Determinants of Agricultural Export Product: Case of Sesame Seed Exports from Ethiopia.

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DECLARATION

First, I declare that this research thesis is my solely work and that all sources of materials used for this proposal have been duly acknowledged. It has been submitted in partial fulfillment of the requirements for M.Sc. degree at the Jimma University and is deposited at the University Library to be available to borrowers under rules of the library. I seriously declare that this research paper is not submitted to any other institution anywhere.

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ACRONYMS

ADLI	Agricultural Development Led Industrialization
CSA	Central Statistical Agency
ECX	Ethiopian Commodity Exchange
EGTE	Ethiopian Grain Trade Enterprise
EIAR	Ethiopian Institute of Agricultural Research
EOSPEA	Ethiopian Pulses, Oilseeds and Spices Processors-Exporters Association
ERCA	Ethiopian Revenue and Customs Authority
FAO	Food and Agricultural Organization
FDI	Foreign Direct Investment
GDP	Growth Domestic Product
GTP	Growth and Transportation Plan
MOFA	Ministry of Foreign Affairs
MoFED	Ministry of Finance and Economic Development
MOT	Ministry of Trade
NABC	Netherland African Business Council
PASDEP	Plan for Accelerated and Sustained Development to End Poverty
UNDP	United Nations Developmental Program
USD	United State Dollar
WTO	World Trade Organization

ABSTRACT

This study is purposed on informing future trade policy decisions on how the sesame seed export can be improved in both volumes and value of exports. To achieve this, effort was made to identify and assess the magnitude and effects of key determinants of sesame seed exports from Ethiopia for the period 1970-2013 both in the short run and long run. The study involves separate consideration of value and volume of exports as explained variables, and sourcing of ways by which beneficial implications noted could be maximized for both variables, while minimizing adverse ones in the process. This study solely involves the use of secondary data obtained from different sources. Separate equation with value and volumes of exports as explained variables were estimated using Johansen cointegration and error correction method (ECM) for long run and short run relationship respectively. All descriptive and econometrics analysis was done through EVIEWS 5. Finally, both the short run and long run equation was tested for appropriate standard Gaussian assumptions, appropriateness of specification and stability of coefficients. Various factors were found to have a significant impact on values and volumes of sesame seed export amongst which: domestic production of sesame seed, terms of trade, net inflow of FDI are positively related in the long run. But, real effective exchange rate negatively related with both values and volumes of sesame seed. Export price of sesame seed only affects export values of sesame seed in the long run. The error correction term has also indicated that the short run equilibrium quickly reverted to the long run equilibrium for both values and volumes of export. The identified determinants will provide a guideline for future trade promotion in the sector. Accordingly, future strategy required to increase sesame seed export was recommended.

Key words: *Sesame Seed, Cointegration, Value, Volume, Export*

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

For developing countries like Ethiopia to achieve a rapid economic growth and development exports are generally perceived as a motivating factor for economic growth. The desire for rapid economic growth in developing countries is attained through more trade. Empirical and theoretical studies also confirm the role of exports in raising the economic growth and development of a country. For example, the study done by Debel (2002) in Ethiopia, found that exports can substantially contribute to economic growth of Ethiopia. Similarly, studies done in Libiya, Cameroon and Pakistan confirm the contribution of export to economic growth. Specifically, some studies were also found agricultural export have a positive contribution to economic growth (Khaled et al., 2010; Dr. Noula et al., 2013). Theoretically also, the classical economists like Adam Smith and David Ricardo have argued that international trade is the main source of economic growth and more economic gain is attained from specialization.

As the theoretical or empirical reviews indicate export has crucial benefit to stimulate economic growth of the country. In line with this, studies are required in order to identify the main factors which affect export growth of countries. In response, studies have been done in order to capture the main determinants of export in general and agricultural export in particular of developing countries (Eyayu, 2014, Muhammad et al., 2006; Sharma, 2001; Idsardi, 2010; Juthathip, 2007).Even if most of the studies investigate determinants of aggregate export some studies like Eyayu(2014) and Idsardi (2010) investigateddeterminants of agricultural export particularly. Eyayu (2014) investigate determinants of agricultural export in47 sub Saharan African countries through panel data. Similarly, Idsardi (2010) try to find out determinants of ten of the identified agricultural export products in South Africa.

As most of the studies concerned to investigate determinants of aggregate export after while studies have emerged to study separately with in sectors like agricultural products export, manufacturing sector products and so on. This showed that single factors have different impacts on different sector exports. Similarly, single factors may have different impacts on different

agricultural products export. Since Ethiopia is agrarian country studying factors of agricultural products independently will help in order to formulate favorable policies for each commodity rather than dealing on aggregate export. Accordingly, in Ethiopia Zelalem (2011); Hailegiorgis (2011) and Yared (2010) studied the determinants of coffee, oil seeds and textile export respectively. Even if the variables all used and their findings have similarities, we cannot say the findings are consistent from product to product. This fact anticipate researcher to conduct research on sesame seed export separately to able to design future trade policies of sesame seed and the results are expected to be different from the above studies.

As it is known Agriculture has always been the pace setter of the Ethiopian economy accounting for about 45 percent of the Ethiopian gross domestic product, over 90 percent export and 83 percent employment (MOFED, 2011/12). The country agricultural products account 70.3% of the total products exported (Ibid). Ethiopia generated $1.22 billion from the exports of agricultural commodities in the first seven months of 2014/15 (UNDP, 2014). Major export agricultural products are coffee (21%), oilseeds (17%), gold (13%), Kchat (10%), pulses (9%), cut flower (7%),and live animals (6%) (Ibid).As apart from earning valuable foreign currency, it creates sustainable jobs; increases the adoption of advanced technologies and production practices as well as the enhancement of overall competitiveness of the agricultural sector.

Our focus, Sesame seed is among varieties of oil seeds grown in Ethiopia. It is by far the most important both in terms of volume, value and export earnings. Ethiopia earned 641.5 million USD in 2014 from export of oil seeds (NABC, 2015). Out of the total exports of oilseeds the largest share is taken by sesame seed which accounts 88% of the total oil seed exports. It is the second commodity next to coffee in foreign exchange earnings (MOFED, 2011/12).

As explained above sesame seed has been supporting Ethiopia's economy as being as source of foreign exchange earnings. But as reviewed before there hasn't been a single study that was done in Ethiopia to find the determinants of sesame seed export from Ethiopia. Accordingly, this study tried to assess trends of sesame seed export value and volume in addition to finding its determinants during the period 1970-2013. The study uses Johansen Cointegration and Vector Error Correction Method (VECM) in order to find the long run and short run determinants of values and volumes of sesame seed separately. The objective of separately studying values and volumes of sesame seed export is will leave option to see the real impacts of variables and avoid

the nominal influences. For example, increase in price may leads to rise in value of export value of sesame seed but when we see the amount (volume) of exported sesame seed it may decrease due to inflation effect. Finally, based on the finding future policy implications in stimulating sesame seed export was also listed.

1.2. Statement of the Problem

Since there is no country which is self-sufficient, one nation has to trade with many others so as to enjoy goods and services with a comparative advantage in its production. This is the case with Ethiopia where a majority of her labour force is employed in the agricultural products such as coffee, oilseeds, gold, pulses, livestock, kchat, flower and textile products…etc.

For several years Ethiopia has experienced an economic recovery from the exportation of agricultural products. But this sector was seriously affected by internal and external factors which led the country into serious crisis. This is basically from the fact that the country depends on solely on the proceeds from this sector for the wellbeing of her nationals. For the fourth consecutive year of the GTP period in 2013, Ethiopia's export revenue has been lower than the target set by the government[1]. Over the past fiscal year the government targeted to earn USD five billion from exports, while the actual achievement stood at USD three billion[2]. The country's export has subsequently registered growth over the past few years, but international price decreases on major export items have contributed to a slight decrease in the growth rate and the WB report indicated that also exporters declined from 2,033 in 2010 to 1,800 in 2013 (WB, 2014).

Sesame seed is the main agricultural products in making foreign currency earnings. Over the last two decades, the quantity of sesame traded on the world market has more than double (FAO, 2014). Similarly, the quantity of Ethiopian sesame supplied to the world market has been increased (Ibid). This shows that world demand and supply of export is increasing. This in turn leads to rise in competition in international market since the size of the market increasing. In other way, the volume (amount) of sesame seed supplied to the world market from Ethiopia and

[1]http://www.dpworld-doraleh.com/china-ethiopias-top-export-destination/
[2]http://www.dpworld-doraleh.com/china-ethiopias-top-export-destination/

foreign earnings (values) showed a fluctuating trend. For example, in the year 2001, 2008, 2010, 2015, the volume and values of export faced a dramatic decline (Based on FAO data manipulation).The decline in 2015 was very savior and it almost account 23% decline from the previous year (MOT, 2015).The decline in sesame export may be associated with following shifts in market demand especially the main importer of Ethiopian sesame China to India and other relevant economic and policy indicators, as well as the country's slow adaptation to changes on market (Ibid). Therefore, an empirical study is required to determine future strategies of stimulating sesame seed export from Ethiopia.

Even if effective improvements of the sesame subsector may require improvement in quality of exports, as well as increase in volume and value of exports, but there has been no study conducted on determinants of volume and value of export of sesame in the country. Achieving this however requires identification of existing associations between value and volume of sesame seed exports and key determinants of export trade, capturing the effect of quality through a competitive index. By this, the present study is proposed on informing future trade policy prescriptions on how the sesame seed exports dimension of the subsector can be improved through identification and assessment of the magnitude and effects of key determinants of sesame seed exports from Ethiopia for the period 1970-2013.

Thus, it would be of interest to study the past and present trend of sesame seed export values and volumes and determinants in Ethiopia. The above issue raised brings us to the focal point of this research work which is to examine the determinants of value and volume of sesame seeds exports. This problem is transform in to the following research question:

How are likely the trends of sesame seed export in Ethiopia for the period 1970-2013?

What are the factors that affect sesame seed export in volume and value?

What strategies are required in order to increase sesame seed export in volume and value?

1.3. Objective of the study

The general objective of this study is to identify and assess the magnitude and effects of key determinants on sesame seed exports of Ethiopia.

In order to achieve the main objective of the study, the specific objectives are:

- To assess the trend of sesame exports volume and value of Ethiopia for the period 1970-2013.
- To identify the key determinants of volume and value of sesame seed export of Ethiopia.
- To recommend feasible trade policy to improve sesame exports of Ethiopia.

1.4. Significance of the Study

This study is intended to identify Ethiopian sesame export value and volume in the international market. In addition this study also used to identify the most important factors that affect sesame export value and volume of Ethiopia. Since the study identified the key factors of sesame export, the study will help to inform future trade policy decisions on how the sesame exports from Ethiopia could be enhanced. Moreover, this study also helpful, in order to formulate policy about sesame production and export in the future. Future researchers, who are interested to work on sesame production and export, may also use this research as a baseline

1.5. Scope of the Study

The study is delimited to identify and assess the main factors of export of Ethiopia in value and volume of sesame. It considered the internal and external side factors of sesame export. Internal side factors are domestic production of sesame, real effective exchange rate, and net inflow of Foreign Direct Investment (FDI)and as external side factors export price of sesame seed and terms of trade (TOT) was considered. The study was used44 years data's from 1970 to 2013. Time series analysis like Johansen co-integration, error correction method (ECM)and granger causality tests was also used for analysis in order to analysis long run, short run relationships and causation between variables respectively.

1.6. Organization of the Study

This study will be presented in five chapters. The first chapter will give a general background of the study, statement of the problem, objective, its significance and limitation of the study. Chapter 2 will deals with the review of literature on oilseeds and sesame export in Ethiopia and the rest of the world, whereas chapter three will specify the data and methodology of the study such as sources of data and variables to be included in the study with their coding and

description. Methods of data analysis will also describe in this chapter. Chapter 4 will report results from the statistical data analysis and provides discussions. Finally, in the last chapter discussion, conclusion and policy recommendations based on the findings of the study will be presented.

CHAPTER TWO

2. LITERATURE REVIEW

2.1. Theoretical Literature

The theory of international trade is the oldest applied area of economics (Bhagwati, 1971). During the mercantilist period that preceded Adam Smith's *An Inquiry into the Nature and Causes of the Wealth of Nations* of 1776, pamphleteers and businessmen discussed the rationale for foreign trade and its policy implications, and concluded that it was vital to the health of an economy and the power of the nation state. Speculations on foreign trade continued to play a vital role in the evolution of economic thought and the conduct of economic policy during the classical and neoclassical periods that followed mercantilism. The theory of any branch of economics carries with it implications for economic policy, and trade policy has been the subject of much debate, advocacy and analysis since mercantilist times. International trade theory and policy have remained the object of active research and controversy to our day.

