability problem. But, in this study both the CUMSUM and CUMSUM square of the residuals are found within the boundaries of the 5% significance critical bounds. Therefore, the result implied that there is no structural instability in the model during the period under consideration. From this, the model appears to be robust in estimating short run and long run relationship between the dependent variable and the included regressors.

Figure 5.3 Plots of CUMSUM and CUMSUM SQUARE Stastics for Coefficients Stability Test




Plot of Cumulative Sum of Squares of Recursive Residuals
1.5
1.0
0.5
0.0
-0.5
1973
1978
1983
1988
1993
1998
2003
2008
2011
The straight lines represent critical bounds at 5% significance level

5.3. Test for Long Run Relationship

Following the stationanrity test, the model was estimated by using OLS in order to test the presence of long run relationship among the variables. Prior to this we had to obtain the optimal lag length for the ARDL model. For annual data Pesearon and Shin (1999) recommended using a maximum of two lags as quoted in Narayan (2004). In the model, Schwarz Bayesian Criterion is used for estimation as recommended by Pesearon and Shin (1999) for the reason that the computation of F-statistics for cointegration is very sensitive to lag length.

Table 5.4 F-Statistic for Testing the Existence of Long-Run Relationship

Order of Lag	Calculated F-stastics
2	4.949

Table 5.5 The critical values for bound test for the cases with unrestricted intercept and trend (cases 3)

Critical Values	1%		5%		10%	
	Lower bound	Upper bound	Lower bound	Upper bound	Lower bound	Upper bound
Pesearan et al	3.60	4.90	2.87	4.00	2.53	3.59
Narayan	3.800	5.643	2.797	4.211	2.353	3.599

Source: Pesearon et al (2001) and Narayan (2004)

In this analysis we used Narayan (2004) which is developed based on 30 to 80 observations as mentioned earlier in the third chapter. Since, the calculated F- stastics (4.949) is larger than the upper bound critical value (4.211) at 5% level of significance the null hypothesis of no cointegration is rejected at 5% significance

level. Therefore, it confirms that there exists a co-integrating relationship among the variables.

5.4. Estimation of the Long Run coefficients of ARDL Model

Subsequent to determination of cointegration among the variables, long run coefficients are estimated for the model. The optimal lag length of the long-run coefficients is found by using Schwarz Bayesian Information Criterion. The table below shows the result of the estimated long run coefficients.

Table 5.6 Estimated Long Run Coefficients using ARDL approach [ARDL (1,1,0,0,0,0,0) selected based on Schwarz Bayesian Criterion]

Dependent variable: LRGDP

39 observations used for estimation from 1973 to 2011

Regressor	Coefficient	St.Error	T-Ratio[Prob]
LINVG	0.016172**	0.0065850	2.4560[.020]
LLFP	-0.14462	0.095394	1.5161[.140]
LHK	0.55547***	0.15259	3.6402[.001]
LEDGDP	-0.018076***	0.0041649	4.3402[.000]
LDSEXP	-0.0015284	0.0026440	0.57809[.568]
LOPEN	-0.027714***	0.010960	2.5286[.017]
C	1.1258	0.42445	2.6525[.013]
T	0.0036731	0.8357E-3	4.3951[.000]

Note: ***, **,* denotes significance at 1%, 5%, 10% respectively (indicate rejection of the null 1%, 5%, 10% respectively)

Source: Microfit 4.1 ARDL (1,1,0,0,0,0,0) result

The estimated equation is given below, where the values with the bracket are the calculated 't' values

$$LRGDP = 1.13 + 0.02LINVG - 0.14LLFP + 0.56LHK - 0.02LEDGDP \quad - 0.001LDSEXP - 0.03LOPEN$$
$$(2.65) \quad (2.46) \quad (1.52) \quad (3.64) \quad (4.34) \quad (0.58) \quad (2.52)$$

The result implied that the variable real investment as share of GDP which is used as a proxy variable to measure capital in the economy significantly positively affect growth in the long run. This shows that capital influences output as it is included as an input in production and plays a major role in enhancing growth. This is consistent with the standard growth theory. The long run elasticity of LRGDP with respect to LINVG is 0.016172 indicating one percent increase in real investment as share of GDP induces 0.016172 percent increment in output. The result is significant at 5%. Quite large number of studies undeniably supports this outcome. For instance, the result coincides with Hailemariam, (2011) for the case of Ethiopia, Were (2001) for the case of Kenya and Karagol, (2002) for the case of Turkey.

