Causal Nexus between Export, External Debt and Economic Growth: The Case of Ethiopia

By

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This is to certify that the thesis prepared by Medina Menur, entitled: *Causal Nexus Between Export, External Debt and Economic growth: the case of Ethiopia* and submitted in partial fulfillment of the requirements for the Degree of Master of Science in Economics (International Economics) complies with regulations of the University and meets the accepted standards with respect to originality and quality.

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Abstract

This study aimed to investigate the causal nexus between Export, External debt and Growth using the annual data from 1985-2016 in the case of Ethiopia. The study applied the Auto Regressive Distributed Lag (ARDL) Approach to investigate the short run and long run dynamics of the variables whereas the Granger causality approach is used to study the nature and direction of causality between the variables. The bounds F–test for cointegration test yields evidence of a long-run relationship among the variables. The Granger Causality test result revealed that there is no evidence of Granger causal relationship between export and growth implying neither export led growth nor growth driven export is valid in the context of Ethiopia. On the other result, the study found that there is a uni directional Granger causality from external debt service to growth while there is no Granger causality between external debt stock and economic growth in both directions. Finally, our result showed that there is a bi directional Granger causality relation between investment and export implying that export and capital formation Granger cause to each other.

Keywords: economic growth, exports, external debt, cointegration analysis, causality

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List of Acronyms

ADF:	Augmented Dickey Fuller
AIC:	Akaike Information Criteria
ARDL:	Auto Regressive Distributed Lag
CUMSUM:	Cumulative Sum of Recursive Residuals
CUMSUMSQ:	Cumulative Sum of Squares Recursive Residuals
ECM:	Error Correction Model
ELGH:	Export Led Growth Hypothesis
FDI:	Foreign Direct Investment
GDP:	Gross Domestic Product
GTP:	Growth and Transformation Plan
IMF:	International Monetary Fund
LDCs:	Least Developed Countries
NBE:	National Bank of Ethiopia
OECD:	Organization for Economic Cooperation and Development
OLS:	Ordinary Least Square
PP:	Philips and Peron
SBIC:	Schwarz's Bayesian information criterion
UECM:	Unrestricted Error Correction Model
VECM:	Vector Error Correction Model
WDI:	World Development Indicator

CHAPTER ONE

INTRODUCTION

1.1. Background of the study

The economic growth of developing countries is the popular subject of researches and discussions from the earliest to recent economists. Since the earliest economic theories by Adam Smith and David Ricardo, international trade was considered to play an important role in economic growth. The neoclassical approach also emphasizes the importance of competitive advantages in international trade. Each country maximizes its welfare through the activities which are the most efficient regarding resource and production.

Regarding international trade, there are two well-known alternative strategies that have been followed by different nations. The first one is Import substitution (inward oriented strategy) which emphasizes on developing the economy through appreciating and protecting the domestic sector from import dominance. The other alternative is export expansion (out ward oriented strategy) which emphasizes on the economic benefits of participation in the outside world that is known as export led growth (Ahmed et al, 2000).

Before 1970s, most LDCs used to follow the inward oriented strategy. However, since the mid-1970s in most developing countries there has been a considerable shift towards export promotion strategy from the previous inward oriented strategy. Shirazi and Manap (2004). This shift towards new strategy was because the success of the East Asian countries attributed to the performance of the external sector where the export sector was given a greater emphasis coupled with failure of the import substitution (IS) strategy, which once was held by many LDCs as the appropriate policy during the 1950s and 1960s (Debel ,2002). For these reasons, most LDCs gave due attention to the export promotion trade strategy. It is argued that this strategy would help primary commodity exporting countries achieve optimal scale and enable them bring foreign technology which is considered to be important for the growth process of these countries.

The relationship between economic growth and exports in developing countries has drawn the attention of researchers both theoretically and empirically since the classical economic theories by Adam Smith and David Ricardo, who argued that international trade plays an important role in economic growth, and that there are economic gains from specialization. A series of empirical

studies have been conducted to investigate the contribution of exports to economic growth and to examine the hypothesis whether a causal relationship exists between these two variables. There has also been a debate in literatures over the validity of export led growth hypothesis or growth driven export hypothesis to developing countries (Dodaro, 1993).

Export-led growth hypothesis postulates that export expansion leads to better resource allocation creating economies of scale and production efficiency through technological development. It also facilitates capital formation and employment creation. In this regard, the export Led Growth hypothesis suggests that export is a key to promote economic growth and thus raises the rewards of factors of production. For many poorest LDCs, there is a need to earn foreign exchange in order to import capital goods and materials required for domestic production. Thus, exports promote domestic capital accumulation and, consequently, overall economic growth (Dodaro, 1993). Furthermore, it opens investment opportunity in the economies due to the higher level of income and saving, thus leads to the sectoral growth.

Export earnings are the most important source of foreign exchange to developing countries that can be used to ease the pressure of balance of payment and reduce the impact of external shocks on domestic economy (Medina-Smith, 2001).It is generally accepted that economies having high export performance also perform well in their GDP growth and vice versa. This raises an important question about the nature of the link between exports and GDP. Whether the co-movement between exports and GDP is in accordance with growth accounting identity in which exports is one of the components of GDP; or whether there exists a causal relationship between the two (Afzal et al, 2000).The existence of such nexus between export and economic growth, therefore, has been the focus of many researchers.

Ethiopia, like many other developing countries has actively pursued the import- substitution industrialization strategy during the Imperial and Derge regimes. The World Bank (1987) classified Ethiopia as one of the strongly inward oriented countries during the periods of 1963-73 and 1973-85, which coincides with the Imperial and part of the Derge regimes, respectively. However, the IS trade strategy hadn't performed well, because the import competing industries remained infant and were at their primary stage despite the tariff and non-tariff protection. With the fall of the Dergue regime, however, the current regime initiated trade liberalization in which export promotion is the major component of the program (Debel 2002; Messay, 2009).

To assess the contribution of export to economic growth of Ethiopia, many researches have been conducted in terms of bivariate causal relationship study. In the investigation of the validity of the export led growth hypothesis to Ethiopia, mixed results have been observed most of which are inclined to support export led growth hypothesis. According to Debel (2002), causality runs from exports to economic growth in case of Ethiopia. Also the study by Tigist et al (2015) empirically determined the causality relationship between agricultural exports and economic growth (GDP) in Ethiopia and found bidirectional relationship between coffee export, oilseed exports and economic growth whereas unidirectional relationship was found between pulses export and economic growth which is running from pulse export to economic growth (GDP).Biramo (2012) with the application of Granger causality test found a result that supports export led growth strategy for Ethiopia. However, these studies did not include some other relevant variables such as external debt, exchange rate, external debt servicing, etc. that could have significant relationship with the two variables in question (Saad, 2012) .

On the other side, External debt burden has been one of the most important bottlenecks which hindered sustainable growth in Ethiopian economy. Following the proclamation of the Growth and Transformation plan (GTP), the Ethiopian government has been making large amount of government expenditure which in turn widen the country's fiscal deficit problem and led to massive debt accumulation (Mulugeta, 2014).In addition, The Ethiopia's large-scale public investment in infrastructure has been financed by significant borrowing, which has resulted in higher public debt (IMF, 2015).

The Total debt stock of the country in 2016 is reported to be around 23 billion USD (World Bank data, 2018) which accounts for 44percent of the GDP in the year. On the other hand, the country spent around 1.24 billion USD for servicing its debt in the year 2016 (World Bank, 2018).And this amount equals with 21 percent of the export revenue. Furthermore, according to IMF's report, the external debt of the country is at risk of distress because the export performance is less than the expected in order to service the debt burden (IMF, 2016). Given this conditions along with the reliance of the export sector only on the primary products which are subject to price fluctuation is also one of the reasons for the country to stay in the debt burden.

The question of whether export growth causes economic growth or economic growth causes export growth in case of Ethiopia is an unresolved issue. Because most of the earlier studies on the export - growth nexus were using only two variables. In other words, they employed

bivariate models which cause an omitted variable problem. Thus, to avoid this problem, a multivariate model is used in this study by adding external debt service and external debt stock into the model because, these two variables have a potential significant impact on the relationship between export and growth. Many authors also have utilized different econometric models for different countries. However, to the extent of my readings of literatures, no study has been conducted on the causal relationship between GDP and export for Ethiopia by introducing external debt in the model and using the ARDL bounds testing approach. This paper will contribute as the first trivariate study to address the existing economic problem of Ethiopia. As well as it will fill the in previous literatures in the area.

1.2 Statement of the problem

The importance of export and its impact on economic growth of developing countries such as Ethiopia raises the question about the nature and direction of causality between these two macroeconomic variables. In other words, it is worthwhile to investigate whether a causal relationship exists between these two variables and weather the co-movement between exports and GDP is in line with the export-led growth hypothesis. Bivariate causality analysis fails to include some other relevant variables such as external debt stock, external debt service, exchange rate, capital formation, etc. that could have significant relationship with the two variables in question (Ahmed et al,2000).

There were many cross sectional and time series bivariate causality studies conducted in this area to study the causal relationship between export and growth. However, most of those literatures failed to include the relevant variables. And they mainly did their empirical analysis through the two variables i.e. GDP or real GDP to represent growth and export of goods and services to represent export (Laszol, 2004; Shihab et al 2014; Sampathkumar and Rajeshkumar, 2016). Similarly in the Ethiopian case, (Chemeda, 2001; Tigist et al, 2015).Hence this study believes that it is necessary to incorporate those omitted variables such as external debt stock and external debt service in order to make a strong analysis of the causality between export and growth. The limitation of these bivariate studies is that it is difficult to conclude the result without including other factors .Because, Even if exports have great role in Ethiopian economy, in most developing countries including Ethiopia, the income generated from export might not directly be used for growth purpose rather most of the revenue is used for external debt service. Hence, without including external debt stock and external debt service in our model, we cannot get the real causal nexus of export and growth in Ethiopian case.

For that reason, we find many empirical studies which included additional relevant variables in the model such as real import, external debt service and exchange rate and found different results. For instance, (Shirazi and Manap, 2004; Ahmed et al, 2000; Saad, 2012) etc. Similarly in case of Ethiopia, (Jara ,2013;Senayit,2014;) investigated the causal relationship between export

and growth by incorporating additional relevant variables such as import and domestic demand and found out a different outcome. As per the findings of Senayit(2014), the adoption of both Export -Led Growth and Growth-Led Export growth strategies is relevant in case of Ethiopia.

There is also an argument that Countries with promising export potential tend to succeed in obtaining more foreign loans and, hence, to carry larger external debt and have a larger foreign debt servicing burden which will then affect the growth negatively (Feder ,1982). Thus, the expected positive relationship between exports growth and economic growth may not be significantly obtained, because, the resources from exports are directed to servicing external debt instead of investment or any other growth enhancing programs.

According to various years' reports of the IMF, Ethiopia is one of Highly Indebted Poor Countries and its external debt stock is reported to be at moderate risk of distress. IMF (2016).There is also a potential of causality between export and external debt in the case of Ethiopia because export revenue is the major source of foreign debt servicing, in many developing countries such as Ethiopia. Furthermore, the current high exchange rates with domestic fiscal deficits caused the trade balance to be in a deficit position, necessitating foreign borrowings. For this reason, the nature and direction of the causal relationship between economic growth and Exports growth needs to be empirically reconsidered taking into consideration the role of foreign debt in such indebted countries such as Ethiopia (Ahmed et al, 2000).

In light of the above issues, the aim of this research work is to fill the above mentioned gaps of previous literatures i.e. studying the causal nexus between export and growth by including in the model external debt stock and external debt service which are relevant but omitted variables in the previous works .This is due to the fact that it is necessary to study the channels in which export affects the economic growth of Ethiopia by considering the variables that have potential causal relation with the variables in question. The central research question is, what is the nature and direction of causal relationship between export, external debt and growth in Ethiopia? Furthermore, this study intended to investigate the short run and long run relationship between the variables by including other control variables such as capital formation and inflation rate that can affect the economic growth in the context of Ethiopia. An Auto Regressive Distributed Lag (ARDL) bound test and Granger causality test approach is employed for these purposes.

1.3 Objective of the study

The general objective of this study is to investigate the Causal nexus between Export, Economic Growth and External debt in Ethiopia.

Specifically the study aims :

- To empirically examine the dynamic relationship between exports and economic growth i.e. to assess the long run relationship between export growth and economic growth through ARDL cointegration analysis.
- To examine the nature and direction of causation between the export growth and economic growth using Granger's causality test for Ethiopia.
- To examine the nature and direction of causation between external debt and economic growth using Granger's causality test for Ethiopia.
- To suggest appropriate policy options on the basis of the empirical findings

1.4. Significance of the Study

This paper is expected to be contributing as a first multivariate analysis of causality between export growth and economic growth in the case of Ethiopia. It is believed to be appropriate reference to further studies as it is empirical analysis of a recent data from 1985-2016. Moreover, this study will add some value by showing the real causal relationship between export and growth for Ethiopia and suggesting the direction of focus to policy makers to design economic strategies, in order to address key problems and to implement the appropriate policy.

1.5. Scope of the Study

This study focuses on the causal nexus among export ,growth and external debt in case of Ethiopia. And the study covers time series data between 1985 and 2015/16. The major macro-economic variables incorporated in the econometric model are Rate of growth of Real GDP, rate of growth of real export, external debt stock, external debt service , Gross capital formation and rate of inflation. The study is limited to the case of Ethiopia and hence the policies recommended at the end of the paper are also subject to the Ethiopian case.

1.6. Organization of the Paper

The rest of the paper is organized as follows. Chapter two gives a brief review of both the theoretical and empirical literatures related to trade, export, external debt and growth. Subsequently, the third chapter deals with the overview of the Ethiopian economy in general and related to trade, export, external debt and growth in particular. Chapter four explains model specification, the data source and type used along with the methodology adopted. The econometric analysis is discussed in chapter five. The last chapter deals with conclusions and policy implications based on the findings obtained from the study.

CHAPTER TWO: LITERATURE REVIEW

The relationship between exports and economic growth has been a popular subject of debate among economists all over the world. The role of exports and the impact of debt particularly in the economies of developing nations have been subject to a wide range of empirical and theoretical studies. The literature review section of this study will deal with both the theoretical and empirical literature regarding the nexus between export, external debt, and growth.

2.1. REVIEW OF THEORETICAL LITERATURES

In this section, different theories and views of scholars regarding trade, external debt and economic growth are discussed.

2.1.1 Theories of Trade

The idea of trade and economic growth nexus was an area of discussions and writings of different scholars for more than two centuries. (Mesay, 2009). As Bhagwati put it, the initial wave of favorable arguments with respect to trade can be traced to the classical school of economic thought that started with Adam Smith.

Before the introduction of the classical trade theory, the idea of Mercantilists was popu1lar from sixteenth to the middle of the eighteenth century. The mercantilists advocated that government must stimulate the nation's exports and discourage and restrict imports since they believed that the wealth of a nation is measured by the amount of gold that it acquired. However this theory was latter criticized by Adam Smith since it considered trade as a zero-sum game (Salvatore, 2013, p: 32).

The development of trade theory began from the seventeenth century through the first part of the twentieth century. The basic issues that the earliest theories attempted to raise were on the basis for trade and the gains from trade that derive a nation to voluntarily engage in trade. And how are gains from trade generated? How large are the gains and how are they divided among the trading nations? The other issue also was the pattern of trade? That is, what commodities are traded and which commodities are exported and imported by each nation? The development of these theories provided extensive theoretical discussions concerning the patterns and role of trade in economic growth (Salvatore, 2013, P: 34).

As opposed to mercantilists, Adam Smith raised a simple truth that for two nations to trade with each other voluntarily, both nations must gain. He also argued that accumulations of wealth had little part in welfare of nations. Adam smith attacked the main mercantilists' views and proposed the classical theory of international trade based on the concept of absolute advantage model. According to him stock of human, man-made and natural resources rather than stock of precious metals were the true measure of the wealth of a nation. In addition, he showed that trade can make a nation better off without making another worse off. According to Adam Smith, trade between two nations is based on absolute advantage. He argued that a country should export goods and services in which it has absolute advantage (less cost per unit) and import goods and services in which it has absolute disadvantage. (greater cost per unit).Hence, countries can gain by each specializing in the production of the commodity of its absolute advantage and exchanging part of its output with the other nation for the commodity of its absolute advantage.

However, the theory of Adam smith fails to explain how trade can occur if there is absolute advantage in both commodities. As Bjornskov,(2005) put it, the law of comparative advantage is one of the most important and still unchallenged laws of economics, with many practical applications.

According to the law of comparative advantage, even if one nation is less efficient than (has an absolute disadvantage with respect to) the other nation in the production of both commodities, there is still a basis for mutually beneficial trade. The first nation should specialize in the production and export of the commodity in which its absolute disadvantage is smaller (this is the commodity of its comparative advantage) and import the commodity in which it's absolute disadvantage is greater (this is the commodity of its comparative disadvantage).

"*The theory of comparative advantages has been called the most successful theory ever in social sciences. It is often found that about half of the entire world trade can be explained by differences in comparative advantages."(*Bjornskov, 2005, p: 13)

According to neoclassical economists difference in factor endowments is one source for comparative advantages.

As explained by the Hechsher Ohlin theory, some countries are endowed with a lot of capital in which capital is cheap whereas others had a large labor force where labor is cheap. Hence this relative price of factor inputs can generate comparative advantages.

The other source of comparative advantage is Economies of scale: An economy of scale explains trade between countries with similar characteristics. Once the production of one commodity increases, the average unit cost to produce the commodity becomes lower.One country would have comparative advantage on the production of the commodity in which it has low average unit cost. (Bjornskov, 2005 p: 13)

The analyses of the classical economists in late eighteenth and nineteenth centuries were based on the labor theory of value and the assumption of constant costs (that is, constant returns to scale).In late nineteenth and early twentieth, the development of the neoclassical economic theory (the neoclassical school) provided tools for analyzing the impact of international trade in a more rigorous and less restrictive manner extending and improving on the basic foundations of the classical economists. The questions raised by the neoclassical economists were: What determines a country's comparative advantage? and how does international trade affect the payments or returns to factors of production such as labor and capital?

Under the neoclassical school of thought, the dominant model of comparative advantage in modern economics is the Heckscher – Ohlin model. The key points in the H – O theorem are: Differences in factor endowments, that is, different relative factor endowments and different factor intensities. That is, factor proportions are different between the two countries. This theorem postulates that a nation will export the commodity whose production requires the intensive use of the nation's relatively abundant and cheap factor and imports the commodity whose production requires the intensive use of the nation's scarce and expensive factor. In short, the relatively labor – rich nation exports the relatively labor-intensive commodity and imports the relatively capital-intensive commodity (Sen, 2010).