A common aim of mercantilist writers, and an apparent obsession for some, was the promotion of a favorable 'balance of trade', defined as the excess of exports over imports in value terms. Another interpretation of that goal assumed greater importance with the passage of time, that a positive balance of trade led to a positive 'balance of labor': commodity exports were associated with 'foreign paid incomes' or the 'export of work', that is, to greater employment and a higher level of output, whereas imports meant that any gain in employment went to foreigners. Generally, mercantilists wished to promote exports and discourage imports in order to accumulate the difference in the form of bullion (precious metals). In order to limit or protect excess import to countries they advocate different trade policy instruments. Trade policy instruments used since mercantilist times include: (a) import tariffs (or duties); (b) export taxes; (c) import quotas or prohibitions; (d) export quotas or prohibitions; (e) export bounties (or subsidies); and (f) treaties of commerce with other nations. Some of these instruments are substitutes for one another. An import duty can always be found that has the same restrictive effect on imports as a quota, and if raised sufficiently high can cut off all imports, thus amounting to an import prohibition. Many other policies that are not listed above, such as exchange rate policy, fiscal policy, wage policy, and production taxes or subsidies, can also affect trade flows also.

In other direction although the classical school of economics was emerged as the advocacy of free trade. In England Dudley North, Isaac Gervaise, Henry Martyn and others preceded Smith in this, but their writings, in the form of pamphlets rather than books, remained almost unknown until they were rediscovered in the nineteenth century (Krugman, 1981). A much more significant precursor of Smith was the first cohesive school of economists now known as the physiocrats, who were staunch advocates of freedom in both domestic and foreign trade. They regarded freedom in foreign trade as part of the natural order, going hand in hand with the doctrine of laissez faire in domestic trade. Smith favored a duty on foreign goods equal in size to an existing tax on similar domestic goods, so as not to discourage production of the latter.

As the classical school of thought gradually gave way to the marginalist economics of W. Stanley Jevons in England, Carl Menger in Austria, and Léon Walras in France and Switzerland, and to the neoclassical school founded by Alfred Marshall in England, trade theory and the justifications for trade policies underwent significant changes and refinements. Marshall depicted J. S. Mill's reciprocal demand analysis by means of offer curves, and Francis Edgeworth used them to illustrate the effects of commercial policy on the terms of trade. A third British economist, Charles Bickerdike (1906), explored the determination of the optimal tariff rate that maximizes a country's gain from trade by using demand and supply curves, together with the Marshallian tools of consumer and producer surplus. Edgeworth and Bickerdike recognized that a tariff decreases the volume of trade and hence the potential gains from it, and that a country's welfare is maximized when it sets a tariff such that, at the margin, the gain from improved terms of trade is just offset by the loss from a lower volume of trade.

In this brief and necessarily incomplete survey of trade policies since mercantilist times, Adam Smith's name stands out as the founder of the classical school of economic thought and the proponent of free trade as part of his 'system of natural liberty'. Despite the title of his most famous book, the 'wealth of nations' was not Smith's sole objective. He was willing to use trade and other policies, even if they resulted in a loss of efficiency, in order to achieve a variety of economic and noneconomic objectives. Noneconomic objectives such as national defense and protection for the industries that support it were invoked by Smith. Although he was more tentative about the use of protection to alleviate unemployment when imports flow into a country after a suspension of trade, he made a good case for a gradual approach to free trade. Economists of the classical school such as Ricardo agreed with him that in such cases protection should be

removed gradually to allow factors to make an orderly redeployment from import-competing industries.

It was left to Ricardo to sort out the basic premises of a theory of free trade, which Smith had initiated. Industrial capitalism in Ricardo's England was at a relatively advanced stage as compared to what it was in Smith's time, both with rapid growth of large-scale industries and captive markets in overseas colonies. Imports of wage goods (corn) had a special role by cheapening wage goods and hence labor cost for industry in Ricardo's England. Free trade, as opposed to the Mercantilist policies of protection, was championed by both Smith and Ricardo as a route to achieve production efficiency at a global level. Ricardo's cost calculations, despite his concerns for the introduction of machinery on a large scale, were based on labor hours, which were treated as a single homogeneous input with production (in a two commodity world) subject to constant costs. It was comparative and not absolute advantage, which was considered both necessary, as well as sufficient, to ensure mutually gainful trade across nations, warranting complete specialization in the specific commodity with a comparative advantage in terms of labor hours used per unit of output.

But, the Ricardian doctrine missed out the role of demand as an explanation of the terms of trade in exchange. It was for J.S. Mill to do the balancing act by introducing the notion of "Reciprocal Demand." A few years later Alfred Marshall further advanced the role of demand in terms of the "offer curve" construct, which, according to him, completed the Ricardian trade theory by determining the "terms of trade." However, the supply-side embedded in these theories had in the meantime changed drastically from the Ricardian notion of fixed labor time inputs to "real costs." These costs, for Marshall, were measured by the subjective disutility or sacrifices of labor at the job. In addition, output was subject to diminishing returns, with changing factor proportions rather than with constant factor (labor) coefficients as in Ricardo.

The balancing act between forces of supply and demand was carried forward by the Austrian school with their notion of opportunity cost, defined in terms of the utility of foregone consumption. This provided the base for the Heckscher-Ohlin version of free trade doctrine that followed. Use of the marginal rates as in this theory turned the Classical theory on its head. Simultaneously, a basis was laid for the defense of free trade as Pareto-optimum, rather than on grounds of comparative supply costs alone, thus ensuring optimization of production,

consumption, and exchange (trade) for the two trading nations at equilibrium. This version of neo-classical trade theory has continued to have a special appeal to economists championing the cause of free trade on the grounds of optimization at a global level, of productive efficiency, consumption (and as such welfare), and the automatic utilization of factors of production at full capacity. Returns to the two factors of production that included labor and capital were at levels that were in proportion to their respective material contribution valued at market prices. Unlike in the Ricardian paradigm where the supply cost measured in labor hours was the determining factor of trade advantages, consumer preferences (ordinal rankings) for goods was as important as the supply factors in determining price competitiveness of goods for the trading nations.

Nowadays governments recognize the existence of the adjustment costs faced by these industries, and often provide trade adjustment assistance to extend unemployment benefits and provide retraining for workers as a condition for further trade liberalization. Smith also allowed for the possibility of retaliation against a foreign country that imposes duties on the home country's exports, in the hope that this would lead to a mutual lowering of trade barriers and thus yield freer trade between them. Robert Torrens approved of this call for reciprocity in trade relations, and the issue remained alive in Britain and inspired the tariff reform debate of 1903.
Empirically, the share of trade in gross domestic product (GDP) of many nations has been a key ingredient for growth and development. But in developing countries, the export of primary commodities and import of finished products is mostly the basic structure of the economy. To aim to explain or predict the type of goods and services exported and imported by nations, their market destinations, and the underlying economic and political conditions, several theories have been formulated.

Generally, based on the review of scholars' like Sen S.(2007) notable theories justifying free trade include classical tenets of absolute advantage and comparative advantage espoused by Smith and Ricardo respectively, and neo-classical models such as the Heckscher-Ohlin and New Trade Theory (NTT). Although free trade policies have been heavily criticized in literature, they are still utilized to advance trade liberalization especially in developing countries Sen S. (2010). Thus, it is within the ambit of the free trade paradigm that trade liberalization policies were instituted in many developing countries as an alternative to the import-substitution economies in the 1980s.

Thus, our research model is derived based on neo-classical, the Heckscher-Ohlin theoretical model. In which case where export of sesame seed is under the assumption of free trade paradigm and is affected by internal (supply side) and external factors (demand side factors).

2.2. Empirical Literature

In many Sub-Sahara African countries, exports of primary commodities have increased. The situation is not different in Ethiopia as adoption of the economic policy reforms stimulated export-growth of sesame as new addition to traditional export crops like coffee. Following the wave of trade reforms especially in developing countries, many empirical scholarships have emerged. We generally review some of such studies, and place emphasis on areas that are particularly pivotal to our paper. Various authors have studied the determinants of cross-country agricultural commodity exports and recommended plausible variables accordingly.

As a key supply side determinant of export growth, output or production of primary agricultural commodities has been noted to yield beneficial implications for exports in several studies. In as much as increments in production is deemed bad for trade in a closed economy due to the downward pressure such increments induce on prices, in open economies however, increased production offers a great opportunity for export expansion through surpluses. Juthathip, (2007) showed that world production capacity has gained importance in determining export volume in East and South East Asia. Particularly in the long run, production capacity tends to play an important role in determining performance of exports. For example, in assessing the determinants of agricultural export trade in case of fresh pineapple exports from Ghana David et. al. (2010) found significant and positive impact of increment in domestic and international production of the commodity on the volume and values of fresh pineapple exports from Ghana. Similarly, Boansi, (2009) found significant and positive association between output of cocoa and volume of exports from Ghana. In assessing the competitiveness and determinants of cocoa exports from Nigeria, Nwachuku, et al. (2008) found a strong and positive impact of increments in cocoa production on volumes exported. The study conducted by Abolagba, et al. (2008) in Nigeria revealed significant and positive effect of production on exports of both cocoa and rubber from Nigeria. However, in a similar study conducted by Kumar (2005), on tomato exports, found a significant negative association between production and export growth for tomato in India.

In contrast to the general positive association expected and mostly observed between production and exports, however, a general negative association has been noted in literature between domestic demand and export growth. Juthathip (2007) showed that world demand capacity have increased in importance in determining export volume in East and South East Asia. That is, through domestic production creates surplus by which foreign exchange can be earned through exports, higher level of domestic demand reduces the resources devoted to exports (Ball RJ et al., 1966). This consequently reduces the volume exported, and possibly value in case of minor exporting nations (as minor exporters are mostly price takers). In their analysis on the determinants of fresh pineapple exports from Ghana by David B., et al. (2010) found that, a 1% increase in domestic consumption leads to a 0.31% decrease in both volume and value of export, which is statistically significant at the 1% level. Similarly, the findings of Abolagba., et, al. (2008) showed a statistically significant negative association between domestic consumption and export growth for both cocoa and rubber in Nigeria. Boansi (2009) has also found a significant negative association between domestic consumption and cocoa export growth from Ghana.

Generally, a fair share of the studies investigating the determinants of agricultural export performance shows that in many least developed countries (LDCs), commodity price variables are very important drivers of exports. As proposed by Dercon (1993), prices generally serve as a conduit through which relevant economic policies affect agricultural variables such as production, supply, exports and income. In affirming the importance of commodity prices for export growth, Edwards (2004) noted a strong impact of foreign prices on export performance of South Africa's manufacturing sector. Although a negative effect of foreign price on export growth is observed for Uganda in the long-run (which was deemed a mixed signal), Agasha (2009) found a statistical significant positive association between the second and third lags of foreign price and export growth in the short-run. The short-run association observed conforms to proposition by Ndulu (1990).

However, the findings of David, et al. (2010) indicated that a 1% increase in export of a country leads to a 0.85% increase in value of exports (significant at the 1% level) in Ghana, but no significant effect on volume of exports. Similarly, in accessing cloves export response to trade liberalization in Tanzania, Kingu (2014) found a statistical significant positive association between foreign price and export growth both in the short and long-run. In contrast to these

however, the findings of Nwachuku et al. (2008) and Abolagba et al. (2008) showed no significant effect of export price on volume of cocoa exports from Nigeria. The Study done by Hailegiorgis (2011), aimed assessing export performances of oilseeds and it determinants in Ethiopia showed that export price has no significant influence on export performances of oilseeds in Ethiopia. Similarly, the study done by Samuel (2012) in Ethiopia to identify determinants of agricultural export performance in Ethiopia found that domestic price of agricultural products have no significant influence on their export but world price has very significant influence.

Being open to trade opens doors to greater opportunities for countries that are purposed on diversifying their exports. In addition, it promotes efficiency in production and export through exposing the countries involved to fierce competition on the global market. For example, index of openness to trade (captured by Terms-of-Trade index of exports (TOT)) yields positive impact for both the value and volume of exports of fresh pineapple from Ghana (David, et al., 2010). Openness to trade as suggested by Ngouhouo (2013) presents countries not only with market and trade opportunities, but also introduces exporters to competition from other competing countries, thereby promoting efficiency in the process. Efficiency, as noted in production, trade, and development economics, is a stimulator of competitiveness and hence export performance and growth. In a study to assess the effect of agricultural and financial sector reforms on export growth of cotton lint from Pakistan, Anwar (2010) found that export of cotton lint from the country is stimulated by increasing world demand for the commodity, export competitiveness of the country, and by increase in trade openness.

In affirming the positive association between openness to trade and exports, Ngouhouo (2013) found a significant positive effect of terms of trade index on exports from Cameroon for the period 1970-2008. Moreover, in a study on 'Rethinking policy options for export earnings', Jayant (2006) observed that deterioration in terms of trade index is associated with contraction of export earnings. Samuel (2012) found a strong positive relationship between trade openness and export performances of Ethiopia's agricultural products in short and long run. Similarly, Agasha (2009) found a significant positive association between the index of trade openness and export growth for Uganda in both the short and long-run. This finding affirms earlier results from Musinguzi and Obwona (2000) of a positive effect of terms of trade on exports from Uganda.