The variable human capital has shown a significant positive effect on economic growth in the long run. The result clearly implies that human capital is an important determinant of output. The long run elasticity of LRGDP with respect to LHK is indicating one percent increase in annual real education expenditure which is used as a proxy for human capital induces 0.55547 percent increment in output. The result is significant at 1%. Different theoretical models incorporate human capital as a factor of production and regard the accumulation of human capital as part of the growth process. The findings of many countries also confirmed this positive relationship. Lucas (1993) and Barro and Lee (1993) revealed evidences that human capital

accumulation promotes economic growth. The result is consistent with Ali and Mustafa (2011) for the case of Pakistan, and Hailemariam, (2011) for the case of Ethiopia, he got human capital to have positive effect even if, it is insignificant.

One of the debt burden indicator, external debt as percentage of GDP has a significant and negative relationship with real GDP. It is implied that external debt to GDP has had a negative contribution to economic growth of Ethiopia. The coefficient of LEDGDP -0.018076 indicates a one percent increase in the stock of debt will result in 0.018076 percent decline in real gross domestic product. This indicates the existence of debt overhang problem in the country. This implies that government with a heavy debt burden is forced to increase taxes in the future in order to service high debt burden. Then, the after-tax return on capital will be reduced due to the rise in tax. As a result, the incentive to invest will be lowered. Thus, the decline in investment results in slow economic growth (Krugman, 1987). The result is consistent with the findings of Melese (2004) for Ethiopia, Hailemariam, (2011) for Ethiopia, Elbadawi, et al (1996) for Sub Saharan countries, Ali & Mustafa (2011) for Pakistan, and Afexientue (1993) for twenty middle income countries. The result is significant at 1% level of significance. But it is inconsistent with Jonse, (2002) for Ethiopia and Nawaz et al, (2012) for Pakistan.

The other debt burden indicator i.e. debt service as percentage of export has negative but insignificant relationship with economic growth. It reveals that in Ethiopia, debt overhang hypothesis seem to have played a significant role while there is no evidence of crowding out effect of external debt since it is not significant. Debt servicing as percentage of export does not appear to affect growth significantly. The finding is

consistent with Jonse, (2002) and Melese, (2005) for the case of Ethiopia, and Akram, (2011) for the case of Pakistan. The result is inconsistent with Hailemariam, (2011) for Ethiopia, and Cholifihani (2008) for Indonesia.

The result revealed that trade openness showed negative significant effect on economic growth. This can be explained as suggested by theory of Broda, Greenfield and Weinstein (2006), countries that mostly require economic development will not benefit from openness as a result of being deficient of complementary inputs, institutions, general knowledge capital, etc. Evidences suggest that the failure of trade reforms to promote trade and growth in African countries may be attributable to the poor quality of institutions (Ndkumana and Balimoune, 2007). One feasible justification is that as trade increases the chance for fraud and other wasteful use of resources rise, with negative effect on economic growth. Therefore, institutions are crucial for the success of economic reforms in developing countries (Acemoglu et al, 2003). One possible explanation for the negative effect is poor quality of institutions in the country. The finding of this study is consistent with, Harrison, (1996), and Rodriguse and Rodrik (2001). But it contradicts with Hailemariam, (2011), and Sachs and Warner, (1995). And also we should bear in mind that there is also a great controversy in the literature on the measurement of openness in an economy.

