

JIMMA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

DETERMINANTS OF EXPORT TRADE AND ITS DYNAMICS IN ETHIOPIA

BY

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Partial Fulfillment of the Requirements for the Degree of Masters of Science in
Economics (Economic Policy Analysis)**

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JIMMA

DECLARATION

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

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ACRONYMS AND ABBREVIATIONS

3SLS	Three Stage-Least Squares
ADF	Augmented Dickey Fuller
ADLI	Agricultural Development Led Industrialization
AMA	Animal marketing Authority
CSA	Central Statistical Authority
DC	Developed Countries
DW	Durbin Watson statistics
EEA	Ethiopian Economics Association
EEPA	Ethiopian Export promotion Agency
FI	Foreign Income
GTA	Growth and Transformation plan
H-O	Heschecher and Ohlin Theorem
ICC	Infrastructure condition of country
IFS	International Financial statistics
ILO	International Labor Organization
LDC	Least Developed Countries
MEDAC	Ministry of Ethiopia Economic development and cooperation
MOFA	Ministry of Foreign Affairs
MoFED	Ministry of Finance and Economic Development

MOTI	Ministry of Trade and Industry
NBE	National Bank of Ethiopia
OLS	Ordinary Least Squares
OPP	Openness of Trade
REER	Real Effective Exchange Rate
RGDP	Real Gross Domestic Product
TOT	Terms of trade
WB	World Bank

ABSTRACT

The objective of this study is to examine the determinants of export trade and its dynamics in Ethiopia over the period 1972-2011. The estimation technique used is the simultaneous equation framework with Three Stage Least Square approaches (3SLS). The variables used as determinants of demand side are: the real effective exchange rate, real income of trading partners and trade Openness. On the other hand, the variables used as determinants of export supply include: Gross domestic products, the ratio of price of exports to domestic price, Infrastructure which is proxied by Telephone per 1000 people and dummy variables used (since Ethiopia followed varying policy regimes). The data is collected from NBE (2011), EEA Statistical data base CD-ROM (2012), IFS, WB and MoFED. The estimated results indicated that real effective exchange rate and trade openness significantly affect the export value of Ethiopia. However, Real income of trading partners' is insignificant. On the other hand, on the Supply side, gross domestic product, infrastructure and policy dummy have positive and significant impacts on export supply of Ethiopia. However, relative price (the ratio of price of exports to domestic prices), is negatively related to the supply of export suggesting that some commodities are diverted to the domestic market as their prices increase.

Key Terms: Export, Dynamics, Simultaneous Equation, 3SLS

CHAPTER ONE

INTRODUCTION

1.1. BACKGROUND OF THE STUDY

Ethiopia is one of the least developed nations in the world where agrarian economy is predominant. Large proportion of Ethiopian populations is directly engaged in agricultural activities. Therefore, being a predominantly agrarian economy, it is common to anticipate the greatest share of the country's exports to stem from the agricultural sector. About 94% of total export of the economy came from the agricultural sector in year 2008/2009. Industry is still at infancy and mineral resources are not yet exploited (NBE, 2009). According to World Bank report (2011), Ethiopia continued to maintain the double digit growth rate which averaged 11.4 percent since 2001 to 2009 and also in the fiscal year 2011 real GDP growth was 11.4 percent. This robust economic growth, which is broad based, placed Ethiopia among the top performing Africa and other developing Asian countries. However, the overall performance of the Ethiopian economy in terms of export has been far from satisfactory and continued to be totally dependent on few traditional exports. Ethiopia has lost its market share in their international market while at the same time failing to achieve a significant export in the past thirty years (Alemu, 2009).

The need for export as economic growth strategy has been accepted and it is also believed that expanding export capacity and increasing international competitiveness are vital for rapid growth and development. Ethiopia's export is composed of agricultural products and non agricultural products. The major non agricultural export commodities are leather and leather products, frozen meat, sugar and textiles. However, the bulk of its export comes from agricultural products among which coffee ,oil seeds, chat, and flower are the four major export commodities of the country which together constitute 57.6% of the annual export earnings in the year 2010/11 (MoFED,2012) . During the same period, the volumes of export of the four major export items are accounted for more than 69% of the annual export earnings (NBE,2011).

Still Ethiopia has a potential to increase its foreign exchange earnings from its export. For instances, the country has exploitable potential in, among other, coffee, livestock and sugarcane sector. In line with this, Ethiopia is among very few countries which can produce and supply organic coffee to the world market. Moreover, productivity of agricultural commodities for some commodities is highest in the world given the conducive weather condition. For instance, Ethiopia can produce 116 tons of sugarcane per hectare and 11.5 tons of sugar harvested hectare which is highest in world as compared to the world average production of 11.5 tons per hectare (LMC and IF, 2004). Hence, it at least boosts its agricultural products with some promising measures. The country can currently draw a lesson from past experience so as to exploit high potential to improve export performance. It has not yet been performing at its maximum potential on the export sector as compared to what could have been achieved with a better policy package.

The country has earned 2.75 billion USD in foreign currency from its export trade for the year 2010 /11. From this amount, agricultural product export accounted for 94.5 % and of this income 30.6 % was obtained from the export of coffee while 1.7% comes from export of semi processed agricultural commodities. It should be noticed that the share of coffee in foreign exchange earning was between 50% to 60 % in 1990's (Berhanu,2004/05).

In recent years the Ethiopian economy has considerably changed prompting different view as to the nature of the change. For the first time in the country's history prices and outputs moved in similar direction, both growing in double digits. The agricultural sector seems to be giving way to the service sector with the industrial sector maintaining its old share in the economy. There is a lot of speculation as to why this is happening and on the possible future direction of where the economy is going. For instances, according to World Bank Report (2011) Agriculture, industry and service sector constitute 49.3%, 11.1% and 39.6% respectively. However, the change in the share of sectoral composition is between agriculture and service sector where as industry sector is showing a stagnant growth so far. This imposes certain question in ADLI where the transformation is from agriculture to industry. Agricultural focused policies seem to be changing owing to the fact that productivity of small holder agriculture has not increased significantly. The industrial sector has not grown much in share as expected when growth comes. Accordingly, the

usual shift from the Agricultural sector to industry and then to services has not materialized, thereby bringing a number of questions (Makonnen, 2012).

1.2. STATEMENT OF THE PROBLEM

Ethiopia needs a large and growing export sector in order to finance the import of industrial equipment and raw materials such as capital, fuel, medical instruments and producer goods to develop its agricultural and industrial sector. A rise in capacity to supply diversified goods and service for export purpose is principal component of economic growth (Mahlet, 2010). Regardless of these facts Ethiopia's export trade is not well diversified and is not as expected. The main reason operating behind this fact is that the country's export (which is composed of mainly agricultural commodities) faced a fluctuation in its value and volume (Ibid). Besides, there are many factors for the market fluctuation in volume, value and total export earnings of the country.

According to the Ethiopian Export Promotion Agency (2002), exports of Ethiopia are subject to natural vagaries and suffer from supply side constraints caused by domestic factors. These constraints include traditional production system, weak extension system and shortage of production inputs and finance. Moreover, the type of commodities exported and trend in world demand and price for those commodities, the location of market for export, the trade policies of importing countries and exchanges rate are major reason for poor performance of export trade in Ethiopia (Abay and Zewdu, 1999).

Hence, the fundamental problem for Ethiopia is the poor performance of the export sector. These poor performances lead the country to a deficit problem in the balance of payments. For Ethiopia, importing capital good is a necessary condition for its development which requires sufficient amount of the foreign exchange. However, heavy concentration in few agricultural products has hampered the performance of the sector in particular and economy in general where larger share of export comes from five major export item which accounted for more than 80% of annual export earnings (Berhanu and Befekadu, 1999/2000:256).

On the other hand, the low price and income inelasticity demand for primary product is another problem that the country is facing which also led to the poor performance of the export sector in

particular and the economy in general. The reason behind this is that individual household in developed nation spends only small proportion of their income on such primary commodities. As a result, when the prices of these commodities change, households do not significantly change their purchases of these primary commodities, resulting in price inelastic demand (Salvatore, 1990). Hence, since the country's economy is predominantly agrarian, foreign exchange earning requires diversification of agricultural exports as providing industrial export is difficult in the face of international competition at least in the short run.

Most of the empirical studies in the area consider either the supply side or the demand side determinants of export but not both, except very few studies. For instance, when we consider document of the World Bank (1987), it considered only the supply side factors in the export function while the studies conducted by Tura (2002) considered only the demand side determinants of export. Moreover, Muscatelli (1992) and Sinha Roy (2002), emphasize on significance of the demand side determinants like world demand and world prices in explaining export behavior while others attributes much importance to the supply side. For instance, Khan and Knight (1985) show that supply side factors have significant influence on export performance in the long run. However, Mohanan (2007) highlight that the demand and supply side factors are equally important in explaining export behavior. Hence, to empirically identify the real determinants of export sector, there should be enough studies on both supply and demand side determinants of export sector still Ethiopia export is not archived the targeted export growth. There are hitherto only a few explorative studies on both demand and supply side determinants of export trade for Ethiopia. But, Export sector is still low as compared to SSA countries which are 30% to GDP and 7% to GDP of Ethiopia (access capital, 2010).

Therefore, this study initiated to identify the determinates of both demand and supply side factors that affect export performance of the country by carefully identifying both demand and supply side factors that is explaining export behavior of Ethiopia.

Another gap that initiated the research has to do with the methodology. A number of empirical studies on exports exist with reference to Ethiopia, following different estimation approaches and methodologies. Most of these studies have relied on single equation export function; including both the demand and supply side determinants of exports mixed together. This approach has often led to ambiguous results due to the of inclusion dissimilar classes of variables. The strong

and precise estimates can be obtained only if the demand and supply side equations are carefully specified with appropriate variables. Since there are two endogenous variables in export function, i.e quantity and the price of exports, these have to be determined simultaneously. If we do not capture such kind of actions, it will give rise to simultaneous equation bias and yield misleading results. This study is an attempt to examine the relationship between exports and its determinants and to estimate the demand and supply side equations in a simultaneous equation framework.

Moreover, to examine the impact of the trade liberalization on our exports behavior, export plus import to GDP is introduced in the demand side equation. Another important contribution of this study is the dynamics of trade in the country. Although Ethiopia's import and exports have been extensively studied, direction of trade and its dynamics in general has been neglected in the literature except the one (Makonnen, 2012). But analysis of trade needs to take into explanation the dynamics of international trade and show whether trade in the country is moving in a promising direction. Hence, this paper fills this gap by discussing the dynamics of trade in Ethiopia.

Having the above facts and research gaps, this paper raises the following questions that are address in the study. What determine export trade in Ethiopia and its dynamics? What are the measures that have been taken by the government to make the sector competitive?

This paper attempts to fill in the gap by trying to address the limitations described above by using simultaneous equation framework.

1.3. OBJECTIVES OF THE STUDY

The general objective of this study is to find out the determinants of export trade and its dynamics in Ethiopia.

The specific objectives are:

- To show the dynamics of export trade in Ethiopia
- To estimate the elasticity of each determinants

- To examine some important measures taken by Ethiopian government to make the sector competitive

1.4. SCOPE OF THE STUDY

This paper covered examination of determinants of Ethiopia's export and its dynamics for the period between 1972 and 2011. This is a 39 years' time series data set. Moreover, the paper confined to the major supply and demand side determinants of export.

1.5. Limitation of the study

The study faces the following limitations. First data before 1972 is not available .In addition to this the study does not incorporate the role of domestic institution that could partly explain export performance in Ethiopia.

1.6. HYPOTHESIS OF THE STUDY

Ethiopia's export performance is positively related with real income of home country, real effective exchange rate, trade openness, and infrastructural facilities where as relative price affects export performance of Ethiopia negatively.

1.7. SIGNIFICANCE OF THE STUDY

Since good performance of export sector is one of the tools to enhance economic growth, the outcome of this paper helps those agents working in the export sector to identify major constraints and challenges facing the sector and the direction of export trade as well. Besides, it is believed that this paper provides information to policy makers on how to boost export in the country and hence, for the improvement of the balance of trade and economic growth. In addition, it serves as a reference for further study on related topics.

1.8. ORGANIZATION OF THE PAPER

The paper is organized into six chapters. Chapter one deals with a brief introduction of the study .The next chapter is regarding the review of the existing theoretical and empirical literature regarding the study. The third chapter is about the overview of the role and performance of the export sector. Chapter four is concerned with data sources, methodology, and model specification, chapter five discussions of empirical results while the final chapter presents conclusions and policy implications of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1. CONCEPTUAL REVIEW

2.1.1. Economic Contribution of the Foreign Trade

Foreign trade has a good implication for economic growth of any country because the performance of foreign trade is one of the factors that can affect economic growth of any country. Trade tends to promote a greater international and domestic equality by equalizing factor prices, raising real income of trading countries and making efficient use of nations and the world's resource endowments. For example, raising wages in labor abundant countries and lowering them in labor scarce countries. Moreover, trade is an important stimulator of economic growth. It enlarges a country's consumption capacity, increases world quantities and provides access to scarce resources and worldwide markets for products without which poor countries would be unable to grow (Todaro, 1995).