The Stolper – Samuelson Theorem, which is part of H- O theory, on the other hand, postulates that an increase in the relative price of a commodity (for example, as a result of a tariff) raises the return of earnings of the factor used intensively in the production of the commodity. For example, if the price of a labor-intensive good rises, then the price of labor (wage rate) will rise

because labor is the factor used intensively in that industry, while the price of capital (rental rate) will fall. Similarly, if the price of a capital-intensive good (for example machine) rises, then the price of capital (the rental rate) will rise, while the wage rate will fall.

The Factor-Price Equalization Theorem is also part of H-O theory, and as Bjornskov,(2005) put it ,the theorem postulates that international trade will bring about equalization (or convergence) in the relative and absolute returns to factors of production across nations. In other words, international trade will cause the return to labor (wage rate) to be the same in all trading nations. Similarly, international trade will cause the return to capital (rental rates) to be the same in all the trading nations.

On the other hand, The New Trade Theories has been developed with main idea that differentiates from previous theories that it, relaxes the assumptions of constant returns to scale to increasing returns to scale and perfect competition to imperfect competition.

Intra-industry Trade: - trade in differentiated products, that is, similar but not identical products. In other words, a country simultaneously has a comparative advantage and a comparative disadvantage in a similar good.

Trade based on Economies of Scale:-An economy of scale is the production situation where output grows proportionately more than the increase in the use of inputs or factors of production. Economies of scale arise because of division of labor and specialization, resulting in increased efficiency (pecuniary advantage – cost advantage) and productivity (more incentive schemes and absence of wastage of time). Thus, mutually beneficial trade is possible based on increasing returns to scale.

Trade based on technological gap model:-The technological gap model holds the view that trade among the industrialized countries is based on the introduction of new products and new production processes. The innovating nation/s shall have a temporary monopoly in terms of patents and copyrights, which are granted to stimulate the flow of inventions. As other countries acquire the new technology, they will be in a position to produce the products. In the meantime, the industrialized countries have introduced still newer products and newer production processes. Thus, the process shall continue.

The product cycle model: - This is an extension of the technological gap model. The hypothesis here is that new products are introduced by advanced countries and produced with skilled labor, but will eventually become standardized and can be produced in other nations with less skilled labor. According to this model, changes in technology and the subsequent introduction of new products can change the pattern of exports and imports. Industrialized countries specialize in the production of new products that embody technological innovations, while developing countries specialize in the production of the already well-established goods. Ultimately, however, developing countries would take over the production of the earlier products by advanced nations.

2.1.2. International Trade and Economic Growth

As indicated above, Traditional trade theory argues that if each nation specializes in the production and export of the commodity in which it has a comparative advantage, then world output will be maximized and each nation would share the gains from international trade. When one considers the current pattern of trade based on comparative advantage, developing countries specialize in primary products (whose prices fluctuate) while developed countries specialize in manufactured products (whose prices tend to rise). Therefore, developing countries are of the view that this pattern of specialization would not enable them to reap the dynamic benefits in the long run. Thus, developing countries argue that the traditional trade theory is static and irrelevant for their development process (JaymeJr ,2001).

According to G. Haberler (1963), although international trade cannot in general be an "engine of growth", it has still some potential benefits to the economic growth of developing countries. He identified four major beneficial effects of international trade as follows:

i) Trade as a vent for surplus, i.e., an outlet for potential surplus.
ii) By expanding markets, trade makes it possible division of labor and economies of scale.
iii) Trade acts as a vehicle for transmission of new ideas, new technology, and new managerial skills.
iv) Trade stimulates and facilitates the international flow of capital (or foreign direct investment, FDI) accompanied by foreign skilled personnel.

2.1.3. Export Led Growth Hypothesis versus Growth driven export growth hypothesis

It has been said much in literatures regarding the role of the export sector to the overall economic performance. The major theory that views exports as an engine of growth is pronounced as the Export Led Growth Hypothesis.

The argument concerning the role of exports as one of the main deterministic factors of economic growth goes back to the classical economic theories by Adam Smith and David Ricardo, who argued that international trade plays an important role in economic growth, and that there are economic gains from specialization (Palley,2011).It has received renewed attention following the highly successful East Asian export-led growth strategy during the 1970s and 1980s, and especially compared to the overall failure of import substitution policies in most of African and Latin American countries(Sen,2010).

Export-led growth theory: - assumes that export advancement is one of the key indicators of growth. It encourages that the overall progress of countries can be achieved not only by mounting the quantity of manpower and investment within the economy, but also by increasing exports (Iqbal et al, 2012).Proponents of this theory argue that export has strong correlation with economic growth and can play key roles to enhance overall economic performance of a country.

As Dodaro(1993) put it, For many poorest LDCs, there is a need to earn foreign exchange in order to import capital goods and materials required for domestic production. Thus, exports promote domestic capital accumulation and, consequently, overall economic growth. It is also argued that exports relax the current account pressures for foreign capital goods by increasing the country's external earnings and attracting foreign investment. In addition, the proponents of the Export Led Growth hypothesis argued that exports bring about technological progress i.e. Export expansion brings about technological progress resulting from foreign competition that is crucial for improvement of factor productivity and better use of resources (Kavoussi, 1984, Moschos, 1987). Furthermore, some scholars have also suggested that export growth may effect output growth through positive externalities on non-exports, through the creation of more efficient management styles, improved production techniques, increased scale economies, improved allocative efficiency and better ability to generate dynamic comparative advantage. If there are incentives to increase investment and improve technology, this would imply a productivity

differential in favor of the export sector (in other words, marginal factor productivities are expected to be higher in the export sector than in the other sectors of the economy). It is thus argued that an expansion of exports, even at the cost of other sectors, will have a net positive effect on the rest of the economy (Sharma and Panagiotidis, 2004). On the other hand, there is a view that exports increase the Total Factor Productivity and consequently the well-being of the country (World Bank, 1993). The basic idea of this argument is that exports increase total factor productivity because of their impact on economics of scale and other externalities such as technology transfer, improving skills of workers, improving managerial skills, and increasing productive capacity of the economy. Another argument in favor of the advantage of export-led growth is that it allows for a better utilization of resources, which reflects the true opportunity cost of limited resources and does not discriminate against the domestic market (Fouad, 2005) .Thus , as the world bank summarized , promoting exports and achieving export expansion are beneficial for both developed and developing Countries for the following major reasons, they generate a greater capacity utilization; I. they take advantage of economies of scale; II. They bring about technological progress; III. They create employment and increase labor productivity; IV. They improve allocation of scarce resources throughout the economy; they relax the current account pressures for foreign capital goods by increasing the country's external earnings and attracting foreign investment; they increase the TFP and consequently the well-being of the country (World Bank, 1993).

Growth driven export hypothesis: postulates that growth affects the performance of export. This can be explained by the assumption that productive firms export more, e.g. as a result of lower domestic costs (Thangavelu - Rajaguru 2004), and a general increase in Productivity should therefore result in increased exports. The productivity increases caused by domestic labor productivity increases or diffusion of foreign technology and from other aspects of trade than export (e.g. imports) could improve the domestic productivity and cause a growth-led export expansion. In this regard, Ifwarsson (2010),Jara(2013),Alimi and Muse,(2012),Senait(2014) support growth –led export hypothesis in their research outcomes.

2.1.4. External Debt

The achievement of reasonable and sustainable level of growth remains the prime objective of every government. This objective, however, requires adequate mobilization of domestic resources, particularly saving for productive investment. In the developing countries, the rate of capital formation is practically low and inadequate to prosecute productive development. Less developed countries suffered from constant supply of investable funds (Clements et al, 2003). The financial institutions (both capital and money markets) are not fully developed for the supply of investable funds. In order to supplement saving investment gap, many of these countries resorted to external sources for procuring financial resources to address the question of capital scarcity and epileptic domestic saving. Reasonable levels of external debt that help finance productive investment are expected to enhance growth, but beyond certain levels additional indebtedness may reduce growth (Pattillo et al, 2002).

External debt or borrowing refers to taking monetary aids from a foreign country or institution. It can be explained in many ways. By definition, external debt refers to the portion of a country's debt that was borrowed from foreign lenders including commercial banks, governments or international financial institutions (Ajayi & Khan, 2000).

A country has a number of options of raising the funds to finance its activities. It can make use of the internal sources such as taxes and fees or it can borrow from abroad if the internal source is not enough to finance the budget deficit. According to the theory in developing countries, the level of domestic savings is not sufficient to finance the needed investment to ensure economic development. Since investment is a function of savings, it is logical to require the use of complementary external goods and services.

The country should borrow abroad if it is anticipated that the return on the borrowed funds will be higher than the cost. If it is not used wisely, debt can hamper the long term growth prospect of the country. External debt does not transform automatically into debt burden when a country optimally make use of the fund. According to Clements et al (2003), in an optimal condition, the marginal return on investment is greater than or equal to the cost of borrowing, in this case debt will bring a positive impact on growth.

According to the neoclassical growth theory, debt has a positive direct effect on economic growth. This is because the amount borrowed if used optimally; it is expected to increase investment. On the other hand the indirect effect of debts is its effect on investment. The transmission mechanism through which the debt affects growth is its reduction on the resources available for investment by debt servicing. Economic theory suggests that reasonable levels of borrowing by a developing country are likely to enhance its economic growth. (Krugman, 1988, Sachs, 1989a). Countries at early stages of development have small stocks of capital and are likely to have investment opportunities with rates of return higher than those in advanced economies. As long as they use the borrowed funds for productive investment and do not suffer from macroeconomic instability, policies that distort economic incentives, or sizable adverse shocks, growth should increase and allow for timely debt repayments. According to debt overhang hypothesis, a certain level of external debt has a direct positive effect to economic growth until a certain point where by an additional debt will have a negative effect to growth (Krugman ,1988).

The Debt Overhang Theory

In order to answer the question why large levels of accumulated debt lead to lower growth, the best-known explanation comes from "debt overhang" theories. which show that if there is some likelihood that, in the future, debt will be larger than the country's repayment ability, expected debt-service costs will discourage further domestic and foreign investment and thus harm growth. Potential investors will fear that the more a country produces, the more it will be "taxed" by creditors to service the external debt, and thus they will be less willing to incur costs today for the sake of increased output in the future (Krugman, 1989).In other words according to Krugman (1989) by a debt overhang we mean the presence of an existing, “inherited" debt sufficiently large which is very difficult for the debtor country to repay and that creditors do not expect with confidence to be fully repaid.

These arguments are represented in the debt "Laffer curve” .The debt laffer curve shows that larger debt stocks tend to be associated with lower probabilities of debt repayment. Debt service is therefore considered as an implicit tax, thereby discouraging investment and stifling economic growth which makes it virtually impossible for highly indebted countries to escape poverty

(Clements et al, 2003;Fonchamayo, 2009).The debt overhang hypothesis suggests that if there is some likelihood in the future that external debt will be larger than the country's repayment ability, the expected debt-service costs would discourage further domestic and foreign investment and harm economic growth (Pattillio et al, 2002). It has been postulated that debt overhang occurs at the peak of the debt Laffer curve. High debt service burden increases expected future taxes on the private sector and lowers private investment. Resources that might have funded investments are consumed by debt servicing. In addition, debt overhang can worsen economic performance by changing the quality of investment.

As it is clearly observed from the above discussions of literatures, from earliest to recent scholars have revealed that international trade/export and growth are correlated and are expected to have important causal relationship to each other. This could be either from export to growth i.e being the main source to foreign exchange or from growth to export i.e through creating positive externalities for a good export performance .On the other hand, most of developing countries are highly reliant on external debt in order to finance their expenditures And according to most of the literatures and the existing situation in the LDCs, high external debt burden creates a pressure on the overall economy by hampering domestic saving and investment through eroding foreign exchange availability. These all facts lead to a conclusion that it is worthwhile to study the causal nexus between exports, external debt so that we can identify the nature and direction of causality among these variables in the context of Ethiopia.

2.2. Empirical Literature Review

Many literatures have been conducted at cross country and country level regarding the relationship between export, external debt and growth on the basis of bivariate and multivariate study. These various studies used different econometric approaches based on the context of their objectives. In the following section, we will explore variety of empirical researches that are previously conducted related to our study.

2.2.1. Cross -Country Studies on the relationship between Export, External debt and Economic growth

Adjaye and Chakraborty (1999) conducted tests of the export-led growth and the import compression hypotheses for four less developed countries (LDCs) such as India, Nigeria, Fiji and Papua New Guinea (PNG).Based on Johansen's multiple co integration tests, they tested for cointegration between real output, exports and imports. According to their findings, real output, exports and imports are found to be co integrated in two of the countries and the resulting error correction models suggested that Granger causality runs from exports and imports to real output in these cases. In this study, Exogeneity tests were also conducted for exports with respect to real output. However, while the assumption of weak erogeneity is validated in two of the countries, the null hypothesis of super exogeneity is rejected. The test results therefore cast doubts on policy recommendations for the LDCs based on the export-led growth hypothesis.

Laszlo1 (2004) investigated the possibility of export-led growth and growth-driven export by testing for Granger causality between the logarithms of real exports and real GDP in twenty-five OECD countries between 1960 and 1998. Two complementary testing strategies were applied. First, depending on the time series properties of the data, causality was tested with Wald tests within finite-order vector autoregressive (VAR) models in levels and/or in first-differences. Then, with no need for pre-testing, a modified Wald procedure was used in augmented level VAR systems. In both cases the study experimented with alternative deterministic trend degrees. The results indicated that there is no causality between exports and growth in Luxembourg and in the Netherlands, exports cause growth in Iceland, growth causes exports in Canada, Japan and Korea, and there is two-way causality between exports and growth in Sweden and inthe UK. Although with less certainty, the researcher also concluded that there is no causality in Denmark, France, Greece, Hungary and Norway, export causes growth in Australia, Austria and Ireland, and growth causes export in Finland, Portugal and the USA. However, in the case of Belgium, Italy, Mexico, New Zealand, Spain and Switzerland the results were too controversial to make a simple choice.

Shirazi and Manap (2005) examined the export led growth hypothesis for five south Asian countries through cointegration and multivariate granger causality tests. Strong support for a long run relationship among imports, exports and real output for all the countries except Sri

Lanka were found. Feedback effects between GDP and exports for Bangladesh and Nepal and unidirectional causality from exports to output in the case of Pakistan were found. No causality between these variables was found for Sri Lanka and India, although for India GDP and exports did induce imports. A feedback effect between imports and GDP was also documented for Pakistan, Bangladesh and Nepal as well as unidirectional causality from imports to output growth for Sri Lanka.These findings were discussed from the stand point of export led growth hypothesis.

Medina-Smith (2001) studied the validity of Export led growth hypothesis by choosing Costa Rica as a case study. This study went beyond the traditional neoclassical theory of production by estimating an augmented Cobb-Douglas production function. The inclusion of exports as a third input provided an alternative procedure to capture total factor productivity (TFP) growth. The study tested the hypothesis by analyzing the case of Costa Rica, using annual data for the period 1950-1997. In using several procedures to test for co integration, it went beyond the traditional time series studies by examining empirically the short-term as well as the long-run relationship. The study found that the export led growth hypothesis is valid in this particular case; however, the empirical results show that physical investment and population mainly drove Costa Rica's overall economic performance from 1950 onwards. From a review of the literature we find that the empirical evidence regarding the relationship between exports and growth is not robust, and although the results of the study suggest that exports have a positive effect on the overall rate of economic growth and could be considered an "engine of growth" as the ELGH advocates, their impact was quantitatively relatively small, in both the short and the long-run. The evidence presented clearly supports the neoclassical theory of production and, to a lesser extent, the so-called new-fashioned economic wisdom. Moreover, it challenges the empirical literature regarding the export led growth hypothesis and expresses serious doubts with regard to promoting exports as a comprehensive development strategy. The ELGH is probably beneficial only for a limited number of developing countries, and only to a certain extent.

Lampropoulou (2014) studied the impact of debt crisis on export performance by empirically examining the impact of euro debt crisis in Greece, Ireland, Italy, Portugal and Spain in terms of their trade patterns relative to the export performance of OECD countries. The study investigated Panel data for 34 OECD countries with fixed effects within a gravity model framework for

period 1992-2012.According to the result ,the author concluded that the debt crisis in GIIPS showed to significantly deteriorate its trade patterns by negative values which vary from 17% to 29%, , revealing that the debt crisis in GIIPS was severe. In addition, the robustness checks captured that the incoming effect for the debt crisis countries on exports is kicked in year 2008 and disappears later, but for imports the negative effect persists throughout the whole period of investigation and kicked in 2011.

The empirical study of the study by Dritsakis& Stamatiou (2017) examined the relationship between government debt, exports and economic growth in EU countries with the highest level of government debt, using paneldata for 1990-2014.applyingthe Fully Modified Ordinary Least Square (FMOLS) and Dynamic Ordinary Least Square (DOLS) methods to estimate the long run relationship between the variables together with the Vector Error Correction Model (VECM) in order to investigate the causal relationship between the examined variables, revealed that there are both short and long run relationships. Findings suggested that that there is a unidirectional causality running from exports to economic growth as well as from exports and economic growth to government debt. The results also provided evidence to support the export led-growth hypothesis that is Exports are an important factor for economic development. Moreover, the results revealed that government debt is affected by exports both directly and indirectly through economic growth.

Ahmed et al (2000) investigated causality among export, growth and external debt in the case of eight Asian countries. They attempted to overcome the major shortcoming with the bivariate causality analysis that is the omission of other relevant variables, such as foreign debt servicing by adopting a trivariate causality framework through the standard Granger test modified with an appropriate error-correction term. And they generally concluded that both the export-driven GDP growth and GDP growth-led export promotion hypotheses are not supported in all the cases examined, especially in the 1971–97 total period, except for India. Furthermore, though regular repayment of the external debt was encouraged due to structural adjustment programs, it failed to enhance economic growth and resulted in lowering export revenue in these countries, especially in the case of relatively poor countries, such as Bangladesh.

Clements et al (2003) examined the channels through which external debt affects growth in low-income countries. The results indicated that the substantial reduction in the stock of external debt

projected for highly indebted poor countries (HIPCs) would directly increase per capita income growth by about 1 percentage point per annum. Reductions in external debt service could also provide an indirect boost to growth through their effects on public investment. They further suggested that if half of all debt-service relief were channeled for such purposes without increasing the budget deficit, then growth could accelerate in some HIPCs by an additional 0.5 percentage point per annum. According to their conclusions, High levels of debt can depress economic growth in low-income countries and external debt also has indirect effects on growth through its effects on public investment. They further explained that reducing the stock of debt alone rather than an immediate reduction in debt service is unlikely to induce governments to increase their spending on public investment. And while cutting debt service obligations can provide breathing space to raise public investment, debt relief per se is likely to lead to just a modest rise in this spending. And hence as per this paper, these results have important implications for the design of adjustment programs in countries receiving debt relief.

