INDIRA GANDHI NATIONAL OPEN UNIVERSITY

DYNAMIC EFFECTS OF FOREIGN TRADE ON ECONOMIC GROWTH : THE CASE OF ETHIOPIA

A Thesis Submitted in Partial Fullfilment of the Requirements for the Degree of Master of Economics

Indira Gandhi National Open University

By

Abebe Getaneh Andarge

Indira Gandhi National Open University
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Table of Contents

List of Tables

ABSTRACT

This study examines the relationship between the major components of foreign trade and gross domestic product in Ethiopia using Cointegration, Error Correction Model, and VEC Granger causality over the period 1981-2013and 1992-2013. It also describes the growth, structure and direction of GDP, export and import.

The results of this study indicate that while there is a significant and positive long-run relationship between economic growth, real primary goods export, real manufactured goods export, real intermediate goods import, and real capital goods import. There is also negative impact of real capital on economic growth for the period of 1981-2013. For the period 1992-2013, real capital and real intermediate import has negative impact on economic growth while the rest have positive impact for the same.

In the short run, there is mixed results registered for the major disaggregated variables of external trade impact on real economic growth for the two periods.

The results of the VEC Granger Causality test indicates that the economic growth is import dependent than export led.

There is also sectoral shifts from agriculture to the service sector over the last decade while there is no significant change for manufacturing sector. Foreign trade shows some composition shifts though it is still dependent on few traditional primary exports, widening gap of trade balance and dominance of consumer goods import. The trade relations with other countries are also changing from developed high economies to others.

Overall, the major policy implication of this study is to focus on the value-addition of primary exports and growth and competitiveness of manufactured exports.

Keywords: **Cointegration, Error Correction Model, VEC Granger Causality**

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Certificate

Certified that the Project Work entitled : **Dynamic Effects of Foreign Trade on Economic Growth: The Case of Ethiopia** Submitted by Abebe Getaneh Andarge is his/her own work and has been done/redone in the light of evaluator's comments under my supervision.

It is recommended that the Project be placed before the examiner for evaluation.

(Signature of the Supervisor)

Name: Milkesa Wakjira (Ph.D)

Address: Addis Ababa , Ethiopia

Study Centre:St. Mary's University

Regional Centre: Ethiopia

Date: May 20, 2014

CHAPTER 1 - INTRODUCTION

1.1 Background of the study

Ethiopia has been showing a double digit economic growth commencing since 2003/04. During the fiscal years between 2003/04 and 2012/13, overall economic performance measured by growth in real GDP has registered 10.9 percent on average. During the same period, the annual average growths in value added of agriculture, industry and service sectors were 9.3 percent, 12.2 percent and 12.4 percent. While the share of agriculture, industry, and services out of their GDP were 52.1 per cent, 11 per cent, and 38 per cent respectively, their shares become 42.9 per cent, 12.4, and 45.2 per cent in 2012/13. This shows the contribution of agriculture to the overall economy has reduced relatively in comparison to the last few decades' dominance in the economy. /EEA,2007/08, 2012, 2013 Computation /. Vulnerability to environmental and climatic shocks, especially unreliable rainfall, low productivity, and low cultivated arable land (15 per cent of cultivable arable land) remain critical factor for country's agriculture.(AEO, 2013)

Inflation has been pressing the economy starting since 2004/05. The peak of the annual general inflation at national level recorded 64.1 per cent in July 2008, and then reduced to 38.1 per cent in June 2011, and to 20.9 per cent in June 2012. Some of the causes that contributed for high inflation are the deceleration of agriculture sector, the increase in money supply, the growth of domestic credit, government expenditure, and imported inflation./EEA, 2012, p.16 and EEA, 2013, p.24/. In an effort to combat inflation, the government implemented a tight monetary policy stance. This measure, aided by slowdown in global food

and fuel price inflation, saw consumer price inflation decelerate to 10.3 per cent in February 2013 from the previous years of high inflation. The government also taking fiscal policy measures to decreases prices by strengthening domestic resources and reducing domestic borrowing.

With respect to external trade, the value of exports increased from Birr 779 million in 1980/81 to Birr 44.5 billion in 2010/11. Similarly, the value of imports increased from Birr 1.4 billion in 1980/81 to Birr 129.7 billion in 2010/11 /Data from EEA/EEPRI, 2012 /. Even if the country's export is highly dependent on agricultural products, the more value added part i.e. the manufactured export growth, though minimal in magnitude, shows some positive trend. Besides, the import part like the raw materials, semi finished goods and capital good shows increasing positive pattern /Data from EEA/EEPRI, 2012 /. This implies that there is a relationship between external sector and economic growth in some way. Thus, a study on such topic may be helpful in knowing how the changing structure of external sector behaves and affects economic growth.

1.2 Statement of the Problem

Increasing output is one of the major economic objectives of any nation. Countries pursue different approaches to achieve this goal; one possibility is to promote external trade. There are many studies which investigated the link between international trade and economic growth. Some of the studies have found a positive link between international trade and economic growth (Kotil,E. and Konur F. (2010)). Other studies have found little evidence to support the link (Akeem , (2011). Due to these divergent views amongst different studies, the relationship remains the subject of debate.

As it is highlighted in the previous section, Ethiopia has witnessed prominent double digit economic growth over the last ten consecutive years. There were certainly several factors that contributed to the economic growth of Ethiopia. This helps to suggest that this economic growth believed to be partly affected by the external sector. In this thesis, the effect of foreign trade on economic growth of Ethiopia is taken as a research issue.

While many studies have been done worldwide about the relationship between external sector and economic growth, few studies were investigating some elements of the external trade and economic growth nexus for Ethiopia. This study investigates this some foreign trade elements i.e., export and import together and economic growth dynamic relation and takes a logical further step at major disaggregated level for primary and manufactured goods export of Ethiopian economy and the major composition of import - raw materials, consumer goods, semi-finished goods and capital goods. The reason is that the papers dwelling on the same issue on the country surveyed focus on specific issues of macroeconomic data nevertheless there is ground to give attention to disaggregated variables.

Thus this study attempts to further investigate the relationship between real primary goods import, real manufactured goods import, real intermediate goods import, real capital goods import, and real GDP using Cointegration, Vector Error Correction Model, and Granger Causality from 1981 to 2013. Besides, the study will try to investigate the structural change in the elements of exports and imports based on descriptive analysis.

1.3 Objective of the Study

1.3.1 General Objective

The general objective of the study is to examine how real the major components of foreign trade are related using Cointegration, Vector Error Correction Model, and Granger Causality and see their structural trend in Ethiopia.

1.3.2 Specific Objectives

The specific objectives are:

1. To explore the long run relationship between the major disaggregated external trade components and real GDP.

2. To examine the shortrun relationship between the major disaggregated external trade components and real GDP.

3. To explore the causal direction between the major disaggregated external trade components and real GDP.

4. To describe the growth, structure and direction of GDP, Export and Import.

1.4 Limitation of the study

Because of difficulties in obtaining quality data, more than one source is sometimes consulted to obtain the data series. Data from National Bank of Ethiopia, for instance, may sometimes, differ from that of trade statistics of the World Trade Organization. The differences in data present a problem of choice of appropriate data to use for the study.

The study may also be limited by use of different calendar years. Some data sources may use Ethiopian fiscal year and others use Gregorian calendar year.

1.5 Outline of the Study

The structure of the thesis is organized as follows, into five chapters. The first chapter states the introductory part of the study. Chapter two reviews the relevant theoretical and empirical literatures. Chapter three overviews the methodology of the research. Chapter four is devoted to the empirical examination of the issues using different descriptive and econometric techniques. Finally, chapter five concludes and provides policy recommendations.

The next chapter discusses theoretical as well as empirical literature.

CHAPTER 2- REVIEW OF RELATED LITERATURE

Literatures on the dynamic interaction of foreign trade and economic growth are large. While some scholars argued that trade promote economic growth and development, others argued that it does not. In this chapter, firstly, the paper will present some relevant international trade theories. Secondly, it reviews Ethiopia's and some other countries' relevant empirical evidence on the nexus of foreign trade and economic growth.

2.1 Theoretical Literature Review

2.1.1 Mercantilist Trade Theory

Some of the founders of the mercantilist theory are Thomas Mun and Jean Baptise Colbert. According to this theory, for a nation to become rich and powerful , it has to export more than its imports because it fetches bullion. A nation has to ensure that its volume of exports exceeds the volume of imports. Exports may be enhanced through domestic production. (Hajela, 1994. P.39)

2.1.2 Absolute Advantage Trade Theory

Adam Smith proposed the absolute advantage trade theory. According to him, with free trade each nation could specialise in the production of those commodities in which it could produce more efficiently than the other nations, and then import those commodities in which it could produces less efficiently. That is according to the absolute advantage trade theory, a nation should specialise in the production of export of commodities in which it

has lower cost or absolute cost advantages over others. This international specialisation of factors in production would result in increase in world output, which would be shared by trading nations. Thus, a nation need not gain at the expense of other nations, all nations could gain simultaneously. On the other hand, the same country should import a commodity in which it has higher or absolute cost disadvantage granted (Dunn & Mutti, 2004, p.17).

2.1.3 Comparative Advantage Theory

The theory of comparative advantage was propounded by David Ricardo. According to Ricardo a country should specialise in producing and exporting only those goods and services which it can produce more efficiently. A country has to produce and export at lower opportunity cost than other goods and services which it should import. Ricardo assumed that the factor of production is only labor and a country gain through trade by comparative advantage from labour. It therefore follows that free trade is beneficial to all countries, because each can gain if it specializes according to its comparative advantage.

Alternatively, the principle states that trade is beneficial even if a country does not have an absolute advantage in the production of a good, but does have a cost benefit of producing the good relative to its trading partner. This principle explains why countries specialise in producing and exporting products based on their endowment of resources. The concept is especially important in international trade, suggesting that countries should specialise in areas in which they have a comparative advantage. Differently argued, in the domain of international trade, each nation takes to the production of only those products in the manufacturer of which, she is at an advantage in terms of skill, equipment, machinery or

tradition, as compared to the other nations. Thus, with international specialization, each nation concentrates on the making of only such products in which it has the maximum comparative advantage and the least comparative cost (Dunn & Mutti, 2004, p.19).

2.1.4 Heckscher – Ohlin Trade Theory

The two Swedish economists, Heckscher (1919) and Ohlin (1933) proposed that international trade is based on differences in comparative costs and attempts to explain the factors that make for differences in comparative costs. Different goods require different factor proportions, and different countries have different relative factor endowments; countries will tend to have comparative advantages in producing the goods that use their abundant factors more intensively; for this reason each country will end up exporting its abundant factor goods in exchange for imported goods that use its scarce factors more intensively. That is, the model takes up the case of two trading countries with different endowment facilities. A nation that has a factor available in abundance would have it at a lower cost as well. The other country likewise would have relatively cheaper, the other factor that it has in plenty. Such a proposition is known as factor – abundance hypothesis. Thus, according to the theory, a nation should produce and export a product for which the large amount of the relative abundance resources is used. Such countries should import the commodity in which a great deal of its relative scarce and expensive factors is used. (Dunn & Mutti, 2004, p.52)

2.1.5 Strategic Trade Theory

James A. Brander, Barbara J. Spencer and P.R.Krugman have been associated as the proponents of strategic theory. The theory asserts that specific government intervention in trade relation is possible to enhance a nation's wealth. The theory utilizes trade policies like tariffs and subsidies in the context of imperfect competition and /or increasing returns to scale to alter the outcome of international competition in a country's favour. (IGNOU, 2006, p.24)

2.2 Empirical Review

The empirical studies often made by scholars on the relationships between the foreign trade and economic growth have been rather diversified, in terms of methodology, objectives and research scopes and come up with different possible results. The related empirical literatures to our study often give emphasis to show the link that export and import can increase economic growth and that economic growth can, in turn, promote exports and imports. We review what the proponents advanced to support those possible relationships between export, import and economic growth both in other countries and Ethiopia.

2.2.1 Studies on Other Countries

The first hypothesis is Export Led Growth /ELG/ which means that export cause economic growth. Raju and Kurien(2005) uses stationarity, cointegration, and Granger causality tests to analyze the relationship between exports and economic growth in India over the pre-liberalization period 1960-92. They found strong support for uni-directional causality from

exports to economic growth using Granger causality regressions based on stationary variables, with and without an error-correction term.

Halicioglu (2007) examined the validity of the export-led growth hypothesis of Turkey using quarterly data from 1980 to 2005. He employed an augmented form of Granger causality analysis to show the direction of relationship among the variables both in the short-run and the long-run. The empirical findings suggest uni-directional causation from exports to industrial production.

Mohan and Nandwa (2007) also showed the export-led growth hypothesis for Kenya using autoregressive distributed lag (ARDL) bounds technique and Granger causality test. Their results indicated that there was one-way long-run causality between GDP growth and exports running from exports to GDP growth, and recommended that policies promoting exports to sustain the economic growth in Kenya.

Kotil and Konur (2010) analyzed the relationship between the gross domestic product (GDP) and foreign trade (FT) for the Turkish Economy in the period 1989 to 2007 using a Granger Causality approach. They found that an increase in exports leads to a growth in GDP which in turn leads to increase in imports.