According to classical trade theory, moving from a closed economy to free trade produces substantial economic gains because trading countries benefit from specialization and more efficient allocation of resources. In addition, many believed that trade not only brings this traditional static gain from specialization but also the adoption of new technologies and skills, leading to higher productivity so called dynamic gains from trade (Mannur, 1995).

Moreover, in a world of real trade, international prices and cost of production determine how much a country should trade in order to maximize its national welfare. Furthermore, successful experience of countries like Brazil, Taiwan, and South Korea indicated the importance of trade in the less developed economies (Todaro, 1995). He argued that access to the market of developed nations could provide an important stimulus for greater utilization of idle human and capital resources. Finally, he suggested that expanded foreign exchange earnings through improved export performances also provide the way by which LDCs can augment their scarce physical and financial resources. In general, various models and theories on trade and export have been forwarded by different schools of thought. The following subtopics will be devoted to the discussion of some of the most important trade theories.

2.1.2. The Classical Trade Theory

Absolute advantage of Adam Smith (trade occurs between two countries if one country has an absolute advantage over the other country in one line of production, and the other country has an absolute advantage over the first country in other line of production) can explain only a very small part of world trade, such as the trade between developed and developing countries. Most of world trade, especially trade among developed countries could be explained by David Ricardo's law of comparative advantage (Mannur, 1995:28).

Mannur defined it as follow:

“according to the law of comparative advantage, even if the countries did not have absolute advantage in any line of production over the others ,international trade could be beneficial bringing gains from trade for all participating countries .The first country should specialize in the production and export of those goods in which either its comparative advantage is greater or its comparative disadvantage is less and it should import those goods ,in the production of which its comparative advantage is less or comparative disadvantage is greater. Thereby, a country would be able to maximize its production and it consumption (Mannur, 1995:28-31).”

2.1.3. The Neoclassical Theory

The reason for the differences in relative commodity prices and the comparative advantage between two nations and the effect of international trade on the earning of factors of production where left largely unanswered by classical economists .For example, David Ricardo assumed that the differences in comparative advantage depends on comparative difference in the labor productivity (that is, difference in technology) .But he did not explain the reason for such differences. It remained to Hechscher and Ohlin to offer explanations for comparative advantage.

The H-O theory goes much beyond that by extending the trade model of the classical to examine the bases for comparative advantage and the effect that the trade has on factor earnings between any of the two nations. According to the H-O theorem, within the assumption of the H-O model, the capital surplus country specializes in the production and export of capital intensive goods and the labor surplus country specializes in the production and export of labor intensive goods. That

is, the capital rich country will have comparative advantage in the capital intensive goods and the labor rich country will have comparative advantage in the labor intensive goods (Mannur 1995:117-118)

2.1.4. The New Trade Theories

The new trade theories explain trade partner among the developed economy. The H-O trade model, also called the factor proportion theory, stated that a country should specialize in the production and export of those goods which intensively use the factor that is relatively abundant in the country. However, the new trade theory suggests that we have to go beyond the factor proportion and consider several other factors in order to understand the commodity structure of a country trade (Mannur, 1995: 152-157)

Moreover, the new trade theories explain the trade patterns and demand structures of the country. According to Linder, countries with identical income levels will have similar demand structures and greater intensity or propensity of trade. Despite the advantage of the above models and theories in explaining trade patterns and the importance of foreign trade in both developed and developing countries, trades have failed to benefit developing economies. This is mainly due to the fact that trade theories are under an umbrella of many assumptions such as free trade (Mannur, 1995: 156).

2.2. THE DETERMINANTS EXPORT PERFORMANCE

So far literatures have upraised the importance of export expansion to economic growth. Now in this sub section, the study will look at factors or determinants that affect the performance of export sector. Export performance of any given country is determined by both demand and supply side.

2.2.1. Demand Side Determinants

Unlike for primary products, fuels, raw materials and manufactured goods income elasticity are relatively high (Todaro, 1995). He argued, for example, that it has been estimated that 1% increase in developed countries income will normally raise their import of food stuffs by 0.6%, agricultural raw materials by 0.5%, petroleum products by 2.4% and manufactured product by 1.9%. Consequently, when income raises in rich countries, their demand for agricultural products

from LDCs goes up relatively slowly, where as their demand for manufactured products, which is dominated by DCs, goes up very rapidly. Secondly, demand deficiency hypothesis is reflected by the low price elasticity of demand for these primary commodities. He further argued that the price elasticity of demand for most non-fuel primary commodity is relatively low. In other words, a significant price reduction is not followed by increased demand for that commodity, as a result, lower export receipts.

Finally other the exogenous non price determinants such as development of substitutes, increasing economies in the raw materials and the foreign financial crisis are also causes the demand efficiency. Therefore, the demand side of determinants of export is expressed in terms of relative price and weighted real GDP of trade partner economies.

The functional form of the model is expressed as

$$X_t = f(\text{REER}_t, \text{FI}_t, \text{OPP}_t)$$

Where,

X_t = value of export.

REER_t = relative price of export with respect to price of world export.

OPP_t = trade openness

FI_t = foreign income

Equation above implies that relative price increase will result in higher earning of export receipt and the higher the income, the more will be demand of consumers of a particular good, so is the demand for export.

2.2.2. Supply Side Determinants

The proponents of supply elasticity hypothesis have pointed out the Slow growth of LDC export is mainly due to the constraints appearing on the supply side of export. An exchange rate, relative price, non- price factors which account for export diversification, export incentives government policies, etc are some of constraints in many studies. Besides, weather conditions,

resource endowments, technology demand market growth determine the export supply of developing countries (Todaro, 1995).

An important factor on the supply side is policies. According to Todaro (1995), policies that leads to higher investment causes for spread of new technology in the rural sector, tend to raise agricultural capacity and provided increased export earnings, which can be used to import capital and raw materials necessary to bring expansion in the manufacture sector.

The elasticity approach to the balance of payments provides and analysis of what happens to the current account balance when the country devalues its currency. The Marshal Learner Condition states that starting from a position of equilibrium in the current account; devaluation will improve the current account; only if the sum of the elasticity of demand of exports, plus the home country elasticity of demand for exports, plus the home country elasticity of demand for imports is greater than unity or one. If the sum of these two elasticities is greater than one, then devaluation will lead to the deterioration of current account (Pilmean, 1998). According to him, devaluation may work better for industrialized countries. This is because many developing countries are heavily dependent up on imports so that their price elasticity of demand for import is likely to be very low.

Finally, countries with economic dependants on one or few export products as subjected to economic instability. Export diversification strengthens competitiveness and leads to export expansion (Todaro, 1995). It has been supplemented its analysis of the constraints of Ethiopia's export growth by log-linear export supply model specifying the volume index of exports as a function of real GDP, unit value index of exports deflated by implicit GDP deflator, the export weighted real affective exchange, the ratio of export taxes to exports and the private consumption to GDP ratio (Befekadu, 2004/05.256).

Therefore, the supply side determinants of exports can be described functionally as follows:

$$X_t^s = (RGDP_t, DR_t, ICC_t, RP_t)$$

Where,

$$X_t^s = \text{Export supply}$$

$RGDP_t$ =real GDP at constant price at time 't'

ICC_t =infrastructure at time 't'

DR_t =dummy variable to show different policy's

RP_t =relative price at time 't'

2.3. Dynamics of export Trade In Ethiopia

Recent research shows that there is a prevalence of exporters that start exporting with a small volume, with a large fraction of them exiting after the first year of exporting.

The role of dynamic experience in explaining exports survival in Organization for Economic Co-Operation and Development (OECD) markets and provide several empirical evidence concerning the dynamic of exports and the depreciation of experience. They also propose new unexpected results on the role of preferential trade agreement in boosting developing countries export.

The papers on the dynamics of exports (e.g.; Fecund and pirola, 2010 and Eaton et al, 2012) also introduce uncertain in the trade relationship. In these papers exporters face uncertainty about their ability to export such ability is revealed through export experience. Other papers investigates the sequence of entry in to new markets and show that export experience in a market raise the likelihood of entering subsequent markets by reducing the associated uncertainty(Chaney,2012).The stems from the correlation in profitability across time and destinations.

Exporters use their initial export experience to infer information on their future success in that market and elsewhere, correlation across countries may come from similarities in demand (e.g,consumer's taste and networks) or supply (e.g,learning about export finance and insurance, maintenance of export department within the firm, distribution and customs procedures).

In case of Ethiopia the transitional Government of Ethiopia economic policy document it was reported that "the decline of exportable agricultural products has worsened the foreign exchange position of the country" and past misguided policies, to a larger extent, were blamed for such a failure in agricultural production (Transitional Government of Ethiopia, 1991).

Tura (2002) has estimated on export demand equation specifying real exports as a function of weighted real GDP of trading partners less their exports and relative price of exports.

He concluded by highlighting the possibility of export dynamics in the long run as foreign income and relative prices are not significant determinates of the country's exports. His neglect of supply side factors in the export model could be criticized from the point of view of recent trade theories that favor simultaneous treatment of demand and supply side factors on export function.

2.4. EMPIRICAL LITERATURE

Alternative theories have different predictions about the factors underlying export and about the sign and magnitude of the relationship between export trade and its determinants. Hence, we cannot arrive at a clear conclusion about the sign and magnitude of export trade determinants on the basis of conceptual frame work alone, which require empirical works to supplement the theoretical predictions. Accordingly, numerous studies have been conducted on the issue of factors determining export, both taking export as a subject of study or trade balance in general. This section will provide the empirical evidences on the determinants of export trade.

2.4.1. Empirical Literature on LDCs' Export

The real exchange rate can be an influential impact of export growth and diversification. According to the hypothetical prediction, devaluation (overvaluation) of the currency can boost (undermine) export competitiveness, as it raises (lowers) returns to entrepreneurial activity, especially in the area of discovering new, high-productivity exports. What matters for inducement is the real exchange rate, the level of which is often rendered uncompetitive inflow – income counters by poor macroeconomic management and confusion in financial markets (Kiros, 2012). Volatility of the real exchange rate is also very high for the same reasons, creating a risky climate for new export investment ,as it makes future returns and payments hesitant and as well as leads to the unbalanced export growth (Aghion , 2008). Real effective exchange rate (its increase) is expected to support export diversification by widening the threshold of price differential at which new commodities would be included. This means as real effective exchange rate increases the relative price of goods will encourage the entry of new products in the export channel.

The performance of country's export is largely influenced by the exchange rate regime and particularly on the real effective exchange rate. So far, many studies have proved the theoretical prediction about the between the devaluation and export performances of a given country which says that demand for country's export increase in the international market if the price of export falls in relative to the world prices. At the same time, there are other studies which found evidences against the above theoretical prediction. Hence, different empirical researches have come up with different conclusions on the relationship of export trade and REER. Saruni (2006) found positive relationship between export trade and REER using OLS over the period 1970-2002 for Tanzania.

Similarly, Ahmad (2005) estimated the determinants of exports in developing countries using panel data of 75 countries for the period 1970-2004. He found that REER are positively affects exports. On the other hand, Abiy (2010) has employed Least Square Dummy Variable (LSDV) regression method for the period from 1980 through 2007four African countries. He argued that a one point decrease in REER results in a 0.00014 percent increase in exports. He further said that REER targeting may help the export subsector of the economy. Other studies like the study by Fosu (1992); Sharma (2000); Cushman (1983); Caballaro and Coro (1989); Last rapes and Koray 1990).and also found a negative impact of devaluation, that is its devaluation increases export. Overall, most studies found positive relationship between REER and export performance of the country. In addition Belayenh (2012) examined determinates of export performance using VAR model analysis and found a positive relationship between export earnings and real effective exchange rate in Ethiopia.

Another important factor that affects export performance in the literature is Gross Domestic Product of a given country. It is defined as the market value of the final goods and services produced by a country in given period of time. It represents the total dollar value of all goods and services produced over a specific time period. The reason for including GDP is to see the effects of the size of the economy to its export growth rate. As the size of the economy is large which implies the production of that country is excessive than the domestic demand and this leads export the excess (Kumar, 1998). Previous studies on determinants of export trade in developing countries found that GDP has significant positive impact on export trade. Kumar (1998) and

Ngeno (1990) conducted studies on determinants of export trade for developing countries and confirmed that GDP has a significant positive impact of volume of export.