From the extant literature, quite interesting views have been expressed on the impact of exchange rate on agricultural exports. In as much as some analysts estimate the effect of changes in nominal exchange rate on exports, others with policy interest mostly use the real exchange rate due to the latter's ability to adjust for purchasing power differences in currency of trading partners. In contrast to the nominal exchange rate where increments in the rate reflect currency depreciation, increments in real exchange rate reflect currency appreciation, the two consequently yielding contrasting implications for exports. According to economic and trade theory, currency depreciation makes exports cheaper and demand generally higher, currency appreciation usually dampen export-growth. A study conducted by Juthathip (2007) aimed examining determinants of Export Performance in East and Southeast Asia found the long-run coefficient on export volume with respect to changes in the real exchange rate in Hong Kong, China; Korea; Singapore; and Taipei, China. The real exchange rate coefficient in these economies is around 0.3 and is insignificantly different from zero in Taipei, China.

Moreover, a study in 75 developing countries done by Muhammad and Eatzaz (2006) to assess the determinants of exports in developing countries found that real exchange rate affects export positively using OLS regression. The estimation results of the gravity model for the ten emerging agricultural export products of South Africa reveals that the exchange rate had positive and significant effect, contrary to expectation, in the estimation of exports of hop cones (Idsardi, 2010). This indicates that the higher the exchange rate the more exports of hop cones, which is not in line with any theoretical principle. Similarly, a study conducted in Uganda to assess the determinants of export growth rate in Uganda for the period 1987-2006 done by Agasha (2009) found a mixed signal; positive and significant effect for the association between real exchange rate and export growth in the long-run and insignificant in the short-run. The latter observation confirms the proposition by Musinguzi and Obwona (2000) that real exchange rate has insignificant effect on export growth rate.

Parallel to this, a study by Samuel (2012) and Hailegiorgis (2011) showed that nominal effective exchange rate significantly affected the agricultural and oilseeds exports of Ethiopia respectively in the short run and long run; its sign is different from what already expected. In contrast to the insignificant association and mixed signal findings by (Agasha, 2009; Musinguzi and Obwona, 2000), however, Sharma (2000) found a significant negative association between real exchange

rate and export growth for India. Upon this outcome, he inferred that a fall in domestic prices due to exchange rate depreciation makes exports cheaper in the global market, and this consequent stimulates demand. In affirming by the findings of Sharma (2000); Cline (2004) and Kuwornu (2009) found a positive association between depreciation in real exchange rate and export growth.

On the nominal side, Yusuf and Yusuf (2007) found a significant and positive association between nominal exchange rate and exports of rubber from Nigeria. Although a priori expecting positive association between the nominal exchange rate of Nigeria and cocoa exports from the country, Nwachuku (2010) rather obtained a statistically significant and positive association between these two indicators. This unexpected outcome was attributed to declining productivity of the Nigerian economy and a corresponding weak currency of the country**.**

Under favorable domestic production and marketing conditions, foreign direct investment (FDI) stands fueling export growth in less developed economies. This claim is made on grounds that, such investment have the potential to advance technological progress, and improve efficiency and quality of exports. Besides creating favorable trading relationship between the recipient (host) country and its investing partners, FDI do strengthen capital formation, innovation capacity and organizational and managerial practices. In spite of these general beneficial implications of FDI noted worldwide, quite controversial implications of FDI on exports have been found in economic, business and trade literature. For instance, Muhammad and Eatzaz (2006) found positive but insignificant impact of FDI on export growth of developing countries.

Although some researchers including Jeon (1992) affirm a statistically significant negative relationship between FDI and export growth, Yishak (2009) in Ethiopia over all export; and Sharma (2000) in India; Majeed and Ahmad (2006) found no significant effect of FDI on export growth. Others, including (Cabral, 1995 and Pfaffermayr, 1996) found a statistically significant positive association between FDI and export performance. In countries where domestic demand for some agricultural commodities is generally high, most of the investments (FDI) made in such commodities purpose on capturing domestic markets instead of stimulating export growth, while others capture not only domestic markets, but also use that as a means to jump tariffs. Whenever investments are made with a domestic market capturing or tariff jumping motive, they usual

yield detrimental implications for export growth Majeed and Ahmad (2006). Investments, however with export promotion motive usually yield beneficial implications for exports.

2.3. World Sesame Supply and Export Chain for Ethiopia

Over the last two decades, the quantity of sesame traded on the world market has more than doubled. Japan, the European Union, South Korea, USA and Egypt were largest importers, while India, Sudan, Guatemala, china Myanmar, Ethiopia and Nigeria were major suppliers to the world market (Comtrade database, United Nations Statistics Division website, Wijnandset et al. (2007). The supply from some producing countries such as china has been in relative decline over the past few years, despite a general increase in demand for the crop. The main reason for this decline attributes to the fact that other more remunerative crops compete with sesame for the limited amount of agricultural land and the shortage of labour.

Ethiopia has been also significantly increasing its supply to world markets. The main importers of Ethiopian Sesame are China; which is also a major sesame exporter, Israel, and Turkey. In the long term, there is high potential for increasing the Ethiopian export of Sesame to the European market. Europe is a major user of sesame seed for bakery applications and confectioneries. Currently, the main suppliers to European Union countries are India and Sudan. Like China, India could well reduce its sesame supply to the world market as it focuses increasingly on industrialization instead of agriculture. Therefore, the European market presents Ethiopia with a good opportunity to complement existing suppliers and even replace them should their supply decline. The only requirement Ethiopian farmers and traders need to meet is to adequately prevent the adulteration of seeds of different varieties and clean sesame up to 99-99.5% (Wijnands, 2007).

The Sesame Value Chain, however, is highly restricted to the cultivation of Sesame, cleaning and exporting. According to information gathered from Ministry of Trade, there are more than 190 organizations with license to export Sesame in Ethiopia (I^2 Agribusiness Innovation and Incubation Center, 2013). However, only three organizations are actively engaged in Sesame value addition to the level of Hulling. These organizations fully export their products to countries such as Japan, USA, Israel, Turkey, Dubai, Poland, Middle East, and European Countries. The most dominant global supplier of Hulled Sesame Seed is China.

Ethiopia exported 288,752 tons of sesame in the past ten months earning USD 466.44 million in revenue in 2015.In the same period in 2014, the high global demand for sesame led to USD 693.5 million in revenue for Ethiopia, which exported 346,833 tons of sesame seeds. This year's export marks a USD 227 million (or 24.3 percent) revenue drop (MOT, cited. The drop in revenue was caused by an excess of sesame supply and falling prices in the global market, combined with poor local sesame quality caused by bad weather, hoarding of seeds by farmers, and a limited number of export destinations (Tesfaye, G., 2015). China, the world's largest importer of sesame and buyer of 64.5 percent of Ethiopia's sesame seed export, decreased its import of Ethiopian sesame, having met its demand through imports from India and local production. According to the Ministry of Trade (2014), sesame is currently sold at USD 1,300 per ton, down from USD 2,000 to 2,400 per ton in 2014 year.

Three groups of people have been identified so far to engage in Sesame production; the small-holder as an individual, co-operatives (organization owned and run jointly by a group of small-holders), and large scale producers (nucleus farmers/exporters). In as much as some of the small-holders sell directly to wholesalers on the domestic market by themselves, or through co-operatives (in case of contract), majority of the farmers sell their produce to the larger producers/exporters. Similarly co-operatives have the option of selling directly to wholesalers/retailers and to consumers, or selling their produce to exporters (due to limited capacity for most cooperatives to engage directly in export).

Different actors are involved in the entire supply chain, from producers to the export market. In the dominant open-market supply chain, until the product is sufficiently bulked up for delivery to the central market, a number of actors are involved in the collection of the seed, including farmer-traders, petty collectors, middle-sized collectors, etc (Sorsa DG., 2009). Once it has reached a certain volume for delivery to the central market, brokers are usually contacted to accept the loaded seed from a transporter and sell it to the exporter. As an alternative outlet, some local collectors also sell to Ethiopian Grain Trade Enterprise (EGTE), which is a parasternal exporter. EGTE also buys from cooperatives, which collect sesame from their members. Some producers from the Humera area also deliver their sesame directly to the central market. After the central market, the next step in the ladder is the export market, which receives

sesame after it has been cleaned and properly bagged according to the buyers' standards. A simple relationship depicting the chain map is presented below:

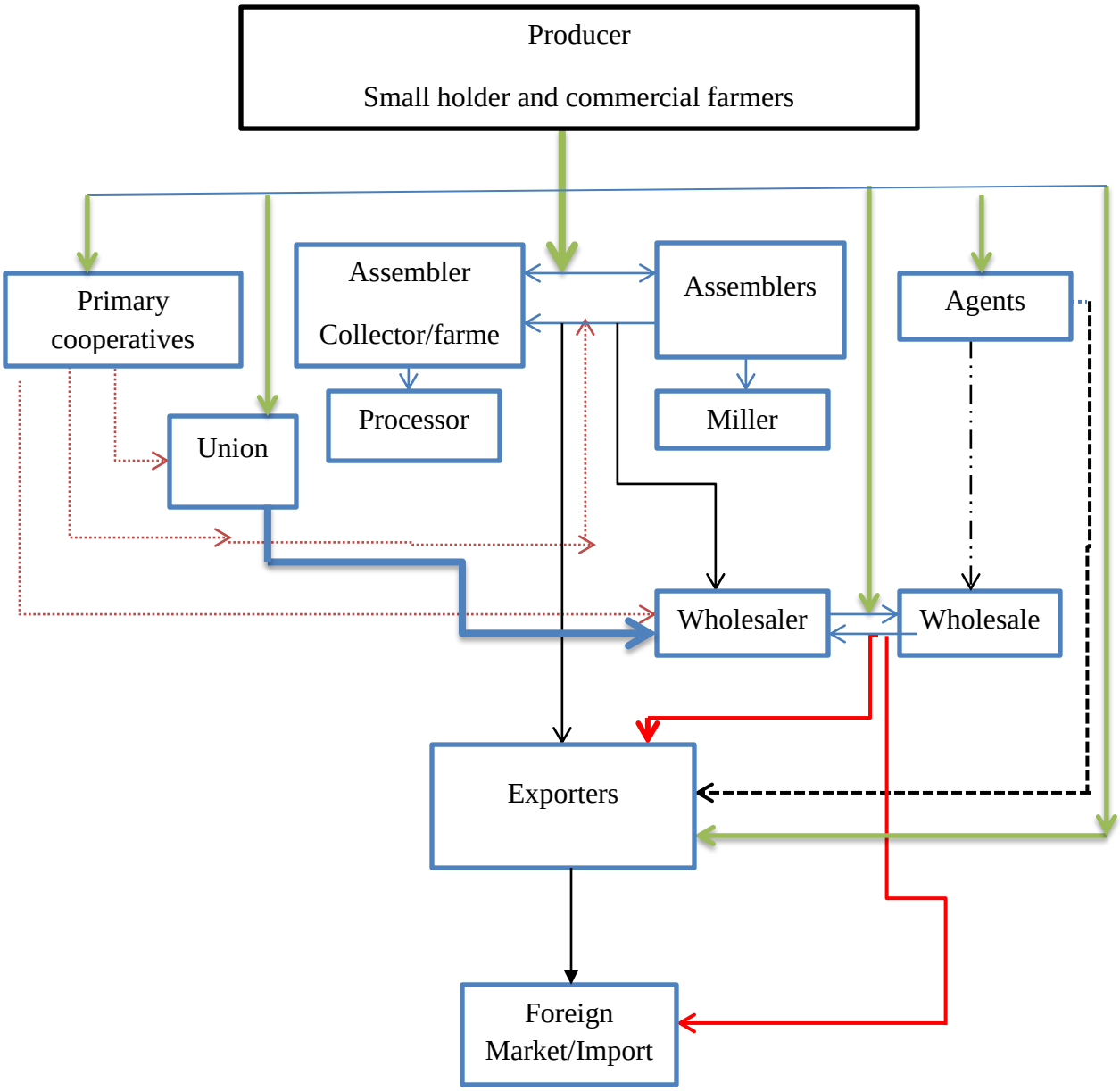

Figure 1: Sesame value chain for Ethiopia (Source: Kindie, 2007)

2.4. An over View of Ethiopia's Export

Ethiopia's export sector has shown dramatic increase in values of export in the past decades. According to Table 1 below the export has grown by 39.48% in the period 2002/3-2005/6 fiscal years relative to 1988/89-2001/2. The export has also grown by 60.95% and 99.96% in the fiscal

year 2006/7-2008/8 and 2009/10-2013/14 relative to 2002/3-2005/6 and 2006/7-2008/8 respectively. Even though the export sector has shown dramatic increase especially in 2011/12 its growth is below imports. The trade balance of the country is also reducing dramatically and negative. For example, the trade balance in the period 1988/89-2001/2 was -8.85 billion in average but in the period 2009/10-2013/14 become -116.682 trillion Birr. As the Table 1 shows that the trade balance of Ethiopia is negative through all the year, which indicates deficits of trade or export goods values were less than imported goods values.