Nguyen (2011) made a research on the relationship between export, import, FDI and economic growth over the time period from 1970 to 2004 for Malaysia and from 1976 to 2007 for Korea using vector auto regression (VAR) . For Malaysia, there is evidence to support the two-way causalities between each pair among the four variables except for the absence of causality from GDP to exports. For Korea, there is one-way causality from exports, imports and GDP to FDI, from exports and imports to GDP and from exports to imports. Exports are not affected by the other three variables.

The second hypothesis is Growth Led Export / GLE/ which suggest growing output level and productivity in the country in order to trade with other countries. Konya (2004) proofed that growth causes export in Canada, Japan and Korea.

The third alternative is the Import-Led Growth/ILG/ which asserts that economic growth could be driven primarily by growth in imports. Lawrence and Weinstein(1999) made a research to identify the importance of the export led and the import led growth for Japan and Korea. They found that more imports of competing products encourage innovation. They also suggested that competitive pressures and potentially learning from foreign rivals are important conduits for growth. These channels are even more important as industries converge with the market leader. This suggests that further liberalization by Japan and other East Asian countries may result in future dynamic gains.

Humpage (2000) noted that imports do not lower economic growth. Imports and economic growth are positively correlated, with causality running in both directions. Faster economic growth does indeed lead to higher imports, but countries that are open to trade—imports and exports—tend to grow faster than countries that are closed or less accessible.

Mazumdar (2001) reached a conclusion that imported machinery leads to higher growth in developing countries.

The most interesting economic scenarios suggest a two-way causal relationship between growth and trade. Ramos and Ribeiro (2001) investigated the Granger-causality between exports, imports, and economic growth in Portugal over the period 1865_1998. They found that there is a feedback effect between exports-output growth and imports-output growth. More interestingly, there is no significant causality between import- export growth.

Konya (2004) has examined that there is no causality between exports and growth in Luxembourg and in the Netherlands, export causes growth in Iceland, growth causes export in Canada, Japan and Korea, and there is two-way causality between export and growth in Sweden and in the UK. There is probably no causality in Denmark, France, Greece, Hungary and Norway, export causes growth in Australia, Austria and Ireland, and GCE in Finland, Portugal and the USA. Finally, in the case of Belgium, Italy, Mexico, New Zealand, Spain and Switzerland the results are too controversial to make a simple choice.

2.2.2 Studies on Ethiopia

In the Ethiopian case, the study by Debel Gemechu /2002/ revealed that export growth positively and significantly affected economic growth. Moreover, Kagnew Wolde (2007) has shown that export growth and output growth were found to be positively related supporting the export-led growth hypothesis.

Sewasew Paulos /2002/ also indicated that in the long run imported intermediate goods positively and significantly affect real GDP.Similarly, in the short run, the change in imported intermediate goods before one year has a positive and significant effect on the change in current real GDP.

It is, therefore, clear that the empirical evidence on the nexus between export, import and economic growth is rather mixed and inconclusive. Furthermore, the studies on empirical analysis so far undertaken on the whole causal nexus between the export, import and economic growth in Ethiopia are rare. This study is particularly important and relevant for Ethiopia because the country is growing at a fast rate during the recent decade and stimulating foreign trade and diversification is one of the economic policies of the country. Given this

fact, a further empirical investigation of the relationship between export and import at disaggregated level with economic growth can provide valuable insight on this yet unresolved important economic issue.

2.3 Summing Up

The main objective of this chapter was to review related theoretical and empirical literature on the relation between economic growth and foreign trade. The merchantilist argue a nation has to encourage export than import. While Adam Smith advices nations to trade if they have absolute advantage of producing different goods, David Ricardo asserts that a nation has to trade if the opportunity cost of producing that good is lower at home than in the other country. The Heckscher-Ohlin theorem explains that the trade between different nations is caused due to differences in relative factor endowments of those countries. The Strategic Trade theory also explains how the industrial policy strategies and the export market shares influence the international trade in favour of a nation.

Different Empirical research on foreign trade- economic growth relations shows different results in other countries. The studies on Ethiopia reveal that export, and import has significant impact on economic growth.

The next chapter provides an overview of the research methodology adopted to be used in empirical analysis.

CHAPTER 3 – RESEARCH METHODOLOGY

In this chapter, data and data sources, and model specification will be explored. Both descriptive and econometric estimation techniques will be analyzed.

3.1 Data and Data Sources

We used annual data for GDP, labour, gross capital formation, primary products exports, manufactured exports, intermediate goods imports and capital goods imports from 1980/81 to 2012/13 for this paper. GDP, Gross capital formation, intermediate goods imports and capital goods imports are collected from Ministry of Finance and Economic Development (MOFED). Data on working age population as a proxy for labour is collected from World Development Indicators (2013). Besides, we took data for primary products exports and manufactured exports from World Trade Organization.

All data except labour are converted into real terms using the implicit GDP deflator collected from World Development Indicators (2013). Since, data on import and export price index are not available for the whole length of the time series used in this paper; we used the implicit GDP deflator to obtain the real values of the variables under consideration. The implicit GDP deflator is based on the revised 2011 base year. All the data used in the study are transformed in logarithmic form. This transformation can reduce the problem of heteroscedasticity as log transformation compresses the scale in which the variables are measured (Gujarati, 2003, p.421).

3.2 Model Specification

Given the theoretical considerations on the possible relation between foreign trade and economic growth, we adopted the following Cobb- Douglas type production function and standard growth accounting framework for this paper.

$$Yt = AtLt^{\alpha}Kt^{\beta}e^{Ut} \quad \text{----------(1)}$$

Where Yt is Real Gross Domestic Output at time t, Lt is Labour at time t, Lt is Real Capital at time t, At is a measure of Total Factor Productivity at time t, and Ut is the error term at time t respectively. This implies that increases in GDP may not only emanate from increases in labour and capital but also because of changes in total factor productivity.

Because we want to investigate how real primary product export, real manufactured export, real intermediate goods import and real capital goods import affect economic growth via increases in productivity, we assume that total factor productivity can be expressed as a function of primary product export, REXPt, manufactured export, REXMt, intermediate goods import, RIMPt, capital goods import, RIMMt, and other exogeneous factors, Ct:

$$At = f(REXPt, REXMt, RIMPt, RIMMt) = CtREXPt^{\gamma}REXMt^{\delta}RIMPt^{\tau}RIMMt^{\varphi} \text{----------(2)}$$

Combining equation (1) and (2), we have the following modified model.

$$Yt = CtKt^{\alpha}Lt^{\beta}REXPt^{\gamma}REXMt^{\delta}RIMPt^{\tau}RIMMt^{\varphi}et^{U} \quad \text{----------(3)}$$

Where $\alpha, \beta, \gamma, \delta, \tau, \text{and } \varphi$ are the elasticities of output with respect to Kt, Lt, REXPt, REXMt, RIMPt, and RIMMt .

To estimate equation (3) we take the logarithm of both sides, which result in the following linear equation :

$$LogYt = C+\alpha LogLt + \beta LogKt + \gamma LogREXPt + \delta LogREXMt + \tau LogREMPt+ \varphi LogREMMt + U_t$$

in which all coefficients are constant elasticities, LogCt=C is a constant parameter, and Ut is the error term which reflects the influence of all other factors.

However, in the empirical analysis of the relation between real foreign trade and real gross domestic output, the models are likely to suffer in simultaneity bias because of the fact that exports are themselves a component of output, via the national income accounting identity. We, therefore, separate the influence of primary goods export and manufactured goods export on gross domestic product from that incorporated in the growth accounting relationship by using a measure of GDP deducting the mentioned exports. We deal with this issue by subtracting primary and manufactured exports from the gross domestic product, i.e., NYt= Yt-RXPt-RXMt, where NYt is net real gross domestic product, instead of total output, Yt. By replacing Yt with NYt, we finally obtain the following equation of interest.

$$LogNYt = C + \alpha LogLt + \beta LogKt + \gamma LogREXPt + \delta LogREXMt + \tau LogRIMPt+ \varphi LogRIMMt + U_t \ldots\ldots\ldots\ldots (4)$$

To give better look for our model of equation 4 , we changed it to the following econometric model to be used in the rest of the study .

$$Log\ RGDP_t=B_0 +B_1 Log\ LBR_t+B2RCP_t+B3REXP_t+B4REXM_t+B5RIMP_t+B6RIMM_t+U_t \quad (5)$$

where RGDPt is real net GDP, LBR_t is labour, RCP_t is real capital and the rest with the meanings mentioned before.

All coefficients are expected to be positive:

flogLBRt≥0; flogRCPt ≥0; flog$REXP_t$≥0; flogREXMt ≥0; flogRIMPt≥0; flogRIMMt≥0.

3.3 Estimation Techniques

In order to examine the relationship between external trade and economic growth, both descriptive and econometric data analysis are utilized using Stata 12. In the descriptive technique, statistical measures such as means, standard deviations, maximums, and minimums are used. These measurements are used to show the trending behaviour of economic growth with respect to external trade and other variables.

In the time series econometric method part, emphasis is placed on investigating, firstly to determine whether the variables included in the model are stationary or not, secondly, to determine the number of lags necessary to appropriately capture the dynamics of the data, thirdly to examine whether any long-run relationships exist between various economic variables, fourthly to estimate the long and short run behavior of economic variables using Error Correction Model , fifthly to determine the direction of causality between the economic variables by using Causality test, and then, lastly to evaluate the influence of exogenous shocks on the variables of a VAR model using innovation accounting.

3.3.1 Test of Stationarity

A series is considered stationary when the roots of the characteristic equation lie inside the unit root circle (roots of lag polynomial lie outside the unit circle). This is done to

avoid the problem of spurious regressions. Most of the economic data series are non-stationary i.e. their mean, variance and covariance changes over time. Stationarity can be achieved by appropriately differencing the series. Order of integration is the number of appropriate differencing to make the series stationary. There are different test proposed by the theory for the presence of unit roots. Among the different unit root tests, we will discuss the following (Sheppard, 2013. P.277-278 and Wang, 2009. P.46-47).

3.3.1.1 The Dickey-Fuller Test (DF test)

The Dickey- Fuller test is the standard test and is conducted under the assumption that the errors (residuals) are serially uncorrelated. It also required testing for non-stationarity, if the current period observations were dependent on its immediately preceding period of observation. Their method has become a benchmark for comparison with other tests of unit roots. The simplest Dickey-Fuller test starts with the following first order autoregressive model.

$\mathrm{Yt} = \rho\mathrm{Yt} - 1 + \epsilon\mathrm{t}$ ……………………………………………… (6)

Where 1$\leq \rho \leq 1$, ϵ represents a random white noise error term and t represents time.

If we conduct a regression analysis based on the above equation, we can estimate the

value of ρ . Hypothesis testing of the value of ρ is the basis of the Dickey and Fuller

unit root tests. To simplify, the above equation can be transformed as follows:

Yt- Yt-1= $\rho\mathrm{Yt} - 1 - \mathrm{Yt} - 1 + \epsilon\mathrm{t}$

$\Delta\mathrm{Yt} = (\rho - 1)\mathrm{Yt} - 1 + \epsilon\mathrm{t}$

$\Delta Yt = \delta Yt - 1 + \epsilon t$ where $\delta = \rho - 1$

If $\delta=0$, $\rho = 1$.

Equation 6 is the most restricted form of the Dickey-Fuller unit root test. To test the null hypothesis that $\delta = 0$ against alternative hypothesis that $\delta < 0$ we expect the usual t-distribution to be used. However, this is not the correct distribution even in large samples. Dickey and Fuller have shown that the correct distribution of unit root statistics that follows τ (tau) distribution. There are three different Dickey-Fuller test equations as listed below.

$\Delta Yt = \delta Yt - 1 + \epsilon t$ (random walk) (7)

The use of equation (7) is appropriate only when the series Yt has a zero mean and no trend term. If a variable has a zero mean, it implies that Yt=0 when t=0-implying no constant term. A constant (drift) is included to the regression since it is difficult to know whether the true value of Y_0 is zero or not. Including a constant ($\beta 1$) to equation (2) gives:

$\Delta Yt = \beta 1 + \delta Yt - 1 + \epsilon t$ (random walk with drift) (8)

Also testing for stationarity using equation (8) is invalid if a series contains a deterministic trend. Because if $\delta = 0$, the null hypothesis will be accepted that the series contains a stochastic trend when there exists deterministic trend. Thus to avoid such results, it is important to incorporate time trend in the equation above:

$\Delta Yt = \beta 1 + \beta 1t + \delta Yt - 1 + \epsilon t$ (random walk with drift and trend) (9)

where t is the trend element.

For the above equations (equation 8 and 9), the parameter δ is used while testing for stationarity and the decision is made using τ-statistics. If the calculated value of τ is less than the critical value, the null hypothesis is accepted and not if otherwise.