It is showed that the variable labour force as share of total population has negative but insignificant effect on economic growth. Priorly, the study hypothesized that labour force can have positive or negative effect on economic growth. We should note that labour force includes both the employed and unemployed labour force. Based on the argument of Todaro, (1994) the labour force can contribute negatively for developing

countries where additional unskilled labour reduces output rather than increasing it. Ethiopia is labour abundant country where most of the labour force is unskilled and with limited opportunity of making it productive. More unskilled labour with low productivity is not likely to raise the level of output in the country. This could justify the negative relationship even if it is insignificant. The result contradicts with the findings of Karagol, (2002) for Turkey, Cholifihani (2008) for Indonesia and Hailemariam, (2011) for Ethiopia. And the result is consistent with the findings of Ali and Mustafa, (2011) for Pakistan. They found negative effect of labour force even if they found it to be significant in the long run.

The existence of cointegrating relationship among the variables suggests that there must be granger causality at least in one direction, though the direction is not known (Chandran et al, 2010 quoted in Tsadikan, 2013).

5.5. Estimation of the Short-run Coefficient of ARDL Model-Error Correction Model [ECM]

Estimation of the error correction model is the next step after the estimation of the long run coefficients. As previously stated in chapter three, the coefficient of the error correction term indicates the speed of adjustment to restore equilibrium in the model. Moreover, it is expected to be stastically significant having a negative sign, showing that the variables converge to the equilibrium. The existence of a stable long run relationship among the variables is further confirmed by the significant error correction term (Bannerjee et al, 1998 cited in Akram, 2011).

Table 5.7 Error Corection model for the Selected [ARDL model (1,1,0,0,0,0,0) selected based on Schwarz Bayesian Information Criterion]

Dependent Variable = dLRGDP

39 observations used for estimation from 1973 to 2011

Regressor	Coefficient	Standared Error	T-Ratio[Prob]
dLINVG	0.045186***	0.0032867	13.7483[.000]
dLLFP	-0.058122	0.040773	1.4255[.164]
dLHK	0.22324***	0.053884	4.1429[.000]
dLEDGDP	-0.0072646***	0.0019536	3.7186[.001]
dLDSEXP	-0.6143E-3	0.0010614	.57875[.567]
dLOPEN	-0.011138***	0.0035756	3.1151[.004]
Dc	0.45246**	0.21497	2.1047[.044]
Dt	0.0014762**	0.4580E-3	3.2229[.003]
ECM(-1)	-0.40189***	0.064658	-6.2155[.000]
R-Squared 0.94489			R-Bar-Squared 0.92778
F-stat. F(8,30) 62.1470[.000]			DW-statistic 2.2523

Source: Microfit 4.1 output result ***, **, * indicates statical significance at 1%, 5% and 10% respectively

The estimated coefficients of the short run model imply that real gross domestic product is well explained by the variables incorporated in the model. The adjusted R-squared (R-Bar-Squared) reveals that 92.77% of the short-run variation in real gross domestic product is explained by the explanatory variables included in the model. The adequacy of the model is also indicated by the F-statistic.

From the above table the coefficient of lagged error correction term (-0.40) is negative and stastically significant at 1% level of significance. The negative and significant coefficient is a proof of cointegrating relationship among the dependent variable and it's regressors. As shown above the coefficient of ECM (-1) is -0.40 showing that the deviation from long term growth rate of gross domestic product is corrected by 40% in the following year. Moreover, the ECM(-1) coefficient implies that the deviation from long run equilibrium level of real GDP in current period is corrected by 40% in the next period to bring back equilibrium when there is a shock to a steady state relationship. As implied by Chandran et al (2010) cited in Tsadikan, (2013), the long run effect can be captured by ECM term. Thus, in the long run LINVG, LLFP, LHK, LEDGDP, LDSEXP, and LOPEN granger cause LRGDP. This further confirms causality run interactively through ECM from the explanatory variables to LRGDP. Therefore, we can infer that there exists unidirectional causality that runs from external debt to economic growth, in view of the fact that, Autoregressive Distributed lag model doesn't require testing for granger causality since, it considers endogenity problem in the model. The result is consistent with Amoateng and Amoaku (1996) for a sample of African countries, and Karagol, (2002) for Turkey.

The effect of the all the explanatory variables in the short run are found to be similar with that of the effect that they were having in the long run.