Ethiopia's export is dominated by export of primary commodities and import of finished products. It include agricultural products mainly coffee, oilseeds, chat, flower, pulses and live animals export; and import of raw materials, semi-finished goods, fuels, capital goods, consumer goods and consumer non-durable goods.

Table1: Summary of Ethiopia's import and export in billions of Birr in the period 1988/89-2013/2014.

Year	Export	Import	Trade Balance
1998/99		11.70	-8.06
	3.64		
1999/00		11.44	-9.16
	3.96		
2000/01		12.31	-9.10
	3.87		
2001/02		15.29	-10.62
	3.86		
2002/03		15.94	-11.79
	4.14		
2003/04		22.30	-17.12
	5.18		
2004/05		31.43	-24.10
	7.33		
2005/06		38.05	-29.37

	8.68		
2006/07		45.13	-34.67
	10.42		
2007/08		63.15	-49.52
	13.55		
2008/09		84.68	-65.43
	15.09		
2009/10		108.96	-82.84
	25.82		
2010/11		129.69	-85.17
	44.28		
2011/12		191587.14	-137092.37
	54,494.77		
2012/13		196871.02	-140747.46
	56,123.56		
2013/14		251047.52	-188804.52
	62,243.00		

Source: Ethiopia's Revenues and Custom Authority and National Bank of Ethiopia (2014).

Coffee remains the major export commodity with close to 22% share in the total exports in 2013/14 according to Ethiopia's Revenue and Customs Authority export data. Oilseeds follow with 20 % share. Gold and Chat follow with 14% and 9 % share in total exports. Although coffee has remained the biggest exports there have been some shift in shares of commodities. In 1984/85 coffee accounted for 62% of the total exports and next in line were leather and leather products with 13% share in total exports. In 2013/14 the share of coffee came down to 22 % of total exports. The share of leather and leather products has declined to 4% while the share of oilseeds reached as high as 20% up from 2% in 1984/85. Flower and Gold are new exports that didn't exist in 1984/85 but their share reached 6% and 14% respectively in 2013/14. The Share of Chat has increased from 2% to 9% of total exports.

Table 2: Value of export in thousands of Ethiopian Currency (1000 Birr) by commodities in 2013/2014.

Commodity	Export 1984/85	Percent	Export 2013/14	Percent
Coffee	466300	62.62	13708114.4	22.02
Oilseeds	15600	2.10	12477209.3	20.05
leather and Leather Products	95408	12.81	2474650.1	3.98
Pulses	16875	2.27	4790442.6	7.70
Meat Products	3922	0.53	1424013.5	2.29
Fruit and Vegetables	6015	0.81	877215	1.41
Sugars	9342	1.25	0	0.00
Gold	0	0.00	8722190.8	14.01
Live Animals	19173	2.57	3553276	5.71
Chat	15903	2.14	5670685.5	9.11
Bee's Wax	3374	0.45	52045.9	0.08
Textile and Textile Products			2100917.3	3.38
Flowers	0	0.00	3817383.8	6.13
Others	92688	12.45	2574855.3	4.14
Totals	744600	100.00	62242999.5	100

Source: National Bank of Ethiopia (2014).

Generally, agricultural commodities (coffee, oilseeds, chat, flower, pulses and live animals) account almost more than 70.72% of the total export of the country during 2014/15. This confirms that Ethiopia's export is still dependent agricultural commodities, only have 1% percent reduction from1984/85 (71.70%) fiscal year. As can we seen from time memories that in terms of commodity composition although coffee continues to dominate, its relative share of total exports has been decreasing while that of other commodities is rapidly increasing on the other hand.

2.4.1. Export by Destination

According to Ministry of Trade (MoT) of Ethiopia report

Ethiopia's exports grew 5.8% in 2013/14 compared with the previous year. In the 2013/14 fiscal year the country earned USD 3.25 billion from exports. In 2012/13 Ethiopia exported to 124 countries, with twenty of those making up 77.8% of the total export revenue and bringing in USD 2.53 billion. Asia was the continent purchasing the highest amount of exported products at 37% and USD 1.2 billion in hard currency earnings. The report stated that 34 Asian countries have received Ethiopian products. 39 European countries spent USD 962 million (29.6%) on exports from Ethiopia, while Africa (USD 605 million) and America (USD 156 million) made up 18.6% and 4.8% respectively.

China replaced Somalia as Ethiopia's top export destination during 2013/14. China has taken 13.7% (USD 446.9 million) of Ethiopia's exports, according to a report from the Ministry of Trade (Ibid). Sesame and other oil seeds were the major products exported at USD 381.9 million, bumping China from second to first place in Ethiopia's export destinations. Manufactured goods like leather (USD 30.7 million) and textiles (USD 8.7million) found their way to the world's most populous nation. The top twenty export destinations have been in flux compared with the 2012/13 fiscal year, according to the MoT report. Saudi Arabia went from 5th to 4th, Israel from 10th to 8th, Turkey from 15th to 9th, United Arab Emirates from 12th to 11th, United Kingdom from 17th to 16th, Egypt from 18th to 17th, France from 21st to 19th, and Jordan from 25th to 20th on the list of top export receiving nations. Meanwhile, the Netherlands went from 4th to 5th, Sudan from 8th to 10th, Japan from 9th to 12th, Djibouti from 11 to 13th, Belgium from 13th to 15th and India from 16th to 18th.[3]

2.4.2. Sesame Seed Production and Export volume in Ethiopia

Ethiopia produces three main varieties of sesame seeds, namely T-85, Kelafo 74, and Mehado-80. Production and exports are however dominated by the T-85, Kelafo 74 varieties, which are well known in the international market. Mehado-80, locally known as Wollega, is characterized by a not so sweet taste and preferred for Sesame Oil extraction. T-85, commonly known as Humera, is recognized for its sweet aroma and taste while having lower oil content-in comparison to Wollega type. It requires intensive management during cultivation as it has high possibility of shattering. Its application is common in bakeries and confectionary. It is this seed variety that is Hulled and further processed into Tahini. Another white Sesame seed is the Kelafo 74-Gonder type-which is known for its uniformity and usually sprinkled on top of bread.

[3] http://www.dpworld-doraleh.com/china-ethiopias-top-export-destination/

Sesame production is gradually expanding to different parts of the country, and yet the dominant regions remain East Wellega, Humera and North Goner. Among the newly starting areas are Benishangul-Gumuz, the Illubabor zone of Oromiya and West Wellega. In terms of agro-ecology, the sesame seed grows in hot areas and areas with relatively brief spells of rainfall. For the first two to three years, newly cultivated land gives excellent yield (up to 10 quintals per hectare in most cases) but then gradually decreases in productivity as crops are repetitively sown on the same field (CSA, 2013).

Sesame seed as any oil seeds classified within grain crops category, nonetheless. In Ethiopia, oilseeds are grown to flavour the food consumed at home and earn some cash for peasant holders in the country. Survey indicate that a total land area of about 12,407,473.46 hectares are covered by grain crops i.e. cereals, pulses and oilseeds, from which a total volume of about 251,536,623.90 quintals of grains are obtained, from private peasant holdings. Sesame seed covered 2.42% (about 299,724.41 hectares) of the grain crop area 0.88% (about 2,202,160.53 quintals) of the grain production according to the CSA 2013/14 "Meher" season total Area and Production of Grain Crops for Private holdings report. The productivity (yields) of sesame is 7.35 per/ hectare at national level. The productivity of sesame is across different areas of the country. According to the study done in East Wellega and Humera Sesame farmers, the productivity of sesame was two quintals/hectare in east Wellega and ten quintals/hectare in Humera (Sorsa DG, 2009).

Even if the degree of problems different across different regions of Ethiopia farmers face problems include lack of improved seed, high input prices, a lack of reliable market information in general and market prices in particular, pest infestation at the vegetative stage, a shortage of land preparation equipment and labour during the picking, and harvesting time of sesame, inadequate/excessive rainfall during the vegetative stage, unexpected rainfall during harvest and the theft of sesame in the fields.

According to CSA (2012) report, around 893,883 small holder farmers were engaged in sesame production in the year 2011/12 with total annual production of around 2.5 million quintals. Although dominated by small holders, the cultivation of Sesame in Ethiopia is also accomplished by Commercial farms creating a direct and indirect employment opportunities for around 1.5 million people (CSA, 2012). In other report of CSA in 2013/14 only 689,977.00 small holder

farmers were engaged in sesame production with total production about 2,202,160.53 quintals in Meher season in 2013/14 (CSA, 2014). When we compared the area cultivated in hectare for sesame production, production in quintal and yield/hectare in 2012/13 and 2013/14 "Meher" season it showed 25.13%, and 21.4% progress in sesame production, production in quintal but 2.91 % reduction in yield of sesame per hectare.

The four major Sesame producing regions in Ethiopia are Amhara, Tigray, Oromia and Benishangul-Gumuz-each respectively holding a share of 39%, 29%, 23% and 9% to the total production volume in 2011/12 (CSA, 2012).According to FAOSTAT (average: 2002 – 2012), Ethiopia's sesame production is considered as fifth highest in the World-after Maynmar, India, China and Sudan (former).

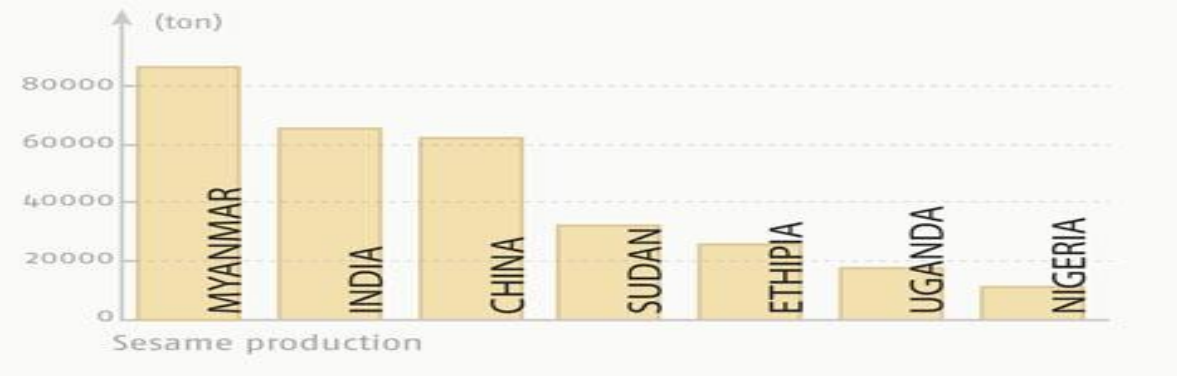

Figure 2: FAOSTAT (average: 2002 – 2012), world's top sesame producers.

As table 3 below showed sesame export was commenced in 1961. The amount of sesame seed export in the first time was 8557 tones; almost account 28% of the total domestic production of sesame (3500 tones). During the period 1961-1965 more than 156, 300 tons of sesame seed was produced in Ethiopia. Out of the total production 41.33% (64,593 tones) of sesame seed was exported to the world market. From the period 1961-1965 to 1971-1975 domestic sesame seed production has increased from 156, 300 tones to 441, 100; correspondingly percent of export volume of sesame rise from 41.33% to 69.83%. After 1975 up to 2000 the amount of domestic sesame production strictly decreasing but percentage of volume of sesame seed export during the period 1991-2000 accounts 94.96% of the total production in the same period. During 2001-2005 the amount of sesame seed export is more than the total production in that year. This happens because there was accumulated production before that period.

Table 3: Production of sesame seed and volume of sesame exports to the world market in Ethiopia (1961-2013).

Year	Production of sesame seed (in tone)	Export volume of sesame seed (in tone)	% of export volume out of production
1961-1965	156300	64593	41.3263
1966-1970	298200	137522	46.11737
1971-1975	441100	308042	69.83496
1976-1980	219000	50091	22.8726
1981-1985	180000	48804	27.11333
1986-1990	173000	26000	15.0289
1991-1995	133200	9153	6.871622
1996-2000	100267	95215	94.96145
2001-2005	296628	436705	147.2231
2006-2010	1073296	943967	87.9503
2011-2013	1296562	812141	62.63804

Source: Manipulated by the researcher based on the data obtained from FAOSTAT database (2014).