Idris et al (2016) conducted a causality test of the relationship between trade openness and economic growth in 87 selected countries which includes both Organizations for Economic Co-operation and Development (OECD) and developing countries for 1977–2011 periods. The study used two measures of trade openness i.e. the ratio of trade openness (TO) that is exports plus imports in nominal value divided by GDP (nominal) which is commonly used in the literature, and trade openness in real (RO) which is defined as the sum of imports and exports in US$ relative to GDP in purchasing power parity US$ (real GDP). An empirical study was also conducted to determine the causal relationship between trade openness and growth in a panel perspective. The authors used a dynamic panel data estimation method i.e. the general method of moments (GMM). The empirical results revealed that there is a bidirectional causal relationship for both developing and OECD countries. Their finding was consistent with the endogenous theory that is increased openness leads to higher growth, which thus prompts expanded openness.

Ejigayehu (2013) examined whether external debt affects the economic growth of eight selected heavily indebted poor African countries including Ethiopia through the debt overhang and debt crowding out effect. The study has been implemented with annual data over the period between years 1991 and 2010. As per the result, external debt affects economic growth by the debt

crowding out effect rather than debt overhang. In the other words the effect of external debt on economic growth is found to be statistically insignificant in terms of debt overhang effect which is contrary to the debt overhang hypothesis. Moreover, in an attempt to mark out debt servicing history, the thesis found the selected countries are not paying (servicing) more than 95% of their accumulated debt. Beside this, the study also revealed that, the total amount of debt relief the countries in the study received is negligible and didn't help the countries towards a better economic growth.

2.2.2. Country Specific Studies

Kipto (2010) studied the determinants of Kenya's external debt sustainability. The findings of the study indicated that Kenya's external debt sustainability is determined mainly by exports, GDP, domestic debt and external debt. According to Kipto, the empirical results indicated strong positive relationship between external debt sustainability, exports and GDP and the findings further revealed that there is a negative relationship between external debt sustainability, domestic debt and external debt.

According to the study by Bolukbas (2016), on the relationship between Trade openness and external debt in Turkey, The Empirical result showed that there is a strong relationship between trade openness and external debt and A 1% increase in trade openness brings about approximately two fold increase in the ratio of external debt and a linear relationship between both variables has emerged meeting the theoretical expectations of the study. Considering the fact that imports have much larger significance than export in the measure of Turkey's trade openness, observed that external debt has an important role in relations with the external world. The study also revealed the fact that there exits an inverse relation between exchange rate and external debt. Because, an increase in exchange rate reduces the value of Turkish Lira which results in increase in export and hence export revenues. External debt payment will ease and in such case it provides reduction of external debt stock.

The study by Saad (2012) was conducted to investigate the causal relationship between Economic Growth, Export, and External Debt Servicing in the Case of Lebanon over the period 1970-2010.This study included a fourth macroeconomic variable that is the exchange rate. The researcher explored this relationship using the vector error correction models (VECM) and employed Granger causality technique in order to investigate the presence of causality among

those variables. The results showed that both short run and long run relationships exist among the variables. Moreover, the finding suggested i) bidirectional Granger causality between GDP and external debt servicing, ii)unidirectional Granger causality that runs from external debt to exports, iii) unidirectional causality running from exports to economic growth, and iv) unidirectional causality running from exchange rate to economic growth.

Fatai (2016) investigated the causal relationship between economic growth, external debt stock and external debt service payments of Nigeria within the context of econometric exposition over the period 1970-2014. He estimated these variables using the vector error correction models (VECM) and Granger causality technique. The results revealed that there is both short run and long run relationships among the variables. Furthermore, Findings from the results show that there exists bidirectional causality between external debt stock and economic growth, external debt service payments and economic growth and unidirectional granger causality going from external debt stock to external debt service payments. From the results he obtained, the author concluded that a large proportion of foreign capital employed to boost domestic economy could raise domestic investment and catalyze economic growth. However, a higher debt service payment could exert adverse effects on long term economic growth.

Dritsaki (2013) examined the relationship between economic growth, exports and government debt of Greece over the period 1960-2011. He investigated this relationship using the vector error correction models (VECM) and employed Granger causality technique in order to explore the presence of causality among these variables. The results show that both short and long run relationships exist among these variables. Specifically, the results show that there is a unidirectional Granger causality that runs from exports to economic growth as well as from economic growth to government debt, whereas there is no short run causal relationship between exports and government debt. In the long run, the results show that there is a unidirectional Granger causality that runs from economic growth to government debt. His findings provide evidence to support the export-led growth hypothesis. Thus, exports are important in stimulating economic growth.

Employing the usual OLS methodology, Malik et al (2010) checked the impact of external debt and debt servicing on economic growth for Pakistan for the period of 1972- 2005. Using time series econometric technique, they took a point of glance of external debt and economic performance of Pakistan. The paper found out that External Debt is negatively and significantly

related with economic growth. The evidence suggested that increase in external debt will lead to decline in economic growth. Debt servicing has also significant and negative impact on GDP growth. According to their conclusion, as the debt servicing tends to increase, there will be less opportunities for economic growth.

2.2.3. Studies in the case of Ethiopia

Debel (2000) investigated the effect of exports on economic growth in Ethiopia for the period1960/61-2000/01. The study reviewed the policies undertaken by the different regimes in relation to export policies, and tested empirically the relationship between exports and economic growth using co integration and error correction models. The key finding in the study was that export growth positively and significantly affected economic growth in the short run. In addition to its direct effect, export was also found to indirectly affect economic growth as evidenced from the simultaneous equation models. Furthermore, He also conducted causality test through Granger causality method and the result indicated that causality runs from exports to economic growth. That is export led growth hypothesis was confirmed for Ethiopia.

A paper by Mesay (2009) examined the Export led Growth Hypothesis for Ethiopia for the period from 1980-2007.He applied the Johansen's Co integration Procedure, Error Correction Model (ECM) and the granger's causality test. His empirical findings have shown that the Export led Growth is valid for Ethiopia in a particular case, only the long run. Exports granger cause GDP growth, asserting the unidirectional relationship running from export to GDP growth as postulated by the export led growth hypothesis. The study further suggested policy recommendations that will further boost the capacity of the sector vis-à-vis volume, value, composition and destination of exports so to exploit the immense growth potential from the sector and thus achieve the upper hierarchical goals of rapid economic growth and sustainable development.

Chemeda (2001) studied the effect of export on economic growth in the context of Ethiopian Economy through Cob Douglas equation model. He employed econometric techniques of co integration system. His findings indicated that strong positive relationship exists between real export and real gross domestic product in the context of Ethiopian economy.

The study by Tigist et al (2015) empirically determined the causal relationship between agricultural exports and economic growth (GDP) in Ethiopia using time series data for forty one years from 1973 to 2013. The study used Granger Causality model to test causality. According to the result, there is bidirectional relationship between coffee export, oilseed exports and economic growth whereas unidirectional relationship was found between pulses export and economic growth which is running from pulse export to economic growth (GDP). Based on the findings, the researchers recommended that policies aimed at increasing the productivity and quality of these cash crops should be implemented. Also additional value should be added to them before exporting. Correspondingly, there is also a need to devote resources on the production of non-export goods in order to increase exports since they have bi directional relationship.

Jarra (2013) also made a trivariate granger causality analysis of Export, domestic demand and economic growth in Ethiopia using time series data over the period 1960 to 2011. He formulated a causality test by including domestic demand as a third variable in the model .Household consumption and government consumption were used to measure domestic demand. Granger causality and Johansen co integration tests were employed in the empirical analysis. Results indicated the existence of long run relationship among the variables and Granger causality test result showed a dynamic relationship between export and economic growth, and between domestic demand and economic growth. As per his findings, Exports and domestic demands are important for economic growth and economic growth has an impact on exports and domestic demand in Ethiopia. And this paper suggested that a successful and sustained economic growth requires growth in both exports and domestic demand. He pointed out that a balanced emphasis should be on domestic demand, particularly household consumption to push the economy towards higher growth path.

Similarly Bethelehem (2017) also investigated the direction of causality between export, import and economic growth in Ethiopia for both short run and long run. The estimation covered the time period 1981 – 2014. She employed VECM and Granger causality test for the analysis. The findings indicated that the income, exports, imports and relative prices are co integrated. According to the paper, the long run bidirectional causality between the import, exports and income growth has been also proved. The study result further indicated that the import-export promotion Policy contributes to the economic growth in Ethiopia.

Senayit (2014) investigated the contribution of export earnings to economic growth of Ethiopia for the period 1960/61-2011/12 by empirically testing the long run and short run relationship and causality between export and economic growth. The study employed time series econometric techniques of co-integration, vector error correction estimation and Granger causality test. The research also performed the review of the policies pursued by the different regimes in relation to export. The result of Granger causality test indicated that in the short run there is no causality among the variables but in the long run there is bidirectional causality among the three variables, including: GDP, Export and Import. The key finding in this study was that export growth positively and significantly affected economic growth and growth also stimulate export in the long run. This result provided support for the adoption of both Export -Led Growth and Growth-Led Export growth strategies in case of Ethiopia. Thus, the paper recommended that effort should be directed towards policies that will expand the volume of a country's exports and at the same time promote the emergence and expansion of domestic industries in order to advance the export performance.

Ramakrishna (2002) studied the external debt situation in Ethiopia across its three economic regimes through debt-growth model in a co integration framework. The evidence provided by the model supports the debt overhang hypothesis as the country has been on the wrong side of the debt Laffer curve. The model indicates negative as well as non-linear relation between debt and growth. The study found out that the country has been experiencing a steady increase in its debt/GDP ratio, which became more than its GDP since 1992.The Debt /exports ratio rose to more than100 percent in the 1980s and remained at a very high level in the 1990s.As a result, this has pushed the country into severe debt service difficulties.

Desta (2005) used a single growth equation model, estimated using the Ordinary Least Squares (OLS) method with data covering the period 1970-2002, after formulating the recent developments in Co integration and Error Correction Models. The regression result showed that past debt accumulation is negatively related to economic growth in Ethiopia which is in line with the theory and the empirical findings of other researchers such as Ramakrishna (2002).On the other hand, the debt service variable has a negative effect on growth through the crowding out effect of public investment .

As Mulugeta (2014) evaluated using time series data for the period 1983/84 to 2012/13 through the Johansen Maximum Likelihood approach, the results revealed that Ethiopia's real GDP is influenced negatively by the past stock of external debt and debt servicing and, positively by the current external debt inflows. And this indicates the existence of debt overhang problem and crowding out effect in Ethiopian economy due to heavy debt accumulation which is also found out by preceding researches.

The above discussed literatures are a mix of bivariate and multivariate studies on the relationship between export, external debt and growth. Most of the bivariate studies have limitations. Because, many of those studies did not include some relevant variables such as external debt and external debt service which are very relevant channels in which export can determine the economic growth of developing countries. (Saad, 2012).On the other hand, when we see the result of the multivariate studies mentioned above in both the country and cross country cases ,we can notice different outcomes unlike the bivariate studies. (Shirazi and Manap, 2004; Ahmed et al, 2000; Jara, 2013)

In addition, some of the above researches are causality studies .And they only attempted to study the causal relationship between export and growth and between external debt and growth without showing the short run and long run relationship among growth determining variables and growth itself. And this might led them to wrong conclusion since they did not consider other control variables in their study.

Hence ,the contribution of this research work will be to fill the above mentioned gaps of previous literatures i.e. studying the causal nexus between export and growth by including in the model external debt stock and external debt service which are relevant but omitted variables in the previous works .This research first investigated the short run and long run relationship among growth and its potential determinants in the case of Ethiopia including other control variables such as capital formation and rate of inflation.

CHAPTER THREE

3. OVERVIEW OF THE ETHIOPIAN ECONOMY

3.1. General Overview

Ethiopia is one of the poorest countries in the world and highly vulnerable to internal and external shocks. It has witnessed broadly, three policy regimes: the imperial rule (prior to 1975), the socialist regime (1975-1991), and the present regime (1992 onwards). Beginning in 1992, the Ethiopian government began to implement an economic reform program with a view to revive the economy. Various policy measures, some homebred, others imposed by the IMF and the World Bank, have been undertaken.

Ethiopia's economy experienced strong, broad-based growth averaging 10.3% a year from 2005/06 to 2015/16, compared to a regional average of 5.4%. (World Bank, 2018).According to official statistics, Ethiopia's gross domestic product (GDP) is estimated to have rebounded to 10.9% in FY2017. The expansion of agriculture, construction and services accounted for most of this, with modest manufacturing growth. Private consumption and public investment explain demand-side growth, the latter assuming an increasingly important role.

Ethiopia's main challenges are sustaining its positive economic growth and accelerating poverty reduction, which requires progress in job creation and improved governance. Sustainable ways to finance infrastructure, support private investment through credit markets, and tap into the growth potential of structural reforms can help the country maintain high economic growth.

Important measures were taken to address persistent Birr overvaluation, large external imbalances, foreign exchange shortages, and rising external debt. Inflation remained in single digits on average in FY2017, but accelerated to 15.6% by February 2018. Key challenges relate to limited competitiveness, an underdeveloped private sector, and political disruption. The lack of competitiveness constrains the development of manufacturing, the creation of jobs and the increase of exports. A larger and stronger private sector would seem to be the main response to strengthen Ethiopia's trade competitiveness and resilience to shocks. The Ethiopian government is counting on the expansion of the private sector, especially through foreign investments in the industrial parks, to make Ethiopia's growth momentum more sustainable. Political disruption

associated with social unrest could also negatively impact growth through lower foreign direct investment (FDI), tourism, and exports.

Economic Performance

According to the annual report of national bank of Ethiopia in 2016/17, the Ethiopian economy exhibited 9.9 percent average annual growth during 2012/13-2016/17 which registered 10.9 percent growth in 2016/17, depicting recovery from challenging macroeconomic and weather conditions of the previous year. The registered growth rate in real GDP was 0.2 percentage point lower than base case scenario GTPII target set for the fiscal year although it was significantly higher than 2.6 percent average growth estimated for Sub - Saharan Africa. The growth in real GDP was mainly attributed to 10.3 percent growth in services, 6.7 percent in agriculture and 18.7 percent in industrial sectors .Nominal GDP per capita rose to USD 863 depicting 7.8 percent improvement over the previous year. The Ethiopian economy is projected to grow 11.1 percent in 2017/18 in contrast to IMF's forecast of 3.7 percent growth for the world and 3.4 percent for Sub-Saharan Africa.

Regarding the sectoral contributions to GDP and GDP growth, the service sector continued to take the first lead in 2011/12-2016/17 while the agricultural and industry sector follow second and third respectively. Service sector continued to dominate the economy as its share in GDP was about 39.3 percent and its contribution to GDP growth reached 36.7 percent. The 10.3 percent growth in service sector was largely attributed to the expansion of wholesale & retail trade (7.6 percent), public administration & defense (22.1 percent) and transport & communication (12.1 percent)

Ethiopia's foreign exchange earnings are led by the services sector - primarily the state-run Ethiopian Airlines - followed by exports of several commodities. While coffee remains the largest foreign exchange earner, Ethiopia is diversifying exports, and commodities such as gold, sesame, chat, livestock and horticulture products are becoming increasingly important. Manufacturing represented less than 8% of total exports in 2016, but manufacturing exports should increase in future years due to a growing international presence.

3.2. External Sector and Foreign Exchange Developments

According to NBE, During the third quarter of 2016/17, total merchandise export earnings (including electricity) amounted to USD 768.1 million, showing a 0.3 percent improvement over same quarter of last year on account of rise in export earnings from coffee (42.4 percent), pulses (56.6 percent), meat & meat products (4.8 percent), fruit & vegetables (1.2 percent), chat (6.6 percent), electricity (208.7 percent) and other exports (19.3 percent) due to higher export volume, prices or both.

The Birr continued to lose ground against the USD in the inter-bank foreign exchange market. During the third quarter of 2016/17, the weighted average official exchange rate depreciated 6.5 percent over the corresponding quarter of last year and stood at Birr 22.5832/USD. In contrast, the Real Effective Exchange Rate appreciated by 8.2 percent on annual basis; mainly due to relatively higher domestic inflation and lower depreciation of Birr relative to trading partners. Similarly, NEER depreciated by 2.4 percent during the same period.

3.2.1. Merchandise Trade

In 2016/17, merchandise trade deficit in 2016/17 was USD 12.9 billion, which showed a 6.9 percent improvement over the preceding fiscal year mainly due to slowdown in total import bills coupled with marginal increase in merchandise export. Yet, merchandise trade deficit as a ratio of GDP dropped by 3.1 percentage points and stood at 16.0 percent. N BE(2016/17 Annual Report)

Total merchandise export (including electricity) increased by 1.4 percent year-on-year due to higher export earnings from coffee (22.2 percent), pulses (20.5 percent), chat (4.0 percent), fruit and vegetables (4.5 percent), meat & meat product (2.3 percent), electricity (133.0 percent) and other export items (33.4 percent). Thus, the ratio of merchandise export to GDP declined to 3.6 percent from 4.1 percent a year ago.

Export earnings from coffee increased owing to 7.5 percent rise in international price and 13.6 percent increase in export volume. As a result, the share of coffee in total merchandise export rose to 30.4 percent from 25.2 percent a year ago. Receipts from oilseeds declined by 26.4 percent and reached USD 351 million on account of 3.7 percent drop in international price and

23.6 percent decrease in export volume. Hence, the share of oilseeds in total merchandise export was down to 12.1 percent. Likewise, gold generated USD 208.8 million, about 28.2 percent lower than last year as a result of a 30.4 percent slowdown in volume despite a 3.2 percent growth in international price. As a result, the share of gold in total merchandise export stood at 7.2 percent.

Revenue from chat export increased by 4.0 percent as export volume rose by 3.9 percent despite 0.1 percent decline in international price. Hence, the share of chat export in total merchandise export went up to 9.4 percent. In contrast, revenue from export of live-animals declined by 54.2 percent as a result of a significant (53.6 percent) drop in export volume and 1.3 percent fall in international price. Therefore, the share of live-animals in total merchandise export earnings decreased to 2.3 from 5.2 percent a year ago.

Export earnings from leather & leather products decreased by 1.1 percent due to a 1.6 percent fall in export volume despite 0.5 percent rise in international price. Consequently, the share of leather & leather products in total export revenue stood at 3.9 percent. Electricity export earnings surged by 133.0 percent over last year same period owing to 155.3 percent hike in export volume despite 8.8 percent hike in price. As a result, the share of electricity in total merchandise export earnings increased to 2.5 percent from 1.4 percent last year same period.