Similar to the long run effect, the variable real domestic investment as share of GDP which is used as proxy for physical capital is found to have positive and significant effect at 1% level of significance in the short run. The coefficient of the variable indicates that a 1 percent increase in real domestic investment as share of GDP will

result in 0.045 percent rise in real gross domestic product. The result is consistent with the findings of Hailemariam, (2011) for Ethiopia, Ali and Mustafa, (2011) for the case of Pakistan and Karagol, (2002) for the case of Turkey.

The variable human capital is also found to be positive and stastically significant at 1% level of significance in the short run. The result is in line with what was initially hypothesized. The result clearly implies that human capital is an important determinant of output. The short run elasticity of LRGDP with respect to LHK is indicating one percent increase in annual real education expenditure which is used as a proxy for human capital induces 0.22324 percent increment in output. The finding is consistent with Hailemariam, (2011) for Ethiopia and Ali and Mustafa, (2011) for Pakistan. But inconsistent with the result of Karagol, (2002) for Turkey where the error correction model estimates clearly implies that human capital is not an important determinant of economic growth in the short term.

Likewise to the long run effect, the variable external debt as share of GDP exerts a significant negative effect on economic growth in short run as well. The result is significant at 1% level of significance. This indicated that the effect of external debt in Ethiopia during the period under consideration is permanent as well as transitory and debt overhang occurs both in short and long run. In the short run, improper management of external debt contributes mainly for the negative effect of external debt on economic growth. The coefficient of external debt as share of GDP indicates that 1 percent increase in external debt as a percentage of GDP will cause 0.0072646 percent decrease in real GDP in the short run. The result is inconsistent with Jonse, (2002) for Ethiopia and Nawaz et al (2012) for Pakistan. But the result is consistent

with Hailemariam, (2011) for Ethiopia, Were, (2001) for Kenya, Shabbir (2013) for 70 developing countries, and Choong et al, (2010) for Malaysia.

The variable trade Openness still maintain it's negative sign and stasically significant at 1% level of significance in the short run. As suggested by theory of Broda, Greenfield and Weinstein (2006), countries that mostly require economic development will not benefit from openness as a result of being deficient of complementary inputs, institutions, general knowledge capital, etc. These factors could contribute for the negative effect of openness on economic growth as in the case in the long run. In addition, the world economic crisis from 2008-2011 can also contribute for the negative effect of trade openness on economic growth. Since, the domestic economy is influenced by the situation in the rest of the world. The result is inconsistent with Hailemariam, (2011) for Ethiopia and Akram, (2011) for Pakistan even if he found it to be insignificant in the short run but it's sign is found to be positive. The result is consistent with Jin, (2006) for South Korea.

The variable labour force is also found to have negative but insignificant effect on economic growth in the short run. The result is inconsistent with Jonse, (2002) for Ethiopia even if he used different method of estimation he found positive effect of labour force on economic growth, Hailemariam, (2011) for Ethiopia and Karagol, (2002) for Turkey. And it is consistent with Ali and Mustafa, (2011) for Pakistan.

Similar to the long run effect, the variable debt service as percentage of export is also found to be negative but insignificant in the short run. Since, this variable is not found to be significant there is no evidence of crowding out effect in the short run. The

result is consistent with Jonse, (2002) for Ethiopia even if he used different method of estimation he found the same result with this study, Were, (2001) for Kenya. The result is inconsistent with Akram, (2011) for Pakistan, Karagol, (2002) for Turkey and Cholifihani, (2008) for Indonesia.

Chapter Six: Conclusion and Recommendations

6.1. Conclusion

The existence of severe shortage of capital is a common observable fact in most developing countries like Ethiopia, in order to carry out development programs. Consequently, external borrowings turn out to be essential in order to supplement the internal financial resources. In the literature, there is a great controversy whether external debt stimulates economic growth or deters growth. Some studies got positive relationship, some got negative relationship while, others got no significant relationship between external debt and economic growth for diverse economic situation.

The heavy dependence on external debt for deficit financing brings an outcome of debt burden problem which is reflected by a rising level of stock of external debt and debt servicing .The debt burden problem is a great concern because it imposes a number of constraints on it's economic growth rather than causing economic growth. Therefore, the objective of this paper is to examine long run and short run relationship between external debt and economic growth of Ethiopia by using yearly data for the period 1970/71-2010/11. Moreover, the trend, structure and composition of the country's external debt was also assessed.