During 2006-2010 the amount of sesame seed produced is increased from 296629 during the period 2001-2010 to 1073296 (72.36% increase). Similarly, the volume of export is dramatically increase from 436705 to 943967 (50% increase); but not more than the amount produced in the year. In the recent period (2011-2013) the amount of sesame produced shown a dramatic increase to 129, 6562(17%) relative to 2006-2010. Unlike the sesame production, total volume of sesame seed export has shown a dramatic decrease from 943967 to 812141 (16.24% reduction).

CHAPTER THREE

3. METHODS AND MATERIALS

3.1. Sources of Data

The study used secondary data collected from different sources. All the data used in this study were gathered from the agricultural production, supply and trade database of FAO (FAOSTAT [4] and the United Nations Conference on Trade and Development Statistics (UNCTADSTAT[5]) and National Bank of Ethiopia (NBE) and World Bank (WB). Production of sesame, Value and volume of sesame seed export were gathered from FAOSTAT. The export price was calculated based on value and volume of exports as obtained. Data gathered from the UNCTADSTAT include foreign direct investment (Net inflows). Real effective exchange rate obtained from National Bank of Ethiopia .Data gathered from WB includes measure of trade openness (TOT). Even though, sesame seed export from Ethiopia was commenced in 1961, due to unavailability of all variables from 1961 we used yearly data's covered from the period 1970 up to 2013 only.

3.2. Methodology of the Study

The study uses descriptive and inferential analysis tools. In descriptive analysis we used tables, graphs and percentages in order to elaborate the findings. As inferential analysis tools Johansen cointegration and Engel Granger short run error correction methods were employed.

3.2.1. Model Specifications

In this study, two primary equations was estimated; one with value of exports as the explained variable, and the other with volume of exports as the explained variable. Use of two different explained variables will help to identify how the effects of the respective explanatory variables on one explained variable (volume of exports) translate into the other (value of exports).

[4]FAOSTAT: Agricultural production, supply and trade database:
Available:http://faostat.fao.org/site/342/default.aspx . Accessed online on January 28, 2014

[5]United Nations Conference on Trade and Development. Available:
http://unctadstat.unctad.org/ReportFolders/reportFolders.aspx . Accessed online on January 28, 2014

Based on the empirical literature reviewed and objective of this study, our model is specified econometrically as follows holding the following a priori expectations (for both value and volume of exports):

$$EXPORTVALUE = f(PRODUCTION, \text{EXPORTPRICE}, \text{REER}, \text{TOT}, \text{FDI})$$
$$\text{EXPORTVOLUME} = \text{f(PRODUCTION, EXPORTPRICE, REER, TOT, FDI)} \quad (1)$$

At estimation stage taking logs of the variables in equation (1) and differentiating with respect to time gives the trend of exports of sesame seed as:

$$Ln(EXPORTVALUE_t) = \beta_0 + \beta_1 \ln(PRODUCTION_t) + \beta_2 \ln(EXPORTPRICE_t) + \beta_3 \ln(TOT_t) + \beta_4 \ln(REER_t) + \beta_5 FDI_t + \varepsilon_t$$

$$Ln(EXPORTVOLUME_t) = \beta_0 + \beta_1 \ln(PRODUCTION_t) + \beta_2 \ln(EXPORTPRICE_t) + \beta_3 \ln(TOT_t) + \beta_4 \ln(REER_t) + \beta_5 FDI_t + \varepsilon_t$$

Ln(EXPORTVALUE): Log of value of sesame exports

Ln(EXPORTVOLUME): Log of volume of sesame exports

Ln(PRODUCTION): Log of domestic production of sesame.

Ln(EXPORTPRICE): Log of export price of sesame seed

Ln(TOT): Log of Terms-of-Trade Index of exports (measure of trade openness)

Ln(REER): Log of real effective exchange rate.

FDI: Net inflow of Foreign Direct Investment

β's are unknown parameters to be estimated, t is time in years (1970-2013) and ε is random terms that are independently and identically distributed with mean zero and constant variance δ^2. Use of FDI in level instead of logging it is to make the specification externally valid. Some values under the scope of the study period (1970-2013) are negative. This could preclude logging for extended period. In addition, data for some countries from the developing world shows negative net inflows in a significant number of years, and using log of FDI may require

modification of our specification in situations where researchers want to apply the exact equation in their study.

Sesame Seed Export

Sesame Seed export here is considered in terms of volume and values of export. A value of export is the annual values (in 1000US $) and Volume of export is Volume (In tons) of sesame seed exported from Ethiopia to the rest of the world.

Domestic production (PRODUCTION)

Domestic production is production of sesame seed in Ethiopia annually. High production of sesame leads to high amount of sesame seed supply for export in turn leads to high value of export earnings. Thus, it is expected to have positive effect on sesame export.

Foreign Direct Investment (FDI)

FDI could represent a measure of production development in the export sector. It can be expected to contribute to the enhancing of a country's competitiveness on international markets by increasing the technological content of exports. FDI is included in this study as stock since FDI stock measures its productive capacity. As it is believed that transformation of the composition of exports increases with FDI, then the sign of this variable is expected to be positive.

Real Effective Exchange Rate (REER)

Since Ethiopia do not conduct all their trade with a single foreign country, policy makers are not so much concerned with what is happening to their exchange rate against a single foreign currency but rather what is happening to it against a basket of foreign currencies with which the country trade. The effective exchange rate as a measure whether price of the currency is appreciating or depreciating against a weighted basket of foreign currencies.

The calculation of the average real effective exchange rate is based on the IMF definition of the real exchange rate that is real effective exchange rate as price of domestic currency against foreign currency:

$$REER = \sum_{i=1}^{n} \frac{(NEER_i)P}{p_i^*}$$

Where i is each individual country trade with Ethiopia; n is number of countries trade with Ethiopia.

NEER is the nominal effective exchange rate, P* is the consumer price index of the foreign country (Here basket of foreign country trade with Ethiopia and P is the domestic consumer price index (Ethiopia in this case).

Appreciation of the real exchange rate enhances the competitiveness of the domestic goods and for the foreign goods. On the other hand, depreciation in real exchange rate will decrease competitiveness of home goods in international markets due to higher domestic price from foreign price. Therefore, negative relationship is expected between real effective exchange rate and export growth.

Trade openness (TRADEOPNESS)

Terms of trade is defined as the ratio of the price of imports to price of exports (both in US currency) and favorable terms of trade are associated with increased export growth rates, so its effect is expected to be positive.

Export price (EXPORTPRICE)

The export price here is the average price of sesame seed in the international market. The export price is calculated based on value and volume of exports as follows:

$$Export\ \text{price} = \frac{\text{Value of Export}}{\text{Volume of Export}}$$

The outcome will be $/ton.

The price of exports on the international market is one of the major determinants of export growth especially for countries which depend on exportation of agricultural products whose prices fluctuate from time to time. As a result of it assume that it affects positively for the growth of country's export.

3.2.2. Estimation Procedure

The time series properties of the data set used in this study was first be examined by employing vigorous tests for stationarity. There are several methods of testing for stationarity (example: tests of stationarity based on Correlogram, the Box-Pierce, Q-statistic and the Ljung-Box (LB)

statistic. This paper will however employ the unit root test for stationarity using the Dickey-Fuller as well as Augmented Dickey-Fuller (ADF) tests will be carried out using E-Views.

After performing the unit root tests for stationarity, cointegration analysis was also e employed to determine the long run relationship of the variables entering the values and volumes of sesame seed model independently. To determine the short run relationship of variables error correction method was also employed. Finally, all assumptions of models for long run and short run equations were also analysed..

3.2.2.1. Cointegration

Cointegration analysis can be used to evaluate the co-movement of a long-term value and volume of sesame seed export within an equilibrium model. Firstly, cointegration analysis establishes a long term relationship by calculating long-run equilibrium asset prices. Next, correlations within an error correction model are estimated. Therefore, stochastic trends common to the respective time series are found prior to the cointegration analysis.

Cointegration analysis was introduced by Engle and Granger in the early 1980s, with improvements and additions made in subsequent years. Cointegration is a modeling process that incorporates non-stationarity with both long-term relationships and short-term dynamics. To examine time series in financial data using cointegration, the time series in its level form should be non-stationary and integrated of order 1, written as I(1). Integrated of order 1 means the series becomes stationary after differentiating it once. Variables are said to be cointegrated if they are I(1) and have a linear combination which is stationary without the need to differentiate the data.

There are two main cointegration methods that have consistently been used throughout past studies which are: 1) Engle-Grangers Two Step Estimation Method; and 2) Johansen's Maximum Likelihood Method using either the Trace Statistic and/or the Maximum Eigenvalue Statistic.

Our study uses the Johansen's Method due to reasons mainly relating to the shortfalls of Engle-Grangers Two Step Estimation Method. The Two Step Estimation Method is very easy to run, however it needs a larger sample size to avoid possible estimation errors and can only be run on a maximum of two variables (Brooks, 2008). It also doesn't allow for hypothesis testing on the

cointegrating relationships themselves, unlike Johansen's method (ibid). Since we are also examining a total of 5 variables on export volume and value of export, we want the ability to examine them in a multivariate framework, allowing for the possible discovery of more than one cointegrating vector, which the Engle-Granger Method cannot accomplish. In this situation, Johansen's Method better suits the data, due the fact that it can examine more than two test variables, and can treat all test variables as endogenous.

3.2.2.1.1. Stationary Series and Stationarity Test

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 depends 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 G., 2002).

According to Madala (1992), a time series is said to be strictly stationary if the joint distribution of any set of N observations $Y_1, Y_2, ...Y_t$ is the same as the joint distribution of $Y_{1+k}, Y_{2+k}, ...Y_{t+k}$ for all N and K. The distribution of Yt 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 (J. Gudeta, 2010).

Therefore, it is necessary to check whether or not the variables included in the model are stationary or not before going to the next step which is regression analysis.

Stationarity of time series data is detected through unit root test. Unit-roots are important to detect the stationarity of time-series data. To test if the series, used have unit-roots we will apply a test based on the work of Fuller (1976) and Dickey and Fuller (1979, 1981). The Augmented

Dickey-Fuller test is a similar but modified version of the Dickey-Fuller test which is used when error term is not a white noise. While testing for stationary, 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) (Verbeck, 2004).

3.2.2.1.2. Johansen's Cointegration Method

After completion of unit root testing on our time series, assuming all our time series are integrated of the same order, we conduct a bivariate Johansen test between each of our 6 indices The main analysis we conduct is a multivariate Johansen test on all 6 of the indices so that we can investigate cointegration involving all variables instead of analysis only at the bivariate level.

The Johansen process is a maximum likelihood method that determines the number of cointegrating vectors in a non-stationary time series Vector Auto-regression (VAR) with restrictions imposed, known as a vector error correction model (VEC). Johansen's estimation model is as follows:

$$\Delta X_t = \mu + \sum_{i=1}^{p} \Gamma_i \Delta X_{t-i} + \alpha\beta' X_{t-i} + \varepsilon_t \qquad (2)$$

Where

X_t = (n x 1) vector of all the non-stationary indices in our study

Γ_i = (n x n) matrix of coefficients

α = (n x r) matrix of error correction coefficients where r is the number of cointegrating relationships in the variables, so that 0< r< n. This measures the speed at which the variables adjust to their equilibrium. (Also known as the adjustment parameter)

β = (n x r) matrix of r cointegrating vectors, so that 0 < r< n. This is what represents the long-run cointegrating relationship between the variables.

In determining lag lengths for the Johansen's procedure, we chose between using Akaike's (AIC) and the Schwarz's Bayesian (SBIC) information criterion processes. The SBIC is usually more consistent but inefficient, while AIC is not as consistent but is usually more efficient (Brooks, 2008). As per Brooks (2008), SBIC will usually give a larger average variation in selected model orders and AIC is known to avoid this situation, therefore our study prefers to use AIC over SBIC in determining lag lengths. Literature surrounding cointegration analysis have used both AIC and SBIC with neither alternative firmly agreed upon between studies.

Johansen (1991) defines two different test statistics for cointegration under his method: the Trace Test and the Maximum Eigen value Test. The Trace test is a joint test that tests the null hypothesis of no cointegration ($H_0 : r = 0$) against the alternative hypothesis of cointegration ($H_1 : r \geq 0$. The Maximum Eigen value test conducts tests on each eigen value separately.

It tests the null hypothesis that the number of cointegrating vectors is equal to r against the alternative of r+1 cointegrating vectors (Brooks, 2008).

$$\lambda_{trace}(r) = -T \sum_{i=r+1}^{g} \ln(1 - \hat{\lambda}_i) \ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

$$\lambda_{\max}(r, r+1) = -T \ln(1 - \hat{\lambda}_{r+1}) \ldots\ldots\ldots\ldots\ldots\ldots \quad (4)$$

A significantly non-zero Eigen value indicates a significant cointegrating vector.