Moreover, study by Agasha (2008) for Uganda also found a direct and significant relationship between export and GDP.

Foreign income is postulated to have a positive impact on export trade. The studies by Srinivasan (1998) for India and Agasha (2008) for Uganda have got a positive and significant effect of foreign income on export.

The price of exports on the international market is one of the main factors that determine export growth especially for countries which depend on exportation of agricultural products whose prices fluctuate over time (Srinivasan, 1998). Edwards and Golub (2004) examined the impact of foreign prices on South Africa's export using time series data and found that foreign prices have a strong positive impact on manufacturing sector's export growth. Similarly, the study by Roderick (1997) for Sub Saharan African countries also revealed that protection in form of export quotas and price decline of primary commodities accounted for one third of the total world market share loss by Sub Saharan Africa. In contrast to this studies, and Srinivasan (1998) found unexpected and negative impact of foreign price level for Uganda using Error Correction Model.

Another factor affecting export performance the degree of openness to trade which liberalization of the economy, the sectors in home countries have a comparative advantage in which they can export their products to the rest of the world, while the import competing sectors face foreign competition. According to Roderick (1997) high levels of trade restrictions have been an important to obstacle to exports and their reduction can be expected to result in significantly improved trade performance in the region. The removal of export restrictions, dismantling of marketing boards, relaxation of quantitative restrictions on imports, and lowering of import tariffs will sharply increase traditional and non-traditional exports. Country size (as measured by population) and per capita income are two very strong determinants of openness in the economy

The empirical researches focusing on the impact of trade liberalization (openness) on export earnings have exhibited more mixed results. Yared (2010) found that positive effect of trade openness with export and Some of them show that countries which get on liberalization

programs have improved their export performance (Ahmed,2005; Paulino,2002b) ;Yiwu and Lizeng(2008) on the other hand Morrissey and Mold(2007) have found negative relationship with export earnings and trade openness.

Infrastructure is one of the major determinants of export performance which affect exports especially in least developing countries. Of the factors that boost production as well as export supply of commodities, infrastructural facilities come at the forefront. Reliable and efficient infrastructure facilities are essential for reducing costs, ensuring timely supply of exports and thereby improving export performance (Srinivasan, 1998). On the other hand, weak infrastructure is a major obstacle to trade, competitiveness and small island countries. It reduces the return to trade and economic activity and hinders growth prospects of a given country. Thus, we expect a positive link between improved infrastructure facilities and export supply. Abiy (2010) argued that infrastructure condition of the exporting country plays a positive role in promoting export but the effect is statistically insignificant. A unit increase in the infrastructure proxy, distribution of 1 more mobile and fixed line telephone per 1000 population, increases export per GDP by 0.002%. He further indicated that this small effect is also insignificant in statistical terms indicating that the contribution of infrastructure development to export trade is small for the study subjects.

2.4.2. Empirical Literature on Ethiopia's Export

Basically, the most of the characteristics of export sector of LDCs may also hold for Ethiopia as Ethiopia is among one of those LDCs country. However, this does not mean that the sign and magnitude of those determinants of export can not exactly tell about export performance of Ethiopia as there may be difference in characteristics and nature of export sector as well. Hence, we need to see those empirical literature related to Ethiopia's export sector though most of the studies estimated single equation as tried to explained in the methodology. Accordingly, this section will emphasizes on those empirical literature in Ethiopia. Tura (2002) estimated an export demand equation specifying real export as a function of real income of trading partners less their exports. His results revealed that both relative prices and foreign incomes are insignificant in the long run while foreign income is a significant export determinant in the short run. He concluded by highlighting the possibility of export diversification in the long run as

foreign income and relative price are not significant determinant of the country's exports. (Befekadu, 2004/05).

Sisay Minji(2010) investigated determinants of export trade and its performance in Ethiopia he found that relation between export performance and real exchange rate are insignificant using co-integration analysis in the period of 1981-2004 and also Yisak (2009) found insignificant result studied determinates of Ethiopia's export performance by employing A gravity model analysis. In opposite to this, Lemlem (2008) he found that negative relationship between export demanded and real effective exchange rate. The above literature result shows that real effective exchange and export relation is ambiguous.

Gemechu (2002) studied Exports and Economic growth in Ethiopia for the period of 1960-2000/01 he found that positive relationship between real growth of export and RGDP per capita. Lemlem (2008) examined determinates of Ethiopia exports found that positive relationship between RGDP and export supply and Kiros 2012 studied export growth and real GDP he found that direct relationship. Hence all the study in the literature found that positive relationship between export and real GDP.

Tarekegn (2009) regressed value of export on Real GDP of Ethiopia, REER, and Trade Partner's Real GDP of Ethiopia using OLS regression. Accordingly, he found that export performance of Ethiopia is positively correlated with RGDP of Ethiopia but Trade partner's real income insignificant while it is negatively correlated with the REER, which is in contrast to the theoretical expectation. They further argued that as the part of RGDP is invested in export sector by 1%, value of export also increases by about 1.72%.

On the other hand, they indicated that, averagely, a one percent increase in REER leads to a decrease in the value of export by about 0.47%, keeping other explanatory variables constant. They reason out that the Ethiopian economy is characterized by a predominance of rain-fed agriculture whose performance is often influenced by variability of weather; weak manufacturing; and narrow primary commodity export base, with high dependence on coffee.

Lemlem (2008) examined the impact of Trade partner's income by taking weighted average Real GDP of Ethiopia's major trading partners on exports trade of Ethiopia. Accordingly, she found positive relationship between Ethiopia's export trade and foreign income as proxied by weighted

average Real GDP of Ethiopia's major trading partners and concluded that the Trading partners income is an important determinants of demand for exports from Ethiopia. Yshak (2009) examines the determinants of export performance of Ethiopia by employing gravity model for a panel of 30 Ethiopia's trading partners for the period 1995-2007. He indicated that the growth of domestic product (GDP) affects Ethiopian exports positively. Similarly, Kiros (2012) examines determinates export growth rate in Ethiopia using Co-integration and error correction model and found positive and significant effect between export and GDP.

According to Samuel (2012) examined the determinants of Agricultural export in Ethiopia using Co-integration and error correction model in time series data from 1980-2010. He concluded that improved infrastructural condition positively and significantly determine the export performance of Ethiopia. Infrastructural facilities of a given country can be proxy by indexes such as percentage of paved roads out of the total road; number of fixed and mobile telephone subscribers (per 1000 people); number of internet subscribers (per 1000) and so on (Eyasu, 2011). Since the major export products are agricultural, the impact of infrastructure is proxied by kilometers of total paved roads considered.

The review of literature above reflects that enormous research has been undertaken in regard to issues of export trade. An important issue is the analytical framework adopted so far in the literature, while some previous studies have used a Co-integration and Error correction models, others have adopted the use of partial equilibrium such OLS.

The literature has established that the analysis of determinants of export trade requires demand and supply side equations are carefully specified with appropriate variables and determined simultaneously as there are two endogenous variables in export function, i-e quantity and the price of exports. Thus, this study attempts to examine the relationship between exports and its determinants through estimating the demand and supply side equations in a simultaneous equation framework.

CHAPTER THREE

DATA SOURCES, METHODOLOGY AND MODEL SPECIFICATION

3.1. SOURCE AND TYPE OF DATA

The study totally relies on time series and secondary sources of data which include published and unpublished sources such as bulletins, annual and quarterly reports of Ethiopian Economic Association (EEA), National Bank of Ethiopia (NBE), World Bank, Ministry of Finance and Economic Development (MoFED), International Financial Statistics (IFS) and other related research papers. Of all these sources, the Ministry of Finance and Economic Development (MoFED), EEA.CD.ROM (2012), International Financial Statistics (IFS) and the World Bank website are the most important ones for analysis.

3.2. METHODOLOGY

3.2.1. Stationary and Non-Stationary Series

The standard classical methods of estimation which are used in the applied econometric work are based on a set of assumptions one of which is the stationary of the variables. A variable is said to be covariance (weakly) stationary if the mean and the variances of the variable are constant over time and the covariance between two periods only on the gap between the periods, and not the actual time at which this covariance is considered whereas a non-stationary series has a different mean at different points in time and its variance increases with the sample size (Debel, 2002)

According to Madala (1992), a time series is said to be strictly stationary if the joint distribution of $Y_{1+k}, Y_{2+k} \dots Y_{t+k}$ for all N and K . The distribution of Y_t is independent of time and thus it is not only the mean and the variance that is constant but also all higher values of t are independent of t .

In time series analysis, most encountered series are in fact non-stationary. Contrary to the situation of stationary process which fluctuates around their mean, the reversion to a fixed value rarely occurs for non-stationary process. If a non-stationary time series is regressed on one or more non-stationary time series, the results are prone to spurious regression problems. This is a situation where results obtained suggest there are statistically significant relationships between

the variables in the regression model when in fact all that is obtained is evidence of contemporary correlations rather than meaningful causal relations (Yared,2010).

Testing for Unit-Root

Unit-root is important to detect the stationarity of the time –series data. To test if the series, used have unit root this test apply based on the Augmented Dickey-Fuller test is similar but modified version of the Dickey-Fuller test which is used when error term is not a white noise. While testing for stationarity, if a variable becomes stationary at level, then it is said to be integrated of order zero, $I(0)$.And if the variable is stationary at its first difference it is said to be integrated of order one $I(1)$.Similarly, if a variable can be transformed to stationary series by differencing n times, then it is integrated of order n , $I(n)$, (Wooldridge, 2003)

According to Zada (2009) and Monahan (2007) before any regression analysis on time series data, it is essential to verify the series for stationarity. It is supposed that most of the time series have a unit root, i.e., they are non-stationary at level which can be transformed into stationary series because non -stationary variables lead to spurious regression results, from which extra conclusion is valueless . Therefore in order to examine non- stationarity problem The Augmented Dickey Fuller test is used to see the stationarity of the variables under consideration.

3.2.2. Method of data analysis

This paper utilizes both descriptive and econometric analysis based on a time series data from 1972 to 2011 to examine determinants of export trade and its dynamics in Ethiopia. In descriptive case, data is analyzed using tables and graphs so as to examine whether or not a significant shift is observed in the trend, structure and destination of exports with respect to countries as well as continents. In the econometric analysis, on the other hand, while various analytical approaches were employed by different researchers, this study employed the simultaneous equation framework the results obtained from this simultaneous equation method are unbiased and consistent (Wooldridge, 2003; Green,2000).

Among simultaneous equation method the 3SLS more consistent and efficient (Koutsoyiannis, 2008), due to this advantages the study employ 3SLS estimation technique.

3.3. SPECIFICATION OF THE MODEL

Different studies on exports have taken the matter of model specification on precedence basis. The foreign trade models are specified by dissimilar people following different approaches. However, there is a universal agreement in literature about the empirical form of demand and supply functions for exports. As we described in the methodology and literature section, examination of export performance depends on both supply and demand side factors as well.

The model that has been used in this paper is thus the adopted Gold Stein and Khan (1985), the export demand and supply export functions will be specified with two necessary extensions. Before specifying of each model separately, the usual general model is specified as:

$$X_t = (REER_t, FI_t, RGDP_t, OPP_t, ICC_t, RP_t, DR_t) \text{ -----}$$

(1)

Where,

X_t = Total Value of Export at time 't'

$REER_t$ = Real effective exchange rate at time 't'

FI_t = Foreign Income which influences world demand for our export and proxied by the real income of Ethiopia's major trade partners

$RGDP_t$ = Real GDP of Ethiopia

OPP_t = Openness as proxied by ratio of sum of import and export to the GDP of Ethiopia

ICC_t = Infrastructure condition of country i, for year t as proxied by number of mobile phone and fixed line phones per 1000 population

RP_t = Relative price defined by unit value of export price of Ethiopia to domestic price

DR_t = dummy variable that represent different regime.

In the literature the modeling of trade equation has got debate as to which functional form is more appropriate. However, due to the advantage and ease of interpreting coefficients as

elasticity, log linear models are more appropriate than other functional forms. Studies by Khan and Ross (1977) and Salas (1982) suggest that in modeling an aggregate demand function, the log-linear specification is preferable to the linear formulation due to the advantages of interpreting the coefficients as elasticity. Therefore, the log-form specification is used instead of the linear specification for export equation as follows.

$$\ln X_t = \beta_0 + \beta_1 \ln REER_t + \beta_2 \ln FIT + \beta_3 \ln RGDP + \beta_4 \ln OPP + \beta_5 \ln ICC + \beta_6 \ln RP + \beta_7 DR_t + U_t \dots \dots \dots (2)$$

In equation above, we expect real effective exchange rate, real GDP of home country, Foreign income, trade openness and infrastructure have positive impact on the value of export trade in Ethiopia whereas an increase in the relative price deteriorates the export performance of Ethiopia. In other words the explanatory variables with coefficients $\beta_1, \beta_2, \beta_3, \beta_5, \beta_4$ are > 0 where as $\beta_6 < 0$.