The study used the methodological approach known as Autoregressive Distributed Lag Model or bound testing approach to examine the long run and short run relationship between external debt and economic growth in Ethiopia. This approach has greater advantage than that of Johnson cointegration test in which it is useable irrespective of whether the underlying regressors are purely I(1), purely I(0), or

mixture of the two. Stationarity test is applied using ADF test and pp test and revealed that the variable LLFP becomes stationary at level, or I(0) while the remaining variables become stationary after first differencing or I(1). The bound test is conducted and proved the presence of long run relationship among the variables in the model.

The study attempted to examine the long run and short run relationship between external debt and economic growth, considering real gross domestic product as function of annual education expenditure (proxy for human capital), real domestic investment as share of GDP, total labour force as share of total population, total external debt as percentage of GDP, debt service as percentage of export and openness in the economy.

The empirical evidence revealed that both real domestic investment and human capital are found to have positive relationship with economic growth. This is in line with the conventional and modern growth theories. On the other hand, the variable labour force (both employed and unemployed labour force) as share of total population is found to have negative but insignificant relationship with economic growth. A positive relationship between labour force and output depends most importantly on employed labour force. But, we should bear in mind that the variable labour force includes both the employed and unemployed labour force. Therefore, the negative relationship is consistent with the argument of (Todaro, 1994) which implies that the contribution of the labour force can be negative (adversely affect economic growth) for developing countries, in that additional unskilled and inefficient labour makes output to decline rather than increasing it.

The long run estimation also revealed that external debt has a significant negative relationship with economic growth. This clearly shows that higher external debt discourages economic growth. Therefore, it is verifies the existence of debt overhang situation in Ethiopia during the period under the study. But, the other debt burden indicator debt service as a percentage of export is found to be negative but, insignificant. Since, it is not significant there is no evidence of crowding out effect.

The other variable included in the study was trade openness which was found to have unexpected sign. The result showed that it has had negative effect. This could be justified with some reason like poor quality of institutions can make openness to have a negative effect. As suggested by theory of Broda, Greenfield and Weinstein (2006), countries that mostly need economic development will not benefit from openness due to deficiency of complementary inputs, institutions, general knowledge capital, etc. Evidences suggest that the failure of trade reforms to promote trade and growth in African countries may be attributable to poor quality of institutions (Ndkumana and Balimoune 2007). In addition, the world economic crisis from 2008-2011 can also contribute for the negative effect of trade openness on economic growth. Since, the domestic economy is influenced by the situation in the rest of the world.

The short run dynamics of the model implied that all the variables are consistent with the long run estimation. Also a significant adjustment parameter obtained from the estimation confirmed the long run relationship among the variables. An estimation of adjustment parameter suggested that 40 percent of any deviation from the long run equilibrium corrected in one year.

Regarding the causality, the ARDL model revealed the existence of a unidirectional causality running from external debt to real gross domestic product. This indicates that external debt is a deciding determinant of economic growth and the existence of causality in external debt output relationship may be due to the borrowed funds being mismanaged or misallocated. As a result, debt overhang problem have emerged. Therefore, external debt is found to have a negative effect rather than causing economic growth in Ethiopia for the period under study.

6.2. Policy Recommendations

Based on the results obtained, the following policy recommendations are forwarded.

- ✓ In the country the decisions with regard to external debt should be related with a wide-ranging policy frame work that will assure the productivity of invested resources in order to service the debt. This can be attained by devoting the resources on selective and productive investment areas together with basic infrastructural developments that facilitate the productivity of other sectors of the economy.

- ✓ The government could play fundamental part in stimulating the economy if the resources gained from the debt relief initiatives are applied at productive public investments and social expenses for the poor in the country.

- ✓ There should be close monitoring and consistent debt management strategies to avoid the misallocation and mismanagement of external debt. Thus, introducing effective external debt management policy is crucial so as to remove misutilization of resources.