3.3.3.2 The Augmented Dickey-Fuller Test (ADF Test)

In the above DF test, it assumes the errors (residuals) are serially uncorrelated. This led the model to suffer from residual autocorrelation. To overcome this problem, the DF model is augmented with additional lagged first differences of the dependent variable. This is called Augmented Dickey-Fuller model (ADF). The advantage of using this model is that it avoids the autocorrelation among the residuals. Therefore incorporating lagged first differences of the dependent variable to the above three equations-equations 7, 8 and 9 gives the corresponding ADF model as follows:

$$\Delta Yt = \delta Yt - 1 + \alpha i \sum_{i=1}^{m} Yt - i + \epsilon t \qquad (10)$$

$$\Delta Yt = \beta 1 + \delta Yt - 1 + \alpha i \sum_{i=1}^{m} Yt - i + \epsilon t \qquad (11)$$

$$\Delta Yt = \beta 1 + \beta 1t + \delta Yt - 1 + \alpha i \sum_{i=1}^{m} Yt - i + \epsilon t \qquad (12)$$

If there are no significant lags of dependent variable in ADF tests, the test equations go back to those shown in Equation 7, 8 and 9. Distributions to test the null hypothesis that δ=0 in Equations 10-12 are in the same order as that for Equations 7- 9. ADF testing requires the selection of lags for the augmented dependent variable.

3.3.2 Lag Length Selection

When we increase the number of lag length, it will reduce the size of residuals but tends to reduce the forecasting ability of the model. By increasing the number of parameters, we improve the in-sample accuracy but tend to worsen the out-of-sample forecasting ability. (Rachew, Mittnik, Fabozzi, Focardi & Jessic, 2007, p. 357).

Determining optimal choice of lag length in dynamic causal relationship between variables is an essential procedure because it requires knowing how many past values should enter the model before investigating the long run relationship among the variables of the model. A lag length will be chosen which enables to capture all of the dynamics. Selecting the choice of optimal lag length is conducted either by general-to-specific search or by an information criteria. (Sheppard, 2013. P.333-334).

To establish criteria that allow determining a priori the correct number of lags, we will utilize the popular sequential modified Likelihood Ratio test statistics [LR], the Final Prediction Error (FPE), the Akaike Information Criterion (AIC), the Schwarz Information Criterion (SIC), and the Hannan-Quinn Information Criterion (HQIC) as depicted in Stata 12.

3.3.3 Cointegration and Vector Error Correction (VEC) Model

Once the appropriate lag length is set for data series, the next step is to examine whether there exists a longrun equilibrium relationship among the variables. Variables can deviate from the equilibrium relationship in short run, but equilibrium occurs in the long run. These non-stationary variables have a combination that is stationary and, as a result, are said to be

cointegrated. The stationary linear combination is called the cointegrating equation and may be interpreted as a long run equilibrium relationship between the variables.

Although several econometric methods have been proposed to investigate the existence of a long-term equilibrium (i.e. cointegration) between variables given in the form of time series data, including the methods developed by Engle and Granger (1987), for the purpose of the present study, the Johansen (1988) approach to cointegration is used to achieve the objectives of the study.

The Johansen procedure for cointegration is implemented on a cointegrated VAR counterpart to a standard VAR specification. This procedure does not require all variables to be integrated to the same order. It is possible that cointegration is present when there is a mix of I(0) and I(1) variables. In such instances the stationary I(0) variables play a key role in establishing long term equilibrium relationships.

In the Johansen framework, the first step in the estimation of an unrestricted, closed p^{th} order VAR in k variables. The VAR model as considered in this study is:

$$Yt = A1Yt - 1 + A2Yt - 2 + \cdots + ApYt - P + BXt + \varepsilon t \ , t = 1,2, \dots , T \text{--------} \quad (13)$$

where Yt is a k-dimension vector of variables which are assumed to be I (1) series (but can also be I (0)), Ai , i = 1,... p is the coefficient matrix, εt is a k-dimension vector of residuals, and B are matrices of coefficients to be estimated. Since Yt is non stationary, the above equation can be expressed in its first difference form as follows. (Wang, 2009. P.49-50, Alexander, 2009, P. 236-252, Verbeek, 2004, P. 329-339)

$$\Delta Yt = \Gamma 1 \Delta Yt - 1 + \cdots + \Gamma k - 1 \Delta Yt - k + 1 + \pi Xt + \varepsilon t \ , t = 1,2, \dots , T \text{-------} \quad (14)$$

where:

Yt is a PX1 Vector containing the variables

Γi = -I+A1+A2+…+Ai (i=1,2,…,p-1) is the PXP matrix of coefficients.

π = I-A1-A2-…-Ap is the pXp matrix of coefficients

εt is the px1 vector of the disturbance terms of the coefficients.

Granger's representation theorem asserts that if the coefficient matrix Π has reduced rank r < k, then there exist k × r matrices α and β each with rank r such that Π = αβ′ and β′Yt is I(0). r is the number of co-integrating relations (the co-integrating rank) and each column of β is the co-integrating vector. α is the matrix of error correction parameters that measure the speed of adjustments in ΔYt.

Thus, testing for cointgration involves testing for the rank of π matrix , r by examining the three possible ranks.

- Π = αβ′ has a rank of zero. The system is non-stationary, with no cointegration between the variables considered. This is the only case in which non-stationarity is correctly removed simply by taking the first differences of the variables; and equation 14 becomes a simple VAR without ECM.
- Π = αβ′ has a full rank.The system is stationary ,i.e., the variables in levels are stationary.
- Π = αβ′ has a reduced rank 0 < r < k. α and β are both k × r matrices and have a rank of r. There are r cointegration vectors β'Yt which are stationary I (0) series. It is equivalent to having r common trends among Yt . The stationarity of β'Yt implies a long-run

relationship among Yt or a sub-set of Yt – the variables in the cointegration vectors will not depart from each other over time. B'Yt are also error correction terms in that departure of individual variables in the cointegration vectors from the equilibrium will be subsequently reversed back to the equilibrium – a dynamic adjustment process called error correction mechanism (ECM). Equation 14 is therefore called VAR with ECM.

The cointegration procedure yields two likelihood ratio test statistics, referred to as the trace test and the maximum eigenvalue test, which will help determine which of the three possibilities is supported by the data. The study employs both tests to examine the sensitivity of the results to different tests. Both statistics test functions of the estimated eigenvalues of π but have different null and alternative hypotheses. The trace statistic tests the null that the number of cointegrating relationships is less than or equal to r against an alternative that the number is greater than r .

Let $\hat{\lambda}i$ i= 1,2,…,k to be the complex modulus of the eigen values of $\hat{\pi}1$ and let them order such that $\lambda 1 > \lambda 2 > ... \lambda k$. The trace statistic is defined a

λ trace(r)= $-T\sum_{i=r+1}^{k} \ln(1 - \hat{\lambda}i)$----------(15)

There are k trace statistics. The trace test is applied sequentially, and the number of cointegrating relationships is determined by proceeding through the test statistics until the null cannot be rejected. The first trace statistic, λ trace(0)= $-T\sum_{i=1}^{k} \ln(1 - \hat{\lambda}i)$

tests that the null hypothesis that there are at most r cointegrating vectors is tested against the general alternative.

The maximum eigenvalue test examines the null that the number of cointegrating relationships is r against the alternative that the number is r + 1. The maximum eigenvalue statistic is defined

$\lambda \max(r, r+1) = -T \ln(1 - \hat{\lambda}r+1)$----------(16)

Intuitively, if there are r + 1 cointegrating relationships, then the r + 1th ordered eigenvalue should be different from zero and the value of λ max(r, r + 1) should be large. On the other hand, if there is only r cointegrating relationships, the r + 1th eigenvalue should be close from zero and the statistic will be small. We will use trace test in our analysis.

Once the time series are integrated of order one, I(1), and cointegrated, then we need to include additional information gained from the long run relationship to get efficient estimates caused by variables differencing which has permanent shock effect on its level. This requires the inclusion of a vector of cointegrating residuals in the VAR with differenced variables. This is known as a vector error correction model (VECM).

The purpose of the vector error correction model, therefore, enables us to determine the direction of causality among the variables, and to distinguish between the two types of Granger causality: short run and long run causality.

The general form of the VECM is as follows:

$$\left.\begin{aligned} \Delta Xt &= \alpha_0 + \lambda 1 EC_{t-1}^{1} + \sum_{i=1}^{m} \alpha_i \, \Delta Xt - i + \sum_{j=1}^{n} \alpha_j \, \Delta Yt - j + \varepsilon 1t \\ \Delta Yt &= \beta_0 + \lambda 2 EC_{t-1}^{2} + \sum_{i=1}^{m} \beta_i \, \Delta Yt - i + \sum_{j=1}^{n} \beta_j \, \Delta Xt - j + \varepsilon 2t \end{aligned}\right\} \quad \ldots\ldots(17)$$

Where Δ is the first difference operator; EC_{t-1}^{1} is the error correction term lagged one

period; λ is the short-run coefficient of the error correction term ($-1 < \lambda < 0$); and ε is the white noise.

The long run causality from independent variables to the dependent variable is evaluated by testing the null hypothesis that the coefficient of the error correction term λ is zero. Short run causality from an independent variable to the dependent variable is evaluated by testing the null hypothesis that each coefficient on the independent variable is zero.

A negative and significant coefficient of the VECM indicates that any short term fluctuations between the independent variables and the dependant variable will give rise to a stable long run relationship between the variables. In case the coefficient does not fulfill the property of being negative and significant; we conclude that no stable short run relationship exists between the variables. Moreover, the magnitude of the error term coefficient indicates the speed of adjustment with which the variables converge overtime.

In order to evaluate the short term behavior between the two series we look at the coefficients of the lagged terms of Yt and Xt. For instance if the lagged coefficients of Xt turn out to be significant in the regression of Yt then X causes Y.

Omitting the error correction term from the above two equations gives us the Granger causality equations, required to investigate the causal links in case of no cointegration among series. A variable x is said to Granger cause a variable y if, given the past values of x and y are useful for predicting y.

3.4 Summing up

This chapter discussed the data, model specification and the estimation techniques to investigate the effects of the major components of foreign trade and economic growth for the Ethiopan case.

The Johansen Cointegration and VECM frameworks were presented as the estimation methods employed in the study. This was followed by a discussion of the diagnostic tests. This chapter helps for the empirical estimation of the next chapter.

CHAPTER 4 – EMPIRICAL ANALYSIS AND FINDINGS

This section is divided into two parts. The first part explains the results of descriptive analysis. The second part estimates the given time series economic variables by econometric method which includes the unit root test, the lag length selection, the cointegration test, the longrun and short run analysis and the model checking test using Stata 12.

4.1 Overview of the Ethiopian Economic Policy, Growth and Foreign Trade

4.1.1 Overview of Ethiopian Economic Policy towards Foreign Trade

In order to understand the development of the Ethiopian Economy in general and the relation of Ethiopian Economic policy towards the foreign trade in particular, one needs highlights of the most significant events. Therefore, we make review of national economic objectives and strategies of the three successive regimes, namely, the Imperial Government of Ethiopia, the Derg Government, and the Ethiopian People's Revolutionary Democratic Front / EPRDF/ Government /EEA, 1999/2000, 2000/2001,2007/08, 2012, 2013; Ayele, 2006, p. 2-20/.

4.1.1.1 The Imperial Government

In the Imperial era, the Ethiopian economy was a type of mixed economy where the private and the public sectors coexisted. Both sectors were considered equally important and complements. The imperial government of Emperor Haileselasie I prepared and implemented a three five-year comprehensive planning for socioeconomic development /1957-1974/ with different targets and area of priorities. They were the first five year plan (1957-62), the second five year plan (1963-67) and the third five year plan (1968-73).

In the first five plan, the imperial government was more concerned for construction infrastructure that would have been a positive impact on the country export growth. The second five year plan gave emphasis to productive activities by decreasing the volume share of agricultural product export and increase the industrial product. This shift occurred for the reason to improve the country export earnings as well as increase the volume. Beside its main

objective, the imperial government was also desirous to increase the share of manufacture production export. Finally, the third five year plan shifted its emphasis to optimization and hence the attainment of higher standard of living.

Generally, the imperial era employed export oriented and import substitution strategies. The aim of the export-led development strategy was the generation of the foreign currency required for the country's import finance, and this strategy continued up to 1960. After 1960, however, emphasis was shifted to the import-substitution strategy, the aim of which was protecting the infant home industry from competition with the developed foreign industry. The protection was practiced by means of successively higher tariff imposition on similar imported goods.

4.1.1.2 The Derg / Military/ Government

The Military government /1974-1991/ follow command economy after the popular revolution in 1974. The state was involved in all spheres of economic activity including external trade. The regime was characterized by:-

- an attempt to control and eventually curb the participation of private capital in trade and strengthening the state's role both in export and import trade.
- an attempt to closely monitor the price, quantity and distribution of goods.
- giving especially emphasis to external trade sectors deemed essential for economic growth and in the trading of medical equipment and goods that ensure the health and security of the population.
- an attempt to diversify the type and destination of goods(especially from developed capitalist countries towards socialist countries) externally traded.

The state launched the Ten Year Development Plan /1985-1994/ in 1985. The major strategy of the Plan was to ensure linkages among sectors notably between industry and agriculture; industry and mining. Finally, the government assessed its previous performance and the perspective of the economy and decided to transform it into mixed economy in 1990.