In equation (2), there are two endogenous variables, value of export and price. Failure to account for this will give rise to simultaneous equation bias. As a result; we cannot rely on the estimated values of OLS technique. This bias can only be solved if we estimate such models by three-stage least squares (3SLS) estimation techniques (Oczkowski, 2003).

Export Demand Equation

The demand side of export function is specified as

$$X_t^D = (FIT, OPP_t, REER_t) \dots \dots \dots (3)$$

Where,

X_t^D is value of exports demanded

$REER_t = \frac{P^{xt}}{e P_t^{wt}}$ where P^{xt} is unit value index of Ethiopia's export, e is the nominal exchange rate and P^{wt} is unit value index of import of the trading partners

Equation 3 can be re-written as

$$X_t^D = (FI, OPP, \frac{P^{xt}}{eP^{wt}}) \text{-----}$$

(4)

$$X_t^D = (FI, OPP, P^{xt}, eP^{wt}) \text{-----}$$

(4a)

The logarithmic transformation of the model gives

$$\ln X_t^D = \beta_0 + \beta_1 \ln P^{xt} + \beta_2 \ln eP^{wt} + \beta_3 \ln FI + \beta_4 \ln OPP + U_t \text{-----}$$

(5)

Since equation (5) is specified in log linear functional form, $\beta_4 \cdot \beta_2$ and β_3 are (relative) price and income elasticities of value of export demand. In the estimation, we expect $\beta_1 < 0$, β_2 , β_3 and $\beta_4 > 0$.

Export Supply Equation

Similarly, the supply side of export function is written as:

$$X_t^S = (RGDP_t, ICC_t, RP_t, DR_t) \text{-----}$$

(6)

Where,

X_t^S is volume of export supplied

$RP_t = \frac{P^{xt}}{P^d}$ where P^d is domestic price which is measured by the consumer price index (2005=100)

Equation (6) can be further re-written as

$$X_t^S = (RGDP_t, ICC_t, \frac{P^{xt}}{P^d}, DR_t) \text{-----}$$

----- (6a)

$$X_t^D = (RGDP, ICC, P^{xt}, P^d, DR_t) \text{-----}$$

(6b)

Transformation of the model in to the logarithmic gives:

$$\ln X_t^S = a_0 + a_1 \ln P^{xt} + a_2 \ln P^d + a_3 \ln RGDP_t + a_4 \ln ICC_t + a_5 DR_t + U_t \text{-----}$$

----(7)

With , $a_3, a_4 > 0$ and $a_2 < 0$

The simultaneous equation estimation requires the equation to be normalized. Different researchers normalized in different ways: normalization of the export demand function with export price and export supply function with export quantity; or normalization of the export supply function with export price and export demand function with export quantity. It does not matter, how you normalize the demand and supply function but if one employs a system of estimations method rather than single equation method, one would get significant income and price elasticities of export demand (Zada, 2009; Goldstein and Khan, 1978; Muscatel et al 1992; Funk and Holly 1992). Demand function normalized by export quantity and supply equation by export price so that the price dependent export supply function or the inverse supply functions is written as follows;

$$\ln P^{xt} = Y_0 + Y_1 \ln X_t^S + Y_2 \ln P^d + Y_3 \ln RGDP + Y_4 \ln ICC + Y_5 \ln DR_t + U_t \text{-----}$$

(8)

Where $Y_0 = -\frac{a_0}{a_1}$, $Y_1 = \frac{1}{a_1}$, $Y_2 = -\frac{a_2}{a_1}$, $Y_3 = -\frac{a_3}{a_1}$, $Y_4 = -\frac{a_4}{a_1}$, $Y_5 = -\frac{a_5}{a_1}$

Since, $a_1, a_3, a_4 > 0$ and $a_2 < 0$, we expect that $Y_1, Y_2 > 0$, and $Y_3, Y_4, Y_5 < 0$

In this model we assume that when demand equals supply, export quantity and prices get determined simultaneously.

In equilibrium, $X_t^D = X_t^S = X_t$ -----
(9)¹

In the case of empirical analysis, the OLS is used for equation (2) and 3SLS for equation (5) and (8). The purpose of using these equations (2) is to show how much OLS estimates are biased and inconsistent to obtain reliable estimates about the determinants of export trade in Ethiopia. X_t^D is treated as dependent variable in equation (5) and P_t^x is seen as dependent variable in equation (8), X_t^D and P_t^x are said to be the two endogenous variables in the system which have to be determined simultaneously. This means that the two equations are mutually dependent and none can be estimated independently. To estimate this type of model the appropriate estimation technique, is 3SLS estimation approach.

Definition of Variables

Value of export- It the dependant variable that is going to be explained by the independent variables. This variable is obtained by multiplying the volume of export by their respective prices.

Real Effective exchange Rate (REER): It reflects the underlying relative movement of prices at home and abroad, proves to have a significant effect on the export performance of the lowest performers. As economic theory suggests, it is acknowledged that increase in the real effective exchange rate has positive contributions for increment of exports while real appreciation of the exchange rate affects negatively (slows down) exports. The expected sign of this variable is, thus, positive.

Foreign Income (FI): as a representative of relevant foreign demand, weighted average Real income of Ethiopia's major trading partners (about 75% of Ethiopian destination countries) is used. The inclusion of this variable is assumed to capture the demand side determinants of export. The expected sign of this variable is also positive. This means an increase in income of trade partners enhances our export.

¹ Equation (9) is a volume adjustment equation and equation (5) is a price adjustment equation (Zada, 2009).

Infrastructure (ICC): Infrastructure is one of the major determinants of export performance which affects exports especially in least developing countries. Of the factors that boost production as well as export supply of commodities, infrastructural facilities come at the forefront. Reliable and efficient infrastructure facilities are essential for reducing costs, ensuring timely supply of exports and thereby improving export performance (Srinivasan, 1998). Hence, we expect positive relationship between export performance and infrastructure condition of the country. Infrastructure facilities of a given country can be proxied by indexes such as percentage of paved roads out of total road; number of fixed and mobile telephone subscribers (per 1000 people), so on (Eyasu, 2011). In this study the impact of infrastructure is captured by number of fixed and mobile telephone subscribers (per 1000 people).

RGDP: is another explanatory variable that is expected to have contribution in the export performance of the country. The inclusion of real output in the model is based on the argument that the output capacity of an economy or secular changes in the level of real output has implication on factor productivity thus affecting export performances. The expected sign of this variable is positive. This means an increase in real output (RGDP) of the given country leads to expand its export sector.

Relative Price (i.e. ratio of price of exports to domestic price) (approximated by consumer price index). When perfect competition prevails in the industry and the export demand curve is infinitively elastic, then an increase in export prices will lead to an increase in export sales with sales in domestic market remaining unchanged (Berhanu, 2000). Hence, we expect negative relation between relative price and export.

Openness (OPP): is defined as the sum of the ratio of the export and import to GDP. This variable is expected to affect the export performance positively. Accordingly, we expect positive sign.

Dummy Variable (DR): Ethiopia is followed different policy since imperial regime to current government this shows that different policy affects export performance of the country in different ways in order to see the effect of policy change dummy variable 0 and 1 before 1992 and after 1992 is used respectively because policy change is made in 1992. Favorable policy

encouraging export performance .Therefore, this study expects positive effect on export improvement of the country.

3.4. PROBLEM IDENTIFICATION ON SIMULTANEOUS EQUATION

An equation whose parameters can be consistently estimated, especially in model with endogenous explanatory variables is called identified equation. A model can be either identified or not identified. It is said to be exactly identified if unique numerical values of the structural parameters can be obtained, under identified if it is impossible to obtain unique numerical values of the structural parameters and it is said to be over identified if more than one numerical value can be obtained for some of the parameters of the structural equations (Maddala, 1992; Wooldridge, 2003; Green, 2000).The identification problem arises because different sets of structural coefficients may be compatible with the same set of data. To put the matter differently, a given reduced form equation may be compatible with different structural equations or different hypothesis (model), and it may be difficult to tell which particular hypothesis (model) we are investigating (Gujarati, 2004). There are two conditions which must be fulfilled for an equation to be identified: order and rank condition. The order condition shows whether our model is exactly identified, unidentified or over identified while the rank condition confirms identification.

For our case let as assume that:

G=number of endogenous variables in the model

K=number of variables (both exogenous and predetermined variables) missing from the equation under consideration.

Then if:

A, $K=G-1$, the equation is exactly identified

B, $K>G-1$, the equation is over identified

C, $K < G - 1$, the equation is under identified

This is known as the order condition for identification.

Demand equation: $G = 2$, and $K = 3$

$K > G - 1 = 3 > 2 - 1$ which implies that over -identified

Supply equation: $G = 2$, and $K = 3$

$K > G - 1 = 3 > 2 - 1$ Over identified

Therefore, since the system of equations is found to be over-identified according to order condition of identification, we applied 3SLS estimation technique in estimation of the unknown parameters of structural equations. This is because if the equation is over-identified, the appropriate method to estimate such equation is 3SLS (Koutsoyiannis, 2008).

CHAPTER FOUR

OVER VIEW OF THE EXPORT SECTOR IN ETHIOPIA

4.1. THE IMPORTANCE OF EXPORT TRADE

The contribution of international trade to the least developing countries, such as Ethiopia, is very considerable since they depend on imported capital equipments assistance, and all inputs necessary for industrial development (Alemu, 2009). Export trade is critical for any country for a variety of macro and microeconomic reasons including the need to generate foreign exchange

crucial to finance imports; need to exploit larger scale economics that can be achieved by producing for export markets, given the small size of many developing countries and their negligible purchasing power; and potential contribution to growth of national product. Its role as source of government revenue and effects in creating employment opportunities, in extending markets that permit economics of scale in the production considerable (Alemu,2009).

Export development entails promoting export performance accompanied with improved quality and structure transformation (e.g. increasing the share of country's export in dynamic rather than stagnant products in world trade, expanding shares of exports sectors or employment associated with raising living standards and country's overall competitive position, enhancing country performance in particular export category, and structure and improving the quality of jobs generated in the export sector). Higher export growth without structural transformation of export patterns (e.g. higher export incorporation in some products subject to major price and volume fluctuations), may not be conducive to development .Hence, what a country exports matters (Cashin and Dermott, 2002). At the micro-level, export competitiveness can be defined as the-ability of a firm to compete on domestic and international markets .A firm will be said to be competitive if it can produce products and services of better-quality , at lower costs than its domestic and international competitors .

4.2. STRUCTURE AND PERFORMANCE OF ETHIOPIA'S EXPORT

The export structure of country is characterized by its heavy dependence on a few agricultural commodities. Hence, agricultural products have exclusively dominated the commodity export of Ethiopia, just as the economy itself. Agricultural commodities account for more than 90% of the export proceeds of the country (MEDAC 1999). Furthermore, the export of the country have been highly dependent of few products, of which coffee accounts for 70% of the agricultural export 60% of the total export proceeds. MEDAC also indicated that hides and skins and chat distantly follow as the second and third export items accounting on average for 12% and 7% of total export earnings, respectively. Export of hides and skins had successively increased that it reached 21% of total exports in 1991/92. Since 1992, however, the export of hides and skins consistently declined. Pluses and oil seeds had been the third export structure subjects the

external sector of the country to adverse shocks. For instance in 2001 fiscal year, in general, the export sector earned 3.9 billion birr. But, when it is compared with that of the preceding year, i.e. 2000, it showed a decrease by 300 million birr or around 7% in spite of the fact that the volume of export and the number of exporters had increased.

As noted above, one of the main features of the Ethiopian export sector is its lack of diversification or concentration on few crops. Coffee has been the major export crop for a very long time. Until the end of the 1990's the contribution of coffee to the export earnings of the country was around 60%. The country had been dependent on a single exportable item for a long period of time. Although, coffee is still the dominant export item, its contribution to the total export earnings has declined and reached around 30.9% on average over the last five years (NBE, 2012). On the other hand, the share of non-coffee exports has been rising remarkably and reached 69.1% for the same year.

In this case, though not yet dominant, the flower sector has had an actual growth rate of 405.18% over the last five years. The major manufacturing (non-agricultural) export commodities are leather and leather products, textiles and some agro processing products. Albeit their contribution to the export earning has been very small, their share is increasing from time to time. The share of leather and leather products (including semi processed hides and skins) has reached 89.5 million USD which was 7.6% of the total export earnings in 2006/2007. In addition, 12.6 million USD was obtained from exports of textile and textile product which was 1.1% of the total export earnings during the same period (MoTI, 2007).