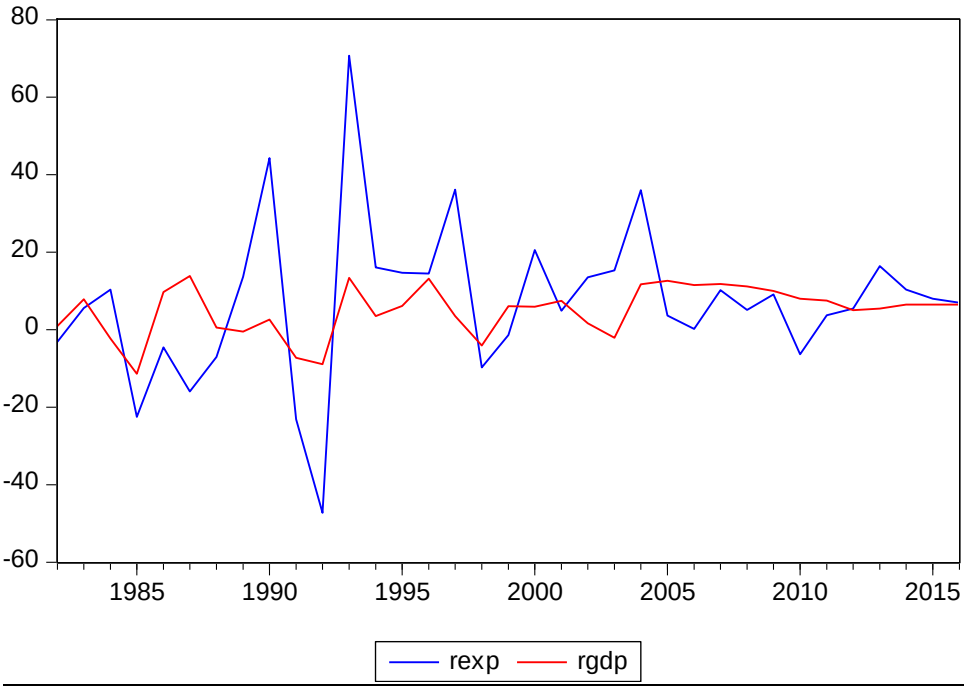
Earnings from pulses increased by 20.5 percent to USD 279.9 million due to 4.6 percent rise in export volume and 15.1 percent increase in price. Thus, the share of pulses in total merchandise export revenue increased to 9.6 percent from 8.1percent a year earlier. Conversely, export proceeds from flower went down by 3.0 percent as both export volume and international price fell by 2.5 and 0.5 percent, respectively. Hence, the share of flower in total export earnings decreased to 7.5 percent from 7.9 percent last year same period.

Receipts from meat & meat products showed a 2.3 percent annual growth mainly on account of a 3.2 percent increase in export volume despite a 0.8 percent decline in price. As a result, the share of meat & meat products in total merchandise export earnings stood at 3.4 percent. Export earnings from fruits and vegetables increased by 4.5 percent vis-à-vis last year same period due to 6.9 percent rise in export volume in contrast to 2.2 percent decline in international price. Thus,

the share of fruits and vegetables in total merchandise export earnings reached 1.9 percent during the review period.

As we see from the above detailed yearly export performance, some of the commodities exhibited a fall in the volume and international price. Commodities such as chat, meats and fruits and vegetables face a fall in international price .In addition some items such as leather and leather products showed a decline in volume while flower declined in both price and volume. Since most of the export items are primary commodities and subject to price fluctuation, Export performance competitiveness of Ethiopia in the international market needs a great effort. Mostly by moving to more value added and internationally competitive items is very important. Regarding trade partner, Asia, Europe, Africa and America were the main destinations for Ethiopian exports. Asia accounted for 37.7 percent of Ethiopia's exports, where as 32.4 percent goes to Europe. The other 21.5 and 7.5 percent of Ethiopia export goes to Africa and America respectively. The trend of annual growth rate of export and growth rate of Real GDP is shown in the following graph

Figure3.1. Trend of growth rate of real export and growth rate of real GDP



Source: World Development Indicators, 2018

3.3. External Debt and Economic Growth in Ethiopia

The Ethiopian economy due to narrow source of revenue base has faced the shortage of resources to finance its spending. Due to this and other factors, it desired to fill its budget deficit through internal and external borrowing. According to the World Bank classification of the Heavily Indebted Poor countries (HIPCs), Ethiopia is one of the 41 severely indebted poor countries (Easterly, 2002).

As IMF and IDA's joint staff report on Ethiopia's debt sustainability in 2015 indicated, the risk of external debt distress has increased from "low" to "moderate" for Ethiopia due to weak export performance and higher than expected non-concessional borrowing, reflecting faster execution of the government's investment program. Because of an increase in the nation's budget deficit and foreign debt the county is more vulnerable because the debt is not sustainable in the near future IMF (2016).

As Mulugeta (2014) found out, Ethiopian GDP is influenced negatively by the past stock of external debt and debt servicing and positively by the current external debt inflows. This indicates the existence of debt overhang problem and crowding out effect in Ethiopian economy.

The External debt burden has been one of the most significant bottlenecks which hindered sustainable growth in Ethiopian economy. Because of the Growth and Transformation plan (GTP), the Ethiopian government has been making large amount of government expenditure which in turn widen the country's fiscal deficit problem and led to massive debt accumulation (IMF, 2015, 2016) .Moreover, Ethiopia's large-scale public investment in infrastructure has been financed by significant borrowing, which has resulted in higher public debt.

The External debt position of Ethiopia is severe due to a number of reasons: The first reason is that the size of the debt is very huge relative to the economy's size which accounted for 44% of GDP in 2016 and this leads to a possible capital flight and more it discourages private investment. .On the other side, Ethiopia's debt Service as ratio of export earnings is very high. For instance, in 2016, total debt service accounted for 21% of the revenue from export of goods and services (World Development Indicators, 2018). This affects economic growth by depleting available foreign exchange for import of capital goods and for the resource for productive investment.

Ethiopian External Debt Scenario during different regimes

Ethiopia's debt grew at an average rate of 13.18 percent during 1970-75 (first regime). The debt service grew at 3.11 percent during this regime. Infrastructure was given a major share in utilizing the long- term debt, which constituted 100 percent of the total debt. During the second regime (1976-91), the existing economic policies led to inefficiencies in investments. As a consequence external debt increased by 13.21 percent and the debt service by 7.18 percent. Debt indicators have shown remarkable increase during this period, while debt servicing as a ratio of exports declined by 1991. The post 1991 period in Ethiopia has witnessed several economic reforms under the structural adjustment program. This became compulsory due to the serious balance of payment crisis in Ethiopia. The new government, which took over in 1991, initiated a set of reforms to address both the need for immediate macroeconomic recovery and long-term structural problems of underdevelopment. The reforms included market oriented policies targeted at removing price and cost distortions, encouraging private sector, promoting exports, and progressive liberalization of the economy with a corresponding reduction in the role and size of the government sector. The objectives of the reforms included broad based and equitable economic growth, lower inflation, and a rapid increase in agricultural output through productivity gains. The reform policies had the encouragement and financial support of both the World Bank and the International Monetary Fund. During 1992 to 1998, the external debt of Ethiopia grew by 10.41 percent while the debt service dropped by 25.03 percent. Out of the total debt during this period, the long-term loan was 95.2 percent, the short-term debt was 4.23percent and the IMF credit was 0.56percent. When we look into the debt ratios, they have presented divergent trends. The debt/GDP ratio has fallen from 169.22 percent in 1992 to160.34 percent in 1998. Debt service as a ratio of exports has declined from 23.74 percent to 11.23 percent during this period. The World Bank classifies countries on three levels: severely indebted; moderately indebted; and less indebted. Countries are severely indebt if they have a debt/GDP ratio of 50 percent or more; a debt/export ratio of 275 percent or more; and a debt service/ export ratio of 30 percent or more. Even though the debt service/export ratio is low and has declined in the latter years for Ethiopia, the country faces severe debt/GDP and debt/export ratios (Ramakrishna 2002).

Table 3.1. Summary of External Public Debt (in billion USD)

Period	GDP	External debt	External Debt to GDP Ratio (%)	Total Debt service	Real Export annual growth rate (%)	Debt service to export ratio (%)
2000	13.07	5.52	42.19	0.14	20.54	13.74
2001	14.16	5.75	40.58	0.18	4.87	18.45
2002	14.37	6.55	45.58	0.09	13.52	7.96
2003	14.06	7.28	51.78	0.09	15.30	7.26
2004	15.97	6.62	41.47	0.10	36.04	5.91
2005	17.86	6.23	34.88	0.09	3.63	4.76
2006	19.80	2.28	11.52	0.14	0.21	6.19
2007	22.06	2.66	12.03	0.13	10.20	4.90
2008	24.44	2.90	11.88	0.11	5.12	3.14
2009	26.60	5.42	20.36	0.10	9.09	3.00
2010	29.93	7.33	24.50	0.18	-6.34	3.95
2011	33.28	8.61	25.87	0.35	3.74	6.05
2012	36.16	10.46	28.93	0.43	5.46	7.19
2013	39.98	12.58	31.45	0.66	16.43	10.85
2014	44.09	16.33	37.04	0.76	10.36	11.96
2015	48.67	20.14	41.38	1.04	7.97	17.32
2016	52.35	23.06	44.06	1.24	6.98	21.01

Source: World Development indicators data

3.4. Investment performance of Ethiopia

Heavy investment has been made to address infrastructure bottlenecks. The concerted infrastructure push has been a particularly important factor in driving growth. Over the past more than ten years, the Government and public enterprises have invested in roads, telecommunication, and energy sector. Those huge investments have led to a major expansion in infrastructure, although from a low base. For example, the power generation capacity has nearly doubled and the paved road network increased three-fold. Overall, the heavy public investment in infrastructure and social services has created a major expansion in domestic demand, raising overall growth.

CHAPTER FOUR: DATA AND METHODOLOGY

This chapter looks at the methods that are adopted to achieve the objective of this study. The chapter basically focuses on how the entire study was done. Issues such as model specification, data sources, estimations procedures and definitions of variables are covered by this chapter.

4.1. Data Source

Annual data of growth rate of Real GDP, growth rate of Real Export, External debt stock; External debt service, capital formation and inflation are used for the study. The data used for this study is a secondary data taken from World Development Indicators for external debt and real export growth, from the IMFs data set for annual Real GDP growth and the data for total capital formation is obtained from national bank of Ethiopia.

4.2. Method of Data Analysis

An econometric method of data analysis is used. The study investigated the cointegration and long run relationship between the variables via Autoregressive Distributed Lag (ARDL) or Bound Test approach. Furthermore, the causal relationship among the variables of our interest was performed through Granger causality test method. The econometric part is analyzed using E-views versions 9 and 10 statistical software packages.

4.3. Conceptual Framework

Basic macroeconomic theory postulates that Gross Domestic Product (GDP) of a given nation per annum , when calculated using the expenditure approach , is equal to the sum of Consumption (C) , Investment (I) , Government Expenditure (G) and Net Exports (X- M).

Export as component of aggregate output can also affect growth:

i.e. $GDP = C + G + I + X - M$..... (1)

The Export Led Growth hypothesis also suggests that there is a positive link between exports and economic growth with exports unidirectionaly causing economic growth via the multiplier effect.(Shirazi and Manap, 2004;Bilas, 2015; Laszlo1,2004; Messay ,2009).

Export has so many contributions for developing economies. Most of the investment activities of export-oriented developing countries rely on import of capital goods. Theoretically, an increase in export allows an increase in demand for imported capital goods, which raises the growth rate

of capital formation and thus stimulates growth.. Therefore, highest export performance in these countries is expected to result in important scale effects and externalities for GDP growth. Ahmed et al (2014).

In the other perspective, beyond the traditional neoclassical theory of production, the inclusion of exports as a third input provides an alternative mechanism to capture total factor productivity (TFP) growth by estimating an augmented Cobb-Douglas production function i.e. $GDP = f(L, K, Ex)$ (Medina-Smith ,2001) .

Contrary to the export led growth strategy, the other alternative hypothesis regarding the causal relationship between export and growth is the growth driven export hypothesis. This can be explained by the assumption that productive firms export more, e.g. as a result of lower domestic costs (Thangavelu - Rajaguru 2004), and a general increase in productivity should therefore result in increased exports. The productivity increases caused by domestic labor productivity increases or diffusion of foreign technology and from other aspects of trade than export (e.g. imports) could improve the domestic productivity and cause a growth-led export expansion (Ifwarsson, 2010; Jara, 2013;Alimi and Muse,2012;Senait,2014) .

The other hypothesis is the causality between export and external debt. These can be seen in terms of three points of view i.e. the nexus between export and debt stock, the nexus between export and debt service payment and the nexus between export and access to loan. At the first point of view, the greater volume of import which is greater than the volume of export in the developing countries like Ethiopia, mostly leads to trade deficit and this will in turn forces the country to seek external debt to finance its expenditures. In the contrary, a country with high export performance will be able to finance its expenses and able to overcome external shocks. In this case, the country might be less likely to be in need of external finance such as foreign debt and the country will be less likely to be highly indebted.(Bolukbas 2016). In this sense export and external debt stock have an inverse relationship. As a result, export is expected to contribute to growth positively by avoiding debt burden and enhancing the domestic investment.

In the second sense, export and debt service payment have positive relationship. Export being the major source of foreign exchange can help the country to finance its debt service payment and further reducing its debt stock (Kiptoo, 2010). The debt service as a ratio of export earning

indicates the crowding out effects of debt at any given time. According to Conventional indicators of credit worthiness, debt service ratio relates debt service requirement to income. The higher the ratio of debt service to exports of goods and services, the country will be less likely to be able to meet debt-service obligations in the long run. Servicing of external debt erodes the foreign exchange available for imports and causes liquidity constraint (Alemayehu, 1998).

From access to loan point of view, good export performance will also give better access to international capital market and credibility by creditors and less cost of borrowing. (Furceri and Zdzienicka,2012).Debt crisis on the other side creates a constrained economic environment for the country such as exclusion from international capital markets, increased cost of borrowing and none provision of trade credit from its creditors (Furceri and Zdzienicka 2012). In other words high debt burden and bad reputation due to failure to pay back debts results in less access to international capital market and difficulty to find new trade partner. These might result in trade deterioration with structural changes in trade (Rose, 2005).

Regarding the nexus between external debt and growth, as the debt overhang theory postulates, reasonable levels of external borrowing can help finance productive investment and is expected to enhance growth. However, beyond certain levels, additional indebtedness may reduce growth. Because, in the future debt will be larger than the country's repayment ability and hence expected debt-service costs will discourage further domestic and foreign investment due to very low expected rate of return from the productive investment projects (Krugman, 1988,Patilo et al 2002).

The channels through which government debt (level or change) is found to have an impact on the economic growth rate are: (i) private saving; (ii) public investment; (iii) total factor productivity (TFP) and (iv) Sovereign long-term nominal and real interest rate (Checherita and Rother ,2010).

Hence the past stock of external debt and debt servicing can significantly affect the growth of an economy through different channels such as crowding out the domestic investment, creating liquidity constraint and so on (Fatai ,2016; Siddique and Selvanathan ,2015; lyoha 1999 Mulugeta ,2014;) .

From the above discussions we can see that countries with promising export potential tend to succeed in obtaining more foreign loans and, hence, to carry larger external debt and have a

larger foreign debt servicing burden (Feder, 1982). Thus, the expected positive relationship between exports growth and economic growth may not be significantly obtained, because, the resources from exports are directed to servicing external debt instead of investment. Therefore, In light of the above framework, this paper aims to investigate the short run and long run as well as causal relationship among Export, external debt and economic growth of Ethiopia.

4.4. Empirical Model Specification

In order to specify the model of our equation, the above variables alone are not the explaining variables of Growth. We have to also include other control variables that might potentially have significant effect on growth of Ethiopia.

In reference to the review of empirical literatures discussed above and taking into account the availability of data and characteristics of the country in question, we decomposed our variables into two groups. On the one hand, our interest variables which we want to study their causal nexus: such as annual growth rate of real GDP (RGDP), growth rate of real export (REXP), external debt service (EDS) and external debt stock (ED). On the other hand, control variables such as investment or Total capital formation (INV), and Inflation rate (INF).

Hence, the general function of GDP growth as a function of its determinants is specified as:

$GDP = f\ (EXP, ED, EDS, , INV, INF)$……………………………..(2)

Following the above discussions and empirical literatures, the standard statistical specification of long run relationship between the real GDP and its determinants will be:

$lnRGDP_t = \alpha_0 + \alpha_1 lnREXP_t + \alpha_2 lnEDs_t + \alpha_3 lnED_t + \alpha_4 lnINV_t + \alpha_5 lnINF_t + \mu_t$……………………………………………………… (3)

Where: RGDP: Annual Growth rate of real GDP, REXP: AnnualGrowth rate of real export of goods and services, ED: External debt stock, EDS: Total External debt service, INV: investment or Total capital formation, INF: Rate of Inflation.

4.4.1. Definition of Variables

Growth rate of Real GDP (GDP): Annual percentage growth rate of GDP at market prices based on constant 2010 U.S. dollars. GDP is the sum of gross value-added by all resident

producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources (World Bank 2018).

Growth rate of Real Export of goods and services (EXP): Percentage change of volume of exports refers to the aggregate change in the quantities of total exports whose characteristics are unchanged. The goods and services and their prices are held constant, therefore changes are due to changes in quantities only (IMF, 2017).

External Debt stock(ED): Total external debt is debt owed to nonresidents repayable in currency, goods, or services. Total external debt is the sum of public, publicly guaranteed, and private nonguaranteed long-term debt, use of IMF credit, and short-term debt. Short-term debt includes all debt having an original maturity of one year or less and interest in arrears on long-term debt. Data are in current U.S. dollars.

Total External Debt Service (ED): Total debt service is the sum of principal repayments and interest actually paid in currency, goods, or services on long-term debt, interest paid on short-term debt and repayments (repurchases and charges) to creditors. Data are in current U.S. dollars.

Total Capital formation/ Gross Investment? (INV): Gross capital formation (formerly gross domestic investment) consists of out lays on additions to the fixed assets of the economy plus net changes in the level of inventories. Fixed assets include land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. Inventories are stocks of goods held by firms to meet temporary or unexpected fluctuations in production or sales, and "work in progress." According to the 1993 SNA, net acquisitions of valuables are also considered capital formation. (World Development Indicators ,2018)

Rate of inflation (INF): Rate of inflation reflects macro- economic stability. Annual percentages of average consumer prices are year-on-year changes (IMF, 2017). The rate of inflation acts as a proxy variable for the quality of economic management. A high rate of inflation is a sign of internal economic tension and of the inability or unwillingness of the government and the central bank to balance the budget and to restrict money supply. The higher the inflation rate, the more

risky the government is perceived to be. Furthermore, inflation can influence the demand for foreign funds through its adverse impact on the trade accounts. That is, inflation would tend to cause export demand to fall and import demand to rise, and the growing trade deficit, in turn, would increase trade-financing requirements (Mulugeta, 2014).