- ✓ It should be recalled that the government should also continue to work more on human capital since, it is found to have positive effect. That is, human capital development makes it possible to increase the productivity of workers and their income, as well as that of the national economy. This enhances development to strengthen the economy.

- ✓ The country should be able to benefit from trade openness by solving the problems that made it to have negative effect. The country should do more on quality of inputs and institutions so as to benefit from trade openness. Since,

openness is highly important to solve the problems with regard to external debt. Like, government could expand the country's export base in order to raise export earnings and promote industrialization so as to reduce import dependency. This enables the country to service the debt.

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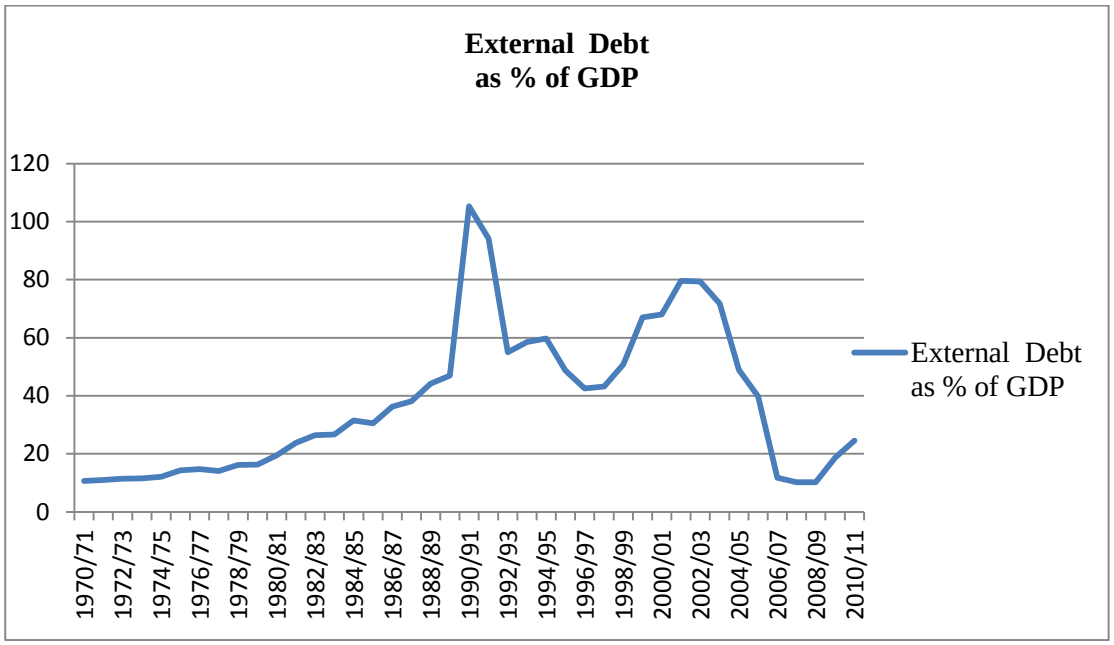
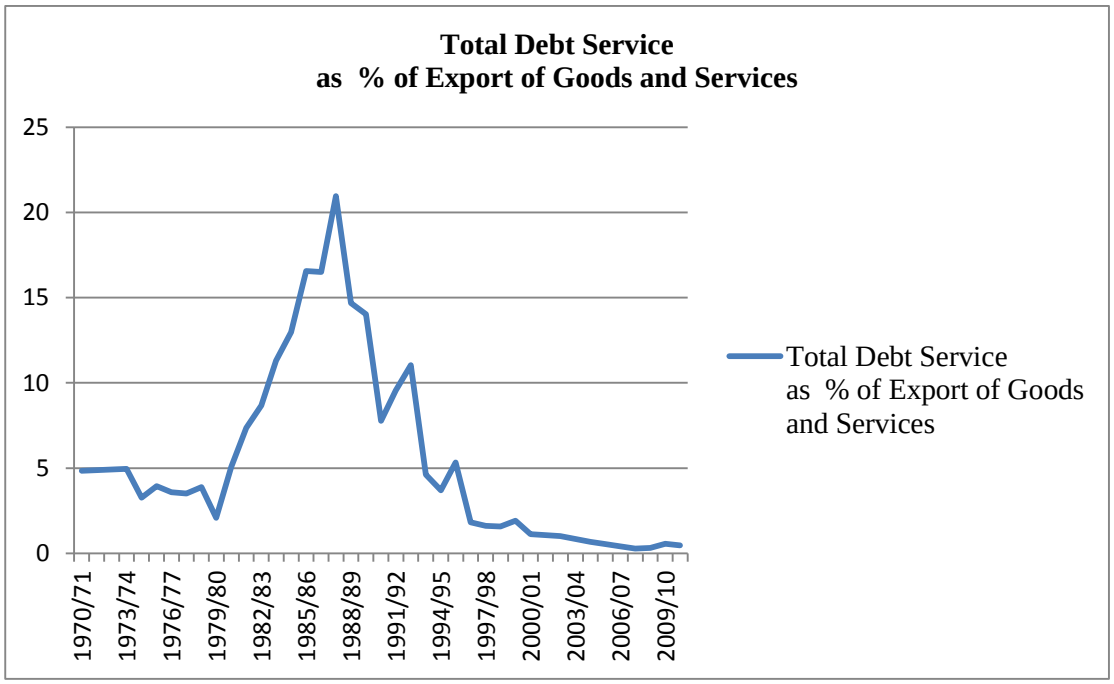
Appendices