4.3. TRENDS OF EXPORT TRADE IN ETHIOPIA

The Government of Ethiopia has been applying at most effort to supplement the export sector which has resulted in turn in sustained and remarkable growth in the export sector. It also tried to diversify the narrow range of export products through new investment in the sector and the growth trend in the export sector is expected to continue at the current or at an improved rate in the near future (MOFA, 2007). Using the data from NBE, it also reported that the total value of exports has increased from USD 153.82 million in 1991/92 to USD 2.75 billion in 2010/11 which is more than seventeen times the total value of export during the period of transition. When we see the recent growth rate of the value of export earning, it grew on average by 40.8%

over the last five consecutive years, with the earnings reaching to USD 2.75 billion in the year 2010/11. According to the report, following this consecutive growth in export sector, the government set the plan to earn 1.6 -1.8 billion dollar in the year 2007G.C.

However, the volume of export has not shown a sustainable and optimistic trend except a pointed rise in the second half of 1990s. It is indicated that there is a fluctuation in the volume of exports of major commodities like coffee, pulses and oilseeds, hides and skins and chat except that of fruit and vegetables and the structure of Ethiopian export is dominated by agricultural products which used to account for more than over a long period except receipt recent years when the export share of other products showed a relative increase. Since 2001/2 to 2002/3, the country's export amount has shown slight increase of 5.2% in total value of export. However, Ethiopia's export performance from 2003/4 to 2005/6 has shown a great jump in foreign exchange revenue. In 2003/4 budget year the country earned 829 million USD, which show an increase of 27.2 % (647.9 million USD) in revenue from the previous fiscal year. The 2005/6 Budget year revenue stood at 1354.7 million USD, exceeding by 172.3 million USD that of the 2004/5 Ethiopian budget year (Mekbib, 2008). He also tried to compare the export performance of 2005/6 budget year with that of the past five consecutive years and came up with an increase both in variety and quantity of export items. Similarly, export destinations are also on the rise. In the aforementioned budget year, USD 1354.7 million in revenue is generated from exported products to more than 100 destinations. In general, the 2005/6 budget year export revenue is higher than any of the previous years.

Among the exported items in 2005/6 ,39% of the export products were to Asia and Middle East other major destination of Ethiopia's export commodities for the 1998 Ethiopian budget year was Europe with more than million which exceeds the 2001/2 export value by 13.9% (NBE, 2002)

Coffee generates 841.8 million USD, which makes it again to lead the export market share, followed by chat which generated 238.3 million USD at the end of 2010/11 (MoFED, 2012). Moreover, According to access capital (2010) report, in the fiscal year 2009/10, Ethiopia has registered a never before seen two billion dollar which is 38% increase from the \$1.5 billion in export registered in the previous year of 2008/09 which is nearly three times the average annual export level of the prior decade (2000-2009). So there is great improvement in the export value of the country recently as mentioned above compared to the previous time. But when it is compared

to other Sub-Saharan African countries even it is to a greater extent unsatisfactory or almost the least. For instance, according to the report of access capital, exports of goods in Ethiopia are only about 7 percent of GDP, compared to an average of near 30 percent of GDP in Sub-Saharan Africa and exports per person remain very low; only \$24 in Ethiopia compared to \$200 in Sub-Saharan Africa and \$580 in developing Asia (Samuel, 2012).

When we come back to the structure of the export sector of Ethiopia, it is characterized by high commodity concentration as is the case with least developed countries. That is, the sector is dominated by a few primary products that account for a lion's share of the country's export earnings. According to MOFA (2007), during the period 2001/02-2006/07 E.C, the leading export products of the country were coffee, oilseeds, pulses and spices, chat, hides and skins, and in the very recent years flower and gold. For example, during the 2006/07, the share of the biggest contributors to the export earnings of the country was as follows: coffee(36%), pulses, oil seeds and spices (22.6%) of which the oilseeds were the most dominant (15.9%), gold(8.2%), chat(7.8%), and hides and skins and leather products (7.6%). In absolute terms this means that coffee accounted for USD 424 million; pulses, oil seeds and spices' share was USD 267.6 million of which oilseeds accounted for USD 188 million ;gold USD 97 million; and hides and skins fetched USD 90 million chat fetched USD 88.5 million and so on in the same year(i.e.2006/2007).

It is therefore abundantly clear that export earnings from coffee still dominate and indeed exceed that of the second major export earners, namely pulses, oilseeds and spices by USD 157 million in that year. There has been, however, an interesting new development in the export composition of the country in recent years. That is, even though the sector is still dominated by a few primary products and coffee is still the biggest foreign exchange earner for the country, its percentage contribution to export earnings has gradually declined from 57% on average during the 1997/98-2001/01 period to 37% during 2000/01-2006/07 period .That is decline from a share of more than half to about one third in a matter of few years. That is, the contribution of product categories such as pulses and oilseeds and new comers such as flowers has reduced the dominance of coffee in the export sector of Ethiopia-indicating a process of gradual horizontal export diversification. The ministry also identified that the earnings from flower export have shown a dramatic growth such that it rose from a mere USD 159,000 in 2001/02 to USD 65 million in 2006/07 which is a

four hundred fold growth, in a matter of six years. After eleven years this value became USD 170 million in 2010/11, which is almost more than twice. Let us look at the export performance of major commodities and their percentage share in 2010/11 from the table below

Table 4.1: Percentage share of value of major commodity export (2010/11)

Rank	Major commodities	Percentage share
1	Coffee	30.64
2	Oilseeds	11.9
3	Gold	16.8
4	Chat	8.7
5	Flowers	6.4

6	Pulses	5.0
7	Live Animals	5.4
8	Hide skins	3.8
9	Meat and Meat products	2.3
10	Vegetables and fruits	1.1
11	Bees Wax	0.06
12	Others	7.9
13	Total	100

Source: Own computation based on data obtained from National Bank of Ethiopia (2012)

From the above table we infer that out of total export in the specified year, agricultural commodities accounted around 70% share with coffee (30.64), oil seeds (11.9), chat (8.7), flowers (6.4), pulses (5.0) and others. Regarding export diversification or concentration of the country though coffee continues to dominate the top spot among Ethiopia's exports but its relative significance is now at a historic low and the ranking of other key commodities is changing rapidly (see table3.1 above). Notable among Ethiopia's non coffee exports is the growing importance of five major products whose share is increasing over time such as oil seeds, gold, chat, flowers, and pulses.

In general when we took at the percentage share of the major export items which are likely agricultural products by dividing into Imperial, Derg regime and EPRDF regimes; the percentage share of coffee became the highest during the Derg regime when it is compared to the Imperial and EPRDF regimes (see table3.2 2below).

In addition, coffee constituted the highest share of the total export value and not changed over the period under consideration. But the contribution of oil seeds and pulses declined during the Derg as well as the EPRDF regime. The contribution of the chat from total export value has increased shapely to 19.51percent as compared to its share during the imperial as well as the Derg regime with amount of 0.86 and 1.83 percent respectively.

Table 4.2: Percentage share of major Export items in three regimes

Commodities	Imperial	Derg	EPRDF (until 2010/11)	Overall
Coffee	43.23	63.57	53.96	53.58
Oil seeds	12.42	2.89	10.4	9.90
Hides and skins	10.44	12.06	14.37	12.29
Pulses	11.08	3.86	6.67	7.20
Meat and meat products	3.43	0.61	1.83	1.96
Fruits and vegetables	9.66	1.09	2.31	4.35
Live animals	0.67	2.04	2.28	1.66
Chat	0.86	1.83	19.51	7.22

Source: Own Computation based on data obtained from National Bank of Ethiopia (2012)

4.4. EXPORT TRADE POLICY MEASURES

The Ethiopian governments have undertaken a number of policy measures so as to strengthen the development of export sector. They put their effort towards the promotion and diversification of the export commodities through export sector. For the sake of comparison, we highlight the trade policy of the three successive regimes.

4.4.1. The Imperial Regime

During this regime, the Ethiopian foreign trade policy was guided by the free trade doctrine. The Emperor has undertaken different measures to facilitate export and in 1960's, there has been remarkable growth in the total value of export earnings (Befekadu, 2004/5). The imperial government of Ethiopia in its three different five year plans tried to put its effort towards promoting export sector. The first five year plan which was from 1957-1962 focused on the building of different infrastructural facilities like road development and import substitution

industrial promotion. However, the three development plan of the imperial government of Ethiopia didn't bring the anticipated export promotion and diversification though there were different attempts done, (Samuel, 2012). In nutshell, the major strategy was import substitution and custom duties were imposed on export products in attempt to raise government revenue and provided protection to domestic producers (Alemu, 2009).

4.4.2. The Derg Regime

Like the imperial regime, the import substitution strategy was the main strategy and it was characterized by centralized economic system where the state played a significant role in all sphere of economic activity including the external trade. The following were the major policy governing external trade for the period (Berhanu and Befekadu, 2004/5).

- ❖ Higher level of regulation on prices, quantities and distribution of goods
- ❖ Policy against the participation of private capital in the sector
- ❖ Fixed official exchange rate high import tariff and tax on export
- ❖ Government marketing channels for all imports and major exports.

In general even though there were various measures taken by both the imperial and the Derg regime to diversify and promote export sector, the country's export products remain undiversified and are still concentrated on very few products (Samuel, 2012).

4.4.3. The Current Regime

Following the fall of Derg regime in 1991, the current government of Ethiopian takes different measures to make the export trade competitive in the world market. Among different measures some are listed below

- ❖ Promotion of private sector
- ❖ Encouraging diversification exports
- ❖ Liberalization of foreign exchange control
- ❖ Restriction of the incentive system to producer of exports

- ❖ Elimination of duty on all exportable with the exception of coffee
- ❖ Reduction of customs duties
- ❖ Establishment of institution, like Ethiopian Export Promotion Agency (EEPA), Animal Marketing Authority (AMA), institute of leather and leather products which have direct relation with export trade.

Within the context of free market based economic policy, Agricultural Development Led Industrialization (ADLI) strategy was developed and has been the principal economic strategy of the government with the objectives of promoting economic efficiency and growth, development of the domestic technological capacities and capabilities for the promotion and development of intermediate and capital goods' industries, promotion of inter and intra-sectoral linkages, creation of the a sound domestic based for the transfer, adaptation, and development of the technology, promotion and greater use of labour intensive technologies and resources, achievement of industrial competitiveness in areas of clear comparative advantages in industrial exports, and promotion of balanced regional industrial development(MoTI,2007).

Moreover, trade policy reform was undertaken which aimed at promoting exports through diversifying the country's product exports. For examples, devaluation of the Ethiopia currency by more than 140 percent in terms of US dollar to make exports competitive and promote export trade; setting of a floor price for coffee, haricot bean and sesame seed; continuous revision of the tariff regime and reduction by of it from a maximum of 230 percent to 50 percent; simplification of the import and export licensing system and making it more transparent so as to encourage new entrants in the export market; the range of goods and services covered by the auction has been progressively extended and finally fully liberalized; a duty draw back scheme was introduced where by exporters are re-funded the tax and duty they paid on the inputs and raw materials used in export production (Samuel, 2012). This is to make available exporters a free trade status on their import of transitional inputs and encourage non-traditional export products, especially that of manufactured goods. But the effectiveness of the scheme on export is constrained by lengthy administrative requirement to get re-funded, a foreign exchange retention scheme has been introduced which entitles exporters to retain 10 percent of their earning to hold in their account and to sell the 40 percent at a competitive rate, while submitting the remaining 50 percent

directly to the National Bank. But the scheme may not be beneficial in view of the usual control over the use of the retained 10 percent and for the fact that it ties up the working capital. In general following these trade policy reforms, a remarkable decrease in the anti-export-bias incentive structure and increase in export volume and earnings was realized (Dembel, 2002).