3.2.2.2. Granger Causality Test

In multivariate time series analysis, causality test is done to check which variable causes another variable. Given two variables X and Y, X is said to Granger causes Y if lagged values of X predicts Y well. If lagged values of X predict Y and at the same time lagged values of Y predict X, then there is a bi-directional causality between X and Y.

According to Granger (1988), the existence of cointegration between X and Y must be checked before running causality test. If cointegrating relationship is found, then there must exist causality in at least one direction. To test for causality the, first the following cointegrating equations need to estimate through OLS.

$$X_t = \alpha_0 + \beta_0 Y_t + \xi_t \qquad (5)$$

$$Y_t = \alpha_0 + \beta_0 X_t + \xi'_t \qquad (6)$$

Assuming that X and Y are I (1), Cointegration implies that the residuals ξ and ξ' be I(0).

Having found that the variables X and Y are cointegrated, the error correction models are formulated as follows:

$$\Delta X_t = a_0 + b_0 \xi_{t-1} + \sum_{i=1}^{M} C_{oi} \Delta X_{t-i} + \sum d_{oi} \Delta Y_{t-i} + \varepsilon_t \qquad (7)$$

$$\Delta Y_t = a_0 + b_0 \xi'_{t-1} + \sum_{i=1}^{M} C_{oi} \Delta Y_{t-i} + \sum d_{oi} \Delta X_{t-i} + \varepsilon_t \qquad (8)$$

The error correction terms ξ_{t-1} and ξ'_{t-1} are the stationary residuals from the cointegration equations (5) and (6) respectively. By including these terms in equations (7) and (8), the error correction models introduce an additional channel through Granger causality can be detected. In equation (7) Y is said to Granger cause X not only if the d_0 's are jointly significant, but also b_0 is significant. The error correction model allows for the finding that Y Granger cause X as long as the error-correction term carries a significant coefficient even if the d_0 's are not jointly significant.

CHAPTER-FOUR

4. RESULT AND DISCUSSION

4.1. Descriptive Results

Table 4: Descriptive statistics

	Export volume	Export value	Export price	Production	Trade openness	FDI	ER
Mean	62951.30	69928.50	849.0723	76003.77	0.282807	137.7955	5.756045
Median	19119.50	10741.00	800.8236	37500.00	0.212905	15.50000	2.651500
Maximum	317920.0	516206.0	2150.016	327741.0	0.598647	953.0000	19.76000
Minimum	246.00300	283.0000	234.4548	15634.00	0.108307	3.00000	2.070000
Observations	44	44	44	44	44	44	44

Table 3 above shows the general features of the data. The maximum export volume and value of sesame seed export was 317920 ton and 516, 206, 000 USD dollars respectively. Similarly, the minimum amount of export volume and value of sesame seed was 246 ton and 283000 USD dollars per year respectively. The average export amount in the period 1970-2013 is 62951.30 ton per year, which is an almost account 82.83 % of the average produced sesame seeds. On average 699, 28, 000 USD dollars was obtained per year from sesame seed export. During the period (1970-2013) averagely 76003.77 tons of sesame seed was produced. From this on average 82.83 % were provided for the export market with an average price of 849072.3 USD dollar/ tone.

Trade openness displays the sum of import and export share of GDP. On average sum of import and export account 28.28 % of the average GDP of the country during 1970-2013.The maximum and minimum average shares of sum of import and export per year were 59.86% and 10.83 % of GDP respectively.

Trends of volume (quantity) and value of sesame seed export has shown a fluctuating trend through the year 1970-2013.In the first two years of 1970 both values and volumes of sesame seed export has shown a dramatic increase and then from 1973 up to 1979 shown a dramatic decrease in both values. Then after up to 1992 both showed short period fluctuations. The minimum export amount of sesame seed was recorded in 1992 and the minimum value of currency obtained from sesame seed export was recorded in 1993. This was the transition period of the country followed by the fall of Dergue regime. Even if the trend is fluctuating both values and volumes of export show increment through time since 1993, but after 2013 export quantity shown a decreasing trend.

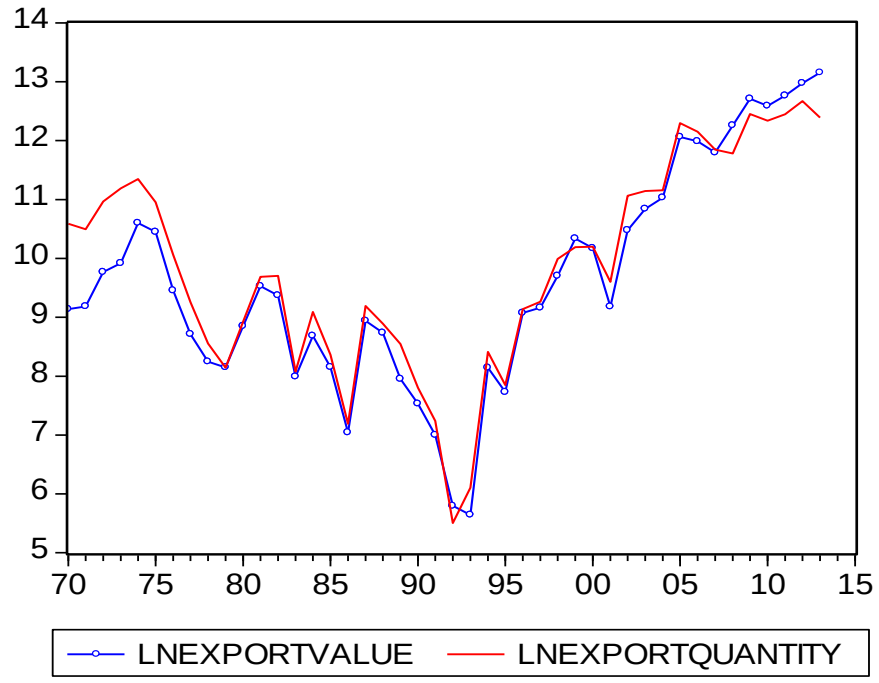

Figure 3: Trends of export value and volume of sesame seed

4.2. Unit Root Tests

Our study has tested each time series individually to ensure non-stationarity at the levels, and also run the unit root tests on the first differences to ensure I(1). The Augmented Dickey-Fuller (ADF) test shows for all 6 indices that the level data was non-stationary; however stationarity was reached after the first difference. As discussed in the methodology section, this means all of our data is integrated of order one, I (1), a requirement for Johansen's cointegration analysis.

Our test results are significant at the 1% significance level for the log transformations of export volume and values of sesame, exportprice, term of trade and FDI under all model specification options. The log transformation of exchange rate is also stationary at the 5% significance level.

Table5: The ADF unit root test results for each variables independently.

Variable		With intercept		With trend and intercept	
		At level	At 1st difference	At level	At first difference
LNEXPORTQUANTITY		-1.2495	-6.9614**	-1.8022	-7.0792**
LNEXPORTVALUE		-0.7465	-6.8298**	-1.5631	-6.9474**
LNPRODUCTION		-0.7761	-4.7187**	-0.8499	-5.1934**
LNEXPORTPRICE		-2.4074	-8.4383**	-3.3957	-8.3294**
LNREER		0.3766	-3.6799**	-2.4738	-4.03053*
LNTOT		-0.9002	-6.7233**	-1.9398	-6.6227**
FDI		0.0137	-10.2211**	-1.7763	-10.3514**
Critical values	At 1%	-3.5924	-3.5966	-4.1865	-4.1923
	At 5%	-2.9314	-2.9331	-3.5181	-3.5208

*Unit root is rejected at 5% critical level and ** Unit root is rejected at 1% critical level.

4.2. Estimation of the Long Run and Short Run Models

Having established the order of integration of the variables that enter the sesame seed export values and volumes model in the previous section, this section will go a step further in trying to determine the maximum number of cointegrating vectors that appropriately span the variables entering the VAR for the current analysis. However, before proceeding to the Johansen's estimation procedure, a test for the appropriate lag length of the VAR was carried out.

Table 6: Lag determination of VECM of export volume of sesame and its covariates in Ethiopia

VAR Lag Order Selection Criteria
Endogenous variables: lnexportvolume lnexportprice lnproduction lnreer lntot lnfdi

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-385.2468	NA	7.830352	19.08521	19.33598	19.17653
1	-176.5442	346.1409*	0.001753*	10.66069*	12.41606*	11.29990*
2	-147.3280	39.90515	0.002740	10.99161	14.25158	12.17871
3	-107.1781	43.08762	0.003091	10.78918	15.55374	12.52417

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level); HQ: Hannan-Quinn

information criterion ; FPE: Final prediction error ; AIC: Akaike information criterion; SC: Schwarz information criterion

The results above show that the LR, FPE, AIC, SC and the HQ test all chose one lags. This means our export volume of sesame and its covariate multivariate model will be explained by one lag. The lag length for export volume equation was also similar (see in the Appendix, Table 11).

Once we have determined the number of lags, our next task is to test for cointegration amongst the variables. Therefore, following the stationarity testing, multivariate Johansen testing was carried out in order to determine the number of long run equation, as per the process outlined in the methodology section. Results for the 1970-2013 year sample periods are presented in the following sections.

Table 7: Johansen cointegration result-Trace test

Trend assumption: No deterministic trend (restricted constant)

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.657875	121.1527	103.8473	0.0022
At most 1	0.478285	76.10446	76.97277	0.0581
At most 2	0.372162	48.77786	54.07904	0.1366
At most 3	0.258652	29.22798	35.19275	0.1906
At most 4	0.221553	16.65802	20.26184	0.1458
At most 5	0.135985	6.138958	9.164546	0.1803

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

The Trace Test in Table 6 indicates the existence of 1 cointegrating equation at the 5% significance level. This cointegrating equation means that one linear combination exists between the variables that force these indices to have a relationship over the entire 44 year time period, despite potential deviation from equilibrium levels in the short-term. In order to confirm the results of the Johansen's Trace test, we also displayed the results of the Maximum Eigen value test in Table 8 below.

Table 8: Cointegration Rank Test (Maximum Eigen value) for export values of sesame seed

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.657875	45.04828	40.95680	0.0164
At most 1	0.478285	27.32660	34.80587	0.2954
At most 2	0.372162	19.54988	28.58808	0.4474
At most 3	0.258652	12.56995	22.29962	0.5988
At most 4	0.221553	10.51907	15.89210	0.2894
At most 5	0.135985	6.138958	9.164546	0.1803

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

The Maximum Eigen value Test also shows 1 cointegrating equations at the 5 % level confirming the Trace Test. Therefore these two tests confirm a cointegrating relationship over the 44 year sample period. Similarly, the cointegration trace and rank test for export volume series have also similar result and the result is shown in the appendix (Table 12).

4.2.1. The Long-Run Equation

The result of Johansen approach cointegration test confirmed the existence of single long run equilibrium equation for both export volume and export value series. For our interest, Johansen cointegration test provided us with the estimation of the determinant of export volume and value of sesame long run equilibrium equation.

Since we have identified the existence of one cointegrating equation, we can say that a stable equilibrium relationship is present. The results are normalized on the LNEXPORTVALUE and LNEXPORTVOLUME. Due to the normalization process, for Eviews output the signs are reversed to enable proper interpretation.

Since all variables except FDI are used in the logarithmic form, the estimated coefficients can directly be interpreted as long term elasticity. Coefficients of the log transformed values of world domestic production of sesame seed, export price of sesame seed, real effective exchange rate, terms of trade significantly affect values of sesame export at 1% level of significance. Net inflow of foreign direct investment has also significance influence on export values of sesame seed

export at 5% level of significance. Similarly, the table result below showed that except export price of sesame seed all are significantly affect sesame seed export volumes like sesame seed export values.

Table 9: The long run Cointegrating results of Sesame seed export value and volume.

Cointegrating Eq:	LNEXPORTVALUE	LNEXPORTVOLUME
LNPRODUCTION	-1.781782** (0.16585) [-10.7432]	-1.781782** (0.16585) [-10.7432]
LNEXPORTPRICE	-0.878215** (0.28923) [-3.03641]	0.121785 (0.28923) [0.42107]
LNREER	6.899916** (1.29225) [5.33947]	6.899915** (1.29225) [5.33947]
LNTOT	-5.302701** (0.83532) [-6.34808]	-5.302700** (0.83532) [-6.34807]
FDI	-0.002830* (0.00124) [-2.28304]	-0.002830* (0.00124) [-2.28304]
C	-2.436073	-9.343826
	Wald(chi^2)=6266.337** P>chi2= 0.0000	Wald(chi^2)=4286.421** P>chi2= 0.0000

Note: (d=differenced once) Adjustment coefficients (standard error in parentheses) [T-statistics in brackets]* Significant at 5 % level of significance ** significant at 1% level of significance.

The long run elasticity of sesame seed export value and volume with respect to production of sesame is 1.7817. It predicts that 1 % increase in production of sesame seed associated with 1.78% increase in value and volume of sesame seed export in the long run. This may be happen because the rise in production may increase supply of sesame products to the international markets and its gain from exporting more products.