Appendix 1 Trend in Total External Debt (as % share of GDP) from 1971-2011



Appendix 2 Trend in Total Debt Service as % of Export of Goods and Services 1971-2011



Appendix 3 Estimated Long Run Coefficients using the ARDL Approach

ARDL(1,1,0,0,0,0,0) selected based on Schwarz Bayesian Criterion

Dependent variable is LRGDP
39 observations used for estimation from 1973 to 2011

Regressor	Coefficient	Standard Error	TRatio[Prob]
LRINVG	.016172	.0065850	2.4560[.020]
LLFP	-.14462	.095394	1.5161[.140]
LRHK	.55547	.15259	3.6402[.001]
LEDGDP	-.018076	.0041649	4.3402[.000]
LDSEXP	-.0015284	.0026440	.57809[.568]
LOPEN	-.027714	.010960	2.5286[.017]
INPT	1.1258	.42445	2.6525[.013]
T	.0036731	.8357E-3	4.3951[.000]

Appendix 4 Error Correction Representation for the Selected ARDL Model

```
 ARDL(1,1,0,0,0,0,0) selected based on Schwarz Bayesian Criterion
*******************************************************************
 Dependent variable is dLRGDP
 39 observations used for estimation from 1973 to 2011
*******************************************************************
 Regressor         Coefficient    Standard Error TRatio[Prob]
 dLRINVG             .045186      .0032867       13.7483[.000]
 dLLFP               -.058122     .040773        1.4255[.164]
 dLRHK                .22324      .053884        4.1429[.000]
 dLEDGDP            -.0072646     .0019536       3.7186[.001]
 dLDSEXP             -.6143E-3    .0010614       .57875[.567]
 dLOPEN              -.011138     .0035756       3.1151[.004]
 dINPT               .45246       .21497         2.1047[.044]
 dT                  .0014762     .4580E-3       3.2229[.003]
 ecm(-1)             -.40189      .064658        6.2155[.000]
*******************************************************************
*********
 ecm = LRGDP   -.016172*LRINVG +     .14462*LLFP     -.55547*LRHK +
.018076*LEDGDP+  .0015284*LDSEXP  +  .027714*LOPEN     -1.1258*INPT  -
.0036731*T
*******************************************************************
*********
 R-Squared                   .94489     R-Bar-Squared    .92778
 S.E. of Regression          .0029374   F-stat. F(8,30)  62.1470[.000]
 Mean of Dependent Variable .0031590    S.D. of Dependent .010930
 Residual Sum of Squares    .2502E-3  Equation Log-likelihood 177.8179
 Akaike Info. Criterion 167.8179  Schwarz Bayesian Criterion 159.5001
 DW-statistic                2.2523
```