More specifically, raising efficiency and competitiveness of the trade sector, strengthening domestic and foreign investment and trade, eradicating rent seeking behaviors, establishing favorable environment for productive investor in the export sector, etc are the main strategic direction of the trade sector in the growth and transformation plan(GTP) period (MoFED,2012)

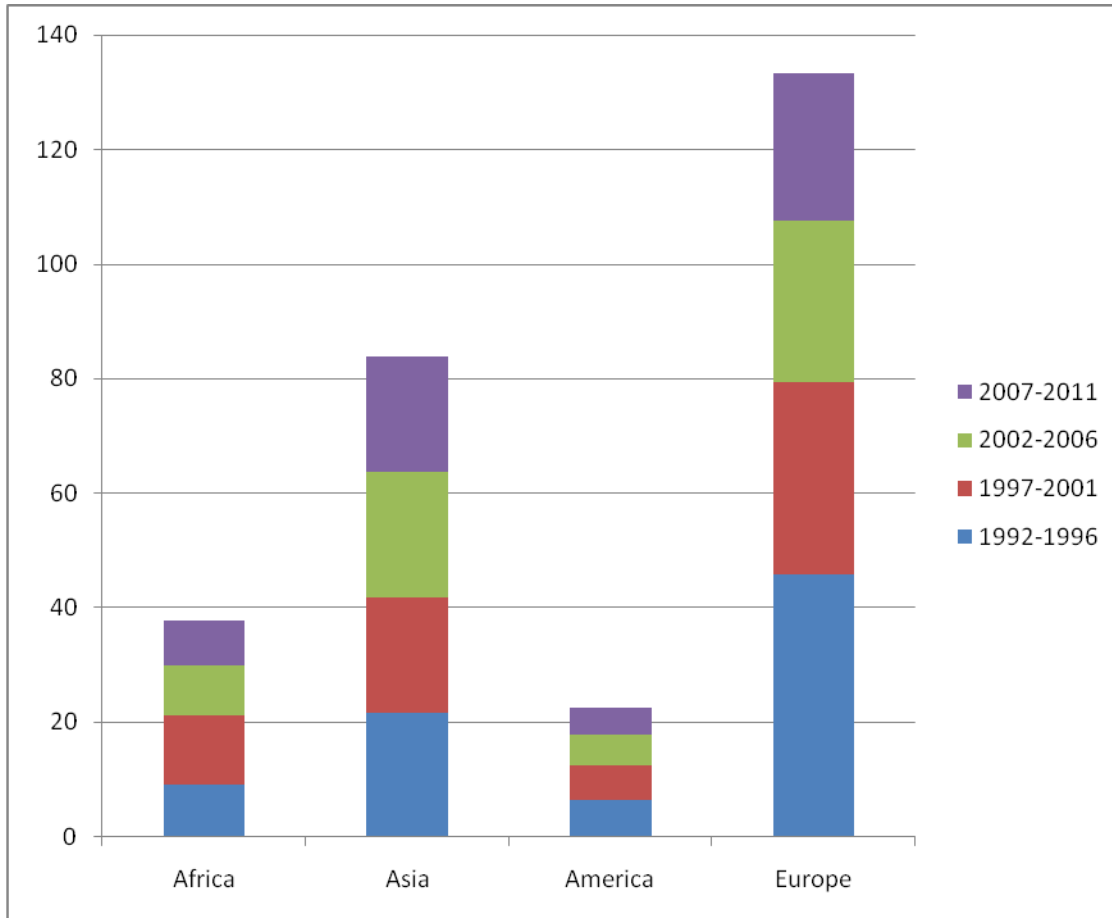
Thus, the examination of the three regimes stipulates that there is controlled trade policy during Derg regimes in opposite to Imperial and current regimes. That means, taxes on foreign trade were an important source of government revenue motivating the high rates. Hence, the direct taxation and pricing policies of Derg regime had a negative impact on the sector. The current government implemented different policy measures in favor of the export sector .As a result, the value and volume of export had increased however, the gap between export and import still remain wide regulation the deteriorated terms of trade (TOT).The external trade policy of the three successive regions in Ethiopia shows that the country's external trade policy has moved from the free trade policy's to controlled trade policy back to again free trade policy.

4.5. Dynamics of Export Destinations

Although Ethiopia's exports have been extensively studied, the direction of trade and its dynamics in general has been neglected in the literature (Mekonen, 2012). But export trades requires critical analysis of the dynamics of international trade and see what kind of shift, if any, is occurring. To this end, this section will discuss the dynamics of direction of export trade in Ethiopia.

In terms of the dynamics of export trade in Ethiopia, there is a significant shift in the value of export from different continents. For instances, Europe stood first in terms of Ethiopia's export over the period 1992-1996 with around 45.95 percent in total value of export. Asia and Africa stood in the second and third place with 21.74 percent and 9.17 percent in the same period.

Comparing the exports during over the period 1992-1996 with 2002-2006, there is a distinct shift of direction of exports from Europe and America to Asia and Africa. When we see the growth rate of the percentage share of Europe and America from total export, their share declined by 38.38 and 17.35 percents respectively during the period under consideration where as the growth rate of percentage share from Asia and Africa increased from 0.36 percent and 32.57 percent respectively. Moreover, in the recent period, share of Europe and America declined from of almost 33.39 and 5.96 percent in the period from 1997-2001 to 25.59 and 4.56 percent respectively during the period 2007-2011. On the other hand the share of Africa increased from 9.17 to 12.16 percent while that of Asia increased marginally from 20.13 to 20.16 percent. This all implies the shift in the direction of Ethiopia's export among continents. This shift is occurring from the relatively developed continents of Europe and Americas to the less developed continents of Africa and Asia, which is a positive change. It is important to note that though the share of export from America and Europe to the total value of exports has declined, the value of total exports to all continents has increased significantly during the last 20 years.



Source: Own Computation Based on the Data obtained from NBE (2012)

Figure 5.1: The share of destination continents in Ethiopia's value of Export

When we see the direction of trade over the two decades for individual countries in particular and continent in general as well, there is a significant shift in destination of our export from European and American countries to Asia and Africa (Table 5.3). For instance, though Germany stood in the first position in terms of its share from our total value of export, its share has declined from 21.25% over the period 1991/92-2000/01 to 10.83% during the period 2001/02-2010/2011. On the other hand, China's share from total value of export was only 0.19% over the first decades (1991/92-2000/01). This share is then risen up to 8.35% in the second decades (2001/02-2010/2011). Similarly, the shares of most European countries except Netherlands (whose share risen from 1.60% in 1991/92-2000/01 to 6.43% 2001/2002-2010/2011) has have declined between the two decades (Italy from 7.48% over the period 1991/92-2000/01 to 4.30% during 2001/2002-2010/2011, France from 3.70% in 1991/92-2000/01 to 1.77% over the period

2001/2002-2010/2011 and United Kingdom from 2.92% in first decade to 2.54% in the second decade). In contrast, the share of Asian and African countries has increased over the two decades. To start with, the share of china and United Arab Emirates increased from 0.19% and 0.70% during 1991/92-2000/01(first decade) to 8.35% and 2.71 % during the period 2001/02-2010/2011 respectively; and of Sudan and Djibouti risen from 0.18%,3.47during the first decade to 4.31% ,4.32 over the period 2001/02-2010/2011 respectively.

Table 5.1: Share of Top Destination Countries for Ethiopia’s Export

No	country	Percentage share from total export(1991/92-2000/01)	Percentage share from total export (2001/2002-2010/2011)
1	Germany	21.25	10.83
2	China	0.19	8.34
3	Netherland	1.60	6.43
4	Saudi Arabia	7.85	6.01
5	USA	6.13	4.74
6	Sudan	0.18	4.31
7	Italy	7.48	4.30
8	Djibouti	3.47	4.32
9	France	3.70	1.77
10	United Kingdom	2.54	2.54
11	U.A.R	0.19	0.70

Source: Own Computation Based on the Data obtained from NBE (2012)

With regard to American countries, the only significant country from the total share of our export is United States of America, whose share from the total export has also declined from 6.13% in the first decade to 4.74 % in the second decade (2001/02-2010/2011). This all suggests that there is a significant shift in the direction of Ethiopia’s export from European and American countries to the developing countries like Asian and African countries.

CHAPTER FIVE

ECONOMETRIC ANALYSIS

5. ECONOMETRIC ANALYSIS

To examine the determinants of export trade in Ethiopia, the Three-Stage Least Squares (3SLS) approach is employed. This technique has certain merits over other methods particularly OLS and Maximum Likelihood methods in addition to the advantages mentioned in chapter three. For instance, it does not require any distributional assumption for right hand side independent variables, the entire system is correctly known and the random term of each equation is serially independent (non-auto correlation) (Bollen, 2001, Koutsoyiannis, 2008). Besides to above qualities 3SLS method is a robust single equation approach which corrects for endogeneity since estimation is made simultaneously (Alazzam and Hawdom, 1999), therefore the results obtained from 3SLS technique is unbiased, consistent and efficient.

5.1. Estimation Results and Analyses

A recent econometric analysis that involves time series data suggests that the variables in the model have to be tested for their stationarity before any meaningful inference is drawn from the results. The reason is that time series data more often than not entails the problem of non-stationarity. And regression results generated from non-stationary time series data are spurious.

According to Green(2000) any regression for which non-stationary regression for which $R^2 > DW$ is to be spurious and indicates a sign of lack of any equilibrium relationship among the variables in the regression. Hence, testing for the stationarity of the variables through the unit root test is important before any estimation is made.

Unit root test (test for stationarity)

Augmented Dickey Fuller (ADF) test for unit root is one of the most commonly used methods of testing for unit root. Accordingly ADF test for stationarity is used in this study. As the test result can be seen in Appendix (1), the dependent variable for supply equation l_xp is stationary both in level and First difference. On the other hand all the variables are non-stationary at level except

licc. However all the independent variables are stationary at First difference. Hence, the estimation is made on differenced variables because at level the variables are non stationary. The model has now safe to estimate both the demand and supply equations using simultaneous estimation techniques. To show the inconsistency of estimating determinants of export trade using OLS, first estimate the export equation model using single equation model with OLS and after estimating single equation come back to our main estimation technique of 3SLS.

Table 5.1 : Single Equation Results Using OLS

Variable	Coefficient	P-Value
Constant	3.776636	0.000
d1lepwt	1.507222	0.055
d1lfi	-0.489559	0.693
d1lopp	-0.4916179	0.400
d1lrgdp	-0.2791619	0.861
d1lpdt	1.029565	0.000
d1licc	0.8378341	0.490
dr	0.5412341	0.000
$R^2 = 0.85$, $R^2 = 0.82$, $DW = 1.48$, $Prob > F = 0.0000$, $Obs = 39$		

The results in the above table show that 85 percent of the variation in value of export is jointly explained by the explanatory variables. Besides, when we see the significance of each coefficient, very few variables are significant. According to the theory, such high R^2 with few significant t-ratios indicates severe multicollinearity that may result in biased and inconsistent results. Moreover, the calculated value of DW statistic is 1.48, which falls under inconclusive

region with 1.146 and 1.864 value of the lower and upper limits and therefore due to the presence of the serial correlation these results could not be confirmed.

An examination of the coefficients implies that three variables such as openness, infrastructure, , trade partners' income and real GDP are statistically insignificant. But real effective exchange rate .domestic prices and policy measures are statistically significant. These results suggest that the OLS estimation results are biased and inconsistent. In order to avoid this problem, the simultaneous equation framework of 3SLS method is used. The key advantages of estimating models using 3SLS is that the complete specification of the entire model is correctly known, the random term of each equation is serially independent (no autocorrelation), does not require any distributional assumptions the right-hand side independent variables can be non-normal. Hence, there is no need of testing for model specification and serial correlation due to these advantages of using this method (Koutsoyiannis, 2008 and Bollen, 2001). As discussed in the earlier chapter, both demand and supply equations satisfied order and rank conditions and hence they are over identified. Since the models are over-identified; they are estimated using 3SLS estimation method and the estimated results of each models are presented as follows.

Table 5.2: Supply Equation Results

variable ²	coefficient	P-value
Constant	2.1493	0.000
d1lrgdp	-0.7012501***	0.000
d1licc	-0.342197**	0.027
d1lpdt	0.155504***	0.000
dr	-0.564403**	0.013
R ² =0.55	Prob>F=0.0000	Obs =39

*** Significant at 1% level and** Significant at 5% level

The result shows an improvement over the OLS estimation. All the supply side variables included in this model explain 55 percent of export supply of Ethiopia. The results for impact of RGDP of home country is also in accordance with macroeconomic theories that are improves export performance of one country. With regard to estimation results the RGDP of home country is significant and positively correlated with the supply equation. The coefficient of real gross domestic products of home country is 0.70 which means that one percent change in real GDP of home country results in 0.70 percent increase in total export supply. This due to the fact that output capacity of an economy has implication of supply capacity by maintaining a country's competitiveness in the international market. Accordingly, the results confirm the expectation that RGDP has positive and significant effect on export supply in Ethiopia. This support empirical results such as Kumar (1998), Ngeno (1990), Agasha (2008), Lemlem (2008) and Kiros (2012), who indicated the negative relationship between the RGDP of home country and export supply

² Since all variables are used in the logarithmic form in both demand and supply equations, the estimated coefficients can directly be interpreted as long term elasticity.

price (that is positive relationship between RGDP of home country and export supply), though they employed different methodologies.

On the other hand, Relative price which ratio of price of exports supply to domestic price (approximated by consumer price index) statistically significant at conventional level of significance and has the expected sign. The result supports the conclusion by Roy, (2002) and Lemlem, (2008), which says that since export is found to be responsive to the domestic prices, improved domestic profitability might act as a significant deterrent for domestic producers to go for export business.