4.5. Methodology

4.5.1. Unit Root Test

Before proceeding to further analysis of our work with a time series data, we should examine the order of integration of the variables by using the Augmented Dicker fuller (ADF) or Philips Peron unit root test to ensure that none of the variables has a unit root or is stationary at second difference and then avoid spurious results (Verbeek,2004;Alemayehu et al,2014).The problem with non-stationary or trended data is that the standard ordinary least squares (OLS) regression procedures can easily lead to incorrect conclusions(PhungThanh Binhl, 2013).This occurs when the regression results reveal a high and significant relationship among variables when there exists no meaningful relationship between the dependent variable and the explanatory variables.

Time series data are noted of carrying past memories. This implies past events do influence current and future events (Hossain, 1995). Most macroeconomic time series data are trended and in most cases are non-stationary. If the data series contains a unit root then the exogenous disturbances have permanent effects on the variable in question in the sense that the effects of the shocks do not disappear over time. That is, shocks to such a variable have permanent effects.

On the other hand, if there is no unit root in the data series then exogenous disturbances only have transient effects in the sense that the effects of such disturbances die down over time and, in the long-run, the variable reverts back to its long-run path. Thus, statistical tests of the parameters resulting from unit root regression may be biased and inconsistent. Thus, to eliminate the possibility of these spurious regressions and erroneous inferences, the study determined the order of integration of these series through unit root tests both in the levels and in the first differences.

Differencing is one way to solve non-stationarity, though this would lead to loss of long-run information. A series that is differenced d times to achieve stationarity is said to be integrated of order d that is I(d).A non-stationary series has one unit root or more, and is therefore differenced

to make it stationary and hence it is integrated of order one, I(1) or higher. By contrast, a stationary series is time-independent, has short memory, constant mean, finite variance, transitory innovations and reverts to its mean or equilibrium value. A stationary series has no unit root and does not require differencing, hence it is integrated of order zero, that is I(0) and it does not have estimation problems. Several tests are employed to test for unit roots. The augmented Dickey-Fuller (ADF) and the Phillips-Peron are considered reliable and as such accepted by many in econometric analysis for the test for unit roots and are employed in the study.

The ADF tests the null hypothesis of the series $Y_t$is integrated of order one against it is integrated of order zero. The test is based on the estimation of a test regression which is stated below in a general form where an intercept and trend is included.

$$y_t = a_0 + a_1 t + \Phi y_{t-1} + \beta \sum_{J=1}^{P} \Delta y_{t-j} + \varepsilon_t \quad ----------(3)$$

Where: y_t is the variable in the model to be tested for stationarity,$a_0, a_1$and β are parameters to be estimated, p refers to maximal lag length, Δ is the first difference operator andε_t is the error term.

The null hypothesis is Φ=1 against an alternative hypothesis of Φ<0. A rejection of the null hypothesis means that the time series is stationary or it does not contain a unit root while accepting the null indicates that the time series is non-stationary. The computed value will be compared with critical values to determine whether the series are stationary or not. Another test used in this study to check for the existence of unit-root in the variables is the Phillips-Perron Test, first suggested by Phillips and Perron (1988). The PP test differs from ADF test in that it does not take lagged difference terms into account for a potential serial correlation in the error terms; instead it uses non-parametric statistical method. PP test is robust with respect to unspecified autocorrelation and heterosckedasticity in the disturbance process of the test equation.

4.5.2. Long Run Relationship: Co-integration

The concept of cointegration focuses on when two non-stationary series have the same stochastic trend in common. That is, if the two series are integrated of order one I(1) and a linear relationship exists between them which is stationary or I(0), then the two variables are said to be cointegrated and they share a common trend (PhungThanh Binh,2013).Consequently, the presence of a cointegrating vector can be interpreted as the presence of a long-run equilibrium relationship (Verbeek, 2004, p: 314). In other words, two variables will be cointegrated if they have a long-run, or equilibrium, relationship between them.

Most econometric literatures provide different methodological ways to empirically examine the long-run relationship and dynamic interactions between two or more time-series variables.The most commonly used methods include the two-step residual based procedure for testing the null hypothesis of no co-integration which is attributed to Engle and Granger (1987) and Phillips and Ouliaris (1990) and the full information maximum likelihood-based approach of Johansen (1988) Johansen and Juselius (1990)and (Pesaran et al,1999).

However, all these methods require the variables under investigation ought to be integrated of order one. This normally comprises of a step of stationarity pre-testing, by introducing a certain degree of uncertainty into the analysis. Furthermore, these tests suffer from low power and do not have good small sample properties (Cheung and Lai, 1993). Due to the above limitations, it was compulsory toadopt a newly developed approach to co-integration. The Autoregressive Distributed Lag (ARDL) or Bound Test approach to co-integration has become popular in recent years which is developed by Pesaran and Shin (1999) and further extended by Pesaran et al. (2001)

The reasons to adopt the ARDL procedure are the following. In the first place, the bounds test procedure is simple. As opposed to other multivariate co-integration techniques such as Johansen and Juselius (1990), the ARDL bound test approach allows the co-integration relationship to be estimated by OLS once the lag order of the model is identified. Secondly, the bounds testing procedure does not require the pre-testing of the variables included in the model for unit roots unlike other techniques such as the Johansen approach. It is applicable irrespective of whether the regressors in the model are purely I(0), purely I(1) or mutually co integrated.(Fosu and

Magnus, 2006).Moreover, endogeneity and serial correlation problems, that exist in many empirical studies, and inability to test hypothesis on the estimated coefficients in the long run associated with Engle and Granger (1987) method is avoided (Pesaran and Shin, 1999).Furthermore, the long run and short run parameters of the model under consideration are determined simultaneously.

Thirdly, the ARDL bound test is relatively more efficient in small or finite sample data sizes. Estimates derived from Johansen-Juselius method of co-integration are not robust when it comes to small sample sizes as compared to bounds test. Fourth, as the name suggests, this approach allows both the dependent and independent variables to enter the model with lags, thereby allowing the past values of variables to determine its present values. As opposed to co-integration VAR models, different lags for different variables are also permitted. This flexibility in terms of the structure of lags of the regressors is particularly plausible because reactions to a change in each variable may be different depending on various factors and in some cases they may respond to the changes in underlying factors with a lag (Pesaran et al, 2001).

The other benefit of using ARDL is that one can include dummy variable in the co integration test process. With these reasons specified, we adopt the ARDL model for this study (Heidari et al,2012).

The ARDL approach requires three steps. The first step is to check the existence of long run relationship among the variables of interest that is determined by F- test. The second step requires the estimation of long run relationship and to determine their values, then the short run elasticity of the variables with error correction representation of the ARDL model. This application of error correction version of the ARDL model is mainly to determine the speed of adjustment to the equilibrium. In the sense that that the ECM estimates the speed at which our dependent variable returns to the long run equilibrium given the change in the independent variable (Mikias, 2012).The study proceeds to estimate the short run and long run relationship by following the Unrestricted Error Correction Model (UECM) which is unrestricted intercepts and no trends based on the assumption made by Pesaran et.al (2001).

Afterwards, causal relationship between the export, growth and external debt is performed in two steps. First, we will define the long-run relationships among the variables by using the ARDL

bounds testing approach of cointegration. Secondly, we will test causal relationships by using the error-correction based causality models.

Therefore, in order to apply the F test, the bounds testing modeling framework involves estimating the following equation:

For co-integration analysis it is necessary that ΔY be modeled as a conditional ECM:

$$\Delta y_t = \beta_0 + \pi_{xy} y_{t-1} + \pi_{y_{x,x}} y_{t-1} + \sum_{i=1}^{p} \theta_i \Delta\, y_{t-i} + \sum_{j=1}^{q} \theta_i\, \Delta y_{t-i} + \theta w_t + \mu_t \quad ---------- (4)$$

Here, π_{xy} and $\pi_{y_{x,x}}$ are long-run multipliers. β_0 is the drift and w_t is a vector of exogenous components e.g. dummy variables. Lagged values of Δy_t and current and lagged values of Δx_t model the short-run dynamic structure.

Coming to our specific case, Equation (2) can be modeled as a conditional ARDL- error correction model as:

$$\Delta lnGDP_t = \beta_0 + \sum_{j=1}^{n} \beta_1 \Delta ln\, rexp_{t-j} + \sum_{j=1}^{n} \beta_2\, \Delta lneds_{t-j} + \sum_{j=1}^{n} \beta_3\, \Delta lned_{t-j} + \sum_{j=1}^{n} \beta_4\, \Delta inv_{t-j} + \sum_{j=1}^{n} \beta_5\, \Delta inf_{t-j} + \eta_1 lnGDP_{t-1} + \eta_2 lnrexp_{t-1} + \eta_3 lneds_{t-1} + \eta_4 lned_{t-1} + \eta_5 inv_{t-1} + \eta_6 inf_{t-1} + \mu_t \quad ----------- (5)$$

Where $\beta_1, \beta_2, \beta_3, \beta_4\ and\ \beta_5$ characterize the coefficients of the short run dynamics of the model whereas $\eta_1, \eta_2, \eta_3, \eta_4, \eta_5 and\ \eta_6$. show the long run relationship. And β_0 is a drift component and μ_t is white noise error. The first step in the ARDL approach is to estimate Equation (2) using ordinary least square (OLS). The second step is to trace the presence of co-integration by restricting all estimated coefficients of lagged level variables equal to zero. That is, the nullhypothesis ($H_0: \eta_1 = \eta_2 = \eta_3 = \eta_4 = \eta_5 = 0$) is tested against the alternative ($H_1 : \eta_1 \neq \eta_2 \neq \eta_3 \neq \eta_4 \neq \eta_5 \neq 0$) by the means of the F-test with an asymptotic non-standard distribution.Two asymptotic critical value bounds provide a test for co-integration when the independent variables are I(d) with $0 \leq d \leq 1$. The lower bound assumes that all the regressors are I(0) , and the upper bound assumes that they are I(1) . If the computed F-statistics lies above the upper level of the band, the null hypothesis that says no co-integration is rejected. If the computed F-statistics lies below the lower level band, the null cannot be rejected, supporting the

absence of cointegration. If the statistics fall within the band, inference would be inconclusive.In this context, the unit root test is conducted to ascertain the order of integration of the variables. If all the variables are found to be I(1), then the decision is taken on the basis of the upper critical value. After confirmation of the existence of a long run relationship between the variables in the model, the long run and short run models can be derived using information criteria such as the Schwartz Bayesian or the Akaike information criteria. The ARDL method estimates $(P+1)^k$ number of regressions in order to obtain the optimal lags for each variable, where p is the maximum number of lags to be used and k is the number of variables in the equation.(Shrestha and Chowdhury, 2005).The SBC uses the smallest possible lag length and is therefore described as the Parsimonious model. The AIC chooses the maximum relevant lag length (see Shrestha and Chowdhury, 2005; and Jalil et al, 2008).

Once co-integrating relationship is determined, the long run and error correction estimates of the

ARDL model are obtained as follows:

$$\Delta lnGDP_t = \alpha_0 + \alpha_1\ lnGDP_{t-1} + \alpha_2 lnexp_{t-1} + \alpha_3 lneds_{t-1} + \alpha_4 lned_{t-1} + \alpha_5 lninv_{t-1} + \alpha_6 lninf_{t-1} + \varepsilon_t \quad (6)$$

After estimating the long run model, the next task is to model the short run dynamics of the model by estimating an Error Correction Model associated with the long run estimates. The error correction representation of the series can be given as follows:

$$\Delta lnGDP_t = \beta_0 + \sum_{j=1}^{n} \beta_1 \Delta ln\, GDP_{t-j} + \sum_{j=1}^{n} \beta_2 \Delta ln\, rexp_{t-j} + \sum_{j=1}^{n} \beta_3\, \Delta lneds_{t-j} + \sum_{j=1}^{n} \beta_4\, \Delta lned_{t-j} + \sum_{j=1}^{n} \beta_5\, \Delta lninv_{t-j} + \sum_{j=1}^{n} \beta_6\, \Delta lninf_{t-j} + ECt_{t-1} + \mu_t \quad (7)$$

Where ECt_{t-1} is the error correction term.It shows how quickly variables converge to equilibrium and it should have a statistically significant coefficient with a negative sign to further confirm the existence of a co integrating relationship.

Before directly getting in to estimating the long run relationship of the model using ARDL bounds testing procedure, we have to first test the order of integration of each variable included in the model. This is mainly to ensure that the variables are not integrated of order two (I(2)).

Because as stated earlier, ARDL approach is based on the assumption that the underlying series is either I(1), I(0) or mutually co-integrated. If the variables are found to be I(2), the computed F or Wald statistic are not going to be valid which may lead to erroneous conclusion. The diagnostic test statistics of the selected ARDL model can be examined from the short run estimates at this stage of the estimation procedure. Similarly, the test for parameter stability of the model can be performed by the Cumulative Sum of Recursive Residual (CUSUM) and Cumulative Sum of Square of Recursive Residuals (CUSUMSQ) statistics. If the plots of CUSUM and CUSUMSQ statistics stay within the critical bounds of five percent level of significance, the null hypothesis of all coefficients in the given regression are stable cannot be rejected.

4.5.3. Causality Test

As stated in the previous parts of this paper, the main objective of this research is to examine the causal relationship between growth, export and external debt in Ethiopia. In order to achieve this objective, Granger causality test is applied. Even though the bounds F–test for co integration test yields evidence of a long-run relationship between export, growth, external debt stock and external debt service, it does not indicate the direction of causality between the variables. Granger causality test examines the causal relationship between a set of variables by testing for their predictability based on past and present values. In Granger's sense, a set of variables Zt is said to be caused by Xt if the information in past or present Xt helps to improve the forecasts of Zt. If Xt causes Zt and Zt causes Xt, then Y t′ = (Zt′, X t′) is a feedback system (Granger, 1969). This test enables an evaluation of the information content in the past values of a variable in predicting the contemporaneous as well as the future path of another. It is therefore vital for two main reasons. First, it is equivalent to the econometric exogeniety in the sense that unidirectional causality that runs from the explanatory variables to the dependent variables serves a prerequisite for the consistent estimation of distributed lag models that do not involve lagged dependent variables. Second, it can be likened to leading indicators and rational expectations. Thus, Granger (1969) observed that it is difficult to determine the direction of causality between two related variables.

Depending on the standard Granger causality test method, the bivariate causality relationship between export growth and economic growth is expressed as specified below:

$$RGDP_t = \alpha_0 + \sum_{i=1}^{k} \alpha_1 RGDP_{t-i} + \sum_{i=1}^{k} \alpha_2 REXP_{t-i} + v_1 \text{----------} (8)$$

$$REXP_t = \beta_0 + \sum_{i=1}^{k} \beta_1 RGDP_{t-i} + \sum_{i=1}^{k} \beta_2 REXP_{t-i} + v_2 \text{----------} (9).$$

Where RGDP is the growth rate of real GDP measured as ln(GDPt/GDPt–1), and REXP is the growth rate of real exports of goods and services measured as ln(Exportt/Exportt–1).

Here the null hypothesis to be tested is H0: $\beta_1 = \beta_2 = \text{-----} = \beta_q = 0$; against the alternative hypothesis H1: At least one of them is not zero. $v_2 and v_2$ are random error terms, which are serially uncorrelated with zero mean and constant variance. If the null hypothesis is rejected for equation (8), it can be said that there is a unidirectional causality from export to Growth. Conversely, if the null hypothesis is rejected for equation (9) it can be said that there is a

unidirectional causality from Growth to Export. If the null hypothesis is rejected for both equations, it can be said that there is bidirectional causality between Y and X. Moreover if the null hypothesis is accepted for both cases, we can conclude that there is no causal relationship between the variables. This is referred to as the short run Granger causality test (Hossain, 2013).

The next task is to specify the Multivariate causal test model by incorporating our additional variables such as external debt service and external debt stock. This is performed by making the generalized extension of the standard case [Granger (1969)] augmented with error correction term as follows: (Ahmed et al, 2000; Acaravci and Ozturk, 2010)

$$\Delta RGDP_t = \alpha_0 + \sum_{i=1}^{k} \alpha_1 \Delta RGDP_{t-i} + \sum_{i=1}^{k} \alpha_2 \Delta REXP_{t-i} \sum_{i=1}^{k} \alpha_3 \Delta LEDS_{t-i} + \sum_{i=1}^{k} \alpha_4 \Delta LED_{t-i} + K_1 Ect_{t-1} + e_1 \quad (10)$$

$$\Delta REXP_t = \Upsilon_0 + \sum_{i=1}^{k} \Upsilon_1 \Delta REXP_{t-i} + \sum_{i=1}^{k} \Upsilon_2 \Delta RGDP_{t-i} \sum_{i=1}^{k} \Upsilon_3 \Delta LEDS_{t-i} + \sum_{i=1}^{k} \Upsilon_4 \Delta LED_{t-i} + K_2 Ect_{t-1} + e_2 \quad (11)$$

$$\Delta LEDS_t = \beta_0 + \sum_{i=1}^{k} \beta_1 \Delta LEDS_{t-i} + \sum_{i=1}^{k} \beta_2 \Delta RGDP_{t-i} \sum_{i=1}^{k} \beta_3 \Delta EXP_{t-i} + \sum_{i=1}^{k} \beta_4 \Delta LED_{t-i} + K_3 Ect_{t-1} + e_3 \quad (12)$$

$$\Delta LED_t = \theta_0 + \sum_{i=1}^{k} \theta_1 \Delta LED_{t-i} + \sum_{i=1}^{k} \theta_2 \Delta RGDP_{t-i} \sum_{i=1}^{k} \theta_3 \Delta EXP_{t-i} + \sum_{i=1}^{k} \theta_4 \Delta LEDS_{t-i} + K_4 Ect_{t-1} + e_4 \quad (13)$$

where, all variables are stationary time series, Δ is the first difference operator and the K1 Ect–1, K2Ectt–1 and K3Ect–1 are the lagged values of the error correction terms derived from the long run cointegration equation.

CHAPTER FIVE: RESULTS AND DISCUSSIONS

5.1. Empirical Results for Unit Root Testing

For these study, before proceeding to further analysis the stationarity of each variables is detected through Augmented DickyFuller and Philips Peron method . In Table 5.1. detailed status of each variable regarding the existence of unit root through ADF test is specified.