Appendix 5 Diagnostic Test Results

```
Autoregressive Distributed Lag Estimates
    ARDL(1,1,0,0,0,0,0) selected based on Schwarz Bayesian Criterion

*************************************************************************
*    Test Statistics        LM Version        *         F Version       *
*************************************************************************
*                       *                                 *
* A:Serial Correlation* CHSQ(1)=2.2058[.137]*F(1,28)=  1.6786[.206]
*                       *                                 *
* B:Functional Form  *  CHSQ(1)= .53081[.466]*F(1,28)=  .38635[.539]
*                       *                                 *
* C:Normality        *  CHSQ(2)=  1.2932[.524]*       Not applicable
*                       *                                 *
* D:Heteroscedasticity* CHSQ(1)= 5.0472[.025]*F(1,37)=  5.5002[.024]
*************************************************************************
*********
   A:Lagrange multiplier test of residual serial correlation
   B:Ramsey's RESET test using the square of the fitted values
   C:Based on a test of skewness and kurtosis of residuals
   D:Based on the regression of squared residuals on squared fitted
    values
```

Appendix 6 ARDL Regression result with additional variable (inflation) as a regressor in the growth model

```
       Estimated Long Run Coefficients using the ARDL Approach
  ARDL(1,1,0,0,0,0,0,0) selected based on Schwarz Bayesian Criterion
*************************************************************************
*********
 Dependent variable is LRGDP
 39 observations used for estimation from 1973 to 2011
*************************************************************************
*********
 Regressor              Coefficient     Standard Error  T-Ratio[Prob]
 LRINVG                    .011602           .017290    .67102[.508]
 LLFP                      -.12192            .12624    .96572[.342]
 LRHK                       .52736            .18290    2.8833[.007]
 LEDGDP                    -.018249          .0043336   -4.2109[.000]
 LDSEXP                   -.9906E-3          .0032943   -.30070[.766]
 LCPI                     -.0077345           .026766   -.28896[.775]
 LOPEN                     -.026116           .012422   -2.1023[.045]
 INPT                        1.2412            .58531    2.1206[.043]
  T                         .0040430          .0015339    2.6358[.014]
```

Appendix 7 Result of Error Correction Representation of the Selected ARDL Model (with additional variable)

```
   Error Correction Representation for the Selected ARDL Model
   ARDL(1,1,0,0,0,0,0,0) selected based on Schwarz Bayesian Criterion
********************************************************************
*********
 Dependent variable is dLRGDP
 39 observations used for estimation from 1973 to 2011
********************************************************************
*********
 Regressor              Coefficient     Standard Error T-Ratio[Prob]
 dLRINVG                   .044198         .0047441      9.3164[.000]
 dLLFP                    -.048337         .053198      -.90862[.371]
 dLRHK                     .20908          .072987       2.8647[.008]
 dLEDGDP                  -.0072351        .0019877     -3.6399[.001]
 dLDSEXP                  -.3927E-3        .0013167     -.29827[.768]
 dLCPI                    -.0030665        .010457      -.29325[.771]
 dLOPEN                    -.010354        .0045102     -2.2957[.029]
 dINPT                      .49211          .25690       1.9156[.065]
 dT                         .0016029       .6352E-3      2.5234[.017]
 ecm(-1)                   -.39647         .068246      -5.8095[.000]

ecm = LRGDP-.011602*LRINVG+.12192*LLFP -.52736*LRHK+.018249*LEDGDP
 +.9906E-3*LDSEXP+.0077345*LCPI+.026116*LOPEN-1.2412*INPT-.0040430*T
********************************************************************
********

R-Squared           .94505          R-Bar-Squared      .92543
F-stat. F(9, 29) 53.5103[.000]      DW-statistic       2.2596
```

Declaration

I, the undersigned, declare that this thesis is my original work and has not been presented for a Masters degree in any other university, and that all the sources of materials used for the thesis are duly acknowledged.

Declared by:

Name: Wessene Kassa

Signature: _____

Date: _____

Confirmed by (Advisor):

Name: Fantu Guta (PhD)

Signature: _____

Date: _____

Place and Date of Submission Addis Ababa/ July, 2014