4.1.1.3 The EPRDF Government

The Ethiopian People's Revolutionary Democratic Front / EPRDF/ took power in 1991 and replaced the command economy with the market economy. It launched an Agricultural Development-led Industrialization /ADLI/ policy in 1995. ADLI has two components; namely, the export-led strategy and the rural centered development strategy. In the export-led strategy both agriculture and mining is expected to play major roles. The rural centered development program is believed to result in rapid productivity growth in the peasant agriculture and hence benefit the society at large by boosting the supply side through sustainable supply of export products, food at reasonable prices, and raw materials for the manufacturing sector. The program is also expected to create market outlets for outputs of other sectors.

There are several development plans formulated from the general strategic framework of the ADLI policy. The first formal development plan was the Sustainable Development for Poverty Reduction Policy (SDPRP) which came into practice in 2000.The focus area of the plan were agriculture, education and infrastructure. In around 2002, the notion of sectorally balanced growth strategy was introduced to it.

The next five year development plan known as the Plan for Accelerated and Sustained Development to End Poverty (PASDEP) was launched in around 2005. PASDEP targeted ensuring high growth, commercialization of agriculture, fostering industry, urban development, and achieving millennium development goals (MDGs), besides the sectors like infrastructure, human capital (education and health), rural development, food security, and capacity building which it has taken over from SDPRP.

The subsequent plan is the growth and transformation plan/GTP/ which is launched in the fiscal year 2010/11. The emphasis by the GTP is given towards the industrial sector though agriculture would continue to be major source of growth.

4.1.2 Highlight of Ethiopian Economic growth

As shown in Table 1, the average real GDP growth for the Imperial period was 3.6 per cent per year compared with an average population growth leading in per capita income of 1.3 per cent per year. For the same period, agricultural production grew by a mere 2 per cent per annum during the period while industry and service grew by 7 per cent per year on average.

Table 1. Growth Rates

Period	Agriculture	Industry	Services	Total GDP	Per Capita GDP
1960/61-1973/74	2.10	7.04	7.47	3.60	1.33
1974/75- 1990/91	0.60	3.60	3.41	1.75	-0.71
1991/92-1999/00	1.78	6.37	7.63	4.12	1.2
2000/01-2004/05	5.55	8.2	6.7	6.22	3.3
2005/06-2010/11	8.5	10.9	14.1	11.2	8.13
2009/10	7.6	10.58	13.2	10.5	7.41
2010/11	9.0	15.0	12.5	11.4	8.45
2011/12	4.9	13.6	11.1	8.6	5.6
2012/13	7.1	18.5	9.9	9.7	6.8

Source: EEA, 2012 EEPRI, 2013 Computations

In the same table, the Derg regime had registered 1.75 per cent per year of the average real GDP growth compared with an average population growth leading a net decline in per capita income of 0.7 per cent per year. Agricultural production grew by a mere 0.6 per cent per annum while industry and service grew by 3.5 per cent per year on average during the same period.

Similarly, during the EPRDF government, the real GDP of Ethiopia has grown on average by about 4.12 per cent, 6.22 per cent, and 11.2 per cent for the period of 1991/92-1999/00, 2000/01-2004/05 and 2005/06-2010/11 respectively. In 2011/12 and 2012/13, real GDP grew by 8.6 per cent and 9.7 per cent respectively. Though this last growth show a deceleration in the economy

compared to the 11 per cent average growth for the last years, it is still a significant performance. The decline in the rate of growth is primarily due to a relatively slower performance of the agricultural sector. The average annual growth rates of the industrial sector were 6.37 per cent, 8.2 per cent, 10.9 per cent, 13.6 per cent, and 18.5 per cent for the periods 1991/92-1999/00, 2000/01-2004/05, 2005/06-2010/11, 2011/12, and 2012/13, respectively. The average annual growth rates of the service sector were also 7.63 per cent, 6.7 per cent, 14.1 per cent, 11.1 per cent, and 9.9 per cent for the same period, respectively.

Table 2. Structure of the Ethiopian Economy

Period	Agriculture	Industry	Services
1960/61-1973/74	64.8	9.8	25.4
1974/75- 1990/91	55.8	11.0	33.2
1991/92-2012/13	48.1	11.9	40.0

Source: EEA, 2012 EEPRI, 2013 Computations

Table 2 reveals that the share of agriculture, industry, and service sectors in the average annual GDP is about 65 percent, 10 per cent, and 25 per cent during the imperial period, respectively. In the time of Derg government, the share of the above three sectors in the average annual GDP is about 56 per cent, 11 per cent, and 33 per cent, in the same order. The share of the mentioned three sectors in the average annual GDP is also 48 per cent, 12 per cent and, 40 per cent. In accordance to the above data, even though the agriculture percentage share in the GDP was the leading and fluctuating across the years, its contribution to GDP was declining. The contribution of the industrial sector in the GDP was also about 11 per cent during the mentioned periods though it varied from year to year. Similarly, the share of the service sector to the GDP was varying even though it was increasing for the same periods discussed.

4.1.3 Overview of Ethiopian Foreign Trade Performance

4.1.3.1 Volume of Foreign Trade

4.1.3.1.1 Value of Merchandise Exports

The value of Ethiopia's total merchandise exports has increased by more than 40 times during the last five decades, from USD 76 million in 1961 to over USD 3 billion in 2012. However, the increase has not been uniform over the three regimes and years. Whereas the merchandise export has risen by more than 3.5 times from USD 76 million in 1961 to over USD 268 million in 1974 during the Imperial Regime, for the period of the Derg Regime, the export growth decelerated from USD 240.5 million in 1975 to USD 189 million in 1991. During the FDRG regime, the merchandise export has shown a more than 17 times increment from USD 169 million in 1992 to USD 3 billion in 2012.

The total merchandise export formed as much as 6.2 per cent of GDP in 1961 and 8.4 per cent in 1974 during the Imperial regime. In the period of the Derg Regime, the rate of growth of total merchandise export in terms of GDP was 7.7 per cent and 2 per cent in 1991. In the FDRG time, its share of GDP was 1.7 percent in 1992 and 6.4 percent in 2012. /Personal computation based on data from WB website, 2013 /.

4.1.3.1.2 Value of Merchandise Import

Ethiopia's total merchandise import has increased by more than 127 times during the last five decades, from USD 94.6 million in 1961 to over USD 12 billion in 2012. However, the increase has not been uniform over the years. Whereas the merchandise import has risen by more than double from USD 94.6 million in 1961 to over USD 283 million in 1974 during the Imperial Regime, for the period of the Derg Regime, the import growth multiplied by more than 1.5

times from USD 312.9 million in 1974 to USD 472 million in 1990. During the FDRG regime, the merchandise import has shown a more than fourteen times increment from USD 839 million in 1992 to 12 billion in 2012. The total merchandise import formed as much as 7.8 per cent of GDP in 1961 and 9.1 per cent in 1974 during the Imperial regime. In the period of the Derg Regime, the rate of growth of total merchandise import in terms of GDP was 10 per cent and 5 per cent in 1991. In the FDRG time, its share of GDP was 8.3 percent in 1992 and 25.8 percent in 2012 /Personal computation based on data from WB website, 2013 /.

4.1.3.2 Composition of Foreign Trade

Generally, the country's export performance during the period 1985/86-2010/11 showed consistent growth in aggregate, though fluctuation was seen in certain export commodities. Coffee continued to dominate the country's export, followed by oilseeds. Other commodities started gaining popularity in the global market and their share in total export increased from year to year. The quantity and value of flower, pulses, oilseeds, and chat has increased from time to time as depicted in Table 3 and 4.

Table 3. Quantity of Major Annual Merchandise Exports (in Metric Tons)

Commodity	1985/86	1990/91	1995/96	2000/01	2005/06	2010/11
Coffee	69999	58232	97578.8	99134.0	147725.0	172217.2
Oilseeds	5630	2558	7831.7	55051.4	265649.0	254186.5
Hides & Skins	11996	5660	7546.8	12409.0	15396.5	5167.4
Pulses	7550	14759	28968.7	26861.2	110437.7	224482.3
Meat Products	1147	268	950.4	869.7	7955.3	16877.4
Fruits & Vegetables	9228	12960	19003.0	17029.7	34797.3	91587.3
Sugar	45500	30695.2	0.0	57004.8	0.0	0.0
Flower	0	0	0.0	0.0	6257.9	41562.6
Live Animals	7353	2195.25	182.5	214.1	33294.1	112802.6
Chat	711	1816	3698.3	11927.7	22258.8	40971.7
Petroleum Products	182903	140446	114514.4	0.0	0.0	0.0
Bee's Wax	180	102	329.8	311.0	334.9	362.5
Gold	0	3.5	0.8	4.8	5.0	11.2

Source: /Personal computation based on data from EEA/EEPRI, 2012 /.

Table 4. Value of Major Annual Merchandise Exports (in Thousands of Birr)

Commodity	1985/86	1990/91	1995/96	2000/01	2005/06	2010/11
Coffee	664790	268451	1724008	1520101	3076494	13617880
Oilseeds	7686	3633	41938	269598	1835270	5282979
Hides & Skins	119459	92206	309701	633752	651333	1690161
Pulses	12635	15716	77224	72800	320969	2232692
Meat Products	3866	1015	12169	14366	160842	1024706
Fruits & Vegetables	6027	12001	21029	45689	114541	512635
Sugar	10401	16362	0	68472	0	0
Flower	0	0	0	0	189006	2845760
Live Animals	18908	5169	770	1506	239240	2387246
Chat	8477	20422	174444	510506	773235	3836251
Petroleum Products	44249	27099	62011	0	0	0
Bee's Wax	12721	689	7987	7247	12551	29127
Gold	0	73899	68232	234890	562141	7540512
Others	14095	77337	107773	487680	749752	3525617
RE-exports	502	2385	0	0	0	0

Source: /Personal computation based on data from EEA/EEPRI, 2012 /.

Consistent increases were not observed in all import products both in quantity and value terms as seen in Table 5, 6, and 7. They fluctuated from year to year. The largest share goes to importation of machinery and equipment, road motor vehicles and metal and metal manufacturing. As observed in Table 7, capital goods import is taking the lead, followed by consumer goods import. Fuel appeared to be the third import product followed by semi finished goods and raw materials.

Table 5. Value of Major Annual Merchandise Imports (in Thousands of Birr)

Commodity	1985/86	1990/91	1995/96	2000/01	2005/06	2010/11
Food & Live Animals	530,599	263,350	575,263	641,597	2,139,779	3,966,149
Beverages	4,962	16,163	21,210	34,628	45,715	167,354
Tobacco	2,835	3,564	7,241	28,561	77,860	230,682
Petroleum Crude	220,261	185,376	445,953	0	0	0
Petroleum Prod.	32,273	25,050	485,912	2,151,326	7,422,807	22,299,884
Chemicals	87,935	85,072	161,265	153,782	348,264	1,118,884
Fertilizers	44,685	79,548	330,578	126,860	1,180,768	5,665,269
Medical & Pharm. Prod	58,513	36,305	165,785	293,784	1,212,655	5,054,381
Soap & Polish	6,683	26,013	64,023	140,236	337,445	685,949
Rubber Prod.	45,569	41,867	279,453	408,838	730,113	2,515,039
Paper & Paper Manfc.	34,944	27,775	81,700	217,050	517,374	1,137,791
Textiles	79,186	44,920	308,065	461,188	1,065,381	1,982,717
Clothings	3,476	14,488	76,391	345,433	1,291,287	2,430,231
Glass & Glass Ware	3,690	5,180	32,944	88,056	145,048	334,932
Metal & Metal Manfc.	166,878	153,769	709,985	1,188,971	4,157,675	10,778,367
Machinery & Aircraft	274,699	562,457	854,155	1,480,393	5,305,516	16,015,252
Road Motor Vehicles	287,134	249,844	1,393,422	1,456,285	4,183,804	13,180,603
Electrical Materials	76,691	58,889	328,577	782,018	2,978,793	7,195,551
Grain	382,447	202,106	506,124	461,335	1,621,232	2,739,632
Telecomm. Appara.	45,754	48,189	51,400	66,419	365,874	73,258

Source: /Personal computation based on data from EEA/EEPRI, 2012 /.

Table 6. Volume of Major Annual Merchandise Exports (in Metric Tons)

Commodity	1985/86	1990/91	1995/96	2000/01	2005/06	2010/11
Food & Live Animals	846,775	401,515	322,279	420,439	819,012	547,513
Beverages	1,077	1,720	1,590	1,747	1,307	2,309
Tobacco	117	780	490	1,006	2,045	2,228
Petroleum Crude	727,531	494,081	417,100	0	0	0
Petroleum Prod.	16,176	12,724	333,632	950,044	1,229,078	1,795,019
Chemicals	43,618	27,984	33,877	30,294	46,715	56,496
Fertilizers	108,079	91,966	115,377	79,525	396,795	622,239
Medical & Pharm. Prod	3,925	11,647	2,110	2,820	3,994	15,023
Soap & Polish	5,314	19,185	17,645	28,860	59,404	34,382
Rubber Prod.	15,244	6,484	14,375	22,399	72,212	37,465
Paper & Paper Manfc.	19,406	9,906	7,835	100,302	9,076	57,452
Textiles	20,797	6,126	16,501	20,680	7,898	38,370
Clothings	143	299	4,808	20,562	4,801	31,669
Glass & Glass Ware	2,428	2,475	5,879	15,254	3,593	25,490
Metal & Metal Manfc.	72,348	45,954	119,762	261,843	58,571	772,361
Machinery & Aircraft	33,926	11,887	42,305	26,964	6,956	231,078
Road Motor Vehicles	31,983	21,224	41,188	91,784	7,567	133,738
Electrical Materials	9,367	6,017	12,488	24,421	10,833	64,157
Grain	704,059	374,114	313,282	360,318	23,040	438,137
Telecomm. Appara.	466	1,399	96	20,588	410	1,135

Source: /Personal computation based on data from EEA/EEPRI, 2012 /.