World export price of sesame seed affects the values of sesame seed export positively in the long run as the expectation. The long run elasticity of export value of sesame seed with respect to export price of sesame seed is 0.8782. The values indicates that, a 1% increase in world sesame seed price leads to 0.88% rise in value of exported sesame seed from Ethiopia. This means that, 1 US $ increase in export price of sesame leads to 878US $ increase in export value. Contrary, the volume of sesame seed export is negatively affected by export price even though its impact is insignificant at 5% level of significance. This may be because when exports price of sesame rises world competition to sell sesame seed in the international market may rise and this in turn leads to a decrease in demand of Ethiopian sesame seed in the international market. Some studies done in Ethiopia have also found a significant relationship between export price and export of agricultural products. For example, the study done by Zelalem and Tekie (2011) on export supply of coffee through OLS estimation found that export price of coffee has a significant positive impact on export volume of coffee. In other studies Hailegiorgis (2010) couldn't find a significant relationship between export price and export performance of oil seeds from Ethiopia in the long run as well as short run even if the direction is positive.

The long run elasticity of both value and volume of sesame seed export with regards to real effective exchange rate of Ethiopia is equal to -6.8999. The value interpreted as, a 1% increment in the real effective exchange rate decreases the sesame seed export value and volume of sesame seed export by 6.90% per year in the long run. It coincides with the theoretical expectation that a fall in domestic prices due to exchange rate depreciation makes exports cheaper in the global market, and this consequent stimulates demand. Few studies done in different agricultural export products find different results on effects of nominal exchange rate and real effective exchange rate. Most of the studies done on raw agricultural products export have found a positive and significant contribution (Hailegiorgis, 2010; Samuel, 2012; Yusuf and Yusuf, 2007; Nwachuku, 2010) with nominal exchange rate. Similarly, in the manufacturing sector, textile industry export from Ethiopia founded a negative relationship between nominal exchange rate and textile export (Yared and Mulat, 2010). The study done by Eyayu (2014) on 47 Sub Saharan African countries also found that real effective exchange rate affects agricultural export of SSA positively but the coefficient is insignificant. With happens some studies has also found negative relationship between export and real exchange rate (Sharma, 2000; Cline, 2004 and Kuwornu, 2009).

Measure of trade openness (TOT) was found to be significant in the estimation of sesame seed export value and volume at 1% level of significance. The sign of the long run elasticity of sesame seed with respect to terms of trade was positive, in conformity with the theoretical expectations of trade liberalization for export. These values reveal that 1% increase terms of trade associated with 5.3027 increases in both export value and volume of sesame seed export per year. The study done on manufacturing sector by Yared and Mulat (2010) confirmed that 1% trade liberalization (openness) affects the textile and apparel industry export positively by 11.79 percent per year. In other studies conducted by David, et al. (2010) TOT yields positive impact for both the value and volume of exports of fresh pineapple from Ghana (David, et al., 2010). Other studies also confirmed that there is a positive relationship between export and terms of trade, for example, Ngouhouo (2013) in Cameroon, Agasha (2009) in Uganda, and Samuel (2012) in Ethiopia.

Under favorable domestic production and marketing conditions, foreign direct investment (FDI) stands fueling export growth in less developed economies. As expected net inflow of FDI has a statistically significant and positive contribution to export value and volume of sesame seed in Ethiopia at 5% level of significance. The coefficients of FDI is equal to 0.0028, indicates that 1 % increase in net inflow of FDI leads to $e^{0.0028}$=1.0028% increase in export values and volumes of sesame seed from Ethiopia.

Generally, domestic production of sesame, world export price of sesame seed, real effective exchange rate, and terms of trade and net inflow of FDI significantly affect export values of sesame seed in the long run. In the same way, except export price of sesame seed all factors have the same impact as sesame values on export volume of sesame seed. All have the expected relationship with export values. But, export price relationship with export value is different from the theoretical expectation.

Looking at the overall goodness of fit of estimations of the model (Wald test), it can be concluded that the specified models explain the export value and volume of sesame seed to a sufficient extend. The results of various diagnostic tests like the Breush-Godfrey Lagrange Multiplier (LM) test for serial autocorrelation, the autoregressive conditional hetroscedasticity test, the Jarque-Bera test for normality, the White's test for hetroscedasticity and Ramsey's general test of model misspecification are reported and all tests did not detect any problem of

serial correlation, hetroscedasticity, non-normality and model misspecification (See in the Appendix Table 15-22).

4.2.2. The Short-Run Equation

Having already obtained the long-run model and estimated the coefficients, the next step will be estimation of coefficients of the short-run dynamics that have important policy implications. Granger proved that cointegrated series can be modeled by ECM as well as the fact that variables entering an error correction mechanism are cointegrated. By building an ECM with the variables entering the cointegration equation, a relationship containing both the long and the short run information is obtained. Here the lagged differences of the listed variables capture the short run change in the corresponding level, while the error correction term (ECM) capture the long run adjustment impact.

Hence, an error correction model was estimated that incorporates the short-term interactions and the speed of adjustment towards long run equilibrium. In the error-correction model, the short-run disequilibrium is approximated by the first lag of the estimated long-run linear combination. In our case, the short run equation relates the differences of log transformed export volume and value of sesame seed export with the difference of LNPRODUCTION, LNEXPORTPRICE, LNTOT, LNREER, FDI and the error term in the lagged periods.

Before fitting the final model we have checked assumptions of the model. Accordingly, the results of diagnostic tests are reported and the tests did not detect any problem of hetroscedasticity, non-normality, serial autocorrelation and model misspecification (Table 24-26 and Figure 6).

The table below indicates that, in the short run equation, production of sesame have a significant positive coefficient at 1% level of significance like the long run equation. The short run elasticity of sesame seed export value and volume with respect to production of sesame are equal to 1.4572 and 1.8016 respectively. Therefore, a 1% increment of sesame seed production only rise the short run value and volume of sesame export by 1.46 % and 1.80% respectively.

Similarly, world sesame seed export price significantly affect export volume of sesame seed but not export value of sesame seed in the short run at 5% level of significance. The short run elasticity of sesame seed volume of export with respect to world sesame seed price is -0.9116; indicate that 1% increase in the price of world export price of sesame seed leads to decrease

volume of sesame seed export by 0.91%. The increase in price of world sesame seed tends to increase value of sesame seed even if the coefficient is insignificant at 5 % level of significance.

In contrast to the long run, export value and volume of sesame seed is less elastic with the change in the real effective exchange rate, terms of trade and net inflow of FDI in the short run. The short run elasticity of export value and volume sesame seed with respect to REER are 2.6633 and 2.6513 respectively; but insignificant at 5 % level of significance. This indicate that real effective exchange rate affects sesame seed export of Ethiopia positively but the insignificant coefficient indicates that appreciating the real effective exchange rate is little to do with enhancing sesame seed export of Ethiopia in the short run. The elasticity values are positive the same to the long run equation.

Table10: Short run model (Error correction mechanism)

Variable	D(LNEXPORTVALUE)	D(LNEXPORTVOLUME)
D(LNPRODUCTION)	1.4572** (0.4128) [0.0011]	1.8016** (0.4480) [0.0003]
D(LNEXPORTPRICE)	0.1043 (0.3638) [0.7760]	-0.9116* (0.3934) [0.0261]
D(LNREER)	2.6633 (1.5833) [0.1010]	2.6513 (1.7275) [0.1333]
D(TOT)	-1.2467 (0.8114) [0.1329]	-1.4566 (0.8867) [0.1089]
D(FDI)	0.00011 (0.0006) [0.8537]	-0.0005 (0.0006) [0.9389]
ECM(-1)	-0.5948** (0.1229) [0.0001]	-0.4925** (0.1284) [0.0005]
R-squared	0.4441	0.4231
Adjusted R-squared	0.3690	0.3451
S.E. of regression	0.63398	0.6852
F-statistic	2.4696 P.Value=0.0000	2.4696 P.Value=0.0000
Log likelihood	-38.1856	-41.5283
Durbin-Watson stat	1.6131	1.5746

Note: (d=differenced once) Adjustment coefficients (standard error in parentheses) [P-value in brackets]

* Significant at 5 % level of significance ** significant at 1% level of significance.

Similarly, the direction of the relationship TOT with export value and volume of sesame seed is negative and unlike the long run relationship. The direction of the short run relationship of FDI with export value of sesame seed is the same to the long run relationship; which is positive. But, the short run elasticity coefficient of export value of sesame seed with respect to net inflow of FDI is negative in contrast to the long run.

The speed of adjustment coefficient is significant at 1% critical value with the correct (negative) sign. This means with the adjustment speed, the rate of variation of the volume and value of sesame seed export in the ECM system is adjusted towards the dynamic equilibrium long run cointegrating relationship. According to this estimate, short run value and volume of sesame seed export disequilibrium is corrected at speed of 59.48%and 49.25% per year respectively.

Totally, both value and volume of sesame seed exports from Ethiopia are noted to decrease with increasing real effective exchange rate in the long run. But in the short run the increase in REER leads to increase in value and volume of sesame seed export but the effect is insignificant. The change in world sesame seed price level has a positive and significant impact on value of sesame seed export in the long run but positive; and its impact is insignificant in the short run. With this in hand, productions of sesame seed have positive and significant impact on both value and volume of sesame seed export in the short run and long run. The direction of the relationship TOT with both values and volumes of sesame seed export is opposite to the long run relationship and its impact is insignificant in the short run. The direction of net inflow of FDI with export value and volume of sesame seed is the same with the long run relationship.

4.2.3. Granger Causality Test

The other two are the issues of causality and simultaneity. In order to tackle the simultaneity problem, previous studies either performed causality test or employed a simultaneous equation model. Simultaneous equation model is estimated in order to take into account the idea that there is simultaneity or feedback relationship between value or volume of export sesame seed and its covariate and to examine the indirect impact.

The causality test is conducted by taking into account the cointegration and error-correction formulation of the variables. It has already been shown that both output and exports are I(1) variables. What remains is to check whether these two variables are cointegrated in the Engle-Granger sense. The result of the cointegration test based on the Engle-Granger two-step procedure is reported in Table 13 and Table 14 in the appendix.

The error-correction term opens up an additional channel of Granger causality so far ignored by the standard Granger (1969) and Sims (1972) tests. The Granger causality can be evidenced through the statistical significance of the t-test of the lagged error correction term(s) or the F-test applied to the joint significance of the sum of the lags of each explanatory variable (Masih and Masih, 1996). Here, the Granger-causality conducted by the F-statistic of the lagged error-correction coefficient suggests statistically significant long-term bidirectional causation between two variables, i.e. export value and volume of sesame seed causes real effective exchange rate devaluation and real effective exchange rate also causes export of sesame seed at 10% level of significance. But at 5% level of significance only REER causes export values and volumes of sesame seed.

Therefore, the result of Granger causality test from the error correction model indicates a different channel through which real effective exchange rate could cause change in export value of sesame and export volume. Export value or volumes of sesame seed causes domestic production of sesame seed at 5 % level of significance. But the remaining variables have no causal relationship with export volume of sesame at 5% level of significance.

CHAPTER 5

5. CONCLUSION AND POLICY IMPLICATIONS

5.1. Conclusion

In identifying the key determinants of Sesame exports from Ethiopia, effort was made to estimate separate regressions with value of exports and volume of exports being the explained variables in the respective regressions. The study reveals that, the results found in the short run and long run equations for both values and volumes of sesame seed are different.

In the long run, domestic productions of sesame seed, real effective exchange rate, terms of trade and FDI have a significant impact on both value and volume of sesame seed export. Except real effective exchange rate all have a positive relationship with both value and volume of sesame seed export. But in the short run, only domestic sesame production have a significant positive effect on export values and volumes of sesame seed export.

Export price of sesame seed have a significant and positive effect on export values of sesame seed in the long run; its effect is statistically insignificant in the short run. But export price of sesame seed have negative and statistically insignificant relationship with export volume of sesame seed in the long run.

The direction of the short run relationship between values and volumes of sesame seed export, terms of FDI is the same to the long run relationship; it is positive. The long run coefficients of terms of trade and real effective exchange rate sign different from the short run relationship.

From granger causality test we conclude that real effective exchange rate unidirectional causes export volume or values of sesame seed. Export volumes and values of sesame seed causes domestic production of sesame seed but domestic production could not causes sesame seed export. But the other variables have no causal relationship with sesame seed export.

Moreover, we conclude that both values and volumes of sesame seed export and covariates are related to past deviations (error-correction terms) from the empirical long-run relationship. It

implies that both variables in the system have a tendency to quickly revert back to their equilibrium relationship.

Totally, as expected from the theory high sesame production, a fall in real effective exchange rate, a rise in export price, improvement of direct investment in the country, and trade liberty increase gain from sesame seed export (export value). But rise in export price could not increase volume (amount) of sesame seed export from Ethiopia. Keeping this, except export price others listed above conditions should increase export volume of sesame seed from Ethiopia.