Table: 5.1. ADF Unit Root Test

	Unit root test At level			**Unit root test At first difference**		
Variables		**t -statistics**	**p-value**	**t –statistics**	**p-value**	**Order of Integration**
RGDP	**Intercept**	-4.457269	0.0012***	-8.707241	0.0000***	I(0)
	intercept & trend	-4.933317	0.0018***	-8.564302	0.0000***	
	None	-3.135180	0.0027***	-8.836680	0.0000***	
REXP	**Intercept**	-5.620158	0.0000***	-6.919327	0.0000***	I(0)
	intercept & trend	-5.742724	0.0002***	-6.807286	0.0000***	
	None	-5.536151	0.0000***	-7.027807	0.0000***	
LNDS	**Intercept**	-0.715132	0.8296	-5.845681	0.0000***	I(1)
	intercept & trend	-1.098687	0.9145	-5.943673	0.0001***	
	None	1.124182	0.9291	-5.726127	0.0000 ***	
LNED	**Intercept**	-1.019756	0.7350	-4.558729	0.0009***	I(1)
	intercept & trend	-1.143133	0.9062	-4.524576	0.0053***	
	None	1.228641	0.9409	-4.472029	0.0001***	
LNINV	**Intercept**	-1.770969	0.3880	-8.347633	0.0000***	I(1)
	intercept & trend	-1.038914	0.9238	-8.506831	0.0000***	
	None	0.187738	0.7346	-8.452204	0.0000***	
LNINF	**Intercept**	-1.306122	0.6154	-3.921697	0.0050***	I(1)
	intercept & trend	-1.936047	0.6133	-3.900274	0.0234***	
	None	10.59479	1.0000	-1.240881	0.1926***	

Source: E-views 9 output.t-statistics is measured in absolute term;*, ** and *** imply statistical significance at 10%, 5% and1%, level of significance, respectively.

RGDP and REXP refer to the growth rate of real GDP and Growth rate of real export respectively whereas LnDS, LnED ,LnINV and LnINF refer to the natural logarithms of external debt service,external debt stock and investment and inflation rate respectively.

According to the above result of the ADF test of unit root shown on Table 5.1, growth rate of real GDP and growth rate of real export are found to be stationary at level with intercept, with both intercept and trend and without trend and intercept. That is, the null hypothesis of the existence of a unit root is rejected. This implies that the data of both variables is mean reverting around a constant long-run mean; and it has constant variance which is time-invariant. On the other side, the remaining variables such as natural logarithm of external debt service ,natural logarithm of external debt stock and natural logarithm of real effective exchange rate are not stationary at level rather they are stationary at first difference. In other words, these variables are integrated of order one I (1). Therefore every variable is stationary with trend, trend and intercept and without trend at 1%, 5% and 10% significant level. In addition, the Phillips-Perron test given in annex 2 gives a result which is consistent with the ADF test and the variables used in the model are a mixture of I(0) and I(1).In this case, none of the variables is found to be I(2). Therefore, our variables are suitable to apply the ARDL model and it is the appropriate method of estimating our model .hus, there will not be problem of spurious regression.

5.2 Bounds Test for Co-integration

One of the advantages of ARDL model over other methods such as Johansson procedure is that it can evaluate the existence of long run relationship or cointegration among variables through bound test of F-statistics irrespective of whether the variables are stationary at level or at first difference. For this study the bound test was conducted in order to know whether there exists a long run relationship between real GDP ,real export, external debt service ,external debt stock ,total investment and inflation rate of Ethiopia .the maximum lag selection was performed using the Akaike info criterion(AIC) and Schwarz criterion SC criterion.

The F-test is used for investigating a level (long-run) relationship and it is then compared with the lower and upper bounds of critical value. If the F-statistic is greater than the upper bound it can be concluded that there is long run relationship among the variables. Conversely, if the F-statistic is less than the lower bound ,we can conclude that there is no long run relationship among the variables under consideration. However, if the F-statistic falls between the upper and

lower bound critical values, it cannot be concluded and there is a need to look at the sign and significance of the error correction model in order to conclude.

Table 5.2 ARDL Bound Test result

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	10.19706	5

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68

As we see from the above table, the calculated F statistics of our bound test is (10.19706) which is higher than both lower and upper bound critical values at 1%,5% and 10% of significance level, respectively. As a result, it is possible to reject the null hypothesis of no co-integration. In other words, the result implies the variables have long run relationship.

5.3. Long Run ARDL Model Estimation Results

Through the test of stationarity the variables are all found to be stationary at level and at first difference. The existence of long run co-integration among the variables is also confirmed by the bound test of the F- statistic. Hence, from now on wards it is possible to proceed to the estimation of the long run coefficients of the model. This will help us to know the effect of the independent variables on the dependent variable in the long run. The following table presents the results found after running the appropriate ARDL model to find out the long run coefficients. The numbers in bracket are number of lag chosen by the model for each variable. The selected model, based on the AIC criteria, is ARDL (2, 3, 3, 3, 2, 0)

Table 5.3 Estimated Long Run Coefficients using the ARDL Approach

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REXP	0.465677	0.130192	3.576856	0.0050
LNDS	-6.868705	3.050862	-2.251398	0.0481
LNED	3.652960	3.695947	0.988369	0.3463
LNINF	6.948103	2.985334	2.327412	0.0422
LNINV	11.290990	4.009389	2.816137	0.0183
C	-135.397705	54.699216	-2.475313	0.0328

Source: EViews ARDL (2, 3, 3, 3, 2, 0) model estimate result

The empirical results of the long run model coefficients are presented in Table 5.3. The results suggest that all the explanatory variables significantly affect the growth rate of real GDP in the long run except the external debt stock.

The long-run relationship between the rate of growth of real export and rate of growth of real GDP is positive, with a statistically significant coefficient. One percent increase in the rate of growth of real export results in 0.4657 percent increase in in the rate of growth of real GDP. This implies that if the rate of growth of real export increases by 1percent then the rate of growth of real GDP will increase by 0.4657percent. This result provides support for the traditional view that for LDCs exports play vital roles being source of foreign exchange for importing much needed capital inputs for the growth of the economy. (Adjaye and Chakraborty ,1999). The Ethiopian economy is highly reliant on the export sector. Because export is used as a source of foreign exchange to import capital goods and productive technologies that are vital inputs for growth enhancing projects such as construction of dams, ,roads , railways and airports . The achievement of these projects is very crucial in serving as sources of huge revenue in the long run and highly facilitating other development activities for long run growth effort of the country. Exporting industries also serve as sources of employment opportunities for a number of citizens and generating revenue for domestic saving and investment. The Result also mimics to export led growth hypothesis and it is in line with the results of Shirazi and Manap(2005) for south Asian countries, and with Chemeda(2001),Debel (2002) ,Simon(2014) Mesay (2009) in the context of Ethiopian economy.

The other variable which is found in our result to significantly determine the growth rate of real GDP in the long run is the external debt service. That is, external debt service has a negative and significant impact on the economic growth of Ethiopia in the long run. According to our long run

ARDL estimation result, a 1 percent increase in the external debt service results in nearly 6.869 percent decrease in the rate of growth of real GDP in the long run. This result coincides with the debt overhang theory which states that large levels of accumulated debt lead to future debt service burden and then lower growth (Krugman 1988). In the other case, huge external debt service expense of the country creates crowding out effect on investment by depleting the availability of foreign exchange for import of capital goods. (Alemayehu, 1998).The country spends much of its foreign currency on debt service rather than on productive investment. For stance, in 2016, the total external debt service was $1.24 billion which accounts for 21 percent of the export revenue. (World Development Indicator, 2017).Debt overhang also depresses investment and growth by increasing uncertainty on potential investors. That is, expected debt-service costs will discourage further domestic and foreign investment and thus harm growth. (Pattillo et al 2002; Clements et al 2003).The result is similar to Ramakrishna (2002), Desta (2005) and Mulugeta (2014). Therefore, an increase in external debt service is likely to negatively impact the growth effort of the country in the long run by affecting the level of investment through the debt over hang and liquidity constraint.

Apart from these, the impact of external debt stock is found to be insignificant in the long run and the result is similar to the fining of Ramakrishna (2015) in the case of Ethiopia. And it contradicts with the findings of Ramakrishna(2002),Mulugeta(2014)and Garedew(2016). Ethiopian economy has experienced structural change as the economy moved from agriculture to the service sector dominant economy. Service sector and agricultural sector growth have contributed positively to the economic growth of Ethiopia both in the short run and long run Ramakrishna (2015). In addition, the fast growing countries such as Ethiopia are expected to manage their foreign debt better as their credit worthiness would be higher and due to the rise in capital inflows in terms of FDI. Due to its good reputation on the outside, Ethiopia could manage its debt by enhancing its export oriented FDI. Hence the stock of external debt has no effect on the growth rate of the economy.

However, the effect of investment on the rate of growth of real GDP the long run is positive and statistically significant. The result is similar to Chimobi(2010), Shimelis (2014). That is the increased level of domestic development oriented investments and foreign investment playing a major role through increasing the export performance and further attracting domestic saving.

Moreover, the long run coefficient of inflation rate is found to be statistically significant. This implies that inflation rate significantly determines the rate of growth of Real GDP in the long run in the context of Ethiopia.

In general, the estimated long run equation can be presented as follows:

RGDP= -135.397+ 0.4657REXP-6.868 LDS+ 3.6529 LED+11.291 LINV+6.948 LINF

(54.699216) (0.1301) (3.051) (3.6959) (4.009) (2.985)

Note: The values in bracket are standard errors of each coefficient.

5.4. Short Run Model ARDL Estimation Results

Once the long-run cointegrating model has been estimated, the next step is to model the short-run dynamic parameters within the ARDL framework. Thus the lagged values of all level variables (a linear combination is denoted by the error-correction term, ECMt-1) is retained in the ARDL model. The table below presents the results of the estimated error-correction model of real GDP growth rate model for Ethiopia using the ARDL technique. The model is selected based on the AIC.

Table 5.4 .Error Correction Representation for the Selected ARDL Model

ARDL Cointegrating And Long Run Form

Selected model: ARDL(2, 3, 3, 3, 2, 0)

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RGDP(-1))	0.170181	0.109346	1.556350	0.1507
D(REXP)	0.177756	0.029377	6.050843	0.0001
D(REXP(-1))	-0.108994	0.034717	-3.139536	0.0105
D(REXP(-2))	-0.062969	0.019687	-3.198424	0.0095
D(LNDS)	5.622124	1.333501	4.216062	0.0018
D(LNDS(-1))	6.267779	1.840898	3.404739	0.0067
D(LNDS(-2))	-2.364277	1.458672	-1.620842	0.1361
D(LNED)	3.590955	1.958696	1.833339	0.0966
D(LNED(-1))	5.526145	2.175091	2.540650	0.0293
D(LNED(-2))	-9.520717	2.082223	-4.572381	0.0010
D(LNINF)	-13.787639	30.045611	-0.458890	0.6561
D(LNINF(-1))	44.561361	31.148628	1.430604	0.1830
D(LNINV)	8.601307	3.005144	2.862195	0.0169
CointEq(-1)	-0.761785	0.142634	-5.340844	0.0003

Cointeq = RGDP - (0.4657*REXP -6.8687*LNDS + 3.6530*LNED + 6.9481 *LNINF + 11.2910*LNINV -135.3977)

Note: D denotes the first difference

The short run analysis results reveal that the lagged value of the growth rate of real GDP is not significant. This implies that the rate of growth of real GDP is not determined by lagged value of itself. The other all variables are significant except the coefficients of external debt stock and inflation rate.

The short run coefficient of growth rate of real export is positive similar to that of the long run coefficient. A 1 percent increase in the growth rate of real export is associated with a 0.18percent increment in the rate of growth of real GDP. This implies that when the export grows with a higher rate, the growth rate of the economy will be at a higher speed than otherwise. Export contributes directly to growth by serving as a source of foreign exchange that will be used to finance the import of capital and intermediate goods which will raise productive capacity of the nation. Also indirectly, exports can foster economic growth substantially by inducing pubic savings, attracting foreign capital and hence promoting investment in Ethiopia. This result agrees with the export led growth hypothesis and it is in line with the results of Debel (2002), Mesay (2009) and Jara (2013) in the context of Ethiopian economy.

As per the estimation result, the short run coefficient of external debt service is positive and significant. One percent increase in external debt service raises the rate of growth of real GDP by 5.62 percent which is contrary to conventional theory. The result is not in line with.(Fatai ,2016; Siddique and Selvanathan ,2015; lyoha 1999 ; Mulugeta ,2014;) .The possible reason of this result may be due to the good reputation created for the country in the eyes of multilateral and bilateral creditors because of the continuous commitment to pay back its debt even in the bad situations. This may have facilitated a good economic environment for the country such as easy access to international capital markets, less cost of concessional loan and provision of trade credit from its creditors (Furceri and Zdzienicka, 2012).In addition, the good reputation that Ethiopia had attracted further loan for productive investments, huge foreign aid, foreign direct investment and other development assistances that has a significant role for its growth. Furthermore, its creditworthiness helped the country to find trade partners in the external market which might have helped the export performance to contribute more to the overall economic growth (Rose, 2005).

On the other hand, in our short run estimation result, the coefficient of external debt stock is found to be statistically insignificant which is similar to the long run result. This implies that

external debt stock does not significantly determine the rate of growth of real GDP in the context of Ethiopia. In the contrary, investment determines the rate of growth of real GDP with positive and significant amount. In our analysis, inflation rate has no significant impact in the rate of growth of real GDP in the short run. This is because when we see the trend of inflation in Ethiopia, at the beginning the rate has been creeping or mild inflation which is somehow moderate, and which has contributed positively to the economy by boosting demand .However, after 2008 the inflation rate has increased in a way that harms the economy. Hence, these two scenarios offset and the cumulative effect of the inflation rate in the year of the study became zero. On the other hand, gross capital formation is found to have statistically significant and positive impact on economic growth both in the long run and in the short run.

The coefficient of the error correction term (ECTt-1) measures the speed of adjustment of variables to restore to equilibrium in the dynamic model. It should have a statistically significant coefficient with negative sign and it should be between zero and one. In this model, it appears with negative and statistically significant at 5% level, ensuring that the long run equilibrium can be attained. A highly significant error correction term confirms the existence of a stable long run relationship among variables (Bannerjee et al. 1998). The coefficient of the lagged error correction term (ECTt-1) is -0.76. This means, the speed of adjustment at which the rate of growth of real GDP can come back to its original position is 76 percent. In other words its magnitude indicates that deviation from the long run equilibrium is adjusted fairly quickly where 76% of the disequilibrium is removed each period.

5.5. Causality Tests

This study explores causal relationship between Export, growth and external debt. Even though the bounds F–test for co integration test yields evidence of a long-run relationship between export, growth, external debt stock and external debt service, it does not indicate the direction of causality between the variables. For this reason, Granger causality models should be used to study the direction of causality among the variables. Granger causality test is applied to study the forerunner-lag relationship between export, external debt and economic growth. Simelyte (2017). A variable is said to Granger cause another variable if past values of it help predict the current level of the other variable. Granger test is based on the concept of causal ordering. In this analysis Four patterns of causality can be distinguished: (a) unidirectional causality from one

variable, let us say X to another variable Y; (b) unidirectional causality from Y to X; (c) feedback or bi-directional causality; and (d) no causality.

Table 5.6 Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
REXP does not Granger Cause RGDP	30	2.10714	0.1427
RGDP does not Granger Cause REXP		0.45972	0.6367
LNDS does not Granger Cause RGDP	30	4.83197	0.0168
RGDP does not Granger Cause LNDS		0.44800	0.6439
LNED does not Granger Cause RGDP	30	0.78768	0.4659
RGDP does not Granger Cause LNED		0.08758	0.9164
LNINV does not Granger Cause RGDP	30	0.62776	0.5420
RGDP does not Granger Cause LNINV		0.33436	0.7189
LNDS does not Granger Cause REXP	30	0.88091	0.4269
REXP does not Granger Cause LNDS		0.02567	0.9747
LNED does not Granger Cause REXP	30	0.80734	0.4573
REXP does not Granger Cause LNED		1.39105	0.2674
LNINV does not Granger Cause REXP	30	4.48207	0.0217
REXP does not Granger Cause LNINV		5.33031	0.0118
LNED does not Granger Cause LNDS	30	1.47068	0.2490
LNDS does not Granger Cause LNED		4.08351	0.0292

Source: views 9 Granger causality test result

As the above table 5.6. Shows, we have conducted pair wise Granger causality test for variables such as growth rate of real GDP, real export, external debt stock, external debt service and gross investment.

In the first place, the causal relationship between export and growth is tested and the test result showed that the statistical probability value is not significant at all levels of significance. Which means, we cannot reject the null hypothesis that says growth rate of real export does not Granger cause growth rate of real GDP. The same also holds true for the reverse causality from real GDP to real export that is, according to the test result, there is no Granger causal relationship that runs from the rate of growth of real GDP to rate of growth of real export in the context of Ethiopia. This implies that in the relationship between export and growth, none of them is a cause for the performance of the other. This result is contrary to both the export led growth and the growth driven export hypotheses. That is none of these alternative growth hypothesis is valid in the

context of Ethiopian economy. This result is similar to the finding of Fanta and Teshale (2014) while it contradicts with the findings of Debel (2001),Mesay (2009),Chemeda(2001), Simon(2014)and Jara(2013).The possible factor for this outcome could be because the real export of goods and services of the country is not growing with a rate that can Granger cause the real GDP growth. As it is seen in appendix 6, the annual data of the growth rate of real GDP shows, the rate of growth is not adequate. This might be due to a number of reasons such as the fact that the competitiveness of our commodities in price and quality in the international market is not yet as such improved. IMF (2016).The other possible factor is the crowding out effect of external debt servicing. That is, Ethiopia loses huge amount of foreign currency annually in order to fulfill its debt servicing commitments. For this reason, most of the revenue from export is being used for debt service instead of productive investments. Thus the expected Granger causality form export growth to economic growth may not be obtained, because, the resources from exports are directed to servicing external debt instead of investment (Feder 1982). Furthermore, a significant portion of the export revenue is spent for the debt service purpose thus the export sector could not grow in a way that causes an economic growth .On the other hand; the economy is not also supporting the growth of the export sector. Some factors such as lack of good governance facilities to encourage exporting industries, foreign exchange constraint to import capital inputs etc. did not allow the export sector to feed the overall economic growth as it is expected in the growth driven export hypothesis.

The other result from Granger causality test is that there is a unidirectional Granger causality running from debt service to rate of growth of real GDP. This implies that the more the country spends money to finance external debt service the more the economy is getting affected negatively. Ethiopia being one of the highly indebted poor countries is affected negatively by external debt through crowding out effect of external debt servicing. That is, the large amount of foreign exchange spent on servicing the debt should have been invested in the economy to increase growth of the economy there is also less incentive for private investment. Clements et al (2003). As a result there is a negative Granger causality from external debt service to economic growth in the context of Ethiopia. The result is similar with the findings of Ramakrishna (2002), Desta (2005), Mulugeta (2014), Fatai (2016) and Alemayehu(1998)

On the other hand, it is found to exist no Granger causality relationship between external debt stock with both the rate of growth of real GDP and real export. In other words, external debt stock is a Granger cause for neither the growth rate of export nor to the growth rate of the economy in Ethiopian case. And there is also no feedback effect from export and growth towards external debt stock.

Similarly, no evidence is found for a Granger causality relationship between external debt service and export. That is, in the context of Ethiopia, the external debt service and export does not cause to each other.