Table 7. Value of Annual Merchandise Import by End Use Categories (in Millions of Birr)

Category	1985/86	1990/91	1995/96	2000/01	2005/06	2010/11
Raw Materials	83	57	180	199	671	2,997
Semi-finished goods	258	237	1,262	1,970	7,133	20,000
Fuels	253	210	935	2,181	7,473	23,025
Capital Goods	742	964	2,595	3,705	12,614	44,657
Consumer Goods	870	643	2,300	3,898	11,128	36,902
Miscellaneous	5	19	144	362	855	2,112

Source: /Personal computation based on data from EEA/EEPRI, 2012 /.

4.1.3.3 Direction of Ethiopia's Foreign Trade

4.1.3.3.1 Major Merchandise Export Destination

The main destination for Ethiopia's exports is the high income economies though with a declining per centage share trend from 1961-74 81.59 per cent to 1992-2011 72.10 per cent. The trend of the percentage of share of the rest of the world shows increasing trend for the same period even though the size is still less compared to the high economies. For detailed illustration, see Table 8.

Table 8. Destination of Merchandise Export in percentage share

S. N.	Export Destination	1961- 1974 Average Percentage share	1975- 1991 Average Percentage share	1992- 2011 Average Percentage share
1	Arab World	17.18	19.82	23
2	East Asia and Pacific Developing Economies	-	-	5.08
3	Europe and Central Asia Developing Economies	-	-	2.03
4	Latin America and the Caribbean Developing Economies	0.07	0.19	0.05
5	Middle East and North Africa Developing Economies	10.29	11.76	13.16
6	South Asia Developing Economies	-	-	2.4
7	Sub-Saharan Developing Economies	1.8	0.97	1.77
8	High Income Economies	81.59	79.4	72.10

Source : World Bank, 2013

4.1.3.3.2 Major Merchandise Import Origin

The predominance of the origin of import into the country was also taken by the high income economies specially Europe though with a declining trend of percentage share from 1961-74 83.68 percent to 1992-2011 59.67 per cent. The trend of the percentage of share of the rest of the world shows increasing trend for the same period even though the size is still less compared to the high economies. For detailed illustration, see table 9.

Table 9. Source of Merchandise Import by major region (Percentage of Total)

S. N	Import Origin	1961- 1974 Average Percentage share	1961- 1974 Average Percentage share	1961- 1974 Average Percentage share
1	Arab World	3.5	5.75	18.8
2	East Asia and Pacific Developing Economies	-	1.23	10.3
3	Europe and Central Asia Developing Economies	-	-	3.2
4	Latin America and the Caribbean Developing Economies	0.13	0.21	0.56
5	Middle East and North Africa Developing Economies	6	2	4.9
6	South Asia Developing Economies	3.1	1.2	5.09
7	Sub-Saharan Developing Economies	1.7	1.4	2.2
8	High Income Economies	83.68	75.9	59.67

Source : World Bank, 2013

4.2 Descriptive Analysis

In the summary statistics given in Table 10 and Table 11, the mean, standard deviation and the number of observations for each variable under study are explained. In addition to these, the maximum and minimum values of the observations are also provided.

Table 10 and 11 shows that the mean of the period 1992-2013 is higher than the whole period for the variables mentioned. The high standard deviations indicate that the values of the economic variables mentioned are increased in the recent past in the country. In addition, the range of deviation between the maximum and minimum of each individual series is found to be larger in comparison to the mean for the two periods.

Table 10. Descriptive Analysis Period 1981-2013

Variable Observations	Observations	Mean	Standard Deviation	Minimum	Maximum
RGDPt	33	228484.3	175644.8	81289.83	681431.6
LBRt	33	30.68538	9.15839	18.22668	48.91223
RCPt	33	55740.94	60898.3	10313.81	244319.6
REXPt	33	11620.82	10288.21	112.2629	39056.4
REXMt	33	1221.20	1350.89	19.63637	4590.36
RIMPt	33	20314.87	21055.32	2357.269	74929.63
RIMMt	33	17890.60	16520.30	2525.296	55554.35

Source: Own Computation Based on available Data

Table 11. Descriptive Analysis Period 1992-2013

Variable Observations	Observations	Mean	Standard Deviation	Minimum	Maximum
RGDPt	22	294780.2	182003.4	110492	681431.6
LBRt	22	35.56004	7.152745	25.1207	48.91223
RCPt	22	76409.23	65609.29	10313.81	244319.6
REXPt	22	14357.25	11706.45	112.2629	39056.4
REXMt	22	1784.633	1334.324	34.25697	4590.364
RIMPt	22	28147	21962.28	2357.269	74929.63
RIMMt	22	24044.05	17206.98	2525.296	55554.35

Source: Own Computation Based on available Data

4.3 Time Series Econometric Analysis

4.3.1 Unit Root Test

Table 12 and 13 displays the results of the unit root test at the constant and trend regression form for the level and the first difference series for the period 1981-2013 and 1992 - 2013which yielded better result under the ADF test. The ADF test statistics reveals that all the level series of log_RGDPt, log_LBRt, log_RCPt, log_REXPt, log_REXMt , log_RIMPt, and log_RIMMt for the period 1981-2013 and 1992-2013 are nonstationary at the 5% level of significance. Hence, the study proceeds to differencing the series to check their stationarity. At the first differencing, both the ADF test reject the null hypothesis of unit root at constant and trend form either at the 5% or 10% level of significance. All the series confirmed stationarity at the first differencing. Thus the variables becomes integrated of order one, I(1).

Table 12. Unit Root Test using Augmented-Dickey Fuller 1981-1983

Variables	Test Statistics	Critical Values	Deterministic Regressors	Lags	Result
LogRGDPt	-1.563	-3.588**	Constant+trend	2	Non-stattionary
Log LBRt	-1.147	-3.588**	Constant+trend	4	Non-stattionary
Log RCPt	-1.557	-3.588**	Constant+trend	2	Non-stattionary
Log REXPt	-2.115	-3.588**	Constant+trend	3	Non-stattionary
LogREXMt	-2.762	-3.588**	Constant+trend	1	Non-stattionary
Log RIMPt	-2.432	-3.588**	Constant+trend	1	Non-stattionary
LogRIMMt	-2.019	-3.588**	Constant+trend	2	Non-stattionary
DLRGDPt	-4.641	-2.986**	constant	1	Stationary
DLLBRt	-2.829	-2.626***	constant	3	Stationary
DLRCPt	-6.606	-2.983**	constant	0	Stationary
DLREXPt	-3.978	-2.999**	constant	2	Stationary
DLREXMt	-7.088	-2.993**	constant	0	Stationary
DLRIMPt	-5.581	-2.983**	constant	0	Stationary
DLRIMMt	-4.446	-2.986**	constant	1	Stationary

Note : ***, **, and * are significant levels at 10%, 5%, and 1% respectively.

Source: Own Computation Based on Available Data

Table 13. Unit Root Test using Augmented-Dickey Fuller 1992-2013

Variables	Test Statistics	Critical Values	Deterministic Regressors	Lags	Result
LogRGDPt	-3.423	-3.600**	Constant+trend	1	Non-stattionary
Log LBRt	-0.917	-3.600**	Constant+trend	4	Non-stattionary
Log RCPt	-2.531	-3.600**	Constant+trend	3	Non-stattionary
Log REXPt	-2.896	-3.600**	Constant+trend	3	Non-stattionary
LogREXMt	-2.505	-3.600**	Constant+trend	1	Non-stattionary
Log RIMPt	-2.061	-3.600**	Constant+trend	1	Non-stattionary
LogRIMMt	-1.684	-3.600**	Constant+trend	1	Non-stattionary
DLRGDPt	-3.019	-3.000**	constant	2	Stationary
DLLBRt	-3.968	-3.000**	constant	1	Stationary
DLRCPt	-3.863	-3.000**	constant	2	Stationary
DLREXPt	-3.121	-3.000**	constant	2	Stationary
DLREXMt	-6.084	-3.000**	constant	0	Stationary
DLRIMPt	-6.588	-3.000**	constant	0	Stationary
DLRIMMt	-11.273	-3.000**	constant	0	Stationary

Note : ***, **, and * are significant levels at 10%, 5%, and 1% respectively.

Source: Own Computation Based on Available Data

4.3.2 Lag Length Selection

Since different choices of lag lengths can greatly affect the cointegration results, choosing the correct lag length is an important procedure. On this basis, various tests for optimal lag selection using the sequential modified Likelihood Ratio test statistics (LR), the Final Prediction Error (FPE), the Akaike Information Criterion (AIC), the Schwarz Information Criterion (SIC), and the Hannan-Quinn Information Criterion (HQIC) are made. Table 14 and 15 below shows that the criteria selected is 4 lags for the two periods.

Table 14. Lag Length Selection Criteria (1981-2013)

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	90.9903				5.9e-12	-5.99931	-5.89749	-5.66626
1	152.893	123.8	49	0.000	2.6e-12	-6.9209	-6.10636	-4.25649
2	244.294	182.8	49	0.000	2.7e-13	-9.94957	-8.42231	-4.9538
3	814.309	1140	49	0.000	3.6e-28*	-47.1649	-44.9249	-39.8378
4	6285.32	10942*	49	0.000	-	-434.952*	-432.101*	-425.626*

Notes:

1. * indicates lag order selected by the criterion
2. LL: Log likelihood
3. LR: Sequential modified LR test statistic
4. FPE: Final Prediction Error
5. AIC: Akaike Information Criterion
6. SC: Schwarz Information Criterion
7. HQIC: Hannan-Quinn Information Criterion

Source: Own Computation Based on Available Data

Table 15. Lag Length Selection Criteria (1992-2013)

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	81.1443				6.2e-13	-8.23826	-8.19051	-7.892
1	137.064	111.84	49	0.00	4.6e-13	-9.00715	-8.6252	-6.23711
2	1551.61	2829.1	49	0.00	6.2e-77*	-160.734	-160.018	-155.54
3	4149.85	5196.5	49	0.00	.	-447.095	-446.236	-440.862
4	4360.01	420.32*	49	0.00	.	-470.446*	-469.587*	-464.213*

Notes:

1. * indicates lag order selected by the criterion
2. LL: Log likelihood
3. LR: Sequential modified LR test statistic
4. FPE: Final Prediction Error
5. AIC: Akaike Information Criterion
6. SC: Schwarz Information Criterion
7. HQIC: Hannan-Quinn Information Criterion

Source: Own Computation Based on Available Data

4.3.3 Cointegration Test

In order to explore the long-run relationship between Growth of real GDP, growth of real capital, growth rate of real primary goods export, growth rate of real manufactured goods export , growth rate of real intermediate goods import, and growth rate of real capital goods import, we do VEC estimation for the two periods, 1981-2013 and 1992-2013. Before doing VEC estimation, we need to do cointegration analysis for checking the variables whether they are cointegrated or not. We run Johansen cointegration test for time-series of Log RGDPt, Log LBRt, Log RCPt , Log REXPt , Log REXMt , Log RIMPt , and Log RIMMt with lags 2(1981-2013) and lag 1(1991-2013). The results of the test are shown in the following table 16 and 17.

Table 16. Johansen tests for cointegration

Trend : Constant				**Number of Obs=32**	
Sample : 1982-2013				**Lags=1**	
Maximum rank	**parms**	**LL**	**eigenvalue**	**Trace statistic**	**5% critical value**
0	7	94.639929	.	158.1423	124.24
1	20	123.33172	0.83358	100.7587	94.15
2	31	139.77842	0.64225	67.8653*	68.52
3	40	152.51193	0.54880	42.3983	47.21
4	47	163.79824	0.50609	19.8257	29.68
5	52	169.82464	0.31384	7.7729	15.41
6	55	172.84229	0.17188	1.7376	3.76
7	56	173.71108	0.05285		

Source: Own Computation Based on Available Data

Table 17. Johansen tests for cointegration

Trend : Constant				Number of Obs=21	
Sample : 1993-2013				Lags=1	
Maximum rank	**parms**	**LL**	**eigenvalue**	**Trace statistic**	**5% critical value**
0	7	71.255084	.	168.2107	124.24
1	20	100.06773	0.93569	110.5854	94.15
2	31	122.32607	0.87995	66.0688*	68.52
3	40	132.12451	0.60670	46.4719	47.21
4	47	140.19084	0.53616	30.3392	29.68
5	52	147.79451	0.51527	15.1319	15.41
6	55	154.13609	0.45336	2.4487	3.76
7	56	155.36046	0.11006		

Source: Own Computation Based on Available Data

The results of Trace test suggest that the series are cointegrated with at least two cointegrating vectors at 5% level of significance. This concludes the existence of longrun relation between the major components of external trade and real economic growth in the country, which keep them from diverging, i.e., moving apart without bound. In other words, the fact that the economic variables are cointegrated implies that there is some adjustment process in the short run, preventing the errors in the long run relationship from becoming larger and larger.