Another crucial factor in the supply side determinants of export trade in Ethiopia is infrastructural condition of the country as proxied by fixed and mobile telephone subscribers (per 1000 people) which is positive and significant volume of export . The result shows that a 1 % increase in fixed and mobile telephone subscribers (per 1000 people) increases the export supply of Ethiopia by 0.34 percent during the period under consideration. The results are consistent UNCTAD(2005),which argued infrastructure development is a key determinate for the for the flourishing and development of any industry, especially export sector in developing countries and will have positive impact on the volume of production for export. These results are consistent with findings like Fugazza (2004) and Edwards and Odeadaa (2008) with emphasizes improvement telecommunication facilities can leads to improvement in export performance.

Another factor that affects export performance of the country is policy changes which is used as dummy variables to show different regimes of the country which is integrated in export supply of the country. In Ethiopian exports did not show any change during imperial and Derg regime .Even though imperial government made different five years plan to boost export performance of the country did not achieved the goal .In Derg regime export is negatively affected because of unfavorable policy and restricted private sector enter in to export business .But as compare to imperial and Derg regime export sector shows some changes in the current regime because favorable policy which favor export improvement of the country since 1992 Ethiopia has taken different measures ,some changes in export performance have been registered during the post reform period .However, Ethiopia's share in the world total export is still very low, at 0.01 percent .Accordingly, the estimation results shows that policy changes have positive and significant effect on export performance of the country. This indicates that the government's

policy changes in this regard met its intended objectives of the export sector growth of the country.

Table 5.3: Demand Equation Results

Variable	Coefficient	P-Value
Constant	0.0518087	0.001
d1lfi	-0.4173238	0.146
d1lepwt	0.522997 ^{***}	0.002
d1lopp	-0.4281096 ^{**}	0.001
R2 =0.39, Prob>F= 0.0000 ,Obs =39		

***significant at 1% level, ** Significant at 5% level

The demand side equation results shows that all the variables are significant and expected sign except the foreign income proxied by the most trading partners GDP which is statistical insignificant at conventional level of significance. Since all variables are used in the logarithmic form, the estimated coefficients can directly be interpreted as logarithmic term elasticity. But foreign is found to be insignificant. The impact of FI on export performance insignificant similar to the finding of Amin (2007) for Ethiopia where the increases in the per capita incomes of our trading partners has no impact on the demand of export. However, the findings Prasad (2000), who argued the growth of foreign income, will not drive movement in developing countries export. This insignificant demand might be due to the possibility of substituting our exports either by producing at home or importing from other countries during adverse global shocks that may increase the prices of exports or reduce our production. Besides, the results also seem to confirm one of the two unanimously accepted arguments among scholars that “traditional export commodities of developing countries have low income elasticity of demand”. Thus we can argue that insignificant impact of foreign income on Ethiopian export which is characterized by export of primary products which is income inelastic. The intuition here is as income of Ethiopia’s trading partners’ increase, since majority of trading partners are developed nations, the income

allocated to primary products is not be changed significantly because of the fact that the income allocated to finished and assembled product increases substantially. Because the nature of primary products exports in the world markets are set prices of that kind of products.

According to the estimation results indicated openness has negative relationship with export demand .This seems to suggest that the study by Morrissey and Mold (2007) may hold for Ethiopia as well. According to their observation, almost all Sub-Saharan African countries have been liberalizing their trade policies (i.e. export taxes, quantitative restrictions, and tariff and no-tariff barriers) most of them in the 1980's. But despite the policy changes, they have not derived a significant benefit from these measures. They have also noted that this is mainly due to the overdependence of their exports on primary commodities. The result indicates that the same is happening in the Ethiopian case

The results shows that real effective exchange rate has also appears to have a positive relation with export performance. In theory, Marshal-learner condition, real effective exchange rate movement is directly related with growth of export performance. An increase in the real effective exchange rates means real depreciation of the domestic currency, which makes exportable items cheap. Thus, according to this research output one percent change in real effective exchange rates results 0.52 percent change in the total export value of Ethiopia. It is well known that exports of LDCs are price inelastic in the international market due to nature of the product that LDCs produces. Therefore this result confirms with fact. This positive and significant coefficient also shows that export may be influenced by exchange rate policy. Also results show that the devaluation of birr in terms of foreign currency improves export price competitiveness which leads to an increased export performance of Ethiopia. The results confirm results found by Kassa (2012), Saruni (2006), Zenegnaw (2010), and Samuel (2012).

5.2. Dynamics of Export

Since the study variables are capable of explaining the existing long run relationship in the static models of export, a dynamic export model is introduced in order to capture the adjustment processes in the short run that is highly important to capture instantaneous deviations from the equilibrium, which is compatible with the validity of the above long run relation of variables of interest. In doing so, the dynamic model of export is estimated on the basis of an over

parameterized model after the optimum lag length in the demand and supply equations of export is selected. Different information criterion procedures, like the Akaike's Information criterion (AIC), Hannan and Quinn Information Criterion (HQIC), Schwarz's Bayesian Information Criterion (SBIC) are used to determine the optimal lag length in each dynamic models of export.

Then, all explanatory variables in the long run equations i.e. demand and supply of export are entered in the dynamic model of export in their difference and lagged difference form. However, the over parameterization problem in the dynamic model of export is mitigated through a systematic elimination of highly insignificant explanatory variables until a parsimonious result is obtained. The table below presents the parsimonious result generated following a step by step elimination procedure of insignificant variables from the dynamic model of export.

Table 5.4: Dynamic Equation for Export

```
. reg3 (d1lx = d1lopp) (lpx = d1lrgdp d1lpdt l2lpx l2licc dr)
```

Three-stage least-squares regression

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
d1lx	38	1	.0856959	0.1793	7.90	0.0050
lpx	38	5	.0367867	0.6647	77.63	0.0000

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
d1lx					
d1lopp	.4965543	.1767024	2.81	0.005	.150224 .8428846
_cons	.0393923	.0153864	2.56	0.010	.0092355 .0695491
lpx					
d1lrgdp	-.4089847	.1612349	-2.54	0.011	-.7249994 -.09297
d1lpdt	.1738185	.0275827	6.30	0.000	.1197574 .2278797
l2lpx	-.2395752	.1359867	-1.76	0.078	-.5061043 .0269539
l2licc	-.3616699	.1785617	-2.03	0.043	-.7116444 -.0116954
dr	-.0630426	.0169037	-3.73	0.000	-.0961732 -.029912
_cons	2.660394	.2940566	9.05	0.000	2.084054 3.236734

Endogenous variables: d1lx lpx
 Exogenous variables: d1lopp d1lrgdp d1lpdt l2lpx l2licc dr

Table 5.4 entails that the sign of the estimated coefficients of the explanatory variables appearing in the finalized export dynamic model are in line with the theoretical expectation that is made at glance. The result of the simultaneous equation framework of 3SLS method on the dynamic model of export revealed that openness measuring domestic economy orientation and degree of restrictiveness towards international trade is positively significant in affecting the performance of export trade in Ethiopia in the short run. Even though, this result contradicts with the result found

in the long run demand equation of export, the positive sign signifies the importance of relieving some trade restrictions for a given time on the performance of export. This result substantiates that liberalizing the trade policies of the country via policy measure targeting export taxes, quantitative restrictions, and tariff and non-tariff barriers has a greater effect in influencing export demand in the short run. However, further actions posed in liberalizing the trade policies of the country in cumulative sense will have a suppressing effect on the demand of export in the long run.

The result on the supply dynamic model of export showed that volatility in real GDP affect the performance of export positively. This result asserts that change in the GDP of Ethiopia's increases the supply of export as exporters in the domestic economy build the confidence on their profitability since profitability is the fundamental issue that motivate private sector to stick on business undertakings. On the other, volatility in the relative price of export measured as a ratio of price of exports supply to domestic price (approximated by consumer price index) affects export performance negatively and significantly. In this case, improvements in the relative price of export in the domestic market as compared to export price in foreign market contribute negatively towards export supply. This is because increase in the value of export in the domestic markets decreases the level of supply in export as exporters get selling these items in domestic markets more profitable as compared to the relative low value of exports in foreign markets if the items are intended to be exported initially.

The other set of variables measuring infrastructural development and export price (lagged by two periods) and the dummy variable used to capture the effect of policy change along changes in the political regime of the country are found positively significant in explaining the supply dynamic model of export. These results points out that the level of infrastructural development and export price in the previous periods has an enhancing effect the supply of export in short run. Here, actions favoring infrastructural development and improvement in export price in the previous periods have a greater tendency of increasing export profit in the current period which in turn instigates more export supply. The dummy variable intended to address the effect of change in policy both in the short run and long run supply equations of export adheres the importance of designing favorable policies towards improving export performance in Ethiopia.

CHAPTER SIX

CONCLUSION AND POLICY IMPLICATION

6.1. CONCLUSION

Foreign trade in LDCs like Ethiopia is assumed to play an important role in the growth and development process. Many economists consider export trade as a device not only to achieve productive efficiency, but also an engine of growth.

In this study, the main objective was to examine the factors determining export trade and its dynamics in Ethiopia. The export trade has shown a significant expansion and contributed to GDP growth over past decades. In order to understand the factors determining export trade in Ethiopia, this study reviewed the existing empirical literature in both developing and developed countries. The empirical literature indicated that most of the existing literature did not treat both demand and supply side factors separately, rather considered both side determinants as if they are one side variables and adopted single equation estimation procedure. However, in order to adequately examine the determinants of export trade, both side determinants needed to treat separately using appropriate methodology. Accordingly, a simultaneous equation framework employed and estimation is made using 3SLS. In addition to this simultaneous equation framework, also descriptive statistics utilized so as to examine the dynamics of our export trade.

Accordingly, this study has assessed the direction of export trade of the country along with the trends and performance of export trade in Ethiopia using descriptive statistics. It was found that there is a significant shift in direction of export trade in Ethiopia mainly from the American and European countries to the Asian and African countries (from developed countries to developing countries). Besides, though the dynamics of export trade shows that there is a significant shift in the share of our export to developing countries particularly China and Sudan, Germany remains the top importer of our export trade in absolute terms.

The empirical findings reveal that most of both demand and supply side factors are significant factors determining the export trade of Ethiopia. Among the supply side determinants, RGDP of Ethiopia, domestic price, dummy used to show different period are significant determinants of our export. The significant RGDP of Ethiopia suggests that the variable had a favorable influence

on the export performance of the country. With increase in the overall domestic economic performance, the export sector also did better during the period under consideration. This suggests that some portion of real GDP might have been invested in the sector and possibly facilitated both the production and the marketing of the export commodities. The analysis also showed that domestic price is a crucial determinant of export trade in Ethiopia. Infrastructure is also another supply side factors that affect export; the empirical result suggest that infrastructure facilities enhance export performance in addition to economic growth.

On the demand side, the study also identified that trade liberalization which is measured by openness has fairly larger (more than unity) and statistically significant impact on value of Ethiopian export. This implies there is high and growing outside demand for Ethiopian products. Hence, openness is an important determinant of our export earnings and the existence of trade liberalization seems to be the driving force behind the growth of our export during the study under consideration. Similarly, relative price is statistically significant and the coefficient implies that depreciation of real exchange rate relative to its trading partners would increases our exports, keeping other variables constant.

6.2. POLICY IMPLICATION

The strong relationship between better export performance and economic growth suggests that countries should identify the important factors that directly and indirectly determine their export performance if they aim at pursuing sustainable growth and prosperity. The two major determinants of export, supply side and demand side factors are investigated in this study. The findings indicate that policy makers should give equal emphasis for demand and supply side factors to improve export performance of the country.

- ❖ Among supply side determinates real gross domestic product has positive and significant relationship with supply of export .Therefore, since RGDP has positive and statistically significant contribution to the value of exports, there is a strong need to allocate more of the real GDP to the export sub sector to improve the efficiency with which it is used to further enhance the contribution of real GDP in the promotion of the export sub sector of the country.
- ❖ This study has found that other supply side factors, particularly domestic infrastructure are important determinants of the country's export performance. Thus there needs to be further investment on infrastructure development to boost export. This pertains, in particular to improvement of telecommunication facilities in production areas and central market.
- ❖ The positive and statistically significant impact of real effective exchange rate on value of export has an important policy implication. The empirical results suggest that an increase in the country's real effective exchange rate cause a gain in competitiveness of that country .Thus, we need to ensure conducive and stable exchange rate policy. Moreover, since the price of domestic goods and services falls due to devaluation, they should invest more on the supply side and increase the supply of exportable goods and services (intensive margin) so that increase in supply of exportable goods and services exceeds the fall in the price of domestic goods and services.