5.2. Policy Implications

The implication of these outcomes is that the focus of future Ethiopia's sesame as well as agricultural products export trade should be strategized along the following guidelines from a marketing perspective:

- ✓ Like other developing countries both values and volumes of sesame export from Ethiopia is highly elastic with world price of sesame seed. From the finding we see that Ethiopia's export gain (value) is increase during the raise in export price of sesame seed in the international market but its volume is unaffected. This may be due to quality of the product, international competition and outside demand for Ethiopian sesame seed. In order to stimulate the sesame seed export when price is rise policy actions like more promotion about Ethiopia's sesame seed in the international market, promoting quality of the product internally, increasing export destinations of sesame seed should have to be taken.
- ✓ From the findings devaluation of currency or appreciation of real effective exchange rateboosts up values and volumes of sesame export in the long run. Therefore, as expected devaluation of currency and lowering domestic price of sesame seed is one of the policy implications for future trade enhancement of sesame seed.
- ✓ As our findings revealed domestic production of sesame seed favor both short run and long run values and volumes of sesame seed. Thus, a mechanism which enables to increase production of sesame should have to be facilitated.
- ✓ The impact of FDI on sesame export is significant in the long run, the sign is positive but the size is small. This indicates that the investment activity in sesame production is very

small, but if there are encouraging activities and more investment in the sector it will have a significant impact on promotion of value and volume of sesame seed export.

- ✓ Being open to trade (TOT) is also one of the policy implication in order to improve sesame seed export values and volume to the future.
- ✓ Here this study only focus on few determinants of sesame seed export but the other important demand and supply factors side factors were not included in the study. Demand side factors like world sesame production, destination countries propensity to import and capacity, distance of destination countries and supply side factors like road presence of infrastructure, agricultural inputs, land and yield of sesame and area of cultivated land expected to have a significant impact on sesame export trade of Ethiopia. So, we recommend future researcher who need to conduct further researches to deal with this factors. In addition we recommend also seeing the impact of sesame seed export on Ethiopian economic growth.

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APPENDIX

Table 11: Lag Length test for export volume model

VAR Lag Order Selection Criteria
Endogenous variables: LNEXPORTQUANTITY LNPRODUCTION LNEXPORTPRICE LNREER LNTOT FDI
Exogenous variables: C
Date: 05/24/16 Time: 22:51
Sample: 1970 2013
Included observations: 41

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-333.0458	NA	0.613615	16.53882	16.78958	16.63013
1	-183.9333	247.3084	0.002514	11.02114	12.77650*	11.66034*
2	-141.3286	58.19173*	0.002045*	10.69896	13.95892	11.88606
3	-100.5457	43.76708	0.002237	10.46564*	15.23021	12.20064

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Table 12: Cointegration test for export volume of sesame seed model

Included observations: 42 after adjustments
Trend assumption: Linear deterministic trend
Series: LNEXPORTQUANTITY LNPRODUCTION LNEXPORTPRICE LNREER LNTOT FDI
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.628626	106.8040	95.75366	0.0070
At most 1	0.431250	65.20106	69.81889	0.1105
At most 2	0.354070	41.49983	47.85613	0.1732
At most 3	0.302498	23.14315	29.79707	0.2391
At most 4	0.164232	8.012629	15.49471	0.4641
At most 5	0.011308	0.477659	3.841466	0.4895

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.628626	41.60295	40.07757	0.0334
At most 1	0.431250	23.70122	33.87687	0.4775
At most 2	0.354070	18.35669	27.58434	0.4657
At most 3	0.302498	15.13052	21.13162	0.2799
At most 4	0.164232	7.534969	14.26460	0.4279
At most 5	0.011308	0.477659	3.841466	0.4895

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 13: Granger Causality test for export value of sesame model

Pairwise Granger Causality Tests Sample: 1970 2013Lags: 1

Null Hypothesis:	Obs	F-Statistic	Probability
LNEXPORTPRICE does not Granger Cause LNEXPORTQUANTITY	43	0.47391	0.49517
LNEXPORTQUANTITY does not Granger Cause LNEXPORTPRICE		3.15371	0.08336
LNPRODUCTION does not Granger Cause LNEXPORTQUANTITY	43	0.10701	0.74527
LNEXPORTQUANTITY does not Granger Cause LNPRODUCTION		8.55599	0.00565
LNREER does not Granger Cause LNEXPORTQUANTITY	43	12.6601	0.00098
LNEXPORTQUANTITY does not Granger Cause LNREER		3.82287	0.05757
LNTOT does not Granger Cause LNEXPORTQUANTITY	43	0.46287	0.50020
LNEXPORTQUANTITY does not Granger Cause LNTOT		0.00011	0.99174

Table 14: Granger Causality test for export volume of sesame model

Pairwise Granger Causality Tests
Date: 05/24/16 Time: 10:35
Sample: 1970 2013

Lags: 1

Null Hypothesis:	Obs	F-Statistic	Probability
LNPRODUCTION does not Granger Cause LNEXPORTVALUE	43	0.16688	0.68507
LNEXPORTVALUE does not Granger Cause LNPRODUCTION		7.15485	0.01078
LNEXPORTPRICE does not Granger Cause LNEXPORTVALUE	43	0.02072	0.88627
LNEXPORTVALUE does not Granger Cause LNEXPORTPRICE		3.15371	0.08336
LNREER does not Granger Cause LNEXPORTVALUE	43	10.2302	0.00270
LNEXPORTVALUE does not Granger Cause LNREER		3.31781	0.07602
LNTOT does not Granger Cause LNEXPORTVALUE	43	0.24512	0.62324
LNEXPORTVALUE does not Granger Cause LNTOT		0.00380	0.95114

Table 15: White Heteroskedasticity Tests for export value model

VAR Residual Heteroskedasticity Tests: No Cross Terms
(only levels and squares)
Date: 05/24/16 Time: 23:25
Sample: 1970 2013
Included observations: 43

Joint test:

Chi-sq	Df	Prob.

Table 16: White Heteroskedasticity Tests for export volume model

VAR Residual Heteroskedasticity Tests: No Cross Terms (only levels and squares)
Date: 05/24/16 Time: 22:54
Sample: 1970 2013
Included observations: 43

Joint test:

Chi-sq	Df	Prob.
299.9453	252	0.0205

297.5877	252	0.0257

Table 17: Residual Serial correlation test for export value of sesame seed model

VAR Residual Serial Correlation LM Tests
H0: no serial correlation at lag order h
Date: 05/24/16 Time: 23:30
Sample: 1970 2013
Included observations: 43

Lags	LM-Stat	Prob
1	42.84142	0.2011
2	39.01347	0.3358
3	55.35958	0.0206
4	40.90528	0.2638
5	37.68706	0.3920
6	53.35463	0.0313
7	38.84917	0.3426
8	35.74687	0.4805
9	38.70101	0.3487
10	46.46218	0.1136
11	37.25259	0.4112
12	35.67872	0.4837

Probs from chi-square with 36 df.

Table 18: Residual Serial correlation test for export volume of sesame seed model

VAR Residual Serial Correlation LM Tests
H0: no serial correlation at lag order h
Date: 05/24/16 Time: 22:56
Sample: 1970 2013
Included observations: 43

Lags	LM-Stat	Prob
1	42.84142	0.2011
2	39.01347	0.3358
3	55.35958	0.0206
4	40.90527	0.2638
5	37.68707	0.3920
6	53.35463	0.0313

7	38.84917	0.3426
8	35.74686	0.4805
9	38.70101	0.3487
10	46.46219	0.1136
11	37.25259	0.4112
012	35.67871	0.4837

Probs from chi-square with 36 df.

Table 19: Residual normality test for export value of sesame seed

VEC Residual Normality Tests
Orthogonalization: Cholesky (Lutkepohl)
H0: residuals are multivariate normal
Date: 05/24/16 Time: 23:37
Sample: 1970 2013
Included observations: 42

Component	Skewness	Chi-sq	Df	Prob.
1	0.207522	0.301459	1	0.5830
2	0.281290	0.553869	1	0.4567
3	-0.063888	0.028571	1	0.8658
4	-0.492985	1.701239	1	0.1921
5	-0.167829	0.197167	1	0.6570
6	0.697180	3.402421	1	0.0651
Joint		6.184726	6	0.4028

Component	Kurtosis	Chi-sq	Df	Prob.
1	1.701271	2.951719	1	0.0858
2	1.563157	3.612907	1	0.0573
3	1.517505	3.846133	1	0.0499
4	2.855382	0.036600	1	0.8483
5	2.306096	0.842630	1	0.3586
6	2.943089	0.005668	1	0.9400
Joint		11.29566	6	0.0797

Component	Jarque-Bera	df	Prob.
1	3.253178	2	0.1966
2	4.166777	2	0.1245
3	3.874705	2	0.1441

4	1.737839	2	0.4194
5	1.039797	2	0.5946
6	3.408089	2	0.1819
Joint	17.48038	12	0.1324

Table20: Residual normality test for export volume of sesame seed

VEC Residual Normality Tests
Orthogonalization: Cholesky (Lutkepohl)
H0: residuals are multivariate normal
Date: 05/24/16 Time: 23:14
Sample: 1970 2013
Included observations: 42

Component	Skewness	Chi-sq	Df	Prob.
1	0.205865	0.296662	1	0.5860
2	0.410157	1.177601	1	0.2778
3	-0.067796	0.032175	1	0.8576
4	-0.492984	1.701235	1	0.1921
5	-0.167829	0.197167	1	0.6570
6	0.697180	3.402423	1	0.0651
Joint		6.807263	6	0.3390

Component	Kurtosis	Chi-sq	Df	Prob.
1	1.709288	2.915392	1	0.0877
2	1.604723	3.406896	1	0.0649
3	1.851356	2.308921	1	0.1286
4	2.855381	0.036601	1	0.8483
5	2.306096	0.842631	1	0.3586
6	2.943090	0.005668	1	0.9400
Joint		9.516109	6	0.1466

Component	Jarque-Bera	df	Prob.
1	3.212054	2	0.2007
2	4.584497	2	0.1010
3	2.341096	2	0.3102
4	1.737836	2	0.4194
5	1.039798	2	0.5946

6	3.408091	2	0.1819
Joint	16.32337	12	0.1769

Table 21: Residual Hetroskedasticity test for export value of sesame seed model

VEC Residual Heteroskedasticity Tests: No Cross Terms (only levels and squares)
Date: 05/24/16 Time: 23:41
Sample: 1970 2013
Included observations: 42

Joint test:

Chi-sq	Df	Prob.
319.9543	294	0.1428

Table 22: Residual Hetroskedasticity test for export volume of sesame seed model

VEC Residual Heteroskedasticity Tests: No Cross Terms (only levels and squares)
Date: 05/08/16 Time: 08:31
Sample: 1970 2013
Included observations: 42

Joint test:

Chi-sq	Df	Prob.
291.5314	294	0.5297

Figure 4: Stability test for export values of sesame seed model

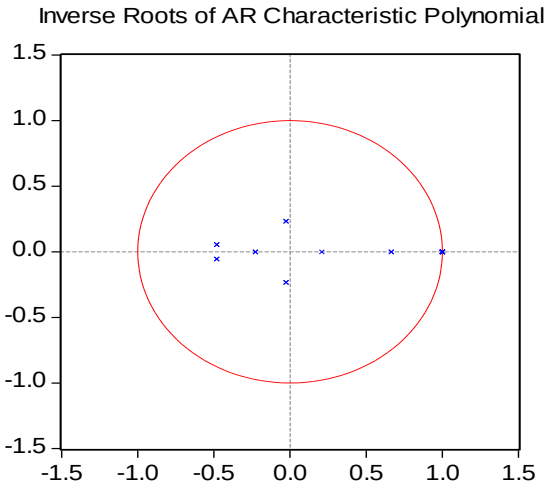

Figure 5: Figure: stability test for export values of sesame seed model

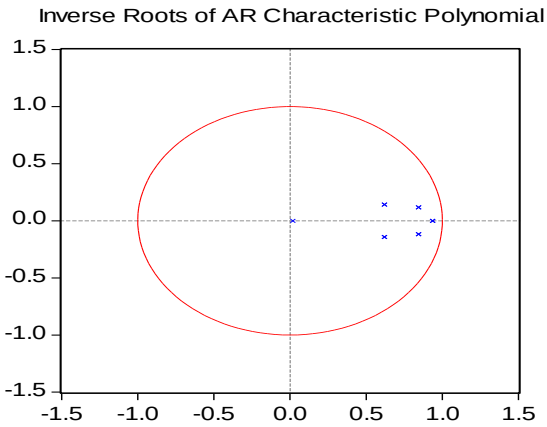

Figure 6: Normality test of the short run model of export volume