However, cointegration test does not indicate the direction of causality, it indicate longrun realationship and therefore confirms that causality is present at least in two directions.

4.3.4 Longrun and Shortrun Dynamics

The discovery of at least two cointegration vectors for the two periods independently in the previous section implies that a Vector Error Correction Model /VECM/ can be used. This allows us to distinguish between the short and long run effects of variables so as to establish the relation between disaggregated foreign trade and economic growth.

4.3.4.1 Long Run Terms

Summary of the long run parameters in the model is reported in Table 18 and 19.

Table 18. Normalised Cointegrated Coefficients: 1 cointegrating equation (1981-2013)

beta	Coef.	Std. Err.	z	P>|z|
log_rgdpt	1	.	.	.
log_lbrt	0 (omitted)			
log_rcpt	.440274	.1962851	2.24	0.025
log_rexpt	-.1590335	.0410924	-3.87	0.000
log_rexmt	-.2270295	.0460526	-4.93	0.000
log_rimpt	-.3128765	.1517041	-2.06	0.039
log_rimmt	-.2248499	.2285392	-0.98	0.325
Constant	-6.140198	.	.	.

Source: Own Computation Based on Available Data

Table 19. Normalised Cointegrated Coefficients: 1 cointegrating equation 1992-2013

beta	Coef.	Std. Err.	z	P>|z|
log_rgdpt	1	.	.	.
log_lbrt	0 (omitted)			
log_rcpt	.3989659	2.000613	0.20	0.842
log_rexpt	-.1126014	.3558882	-0.32	0.752
log_rexmt	-.1123555	.3630413	-0.31	0.757
log_rimpt	.7622637	2.987937	0.26	0.799
log_rimmt	-1.075968	2.634514	-0.41	0.683
Constant	-2.608777	.	.	.

Source: Own Computation Based on Available Data

The results regarding the coefficients of β matrices in terms of normalized cointegrating coefficients of first equation for the period of 1981-2013 and 1991-2013 shows the existence of long run relationship among the variables. For the period 1981-2013, all the variables are statistically significant except capital goods import. The variables are not significant for the period 1992-2013. Accordingly, the equation is the following:

1981-2013 period

logRGDPt = -0.44Log RCPt+0.159Log REXPt+0.227Log REXMt+0.31Log RIMPt+0.22Log RIMMt +6.14 ……(18)

1992-2013 period

logRGDPt = -0.39Log RCPt+0.11Log REXPt+0.11Log REXMt-0.76Log RIMPt+1.06Log RIMMt +2.61 ……(19)

For the period 1981-2013, the equation shows that Log REXPt, Log REXMt , Log RIMPt , and Log RIMMt have a positive long run relationship with log RGDPt. Log RCPt has a negative impact on RGDPt in the longrun. The growth of real primary export, real manufactured export , real intermediate goods import, and real capital goods import by 1 percent leads to 15 percent, 22 percent, 31 and 22 per cent increase in the growth of real gross domestic product respectively. As explained in the overview of foreign trade section of the study, the growth of real primary export mainly coffee, oilseeds and pulses and others and growth of manufactured goods export like leather industries have positive and significant effect on economic growth in Ethiopia, which affirms the export led growth strategy. On the other hand, growth of intermediate goods import and capital goods import represent a channel through which import-driven technology transfer takes place. The effect of this transfer should be positive on the productivity and consequently positive impact on the economic growth.

A unit growth in real capital causes a decrease in growth of real GDP by 44 per cent. This result is not compatible with the economic theory which can be explained by the fact that the positive effect of investment in capital on the real GDP does not appear immediately and takes long gestation period from one side and this investment is mainly implemented in the infrastructure in Ethiopia, from the other side.

While a 1 per cent growth in real primary export, real manufactured export, and real capital goods import has 11 per cent, 11 per cent, and 106 per cent growth in real GDP, there is a 39 per cent and 76 per cent reduction in real growth due to a one per cent growth in real capital and real intermediate import, respectively for the period 1992-2013.

The labour force proxied by working age population of the country seems to have no impact on the real GDP growth for the two periods. This effect may be due to large unemployment, disguised unemployment and low productivity of workers as a result of low level of knowledge and skill.

4.3.4.2 Speed of Adjustment and Short Run Terms

Since long run association has been observed among different variables, we can also explore the possibility of a short run relationship by using an error correction model (ECM) framework. Annex 2 and 3 provides the short run dynamic relationship and the set of short run coefficients in the vector error correction model for the two periods.

For the period 1981-2013, current rate of growth of real GDP is not statistically significant at 5 per cent for all variables mentioned except for their previous period in the study. While last year's rate of growth of real primary export, real intermediate import, and real capital goods import have positive impact on current economic growth, the growth of real GDP, labour force, real capital, and real manufactured export have the reverse sign. The coefficient of the error correction term for the Log RGDPt is negative and statistically insignificant, that means due to any disturbance in the system, convergence to the equilibrium will take place at a very rapid pace (520 per cent per year) and the system will be stable. For the period of 1992-2013, last year's rate of growth of real GDP, labour force, real capital , and real intermediate import has positive impact on the current growth of the same. Last year growth of primary and

manufactured export and real capital goods import has a reducing effect of the same. The coefficient of the error term for the Log RGDPt is positive which makes the system unstable. Similar interpretation is observed for the current Log LBRt, Log RCPt , Log REXPt , Log REXMt, Log RIMPt, and Log RIMMt and their error terms in the lagged period as shown in the Annex 1.The error correction term for the equation of Log LBRt, Log RCPt , and Log REXMt is also negative and insignificant which suggests Log LBRt, Log RCPt , and Log REXMt of the country will converge to the equilibrium position at 0.9 per cent, 497 per cent, , and 276.7 per cent respectively per year after the system faces any deviation. The coefficients of the error correction term for Log REXPt, Log RIMPt, and log RIMMt are positive and statistically insignificant. They will diverge from equilibrium position at 338 per cent ,152 per cent, and 955 per cent respectively due to any disturbance in the system at a very rapid pace and the system will be unstable.

Despite its insignificance, the usage of the error term made rightful contribution in determination of the cointegrating relationships in the models. Thus, a model with an error term is preferred to a model without an error term.

4.3.5 Granger Causality Test

In order to find causality direction, we run VEC Granger causality test. The results are presented in the Annex 4 and 5 for the period 1981-2013 and 1992-2013 respectively. The estimation results show that there had no causality between most of the economic variables. The exceptional causalities found are the causality running from growth of real capital goods import to growth rate of real capital 5 per cent significant level. This relation reveals a unidirectional causality. There is also a unidirectional causality that goes from growth rate of

real manufactured export to growth rate of real capital goods import at 5 per cent significant level and there is unidirectional causality that runs from the growth rate of manufactured export to growth rate of capital for the period of 1981-2013.

For the period of 1992-2013, direction of causality runs from growth of labour to growth rate of real GDP, from real intermediate import to real capital, from real capital goods import to real capital and from growth rate of real primary goods import to growth rate of real capital goods import at 5 per cent significance level. For the same period, there is unidirectional causality from the growth rate of real capital goods import to growth real of GDP, from growth rate of labour participation to growth rate of capital, to growth rate of primary goods export, and to growth rate of manufactured export , and from growth rate of real primary export to growth rate of capital goods import at ten percent significant level.

4.3. 6 Model checking

Model checking is very important to the economic models because they validate the parameter evaluation of the outcomes achieved by the model. We test the VAR model formulated for stability , normality and autocorrelation.

4.3.6.1 Stability Test

Since all the eigen values lie inside the unit circle, the VAR model tested satisfies stability condition as depicted in Annex 6 and 7 for both periods.

4.3.6.2 Normality Test

Normality tests were carried using the Jarque– Bera (J-B) test, skewness test and Kurtosis test. In the J-B statistic, if the p value is high, that is when the value of the test statistic is close to 0; we do not reject the normality assumption (Gujarati, 2003, P.148).

The test of the normality of the residuals compares the 3rd and 4th moments (skewness and kurtosis) to those from a normal distribution.The test has null hypothesis indicating that the error term in the model has skwness and kurtosis corresponding to a normal distribution. The results in Annex 8 and 9 show that the null hypothesis has to be rejected because there are some J-B test, Skewness and Kurtosis in REXPt and REXMt. It might be the case that there is the presence of outlier in the model. Furthermore, failed Jarque-Bera test is a common phenomenon, which will not crucially distort final results.

4.3.6.3 Autocorrelation Test

The Lagrange Multiplier (LM) serial correlation test was used to determine if there was serial correlation in the residuals. The LM test results are given in Table 20 below, found that there was serial correlation at lag lengths 2 but none at lag length 1, 3 and 4. It is likely that there would be serial correlation between residuals in this study.

Table 20.Testing Residuals for Autocorrelation(1981-2013)

Lag	Chi 2	df	Prob
1	61.2331	49	0.11280
2	79.4640	49	0.00383
3	64.8215	49	0.06444
4	51.2540	49	0.38536

Source: Own Computation Based on Available Data

Thus, convincing conclusions on the relation of foreign trade and economic growth can be deduced and applicable policies can be formulated by taking into consideration of the presence of autocorrelation and non-normality at some variables as indicated.

4.4 Summing Up

The country has experienced three regimes over the last fifty years. While the Imperial and Military regimes followed a mixed type and command economy respectively, the EPRDF regime follows a liberalized market economy. The dominant sector is agriculture, which nowadays decreases its share and gives it to the service sector, with no noticeable change in manufacturing sector.

With regard to foreign trade, the volume of trade is increasing even though the share to the GDP remains the same throughout. The gap between the export and import is widening through time. The composition of foreign trade shows some change. The destination of foreign trade is also changing from developed high economies to others.

The Chapter also analyzed the relationship of the major components of foreign trade and economic growth. It describes the trends of each economic variable using location and dispersion measures. Time series econometric analysis is also used to show the long run, short run, causal and directional relation between the variables under study. The unit root tests showed that all the series were non-stationary in level but became stationary after first difference. Therefore the series were integrated of the same order I (1). It is also found that there is a longrun relationship between major components of foreign trade and economic growth for the period 1981-2013 and 1992-2013. Shortrun results and causality direction of the variables are also indicated. Finally, diagnostic tests of the model is made.

CHAPTER 5 – CONCLUSIONS AND POLICY IMPLICATIONS

5.1 Conclusions

This study examined whether there is nexus between the major components of external trade and economic growth in Ethiopia during the period 1981-2013 and 1992-2013. Cointegration and Vector Error Correction approaches have been applied for the identification of the relation between major component of external trade and economic growth both in the short run and in the long run. The study also employs Granger causality test to analyze the causality and direction of the real economic growth, labour force, real capital, real primary goods export, real manufactured goods export, real intermediate goods import and real capital goods import.

Based on the findings of the study both from the descriptive and time series econometric results, the following conclusions are derived. The major contribution of this study is that, unlike other researchers who consider export -growth nexus and import-growth nexus for the country separately, this study looks the nexuses between labour force, real capital, real primary goods export, real manufactured goods export, real intermediate goods import, real capital goods import, and real economic growth together using Co-integration and Vector Error Correction approaches. And further this study found evidence on the nexuses between labour force, real capital, real primary goods export, real manufactured goods export, real intermediate goods import, real capital goods import, and real economic growth in the long run for the two periods. Real capital, real primary goods export, real manufactured goods export, real intermediate goods import, real capital goods import have significant long run impact on real economic growth of the country for the period 1981-2013. Real GDP and real manufactured export have negative impact on the economic growth in the shortrun. Real

primary export, real intermediate import, and real capital goods import have positive impact on real economic growth in the shortrun. Similarly, labour force has no impact in the long run, but it has negative short run effect on real economic growth. The real capital has negative short run and longrun effect on the economic growth.

For the period 1992-2013, real capital and real intermediate import has negative impact on the current economic growth in the longrun, other variables have positive impact for the same except labour which is none. For the period 1992-2013, real primary export, real manufactured export, and capital goods import has negative impact for economic growth, and the rest variables has positive impact for the current economic growth.

The economy growth of Ethiopia did not depend on the growth of export, but it depends on the growth of import.

Furthermore, we have tested the stability of the equilibrium using VECM for the two periods. The results indicate that the coefficient of the error-correction term of real primary export, real intermediate import and real capital goods import for the period 1981-2013 and lagged real GDP, labour ,real capital,and real intermediate import for the period 1992-2013 have positive sign and depict divergence from the longrun equilibrium in the system. The value of the coefficient of the error correction term of lagged real GDP, labour force, real capital, and real manufactured export for the period 1981-2013 and real primary export,real manufactured export, and real capital goods import for the period 1992-2013 have the right sign (negative) and shows restoration of convergence to long run equilibrium position from any case of disequilibrium in every year.

The results of the Granger Causality test for the period 1981-2013 indicated a causal relationship between and real capital import and real capital, real manufactured export and

real capital goods import at 5 per cent significant level, and a casual relation between real manufactured export and labour force at 10 significant level, revealing that while real capital goods import granger causes real capital, real manufactured export granger causes real capital goods import and real manufactured export granger causes real capital, no reverse causality was observed. Causality was also found to run unidirectional from growth rate of labour to growth rate of real GDP, from growth rate of intermediate import to real capital, from real capital goods import to real capital, from intermediate import to real capital goods import at 5 per cent significant level and from real capital goods import to real GDP, from labour to real capital, real primary export, and real manufactured export, and from primary goods import to capital goods import at 10 per cent significant level.