Another important result that is found from the Granger causality test is that there is a uni directional Granger causality running from external debt service to external debt stock. This implies clearly that the more Ethiopia services its external debt, the more likely its stock of accumulated debt will be reduced. Therefore, this intuition explains that external debt Ganger causes the external debt stock by decreasing its amount. However, this can also have an opposite meaning that as the country continues to repay its debts and fulfill its obligations; its reputation in the eyes of its debtors is increased. And hence, additional access to loan from abroad is eased and as a result, the debt accumulation and debt servicing burden is further worsened unless the debt is managed well and used for productive purposes. (Feder, 1982; Rose, 2005; Furceri and Zdzienica; 2012).

Finally, our result showed that there is a bi directional Granger causality relation between investment and export. This implies that, investing in the external market oriented industries further appreciates the performance of the gross capital formation. This happens in a way through increased level of export growth the needed amount of foreign currency is obtained in order to import capital goods and technologies to strengthen the capital formation and increases domestic saving for further productive investment. Export growth can induce pubic savings, attract foreign capital and hence promote investment. And this will in turn advances the export sector growth by facilitating external market oriented production. (Gemechu, 2002)

5.6. Long-run Diagnostic and Stability Tests

In order to test weather our model is appropriate and sound, we conducted the standard diagnostic tests below. The tests evaluated issues such as serial correlation using Brush and

Godfray LM test, functional misspecification test through Ramsey‟s RESET test, normality test (Jaque- Bera test) and heterosckedasticity by Breusch-Pagan-Godfrey test are performed.

Serial correlation test is made to test whether the residual is serially correlated or not that is whether the error of one period is correlated with the error for subsequent period time. The null hypothesis is there is no serial correlation. As Annex 5a result shows, the p-value of the serial correlation test is 0.8529 (85.29 percent) which is more than 5 percent, and thus we can't reject null hypothesis. That is the residual is not serially correlated. Therefore, our model is best model.

B. Heterosckedasticity test is used to test whether there is any data that is not homosckedastic. That is, whether the residual is heterosckedastic or not. To be a best model the residual must be homoscedastic. Our null hypothesis is that there is no hetrosckedasticity. The result on Annex 5b shows that the P-value is 0.8892 (88.92 percent) which is more than 5 percent, meaning that we can‟t reject null hypothesis which is desirable. Therefore our model is best.

C. Ramsey RESET Test for functional form indicates tha`t whether the models are well constructed or not. Annex a 5c result shows that the P-value is 0.5010 (50.10 percent) which is more than 5 percent. Hence, we failed to reject the null hypothesis of Ramsey RESET test. The Result proves that the model do not have omitted variable bias and the models are well constructed

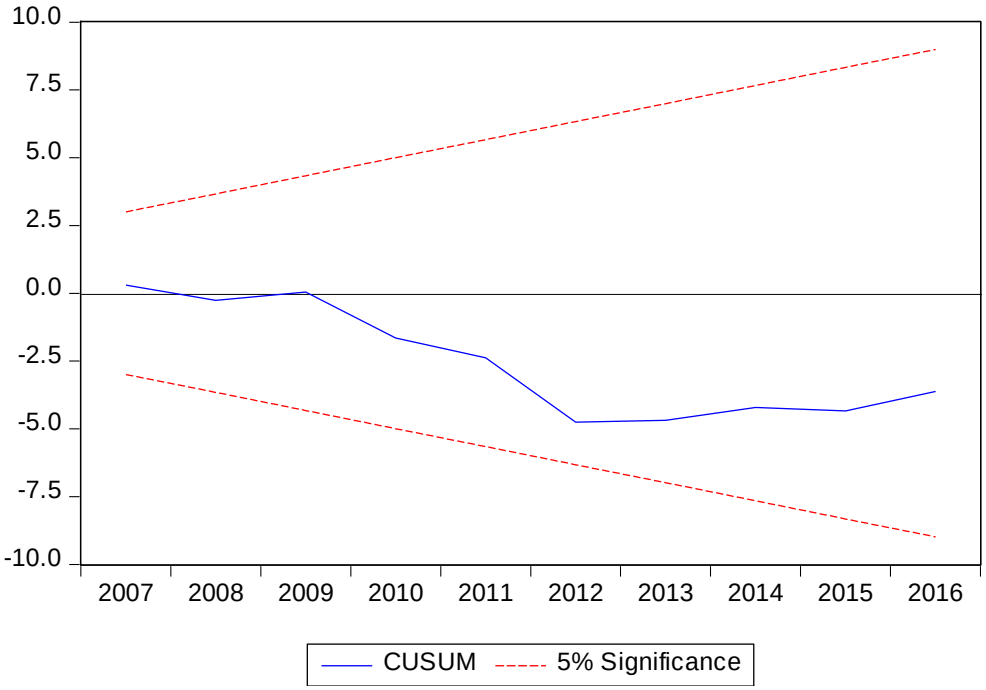
D. Jaque-Berra normality test is used to test whether the residuals are normally distributed or not. Our null hypothesis is that the residuals are normally distributed. Annex a 5d result shows that the P-value is 0.1380 (13.80 percent) which is more than 5 percent. As a result, we fail to reject the null hypothesis.

The above results confirmed the absence of serial correlation and heterosckedasticity in our model as well as the errors are normally distributed. In addition, the Ramsey functional form test confirmed that the model is specified well .Hence; the relationship between the variables is verifiable.

Next, we examined the stability of short-run and long-run coefficients, performing the CUSUM and CUSUMQ stability tests for the AIC-based ARDL models which are recommended by (Pesaran and Shin, 1999, 2001). Since these kinds of stability tests can be graphed, one can easily identify not only their significance but also the point at which stability (structural break) possibly occurred. For the stability test the graph plots both the cumulative sum of residual with 5% critical lines. And, if the cumulative sum remains inside between the two critical lines or

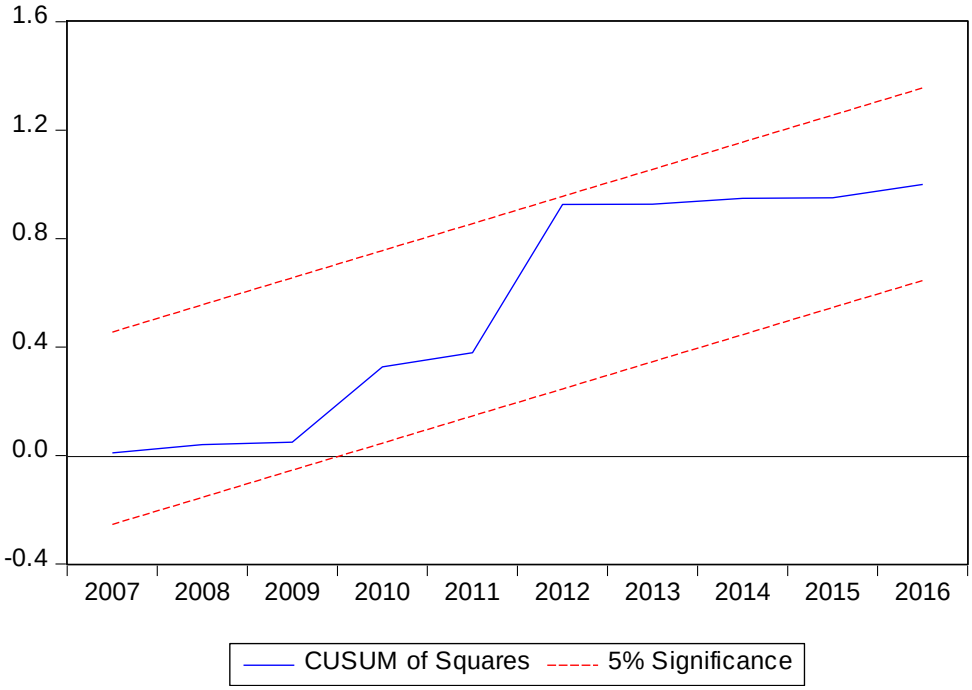
bounds back after it is out of the boundary lines, the null hypothesis of correct specification of the model cannot be rejected. But, if the cumulative sum goes outside (never returns back) between the two critical bounds there exists series parameter instability problem. The tests applied to the residuals indicate the absence of any instability of the coefficients because the plots of the CUSUMQ and CUSUM statistic are confirmed within the 5% critical bounds of parameter stability.

Figure 5.2 Graphical Representation of CUSUM Result



The straight lines represent critical bounds at 5% significance level .As depicted in the figure above, the plot of cumulative sum of recursive residuals graphical test of stability revealed by oscillation of the calculated statistics between the critical bounds at 5%level of significance and it is the indication of stability the parameters under study. This is re-enforced by the same pattern of the plot of cumulative sum of the squares of recursive residuals shown in the figure below.

Figure 5.3 Graphical Representation of CUSUMQ Result



CHAPTER SIX: CONCLUSION AND POLICY IMPLICATIONS

6.1 Conclusion

To assess the contribution of export to economic growth of Ethiopia, many researches have been conducted in terms of bivariate causal relationship study. In the investigation of the validity of the export led growth hypothesis to Ethiopia, mixed results have been observed most of which are inclined to support the Export led growth hypothesis.

The aim of this research was to make a contribution by conducting a multivariate analysis of the causal relationship between export, growth, and external debt in the context of Ethiopia by first studying whether they are cointegrated in the long run. And then to test the validity of the export led growth hypothesis in the context of Ethiopia. Rate of growth of real GDP was used as a proxy to account for the growth of the country and the annual growth rate of real export of goods and services is used to represent the export growth of the country. In addition, to measure the external indebtedness, the annual external debt stock and external debt service data is utilized.

In addition to our main objective variables, the study incorporated additional control variables such as capital formation and inflation rate in order to study the long run and short run relationship among them. For this purpose the recent and latest method of the ARDL bound test approach is applied. Our stationary test result through both the ADF and PP stationary test methods confirmed that two of the variables (RGDP and REXP) are stationary at level while the remaining are stationary at first difference. And the result of the ARDL bound test indicated that all of our variables are cointegerated that is, the variables have long run relationship.

In order to know the impact of each explanatory variable on the economic growth, the ARDL short run and long run estimation has been conducted and the values of coefficients for both cases are identified. The result suggested that all the explanatory variables significantly affect the growth rate of real GDP in both the long run and shot run except the external debt stock. Inflation is also found to be significant only in the long run. The result suggested that export positively and significantly affects the rate of growth of the economy both in the short run and in the long run. This outcome confirms the fact that Ethiopian economy is determined by the export performance such as a source of foreign exchange in order to import capital goods and energy

resources for the long run development of the economy and as a main source of domestic saving and productive investment.

On the other hand, external debt service affects the economy positively in the short run and negatively in the long run. This points out that the enormous external debt service expense of the country imposes crowding out effect on investment by depleting the availability of foreign exchange for import of capital goods and energy resources.

According to our result, external debt stock does not impact the economy both in the long run and in the short run. This implies that, due to its good reputation on the outside through credit worthiness, Ethiopia could manage its debt by enhancing its export oriented foreign direct investment. Hence, the stock of external debt has no effect on the growth rate of the economy. The positive short run and long run effect of capital formation indicates the increased level of domestic development oriented investments and foreign investment playing a major role through increasing the export performance and further attracting domestic saving.

In our main objective, which is the causal relationship of export, external debt and growth, we aimed to know the nature and direction of causality among the variables. That is, whether past value of one variable helps predict the present and future/or value of the other. For this reason, we applied the Granger causality test technique. The result suggested that there is no Granger causal relationship between export growth and economic growth in both direction meaning that none of the alternative strategies (i.e. export led growth and growth driven export) is valid in the context of Ethiopian economy. This implies that export is not performing well in a way that can bring an economic growth. This is due to its poor international competitiveness and the huge expense of export revenue to finance external debt service rather than productive investment. On the other hand, the economy is not also supporting the growth of the export sector. Some factors such as lack of good governance facilities to encourage exporting industries, foreign exchange constraint to import capital inputs etc. did not allow the export sector to feed the overall economic growth as it is expected in the growth driven export hypothesis.

In the other case, the result showed that there is a unidirectional Granger causality that runs from external debt service to growth implying that external debt is positive or negative cause for growth in Ethiopia. This is due to the fact that the external debt service expense of the country

depletes the available foreign exchange for the import of capital goods and energy resources that are used as an input for the country's productive investment. It also creates uncertainty on private investors fearing high taxes and results in capital out flow.

Another important result that is found from the Granger causality test is that there is a uni directional Granger causality running from external debt service to external debt stock. This causal relationship might be positive or negative. The negative causal relation is when external debt service helps reduce the stock of the debt whereas the positive effect is when the debt servicing performance of the country helps as a good reputation to easily access to international capital market. The good reputation also helps the country to access additional concessional loans for productive investment. Otherwise, if the debt is not managed well, the additional loan further worsens the indebtedness of the country which in turn harms the economy.

Finally, our result showed that there is a bi directional Granger causality relation between investment and export implying that export and capital formation Granger cause to each other.

6.2. Policy Implications

One of the key results of this study is that, in Ethiopian economy, neither export led growth nor the growth driven export strategy is valid. This is due to the fact that the export sector is mainly dominated by the limited types of primary agricultural items which are dependent on the natural conditions and are subject to price fluctuations in the international market. And these items are not competitive in the international market. The share of the export of manufactured items is not also growing with a rate that can improve the economic growth.

For these reasons, the government should make an effort to bring a structural change to make the export sector manufacturing goods dominated. These could be achieved by further establishing industrial zones that conform to international best practice. It needs to boost the performance of existing industries to make them function at their full potential through different financial and fiscal incentives such as solving power supply shortage, revising burdensome business rules that obstruct firm entry to the market and, especially high start-up capital requirement, pre-registration bank deposits as well as restricted foreign exchange availability. The government should also attempt to diversify the export items and encourage raising the value and volume of export and promoting exports in order to fully exploit the benefits of the sector and promote economic growth.

As the other main finding of the study reveals, the external debt service of the country imposes negative impact on the real GDP growth through its crowding out effect on investment. To mitigate this problem, the government should increase alternative sources of domestic finance such as increasing domestic saving and investment and encouraging other sources of foreign currency such as foreign direct investment as well as mobilizing the diaspora to invest in the country by fulfilling every facility. Moreover government has to create a network with the diaspora so that they will be encouraged to directly support the economy of the country.

For the long term, the government must avoid foreign debt dependency by revising its over expansionary fiscal policy. And there is a need to design reasonable government policies and strategies that can be achieved through the domestic economy rather than deriving to seeking external borrowing and further worsening the indebtedness of the country.

The country should introduce effective debt management as a major policy concern to achieve the benefits of external finance without creating difficult problems of macroeconomic and balance of payment stability.

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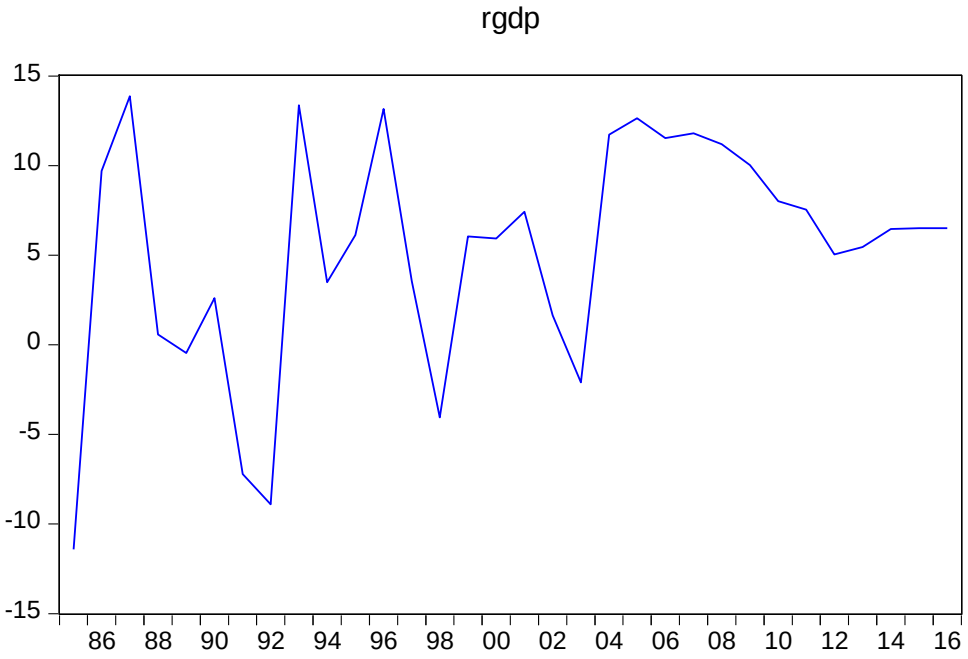
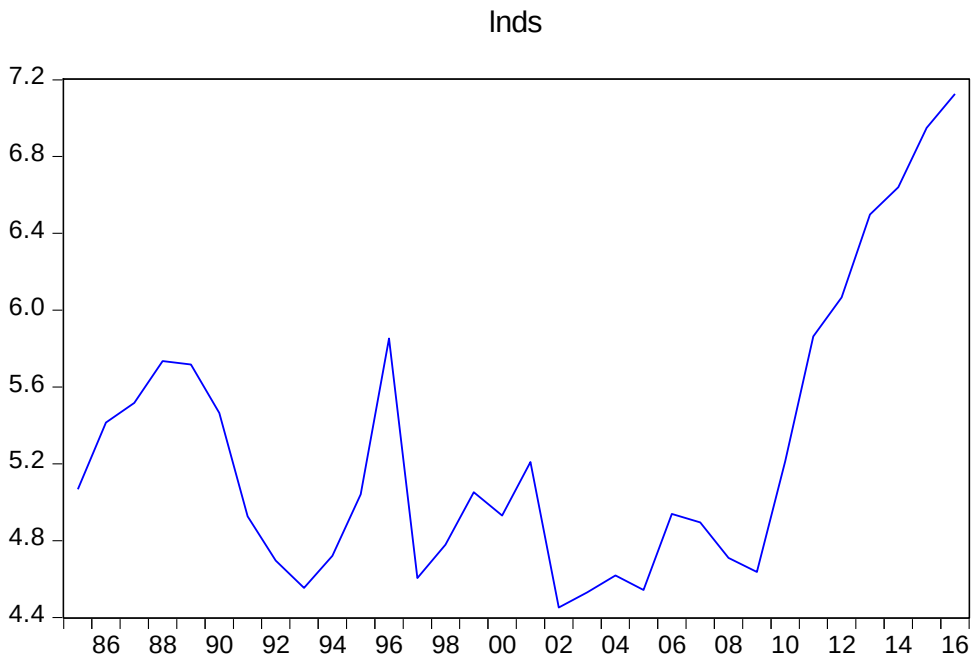
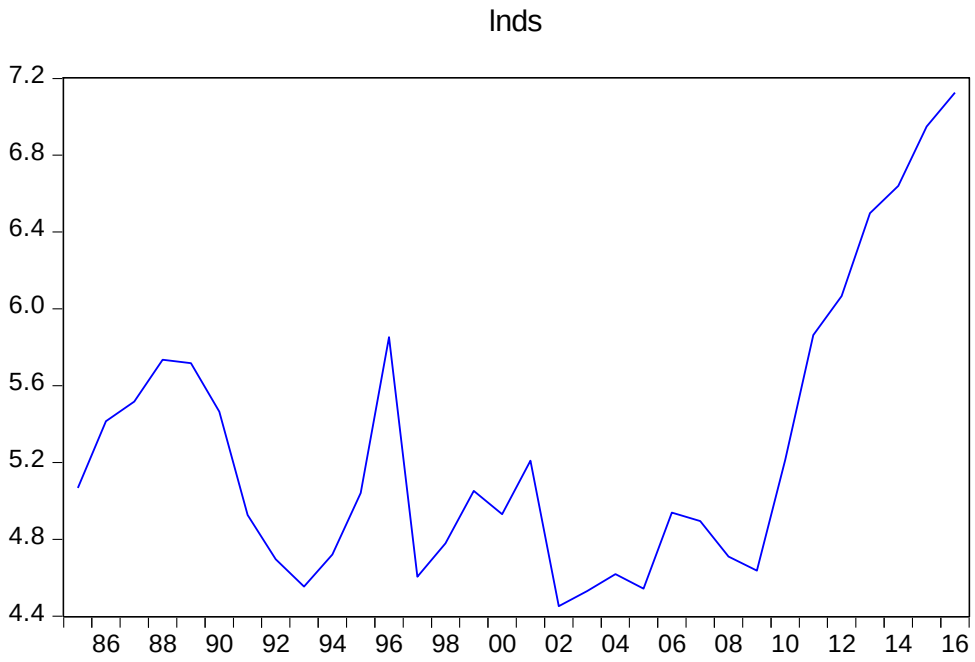
APPENDICES