- ❖ Since export is found to be responsive to the domestic prices, improved domestic profitability might act as a significant limit for domestic producers to go for export business. Hence, this suggests that export sector need to be concerned about the direction of domestic prices against world price
- ❖ Finally export trade moved from developed countries such as Europe and America to developing countries like Africa and Asia. Policy makers should give attention why our export trade shifted from developed countries to developing countries and also they should evaluate the impact of this shifts on our export performance.

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APPENDIX: Unit Root Test

. dfuller lx, lags(1)

Augmented Dickey-Fuller test for unit root Number of obs = 38

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	1.496	-3.662	-2.964	-2.614

Mackinnon approximate p-value for Z(t) = 0.9975

. dfuller lx, trend lags(1)

Augmented Dickey-Fuller test for unit root Number of obs = 38

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-0.549	-4.260	-3.548	-3.209

Mackinnon approximate p-value for Z(t) = 0.9814

. dfuller lx, drift lags(1)

Augmented Dickey-Fuller test for unit root Number of obs = 38

	Test Statistic	1% Critical Value	Z(t) has t-distribution 5% Critical Value	10% Critical Value
Z(t)	1.496	-2.438	-1.690	-1.306

p-value for Z(t) = 0.9281

. dfuller d1.lx, lags(1)

Augmented Dickey-Fuller test for unit root Number of obs = 37

	Test Statistic	1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	10% Critical Value
Z(t)	-3.945	-3.668	-2.966	-2.616

MacKinnon approximate p-value for Z(t) = 0.0017

. dfuller d1.lx, trend lags(1)

Augmented Dickey-Fuller test for unit root Number of obs = 37

	Test Statistic	1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	10% Critical Value
Z(t)	-4.545	-4.270	-3.552	-3.211

MacKinnon approximate p-value for Z(t) = 0.0013

. dfuller d1.lx, drift lags(1)

Augmented Dickey-Fuller test for unit root Number of obs = 37

	Test Statistic	1% Critical Value	Z(t) has t-distribution 5% Critical Value	10% Critical Value
Z(t)	-3.945	-2.441	-1.691	-1.307

p-value for Z(t) = 0.0002

. dfuller lpx, lags(0)

Dickey-Fuller test for unit root Number of obs = 39

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-3.175	-3.655	-2.961	-2.613

Mackinnon approximate p-value for Z(t) = 0.0215

. dfuller lpx, trend lags(0)

Dickey-Fuller test for unit root Number of obs = 39

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-3.293	-4.251	-3.544	-3.206

Mackinnon approximate p-value for Z(t) = 0.0674

. dfuller lpx, drift lags(0)

Dickey-Fuller test for unit root Number of obs = 39

	Test Statistic	Z(t) has t-distribution		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-3.175	-2.431	-1.687	-1.305

p-value for Z(t) = 0.0015

. dfuller d1.lpx, lags(0)

Dickey-Fuller test for unit root Number of obs = 38

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-8.029	-3.662	-2.964	-2.614

Mackinnon approximate p-value for Z(t) = 0.0000

. dfuller d1.lpx, trend lags(0)

Dickey-Fuller test for unit root Number of obs = 38

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-7.958	-4.260	-3.548	-3.209

Mackinnon approximate p-value for Z(t) = 0.0000

Dickey-Fuller test for unit root Number of obs = 38

	Test Statistic	Z(t) has t-distribution		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-8.029	-2.434	-1.688	-1.306

p-value for Z(t) = 0.0000

. dfuller lepwt, lags(0)

Dickey-Fuller test for unit root Number of obs = 39

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-0.230	-3.655	-2.961	-2.613

Mackinnon approximate p-value for Z(t) = 0.9349

. dfuller lepwt, trend lags(0)

Dickey-Fuller test for unit root Number of obs = 39

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-2.169	-4.251	-3.544	-3.206

Mackinnon approximate p-value for Z(t) = 0.5072

. dfuller lepwt, drift lags(0)

Dickey-Fuller test for unit root Number of obs = 39

	Test Statistic	1% Critical Value	Z(t) has t-distribution 5% Critical Value	10% Critical Value
Z(t)	-0.230	-2.431	-1.687	-1.305

p-value for Z(t) = 0.4098

. dfuller d1.lepwt, lags(0)

Dickey-Fuller test for unit root Number of obs = 38

	Test Statistic	1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	10% Critical Value
Z(t)	-5.591	-3.662	-2.964	-2.614

Mackinnon approximate p-value for Z(t) = 0.0000

. dfuller d1.lepwt, trend lags(0)

Dickey-Fuller test for unit root Number of obs = 38

	Test Statistic	1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	10% Critical Value
Z(t)	-5.768	-4.260	-3.548	-3.209

Mackinnon approximate p-value for Z(t) = 0.0000

. dfuller d1.lepwt, drift lags(0)

Dickey-Fuller test for unit root Number of obs = 38

	Test Statistic	1% Critical Value	Z(t) has t-distribution 5% Critical Value	10% Critical Value
Z(t)	-5.591	-2.434	-1.688	-1.306

p-value for Z(t) = 0.0000

. dfuller lfi, lags(2)

Augmented Dickey-Fuller test for unit root Number of obs = 37

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-1.239	-3.668	-2.966	-2.616

Mackinnon approximate p-value for Z(t) = 0.6564

. dfuller lfi, drift lags(2)

Augmented Dickey-Fuller test for unit root Number of obs = 37

	Test Statistic	Z(t) has t-distribution		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-1.239	-2.445	-1.692	-1.308

p-value for Z(t) = 0.1120

. dfuller lfi, trend lags(2)

Augmented Dickey-Fuller test for unit root Number of obs = 37

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-1.096	-4.270	-3.552	-3.211

Mackinnon approximate p-value for Z(t) = 0.9298

. dfuller d1.lfi, lags(2)

Augmented Dickey-Fuller test for unit root Number of obs = 36

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-4.155	-3.675	-2.969	-2.617

Mackinnon approximate p-value for Z(t) = 0.0008

. dfuller d1.lfi, trend lags(2)

Augmented Dickey-Fuller test for unit root Number of obs = 36

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-4.163	-4.279	-3.556	-3.214

Mackinnon approximate p-value for Z(t) = 0.0051

. dfuller d1.lfi, drift lags(2)

Augmented Dickey-Fuller test for unit root Number of obs = 36

	Test Statistic	Z(t) has t-distribution		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-4.155	-2.449	-1.694	-1.309

p-value for Z(t) = 0.0001

. dfuller lopp, lags(1)

Augmented Dickey-Fuller test for unit root Number of obs = 38

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-1.266	-3.662	-2.964	-2.614

Mackinnon approximate p-value for Z(t) = 0.6444

. dfuller lopp, trend lags(1)

Augmented Dickey-Fuller test for unit root Number of obs = 38

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-2.108	-4.260	-3.548	-3.209

Mackinnon approximate p-value for Z(t) = 0.5414

. dfuller lopp, drift lags(1)

Augmented Dickey-Fuller test for unit root Number of obs = 38

	Test Statistic	1% Critical Value	Z(t) has t-distribution 5% Critical Value	10% Critical Value
Z(t)	-1.266	-2.438	-1.690	-1.306

p-value for Z(t) = 0.1069

. dfuller d1.lopp, lags(1)

Augmented Dickey-Fuller test for unit root Number of obs = 37

	Test Statistic	1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	10% Critical Value
Z(t)	-3.475	-3.668	-2.966	-2.616

Mackinnon approximate p-value for Z(t) = 0.0086

. dfuller d1.lopp, trend lags(1)

Augmented Dickey-Fuller test for unit root Number of obs = 37

	Test Statistic	1% Critical Value	Interpolated Dickey-Fuller 5% Critical Value	10% Critical Value
Z(t)	-3.384	-4.270	-3.552	-3.211

Mackinnon approximate p-value for Z(t) = 0.0535

. dfuller d1.lopp, drift lags(1)

Augmented Dickey-Fuller test for unit root Number of obs = 37

	Test Statistic	1% Critical Value	Z(t) has t-distribution 5% Critical Value	10% Critical Value
Z(t)	-3.475	-2.441	-1.691	-1.307

p-value for Z(t) = 0.0007

. dfuller licc, lags(0)

Dickey-Fuller test for unit root Number of obs = 39

Test Statistic	Interpolated Dickey-Fuller		
	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-3.169	-2.961	-2.613

MacKinnon approximate p-value for Z(t) = 0.0219

. dfuller licc, trend lags(0)

Dickey-Fuller test for unit root Number of obs = 39

Test Statistic	Interpolated Dickey-Fuller		
	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-3.959	-3.544	-3.206

MacKinnon approximate p-value for Z(t) = 0.0100

. dfuller licc, drift lags(0)

Dickey-Fuller test for unit root Number of obs = 39

Test Statistic	Z(t) has t-distribution		
	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-3.169	-1.687	-1.305

p-value for Z(t) = 0.0015

. dfuller d1.l1cc, lags(0)

Dickey-Fuller test for unit root Number of obs = 38

Test Statistic	Interpolated Dickey-Fuller			
	1% Critical Value	5% Critical Value	10% Critical Value	
Z(t)	-8.883	-3.662	-2.964	-2.614

Mackinnon approximate p-value for Z(t) = 0.0000

. dfuller d1.l1cc, trend lags(0)

Dickey-Fuller test for unit root Number of obs = 38

Test Statistic	Interpolated Dickey-Fuller			
	1% Critical Value	5% Critical Value	10% Critical Value	
Z(t)	-9.548	-4.260	-3.548	-3.209

Mackinnon approximate p-value for Z(t) = 0.0000

. dfuller d1.l1cc, drift lags(0)

Dickey-Fuller test for unit root Number of obs = 38

Test Statistic	Z(t) has t-distribution			
	1% Critical Value	5% Critical Value	10% Critical Value	
Z(t)	-8.883	-2.434	-1.688	-1.306

p-value for Z(t) = 0.0000

. dfuller lrgdp, lags(1)

Augmented Dickey-Fuller test for unit root Number of obs = 38

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	0.086	-3.662	-2.964	-2.614

Mackinnon approximate p-value for Z(t) = 0.9651

. dfuller lrgdp, trend lags(1)

Augmented Dickey-Fuller test for unit root Number of obs = 38

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-1.315	-4.260	-3.548	-3.209

Mackinnon approximate p-value for Z(t) = 0.8841

. dfuller lrgdp, drift lags(1)

Augmented Dickey-Fuller test for unit root Number of obs = 38

	Test Statistic	Z(t) has t-distribution		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	0.086	-2.438	-1.690	-1.306

p-value for Z(t) = 0.5339

. dfuller d1.lrgdp, lags(1)

Augmented Dickey-Fuller test for unit root Number of obs = 37

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-6.677	-3.668	-2.966	-2.616

Mackinnon approximate p-value for Z(t) = 0.0000

. dfuller d1.lrgdp, trend lags(1)

Augmented Dickey-Fuller test for unit root Number of obs = 37

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-7.687	-4.270	-3.552	-3.211

Mackinnon approximate p-value for Z(t) = 0.0000

. dfuller d1.lrgdp, drift lags(1)

Augmented Dickey-Fuller test for unit root Number of obs = 37

	Test Statistic	Z(t) has t-distribution		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-6.677	-2.441	-1.691	-1.307

p-value for Z(t) = 0.0000

. dfuller lpdt, drift lags(1)

Augmented Dickey-Fuller test for unit root Number of obs = 38

	Test Statistic	Z(t) has t-distribution		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	0.593	-2.438	-1.690	-1.306

p-value for Z(t) = 0.7214

. dfuller lpdt, lags(1)

Augmented Dickey-Fuller test for unit root Number of obs = 38

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	0.593	-3.662	-2.964	-2.614

Mackinnon approximate p-value for Z(t) = 0.9874

. dfuller lpd, trend lags(1)

Augmented Dickey-Fuller test for unit root Number of obs = 38

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-1.439	-4.260	-3.548	-3.209

Mackinnon approximate p-value for Z(t) = 0.8490

. dfuller d1.lpd, lags(1)

Augmented Dickey-Fuller test for unit root Number of obs = 37

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-4.062	-3.668	-2.966	-2.616

Mackinnon approximate p-value for Z(t) = 0.0011

. dfuller d1.lpd, trend lags(1)

Augmented Dickey-Fuller test for unit root Number of obs = 37

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-4.064	-4.270	-3.552	-3.211

Mackinnon approximate p-value for Z(t) = 0.0071

. dfuller d1.lpd, drift lags(1)

Augmented Dickey-Fuller test for unit root Number of obs = 37

	Test Statistic	Z(t) has t-distribution		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-4.062	-2.441	-1.691	-1.307

p-value for Z(t) = 0.0001