The growth of the economy for the last ten years shows remarkable growth and there is structural changes are shown from the agriculture to the service sector, with no sign of change to the manufacturing sector. The volume of the foreign trade shows increasing trend with some addition of new agricultural and manufacturing commodities. The share of trading partners of the country is also changing from the developed high economies to others.

5.2 Policy Implications

Given the significant long run positive impact of the external trade components and economic growth, it is suggested that:

- intermediate goods import and capital goods import can play an important role in the promotion of exports, therefore their share in total imports should be strengthened,
- the government should diversify its export base as over reliance on coffee and other few agricultural exports appears precarious and unsustainable.

- Policies that seek to increase the value of exports, and hence should invest in value addition and general agricultural production and post-harvesting technology among other things,
- Policy of encouraging the exports in industrial sector should be considered more than agricultural exports,
- the business environment should be improved and promote entrepreneurship and productivity.

5.3 Areas of Further Research

The study used working age population to compute labour data in the model due to non-availability of data. This phenomenon does not distinguish the employed workers' contribution to economic growth. Therefore, future research investigates the effect of employed workers on economic growth.

Quarterly data could be more appropriate in estimating the effect of external trade components on economic growth. This is because quarterly data is more frequent and variables are computed at quarterly intervals. Nevertheless, the study used annual data to accommodate the unavailability of quarterly data. Therefore if higher frequency data, quarterly or monthly, can be available for real GDP, the investigation of the causal links between the major components of external trade and economic growth in the country can be revisited in future research.

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Annex 1. Major Componets of Foreign Trade and Economic Growth Data

year	rgdpt	lbrt	rcpt	rexpt	rexmt	rimpt	rimmt
1981	82296.4	18.2267	12095.9	7760.05	19.6364	5182.3	4004.42
1982	86675.1	18.605	12848	6814.22	35.9762	5652.93	4849.4
1983	92827.4	19.0577	12144.6	7026.57	54.4747	6000	4880.87
1984	82758.7	19.5754	15243	6824.61	34.5988	5711.92	7661.46
1985	104002	20.1407	11804.4	7246.53	65.9997	5150.15	4361.8
1986	81289.8	20.7407	14300.5	4448.07	43.9936	3817.97	4768.92
1987	92220.4	21.373	15225.5	6468.54	51.9546	3683.19	6494.76
1988	102577	22.0422	22113.1	5413.36	129.456	4320.73	7741.9
1989	103989	22.7496	15901.9	5946.1	162.269	4374.16	5765.18
1990	106782	23.4979	13940.9	5972.15	233.632	4020.88	4694.86
1991	119401	24.2877	12830.1	3707.37	205.975	3242.27	6197.27
1992	110492	25.1207	10313.8	1799.16	69.3742	2357.27	2525.3
1993	120155	25.9923	17713.8	3289.46	81.161	5690.5	5911.67
1994	110870	26.8891	17690.5	4689.61	34.257	6527.69	5708.44
1995	124286	27.7936	22291.6	4488.68	1193.19	8953.69	8349.73

1996	125476	28.6938	22745.3	8402.61	1054.94	8440.77	9217.96
1997	133089	29.586	24975.3	7390.2	1847.55	11946.6	11703.7
1998	137961	30.4755	26069.6	134.996	1983.88	13563.4	9425.4
1999	153776	31.3717	28150.4	112.263	1551.09	11916.4	13431.4
2000	211347	32.2882	28518.7	11450.7	823.391	13077.5	12958.6
2001	204178	33.2365	46809.3	10913.2	1182.7	13902.9	11842
2002	211911	34.2209	54440.8	9979.63	1550.28	16968.4	13910.3
2003	243013	35.2431	57375.4	10639.3	1781.15	17637.7	16592.2
2004	253229	36.3099	70850.6	11776.1	1572.81	20756	23577.6
2005	298048	37.4284	75955.1	12518	541.907	35922.4	31159.6
2006	336706	38.6052	90673.8	19710.8	1122.85	41754.1	34475.8
2007	396785	39.8411	108526	19708.5	1343.07	39343.7	40311.5
2008	491363	41.1395	116254	20701.5	3300.25	60913.4	34312
2009	513491	42.5112	122116	23039.4	2396.32	53254.6	39449.3
2010	460540	43.9692	110330	22734.3	2674.8	48713.3	48001.4
2011	573495	45.5213	175288	38407.2	4590.36	57252.4	55554.3
2012	681432	47.1712	244320	39056.4	4522.94	74929.6	51829.7
2013	593522	48.9122	209596	34917.6	4043.64	55411.6	48721.3

Annex 2. Vector Error Correction Model Shortrun Results 1981-2013

Dependent Variable	Independent Variable	Coefficient	Standard Error	Z-statistics
D_log_rgdpt	_ce1	-5.203882	-0.51	0.611
	log_rgdpt	4.052674	0.43	0.670
	log_lbrt	584.9909	0.77	0.441
	log_rcpt	-.3787355	-0.26	0.795
	log_rexpt	-.0884054	-0.36	0.719
	log_rexmt	-.1023851	-0.35	0.727
	log_rimpt	-1.944013	-0.49	0.622
	log_rimmt	1.155462	0.49	0.625
	_cons	.4638604	0.83	0.409
D_log_lbrt	_ce1	-.0097191	-0.61	0.544
	log_rgdpt	.0104268	0.70	0.483
	log_lbrt	2.569984	2.16	0.030
	log_rcpt	-.0013958	-0.61	0.540
	log_rexpt	-.0003276	-0.85	0.393
	log_rexmt	-.0002936	-0.64	0.522
	log_rimpt	-.0045469	-0.74	0.461
	log_rimmt	.0028555	0.77	0.440
	_cons	-.0007468	-0.85	0.395
D_log_rcpt	_ce1	-4.967846	-0.30	0.761
	log_rgdpt	4.578152	0.30	0.763
	log_lbrt	-101.0614	-0.08	0.934
	log_rcpt	.01917	0.01	0.993
	log_rexpt	-.1415175	-0.36	0.718
	log_rexmt	-.3306754	-0.71	0.481
	log_rimpt	-2.218794	-0.35	0.724
	log_rimmt	.9748103	0.26	0.796
	_cons	-.8304287	-0.93	0.354
D_log_rexpt	_ce1	33.80198	0.59	0.558
	log_rgdpt	-34.4995	-0.64	0.520
	log_lbrt	1727.486	0.40	0.687
	log_rcpt	-8.708978	-1.06	0.289
	log_rexpt	2.988395	2.16	0.031
	log_rexmt	4.58927	2.77	0.006
	log_rimpt	11.93487	0.54	0.591
	log_rimmt	-3.58235	-0.27	0.788
	_cons	.1870785	0.06	0.953
D_log_rexmt	_ce1	-27.67912	-0.40	0.691
	log_rgdpt	21.6972	0.34	0.737
	log_lbrt	1611.785	0.31	0.755
	log_rcpt	-1.822754	-0.18	0.854
	log_rexpt	-.5339433	-0.32	0.749
	log_rexmt	-.755615	-0.38	0.705

Dependent Variable	Independent Variable	Coefficient	Standard Error	Z-statistics
	log_rimpt	-10.66833	-0.40	0.691
	log_rimmt	5.914985	0.37	0.713
	_cons	-1.140976	-0.30	0.765
D_log_rimpt	_ce1	15.22186	0.59	0.553
	log_rgdpt	-14.63026	-0.61	0.539
	log_lbrt	-1392.818	-0.73	0.464
	log_rcpt	1.861148	0.51	0.610
	log_rexpt	.3990989	0.65	0.516
	log_rexmt	.2374076	0.32	0.747
	log_rimpt	5.483894	0.56	0.578
	log_rimmt	-3.089167	-0.52	0.602
	_cons	-1.698617	-1.21	0.227
D_log_rimmt	_ce1	9.55417	0.38	0.701
	log_rgdpt	-9.392506	-0.41	0.684
	log_lbrt	-2.236824	-0.39	0.697
	log_rcpt	.3598441	0.10	0.919
	log_rexpt	.3926173	0.66	0.510
	log_rexmt	.4182311	0.59	0.557
	log_rimpt	3.535302	0.37	0.712
	log_rimmt	-1.440237	-1.06	0.291
	_cons	-951.9157	-0.52	0.606

Annex 3. Vector Error Correction Model Shortrun Results 1992-2013

Dependent Variable	Independent Variable	Coefficients	Standard Error	Z	P-Value
D_log_rgdpt	_ce1	.1528148	.194287	0.79	0.432
	log_rgdpt	.1676588	.4406761	0.38	0.704
	log_lbrt	-18.01445	19.30196	-0.93	0.351
	log_rcpt	-.0652247	.210127	-0.31	0.756
	log_rexpt	-.0561648	.0485125	-1.16	0.247
	log_rexmt	.0057048	.0407385	0.14	0.889
	log_rimpt	-.1247553	.1835227	-0.68	0.497
	log_rimmt	.107884	.1867259	0.58	0.563
	_cons	.2516159	.6537933	0.38	0.700
D_log_lbrt	_ce1	.0025157	.0001348	18.66	0.000
	log_rgdpt	-.0005386	.0003058	-1.76	0.078
	log_lbrt	.835007	.0133937	62.34	0.000
	log_rcpt	.0003477	.0001458	2.38	0.017
	log_rexpt	-.0000762	.0000337	-2.26	0.024
	log_rexmt	.0000563	.0000283	1.99	0.047
	log_rimpt	.0002935	.0001273	2.30	0.021
	log_rimmt	.0006781	.0001296	5.23	0.000
	_cons	-.0109585	.0004537	-24.16	0.000
D_log_rcpt	_ce1	.6322505	.1589414	3.98	0.000
	log_rgdpt	.2741046	.3605062	0.76	0.447
	log_lbrt	-26.7685	15.79045	-1.70	0.090
	log_rcpt	-.0811466	.1718997	-0.47	0.637
	log_rexpt	-.0845477	.0396868	-2.13	0.033
	log_rexmt	.0457852	.0333272	1.37	0.170
	log_rimpt	.3248046	.1501354	2.16	0.031
	log_rimmt	-.4539627	.1527558	-2.97	0.003
	_cons	-.2874585	.534852	-0.54	0.591
D_log_rexpt	_ce1	-2.050481	2.365504	-0.87	0.386
	log_rgdpt	.5119697	5.365367	0.10	0.924
	log_lbrt	8.229066	235.0073	0.04	0.972
	log_rcpt	-.1808749	2.558361	-0.07	0.944
	log_rexpt	.4596395	.590654	0.78	0.436
	log_rexmt	-.3039778	.4960042	-0.61	0.540
	log_rimpt	-4.061993	2.234446	-1.82	0.069
	log_rimmt	4.521714	2.273445	1.99	0.047
	_cons	.0658684	7.960134	0.01	0.993
D_log_rexmt	_ce1	-.6441348	1.285409	-0.50	0.616
	log_rgdpt	-2.723501	2.915526	-0.93	0.350
	log_lbrt	205.7041	127.7023	1.61	0.107
	log_rcpt	-.9904548	1.390206	-0.71	0.476
	log_rexpt	.1847969	.3209598	0.58	0.565

Dependent Variable	Independent Variable	Coefficients	Standard Error	Z	P-Value
	log_rexmt	-.2693612	.2695274	-1.00	0.318
	log_rimpt	.2927362	1.214192	0.24	0.809
	log_rimmt	-2.099572	1.235384	-1.70	0.089
	_cons	-.0758257	4.325516	-0.02	0.986
D_log_rimpt	_ce1	.3130123	.286143	1.09	0.274
	log_rgdpt	.1375499	.6490213	0.21	0.832
	log_lbrt	-14.21127	28.42764	-0.50	0.617
	log_rcpt	.3471939	.3094719	1.12	0.262
	log_rexpt	-.0864273	.0714484	-1.21	0.226
	log_rexmt	-.0437153	.0599991	-0.73	0.466
	log_rimpt	-.0802977	.2702896	-0.30	0.766
	log_rimmt	.0138965	.2750071	0.05	0.960
	_cons	.8039773	.9628971	0.83	0.404
D_log_rimmt	_ce1	-.045699	.2771072	-0.16	0.869
	log_rgdpt	-.9669312	.6285265	-1.54	0.124
	log_lbrt	-13.0846	27.52995	-0.48	0.635
	log_rcpt	-.221105	.2996994	-0.74	0.461
	log_rexpt	.0076257	.0691922	0.11	0.912
	log_rexmt	.0007647	.0581045	0.01	0.989
	log_rimpt	.0737171	.2617544	0.28	0.778
	log_rimmt	-.1240905	.266323	-0.47	0.641
	_cons	.4838641	.9324907	0.52	0.604