Appendix 1 Time series plot




lnds
7.2
6.8
6.4
6.0
5.6
5.2
4.8
4.4
86 88 90 92 94 96 98 00 02 04 06 08 10 12 14 16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6.4
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4.8
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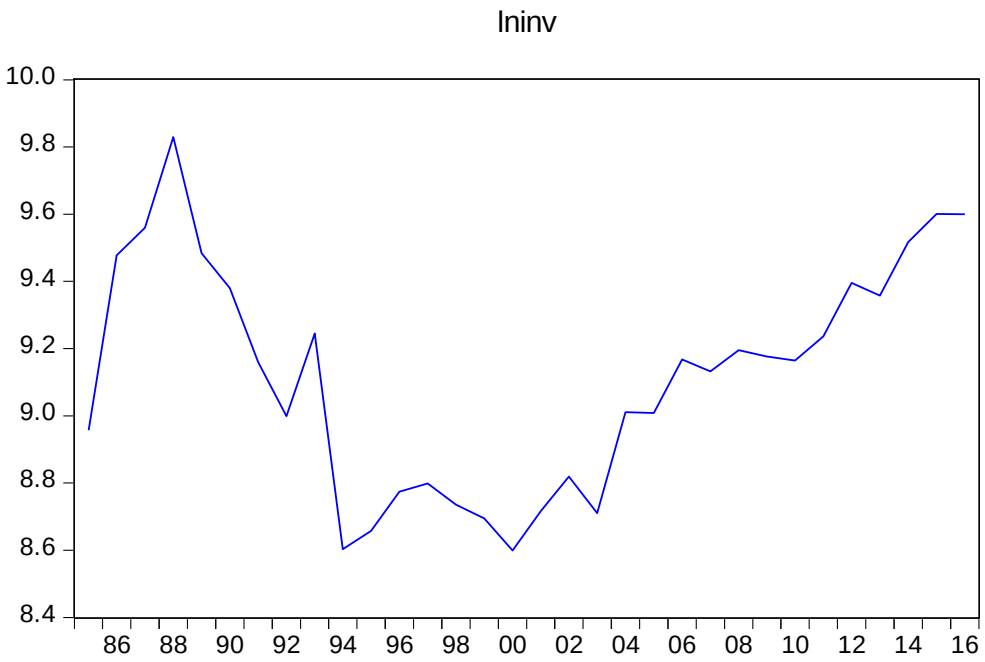
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9.8
9.6
9.4
9.2
9.0
8.8
8.6
8.4
86
88
90
92
94
96
98
00
02
04
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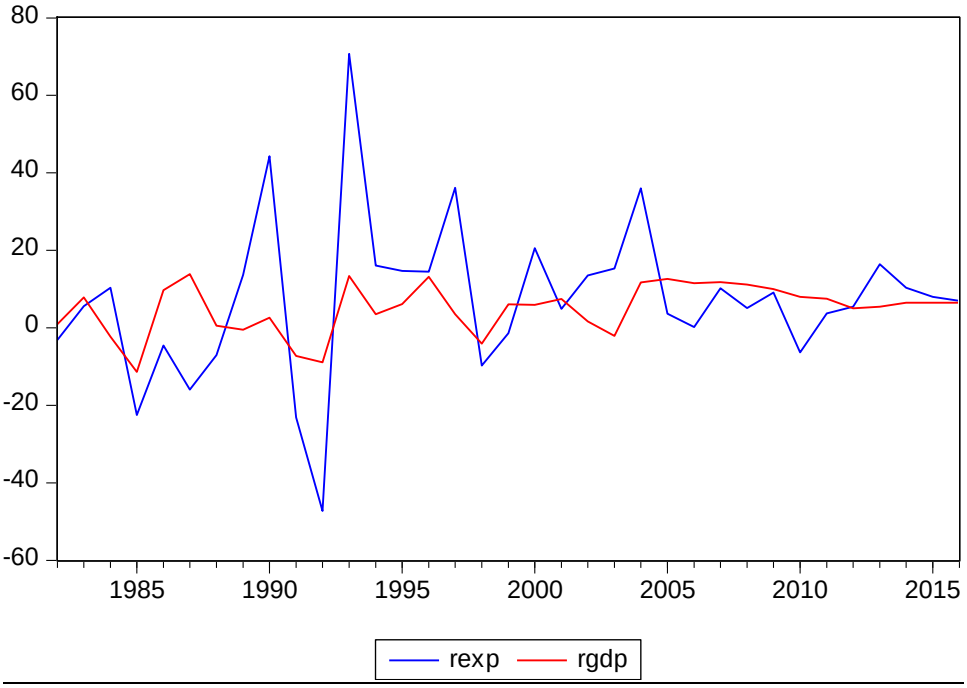
12
14
16


80
60
40
20
0
-20
-40
-60
1985
1990
1995
2000
2005
2010
2015
rexp
rgdp

Appendix 2. PP Stationary Test

	Unit root test At level			Unit root test At first difference		
Variables		**t -statistics**	**p-value**	**t –statistics**	**p-value**	**Order of Integration**
RGDP	**intercept**	-5.059810	0.0003***	-7.214975	0.0000***	I(0)
	intercept & trend	-5.165989	0.0012***	-7.377588	0.0000***	
	None	-3.211675	0.0022***	-7.363518	0.0000***	
REXP	**intercept**	-6.754028	0.0000***	-19.82635	0.0001***	I(0)
	intercept & trend	-6.526376	0.0000***	-20.79117	0.0000***	
	None	-5.295567	0.0000***	-19.82335	0.0000***	
LNDS	**intercept**	-0.466609	0.8848	-5.663441	0.0001	I(1)
	intercept & trend	-0.861872	0.9480	-7.368109	0.0000***	
	None	0.886705	0.8951	-5.644444	0.0000***	
LNED	**intercept**	-0.787945	0.8086	-4.389261	0.0016***	I(1)
	intercept & trend	-0.822895	0.9524	-4.386175	0.0081***	
	None	0.854692	0.8898	-4.370918	0.0001***	
LNINV	**intercept**	-1.602103	0.4696	-6.975071	0.0000***	I(1)
	intercept & trend	-1.487044	0.8124	-7.820813	0.0000***	
	None	0.565762	0.8330	-7.117548	0.0000***	
LNINF	**intercept**	-0.832578	0.7956	-3.930263	0.0053***	I(1)
	intercept & trend	-1.954342	0.6024	-4.060719	0.0172***	
	None	7.041818	1.0000	-1.212982	0.2012	

Appendix. 3. ARDL Estimation Result

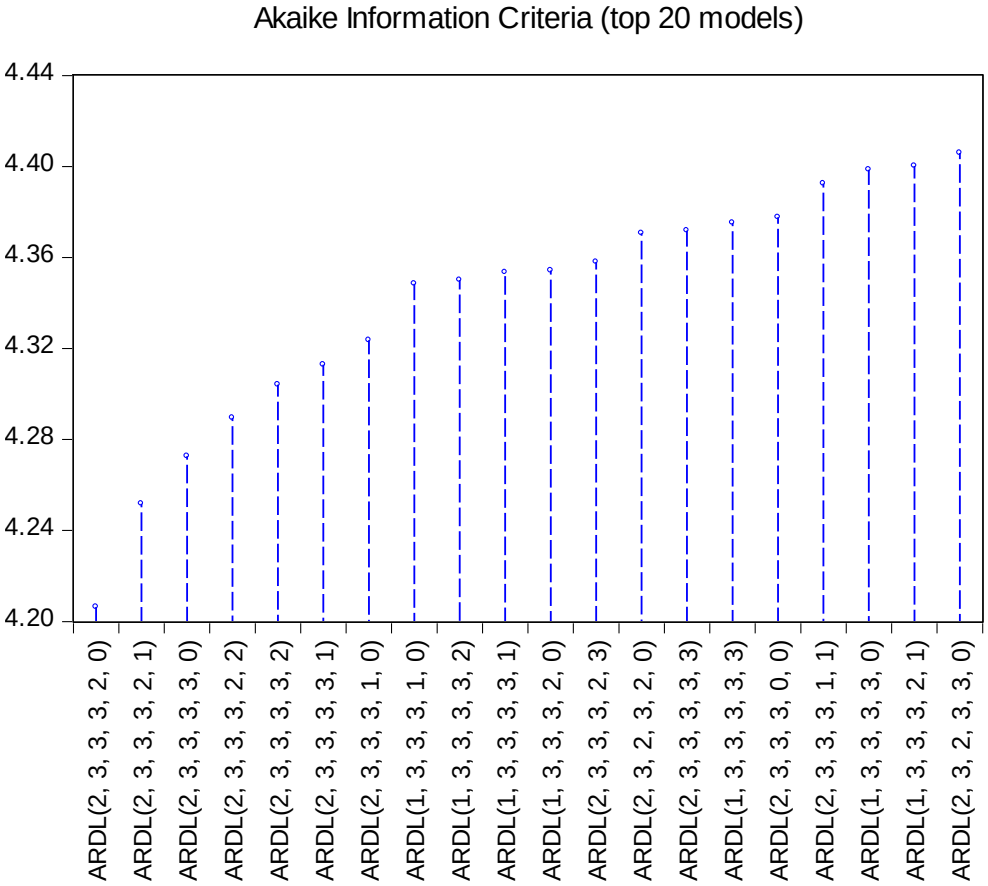
Dependent Variable: RGDP
Method: ARDL
Date: 05/26/18 Time: 18:45
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments
Maximum dependent lags: 2 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (3 lags, automatic): REXP LNDS LNED LNINF LNINV
Fixed regressors: C
Number of models evalulated: 2048
Selected Model: ARDL(2, 3, 3, 3, 2, 0)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
RGDP(-1)	0.408396	0.148613	2.748053	0.0205
RGDP(-2)	-0.170181	0.109346	-1.556350	0.1507
REXP	0.177756	0.029377	6.050843	0.0001
REXP(-1)	0.005026	0.028516	0.176268	0.8636
REXP(-2)	0.108994	0.034717	3.139536	0.0105
REXP(-3)	0.062969	0.019687	3.198424	0.0095
LNDS	5.622124	1.333501	4.216062	0.0018
LNDS(-1)	-6.951098	1.857319	-3.742544	0.0038
LNDS(-2)	-6.267779	1.840898	-3.404739	0.0067
LNDS(-3)	2.364277	1.458672	1.620842	0.1361
LNED	3.590955	1.958696	1.833339	0.0966
LNED(-1)	-4.802756	2.279162	-2.107247	0.0613
LNED(-2)	-5.526145	2.175091	-2.540650	0.0293
LNED(-3)	9.520717	2.082223	4.572381	0.0010
LNINF	-13.78764	30.04561	-0.458890	0.6561
LNINF(-1)	63.64196	34.08651	1.867072	0.0914
LNINF(-2)	-44.56136	31.14863	-1.430604	0.1830
LNINV	8.601307	3.005144	2.862195	0.0169
C	-103.1439	33.48239	-3.080543	0.0116

R-squared	0.968183	Mean dependent var	5.364897
Adjusted R-squared	0.910912	S.D. dependent var	5.873691
S.E. of regression	1.753159	Akaike info criterion	4.206350
Sum squared resid	30.73566	Schwarz criterion	5.102164
Log likelihood	-41.99207	Hannan-Quinn criter.	4.486908
F-statistic	16.90529	Durbin-Watson stat	2.017722
Prob(F-statistic)	0.000034		

*Note: p-values and any subsequent tests do not account for model selection.

Appendix 4



Appendix 5

Diagnostic Test Results for Long Run Model

A .serial correlation

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.010678	Prob. F(1,9)	0.9200
Obs*R-squared	0.034366	Prob. Chi-Square(1)	0.8529

B. heteroskedasticity test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.345545	Prob. F(18,10)	0.9760
Obs*R-squared	11.12063	Prob. Chi-Square(18)	0.8892
Scaled explained SS	1.840658	Prob. Chi-Square(18)	1.0000

C. functional form

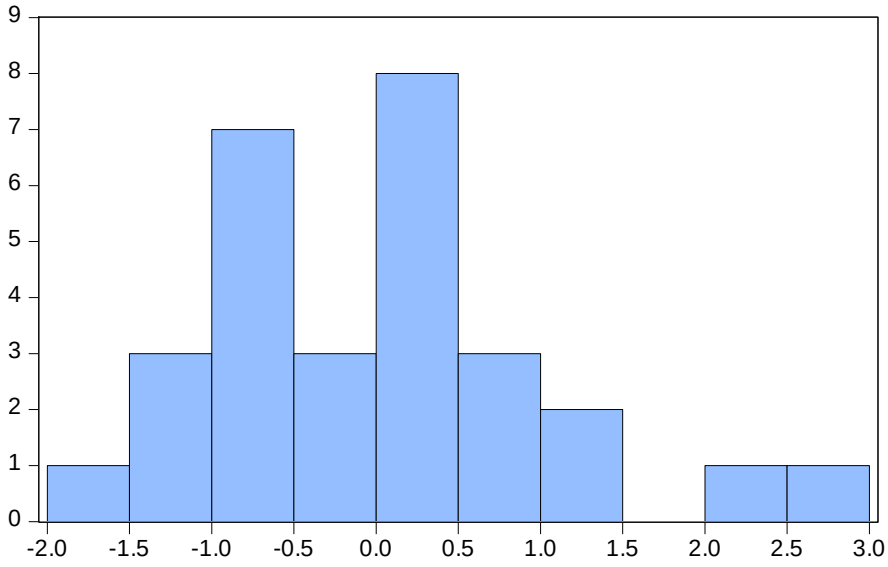
Ramsey RESET Test
Equation: UNTITLED
Specification: RGDP RGDP(-1) RGDP(-2) REXP REXP(-1) REXP(-2) REXP(-3) LNDS LNDS(-1) LNDS(-2) LNDS(-3) LNED LNED(-1) LNED(-2) LNED(-3) LNINF LNINF(-1) LNINF(-2) LNINV C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.701080	9	0.5010
F-statistic	0.491514	(1, 9)	0.5010

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	1.591632	1	1.591632
Restricted SSR	30.73566	10	3.073566
Unrestricted SSR	29.14403	9	3.238226

D. Normality test



Series: Residuals
Sample 1988 2016
Observations 29

Mean	-2.40e-14
Median	0.025411
Maximum	2.777702
Minimum	-1.943094
Std. Dev.	1.047713
Skewness	0.815889
Kurtosis	3.784004
Jarque-Bera	3.960144
Probability	0.138059

Appendix 6

Raw Data used for estimation

Year	Annual Growth rate of RGDP	Annual growth rate of real export	Total external debt service ($mill)	External debt stock ($Bill)	Total capital formation in mill of birr	LN inf
1985	-11.413	-22.469	158.792	5.21247	16066.819	4.361122
1986	9.693	-4.591	224.627	6.144435	27052.041	4.378859
1987	13.87	-15.943	248.942	7.37739	29349.561	4.433943
1988	0.574	-7.02	309.389	7.717005	38447.719	4.545112
1989	-0.457	13.665	304.085	7.85559	27202.435	4.60517
1990	2.602	44.265	236.163	8.645221	24516.099	4.683898
1991	-7.218	-23.09	137.921	9.133604	19684.299	4.746852
1992	-8.907	-47.251	109.545	9.355556	16754.462	4.794525
1993	13.363	70.718	95.001	9.717487	29026.61	4.845281
1994	3.486	16.07	112.258	10.07964	31468.851	4.853248
1995	6.121	14.703	154.621	10.32407	35957.634	4.874838
1996	13.157	14.46	348.057	10.09175	40856.441	4.904497
1997	3.543	36.14	99.975	10.09061	43065.046	4.937864
1998	-4.045	-9.732	119	10.36053	42820.904	4.993706
1999	6.042	-1.362	156.412	5.572315	44833.869	5.013338
2000	5.927	20.541	138.555	5.516257	44195.481	5.024269
2001	7.418	4.867	183.022	5.745842	50811.477	5.066026
2002	1.634	13.519	85.781	6.552441	57784.271	5.073216
2003	-2.099	15.295	92.745	7.28181	52049.637	5.114545
2004	11.729	36.042	101.342	6.624003	70593.367	5.142418
2005	12.644	3.627	93.895	6.229313	70718.504	5.165192
2006	11.539	0.212	139.528	2.280741	83153.024	5.190125
2007	11.795	10.196	133.634	2.655245	81345.907	5.237043
2008	11.187	5.118	111.024	2.904266	91085.659	5.311525
2009	10.03	9.089	103.192	5.416187	100693.33	5.347736
2010	8.008	-6.335	183.712	7.334516	123117.54	5.401578
2011	7.535	3.736	352.07	8.610052	165379.7	5.484133
2012	5.04	5.456	431.289	10.46191	207608.27	5.532258
2013	5.457	16.429	664.23	12.57513	210908.35	5.576275
2014	6.464	10.364	764.897	16.32799	259172.96	5.615494
2015	6.504	7.969	1042.117	20.13985	296900.88	5.649896
2016	6.509	6.98	1243.568	23.06296	311484.13	5.684297

Source: World Development indicators and IMF data set, 2018