Annex 4. VEC Granger Casuality Test 1981-2013

Null Hypothesis : Ho	Chi-Sq.	Prob.	Result
dlrgdpt does not Granger cause dllbrt	1.6278	0.202	Not Reject
dllbrt does not Granger cause dlrgdpt	2.1474	0.143	Not Reject
dlrgdpt does not Granger cause dlrcpt	.16381	0.686	Not Reject
dlrcpt does not Granger cause dlrgdpt	.31491	0.575	Not Reject
dlrgdpt does not Granger cause dlrexpt	.01796	0.893	Not Reject
dlrexpt does not Granger cause dlrgdpt	.2038	0.652	Not Reject
dlrgdpt does not Granger cause dlrexmt	.12687	0.722	Not Reject
dlrexmt does not Granger cause dlrgdpt	.77774	0.378	Not Reject
dlrgdpt does not Granger cause dlrimpt	.5904	0.442	Not Reject
dlrimpt does not Granger cause dlrgdpt	.78001	0.377	Not Reject
dlrgdpt does not Granger cause dlrimmt	.42887	0.513	Not Reject
dlrimmt does not Granger cause dlrgdpt	.16632	0.683	Not Reject
dllbrt does not Granger cause dlrcpt	.10265	0.749	Not Reject
dlrcpt does not Granger cause dllbrt	.15431	0.694	Not Reject
dllbrt does not Granger cause dlrexpt	.27226	0.602	Not Reject
dlrexpt does not Granger cause dllbrt	.00115	0.973	Not Reject
dllbrt does not Granger cause dlrexmt	.38937	0.533	Not Reject
dlrexmt does not Granger cause dllbrt	1.4706	0.225	Not Reject
dllbrt does not Granger cause dlrimpt	1.5621	0.211	Not Reject
dlrimpt does not Granger cause dllbrt	.90906	0.340	Not Reject
dllbrt does not Granger cause dlrimmt	.01267	0.910	Not Reject
dlrimmt does not Granger cause dllbrt	.04681	0.829	Not Reject
dlrcpt does not Granger cause dlrexpt	.00486	0.944	Not Reject
dlrexpt does not Granger cause dlrcpt	.01188	0.913	Not Reject
dlrcpt does not Granger cause dlrexmt	.00396	0.950	Not Reject
dlrexmt does not Granger cause dlrcpt	3.7206	0.054	Reject
dlrcpt does not Granger cause dlrimpt	1.8755	0.171	Not Reject
dlrimpt does not Granger cause dlrcpt	.21223	0.645	Not Reject
dlrcpt does not Granger cause dlrimmt	1.0338	0.309	Not Reject
dlrimmt does not Granger cause dlrcpt	4.1886	0.041	Reject
dlrexpt does not Granger cause dlrexmt	.09507	0.758	Not Reject
dlrexmt does not Granger cause dlrexpt	2.5979	0.107	Not Reject
dlrexpt does not Granger cause dlrimpt	.74813	0.387	Not Reject
dlrimpt does not Granger cause dlrexpt	.17378	0.677	Not Reject
dlrexpt does not Granger cause dlrimmt	.01139	0.915	Not Reject
dlrimmt does not Granger cause dlrexpt	.31855	0.572	Not Reject
dlrexmt does not Granger cause dlrimpt	1.8588	0.173	Not Reject
dlrimpt does not Granger cause dlrexmt	.14139	0.707	Not Reject
dlrexmt does not Granger cause dlrimmt	12.168	0.000	Reject
dlrimmt does not Granger cause dlrexmt	.20843	0.648	Not Reject
dlrimpt does not Granger cause dlrimmt	.31054	0.577	Not Reject
dlrimmt does not Granger cause dlrimpt	.31017	0.578	Not Reject

Annex 5. VEC Granger Casuality Test 1992-2013

Null Hypothesis : Ho	Chi-Sq.	Prob.	Result
dlrgdpt does not Granger cause dllbrt	.44217	0.506	Not Reject
dllbrt does not Granger cause dlrgdpt	10.33	0.001	Reject
dlrgdpt does not Granger cause dlrcpt	.19126	0.662	Not Reject
dlrcpt does not Granger cause dlrgdpt	1.0144	0.314	Not Reject
dlrgdpt does not Granger cause dlrexpt	.0046	0.946	Not Reject
dlrexpt does not Granger cause dlrgdpt	.18648	0.666	Not Reject
dlrgdpt does not Granger cause dlrexmt	.1274	0.721	Not Reject
dlrexmt does not Granger cause dlrgdpt	.19592	0.658	Not Reject
dlrgdpt does not Granger cause dlrimpt	.32461	0.569	Not Reject
dlrimpt does not Granger cause dlrgdpt	.49582	0.481	Not Reject
dlrgdpt does not Granger cause dlrimmt	.08841	0.766	Not Reject
dlrimmt does not Granger cause dlrgdpt	3.677	0.055	Reject
dllbrt does not Granger cause dlrcpt	3.1093	0.078	Reject
dlrcpt does not Granger cause dllbrt	.43313	0.510	Not Reject
dllbrt does not Granger cause dlrexpt	3.1127	0.078	Reject
dlrexpt does not Granger cause dllbrt	.06302	0.802	Not Reject
dllbrt does not Granger cause dlrexmt	3.5569	0.059	Reject
dlrexmt does not Granger cause dllbrt	.00657	0.935	Not Reject
dllbrt does not Granger cause dlrimpt	2.6914	0.101	Not Reject
dlrimpt does not Granger cause dllbrt	2.453	0.117	Not Reject
dllbrt does not Granger cause dlrimmt	.54512	0.460	Not Reject
dlrimmt does not Granger cause dllbrt	.05708	0.811	Not Reject
dlrcpt does not Granger cause dlrexpt	.20238	0.653	Not Reject
dlrexpt does not Granger cause dlrcpt	.014	0.906	Not Reject
dlrcpt does not Granger cause dlrexmt	.20197	0.653	Not Reject
dlrexmt does not Granger cause dlrcpt	.88581	0.347	Not Reject
dlrcpt does not Granger cause dlrimpt	.79419	0.373	Not Reject
dlrimpt does not Granger cause dlrcpt	10.665	0.001	Reject
dlrcpt does not Granger cause dlrimmt	.50652	0.477	Not Reject
dlrimmt does not Granger cause dlrcpt	5.0112	0.025	Reject
dlrexpt does not Granger cause dlrexmt	.05974	0.807	Not Reject
dlrexmt does not Granger cause dlrexpt	1.5407	0.215	Not Reject
dlrexpt does not Granger cause dlrimpt	.889	0.346	Not Reject
dlrimpt does not Granger cause dlrexpt	.28375	0.594	Not Reject
dlrexpt does not Granger cause dlrimmt	.07575	0.783	Not Reject
dlrimmt does not Granger cause dlrexpt	.00381	0.951	Not Reject
dlrexmt does not Granger cause dlrimpt	.04278	0.836	Not Reject
dlrimpt does not Granger cause dlrexmt	1.0261	0.311	Not Reject
dlrexmt does not Granger cause dlrimmt	3.4787	0.062	Reject
dlrimmt does not Granger cause dlrexmt	.62704	0.428	Not Reject
dlrimpt does not Granger cause dlrimmt	5.4419	0.020	Reject
dlrimmt does not Granger cause dlrimpt	.65203	0.419	Not Reject

Annex 6. Stability Test (1981-2013)

Eigenvalue	Modulus
.8406267	.840627
-.8406267	.840627
-6.661e-16 + .8406267i	.840627
-6.661e-16 - .8406267i	.840627
-.6987779 + .2835257i	.754107
-.6987779 - .2835257i	.754107
.2835257 + .6987779i	.754107
.2835257 - .6987779i	.754107
.6987779 + .2835257i	.754107
.6987779 - .2835257i	.754107
-.2835257 + .6987779i	.754107
-.2835257 - .6987779i	.754107
-.7494836	.749484
.7494836	.749484
-4.823e-16 + .7494836i	.749484
-4.823e-16 - .7494836i	.749484
.4833944 + .4833944i	.683623
.4833944 - .4833944i	.683623
-.4833944 + .4833944i	.683623
-.4833944 - .4833944i	.683623
-.4599358 + .4599358i	.650447
-.4599358 - .4599358i	.650447

.4599358 + .4599358i	.650447
.4599358 - .4599358i	.650447
.2955646	.295565
-.2955646	.295565
-1.202e-15 + .2955646i	.295565
-1.202e-15 - .2955646i	.295565

Annex 7. Stability Test (1992-2013)

Eigenvalue	Modulus
-2.647e-15 + .9137681i	.913768
-2.647e-15 - .9137681i	.913768
-.9137681	.913768
.9137681	.913768
-.5789323 + .5789323i	.818734
-.5789323 - .5789323i	.818734
.5789323 + .5789323i	.818734
.5789323 - .5789323i	.818734
.1427524 + .7646889i	.777899
.1427524 - .7646889i	.777899
-.7646889 + .1427524i	.777899
-.7646889 - .1427524i	.777899
.7646889 + .1427524i	.777899
.7646889 - .1427524i	.777899
-.1427524 + .7646889i	.777899
-.1427524 - .7646889i	.777899
.5208498 + .5208498i	.736593
.5208498 - .5208498i	.736593
-.5208498 + .5208498i	.736593
-.5208498 - .5208498i	.736593
-.5557224 + .1329851i	.571413
-.5557224 - .1329851i	.571413
.5557224 + .1329851i	.571413

.5557224 - .1329851i	.571413
.1329851 + .5557224i	.571413
.1329851 - .5557224i	.571413
-.1329851 + .5557224i	.571413
-.1329851 - .5557224i	.571413

All the eigenvalues lie inside the unit circle.

VAR satisfies stability condition.

Annex 8. Normality Test (1981-2013)

Jarque-Bera test

Equation	**chi2**	**df**	**Prob > chi2**
dlrgdpt	0.597	2	0.74191
dllbrt	0.636	2	0.72743
dlrcpt	0.503	2	0.77747
dlrexpt	40.803	2	0.00000
dlrexmt	6.526	2	0.03827
dlrimpt	2.115	2	0.34734
dlrimmt	1.615	2	0.44598
ALL	52.796	14	0.00000

Skewness test

Equation	Skewness	chi2	df	Prob > chi2
dlrgdpt	-.33901	0.536	1	0.46396
dllbrt	.09902	0.046	1	0.83062
dlrcpt	.29217	0.398	1	0.52794
dlrexpt	-.22581	0.238	1	0.62569
dlrexmt	.98607	4.538	1	0.03316
dlrimpt	.66999	2.095	1	0.14780
dlrimmt	-.56391	1.484	1	0.22315
ALL	9.335		7	0.22951

Kurtosis test

Equation	Kurtosis	chi2	df	Prob > chi2
dlrgdpt	2.7718	0.061	1	0.80534
dllbrt	2.2884	0.591	1	0.44215
dlrcpt	2.6999	0.105	1	0.74586
dlrexpt	8.8966	40.565	1	0.00000
dlrexmt	4.3057	1.989	1	0.15846
dlrimpt	2.8689	0.020	1	0.88738
dlrimmt	2.665	0.131	1	0.71743
ALL	43.461		7	0.00000

Annex 9. Normality Test (1992-2013)

Jarque-Bera test

Equation	chi2	df	Prob > chi2
dlrgdpt	0.161	2	0.92254
dllbrt	0.894	2	0.63963
dlrcpt	12.747	2	0.00171
dlrexpt	3.190	2	0.20295
dlrexmt	0.460	2	0.79440
dlrimpt	1.074	2	0.58464
dlrimmt	0.702	2	0.70381
ALL	19.228	14	0.15643

Skewness test

Equation	Skewness	chi2	df	Prob > chi2
dlrgdpt	-.16818	0.085	1	0.77083
dllbrt	.08063	0.020	1	0.88893
dlrcpt	1.6813	8.480	1	0.00359
dlrexpt	-.3391	0.345	1	0.55697
dlrexmt	.13439	0.054	1	0.81595
dlrimpt	-.23859	0.171	1	0.67943
dlrimmt	-.46656	0.653	1	0.41903
ALL	9.808		7	0.19974

Kurtosis test

Equation	Kurtosis	chi2	df	Prob > chi2
dlrgdpt	3.3191	0.076	1	0.78225
dllbrt	1.9204	0.874	1	0.34979
dlrcpt	5.3851	4.267	1	0.03887
dlrexpt	4.9475	2.845	1	0.09168
dlrexmt	2.2641	0.406	1	0.52392
dlrimpt	1.9029	0.903	1	0.34204
dlrimmt	2.7432	0.049	1	0.82401
ALL	9.420		7	0.22389

LIST OF ABBREVIATIONS

ADF	**Augmented Dickey – Fuller**
AIC	**Akaike Information Criteria**
AR	**Auto Regressive**
ARDL	**Autoregressive Distributed Lag**
BIC	**Bayesian Information Criteria**
DF	**Dickey-Fuller**
ECM	**Error Correction Model**
ELG	**Export-led Growth**
GDP	**Gross Domestic Product**
GLE	**Growth-Led Export**
HQ	**Hannan-Quinn Information Criteria**
ILG	**Import-Led Growth**
JB	**Jarque-Bera**
REXM	**Real Manufactured goods Export**
REXP	**Real Primary products Export**
RIMM	**Real Capital Goods Import**
RIMP	**Real Intermediate Goods Import**
VAR	**Vector Autoregressive**
VECM	**Vector Error-Correction Model**
WDI	**World Development Indicators**